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The Laka library consists of about 8,000 books (of which a part is available as PDF), thousands of newspaper clippings, hundreds of magazines, posters, video's and other material.
Laka digitizes books and magazines from the international movement against nuclear power.

The catalogue of the Laka-library can be found at our website. The collection also contains a large number of digitized magazines from the Dutch anti-nuclear power movement and a video-section.

Laka plays with, amongst others things, its information services, an important role in the Dutch anti-nuclear movement.

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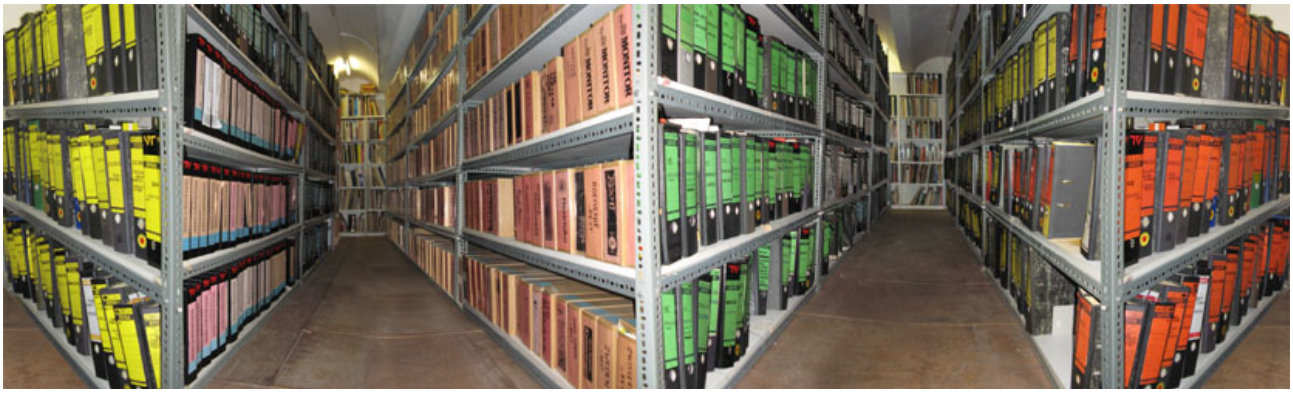

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LET THE FACTS SPEAK
AN INDICTMENT OF THE NUCLEAR INDUSTRY

This publication is a tribute and a follow up to the years of work carried out by retired Western Australian ALP Senator Ruth Coleman. Awareness Education subsequently carried out three years of research, detailing accidents to September 1990.

The next edition of Let the Facts Speak was published in June 1991, by the Office of Jo Vallentine, Senator for The Greens (WA). It was re-released in 2006 by Australian Greens Senator Rachel Siewert, and this fourth edition updates the chronology to 2012.

The electronic document and updates can be found at:

www.letthefactsspeak.org

Foreword by Jo Vallentine

The nuclear industry has been churning out poisons, power and bombs for over sixty years. So, far they haven't managed to figure how to deal with their waste. In this highly technological age, that is a huge failure.

Nor will the industry admit to its accidents, always portraying itself as cleaner than coal and less dangerous than other kinds of mining or toxic industries.

Wonderful foresight back in 1983 led ALP Senator Ruth Coleman to start documenting nuclear accidents as they occurred. We have in "Let the Facts Speak" an extraordinary record, showing how damaging this industry has been since its inception with the Manhattan Project in 1942.

But what's listed here is the bland reporting, just the facts of the accidents, not the human stories of the pain and suffering which many of those accidents have caused. There is no record here of the number of deaths caused by the 1986 Chernobyl disaster. These figures are highly contested due to the fact that in 1959 the World Health Organization signed a Memorandum of Understanding with the fledgling International Atomic Energy Agency to the effect that neither would comment on nuclear health issues without consulting the other (resolution WHA 12.40). So the very organisation which should be giving details about such accidents demurs from its international responsibilities for fear of upsetting its nuclear alliance partner. That is shameful.

The whole truth about nuclear accidents will never be fully exposed: this is a highly secretive industry, which has to be dragged, kicking and screaming to be open and transparent. It is a master of concealment and obfuscation. And it is an international cartel like no other. This is an industry with friends in high places, which works across international boundaries, at the expense of the world's safety. There have been many near misses with nuclear weapons, which are frightening to contemplate.

Since global warming seriously hit the international agenda, the nuclear industry has positioned itself as part of the solution to climate change. It brags of a nuclear "renaissance" which is more in the minds of its exponents than being a reality. The facts are that nuclear power is too expensive, too slow, too dirty and dangerous to be supported as the world struggles to move towards low-carbon economies. Nuclear power generation has always been a smokescreen for nuclear weapons development. The two aspects of the industry are inextricably linked: weapons proliferation is an intrinsic part of the nuclear chain, as is the use of so-called "depleted" uranium in weapons of current warfare.

"Let the Facts Speak" makes a significant contribution to the nuclear debate: citizens have a right to know the risks that their Governments are prepared to take on their behalf. Unfortunately, the tales of nuclear accidents is a never-ending story. just like the never-ending efforts to find a safe way to deal with radioactive waste over thousands of years.

Full commendation to Senator Scott Ludlam and his researchers for updating this important work.

Jo Vallentine

Chairperson of the Anti-Nuclear Alliance of Western Australia and former Senator for WA

Introduction by Scott Ludlam

In introducing a document of this kind, the first thing to note is that the text speaks for itself. This is not a work of analysis or opinion, but a straightforward chronology of accident, incompetence and disaster spanning seven decades.

The key unifying theme here is nuclear technology, roaring into modern history out of the blinding singularity that lit the sky over Hiroshima on August 6, 1945.

The twin industries of nuclear weapons and civil nuclear power hold a unique and forbidding place in our lives as the 20th century recedes and the forgotten struggles of the Cold War mutate into something more complex.

Nuclear weapons slumber uneasily in our mass subconscious, an amnesia broken by irregular and violent cameo appearances in popular culture. The hypnotic concept of a device small enough to fit in the boot of a sedan and capable of instantly obliterating a whole city will be with us as long as we give our collective consent to their continued existence.

A vast multinational endeavour of atomic weapons design, maintenance and deployment grinds away far from the headlines, born out of the terribly flawed Cold War doctrine of mutually assured destruction. It is a work of calculated, unthinkable institutional violence all the more terrible for the way in which its existence has been sublimated and largely forgotten.

The enrichment plants and atomic reactors which gifted Manhattan Project scientists and engineers with their first precious traces of highly enriched uranium and Plutonium 239 have taken a different path since the first white flash sent shadows fleeing across the desert of New Mexico in 1945.

The formative weapons plants producing the world's first fissionable material also shed colossal amounts of heat in operation. It took the US Navy to realise such a compact and energy-rich power plant could form the heart of nuclear powered submarines which could prowl the world's oceans for months without needing to refuel.

From there the race was on to engineer these plants to utility scale for electricity 'too cheap to meter'. A few hundred tonnes of fissioning uranium would take the place of millions of tonnes of coal at the heart of steam generating power stations, and humankind would face a kind of liberation from the earthly constraints of energy poverty.

We shouldn't underestimate the genuine intent of the policy makers and engineers determined to substitute horrific afterimages of mushroom clouds boiling into the stratosphere with something more benign: atoms for peace, an energy source big enough to fire the optimism of post-war industrialisation. While military planners knew full well that development of civil nuclear power would happily call forth identical industrial capacity to undertake a weapons programme, many saw the potential of an unlimited energy source that would free us from the 19th century fossil economy and eventually lift us into space.

This manual documents the fracturing and ultimate failure of this hopeful vision. It is a story of an unforgiving technology which never lived up to expectations but instead bequeathed a daunting legacy which will be with us for many generations.

Three Mile Island, Chernobyl and Fukushima are familiar names to us now. But how many have heard of the fire at Narora, the horrific blast at Chelyabinsk, the ongoing and deadly gamble of Rokkasho? If this manual can play even a tiny part in blowing away the mythology of a benign and proven climate saving technology, if it can turn even one critical thinker away from the seductive mythology of civil nuclear power, it will have been worth it.

We owe a debt of gratitude to all those who have documented the accidents and crimes committed within these pages, those who came before, took a hard look at the reality of the nuclear industry, and chose not to look away.

As I write this, the campaign to ramp up uranium mining and introduce nuclear power to Australia is in full effect, blanketing editorial pages and filling conference venues. While the Australian Uranium Association cranks out glossy brochures with a strange desperation, the volcanic wreckage of four reactors at Fukushima Daiichi still smoulder a year on. More than 150,000 radiation refugees have fled the world's newest nuclear sacrifice zone. 3% of Japan is now uninhabitable.

The impossible economics of domestic nuclear power will hopefully do some of the work in cooling pronuclear ardour in Australia, but it is the human story that most needs to be told.

We will not allow the terrible human and environmental costs of this flawed and obsolete technology to be forgotten. Everywhere this industry touches down it leaves an imprint of misery and injury, and everywhere it goes it is challenged and fought.

If each of us is called on to choose a side in the coming contest over nuclear energy on a warming planet, then at the very least, let the facts speak.

Scott Ludlam

Australian Greens Senator for WA
Fremantle, March 2012

Notes on the database

Date abbreviations are in this format: Day / Month / Year

Glossaries of technical nuclear terms are available online
e.g. www.nrc.gov/reading-rm/basic-ref/glossary.html

Numerous entries are taken from the News Communiques of the World Information Service on Energy (WISE), which merged with the NIRS Nuclear Monitor in 2001. These publications are posted online at www10.antenna.nl/wise/ncidx.html

Accident categories


Nuclear power plants and fuel fabrication plants


Nuclear weapons including weapons production plants


Security threats − terrorism, smuggling, sabotage, theft


Research facilities including research reactors and experimental reactors


Waste including spent nuclear fuel reprocessing


Uranium mining, milling, conversion, enrichment


Transport


Nuclear-powered or nuclear-armed vessels


Medical facilities or procedures

the 1940s

1945, February 11

LOS ALAMOS, NEW MEXICO, USA

Criticality accident − The Dragon assembly; UH3 pressed in styrex; single excursion; insignificant/zero exposures. During an experiment in this reactor, the core material was damaged but no active material was lost, there was no contamination, and no one received any radiation.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1945, June 6

LOS ALAMOS, NEW MEXICO, USA

Criticality accident (moderated metal or oxide systems) − Pseudosphere of uranium cubes; water reflected; single excursion; three significant exposures. The June 6 experiment, designed before the days of remote control, was intended to establish the critical mass of enriched uranium metal surrounded by hydrogenous material. The assembly became critical before expected and the situation was aggravated because no scram (automatic shut-down) device was built into the system.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1945, August 21

LOS ALAMOS, NEW MEXICO, USA

Criticality accident in metal assembly − Plutonium core reflected with tungsten carbide; single excursion; one fatality, one significant exposure. A critical assembly was being created by hand stacking 4.4 kg tungsten carbide bricks around the plutonium core. The lone experimenter was moving the final brick over the assembly when he noticed from the nearby neutron counters that the addition of this brick would make the assembly supercritical. As he withdrew his hand, the brick slipped and fell onto the centre of the assembly, adding sufficient reflection to make the system superprompt critical. A power excursion occurred. He quickly pushed off the final brick and proceeded to unstack the assembly. His dose was estimated as 510 rem (5,100 mSv). He died 28 days later. An Army guard assigned to the building, but not helping with the experiment, received a radiation dose of approximately 50 rem (500 mSv).

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1946, May 21

LOS ALAMOS SCIENTIFIC LABORATORY, USA

Criticality accident in metal assembly − Plutonium core reflected with beryllium; one fatality, seven significant exposures. The techniques involved in creating a metal critical assembly were being demonstrated to several people when a criticality accident occurred. The eight people in the room received doses ranging from 37−2100 rem (370 to 21,000 mSv). The man who performed the experiment died nine days later.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1947, October

USA, ATLANTIC OCEAN

A retired navy pilot Lieutenant-Commander George Earl IV has claimed that he dumped radioactive waste off the Atlantic seaboard on three flights in 1947. Lt-Commander Earl said he disclosed the radioactive dumping because of the U.S. Governments apparent lack of concern over the possibility of the canisters leaking.

West Australian - 3 January 1981

1949−96

USA

From 1949 to 1970, 14 incidents involving spent nuclear fuel shipments were reported in a series of U.S. Atomic Energy Commission reports. They were either traffic accidents with no releases or non-traffic accident events with minor leaks suspected from the casks which resulted in small amounts of observed contamination. From 1971 to present, 58 incidents have been reported in the Radioactive Material Incident Report database operated by Sandia National Laboratories. 49 of the 58 incidents involve minor surface contamination.

www.state.nv.us/nucwaste/trans/nucinc01.htm

1949, December

LOS ALAMOS, NEW MEXICO, USA

Criticality accident in fissile solution − Water boiler reactor; control rods removed by hand; single excursion; insignificant exposure.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

Late 1940s or early 1950s

CHALK RIVER LABORATORY, USA

Criticality accident (moderated metal or oxide systems) − ZEEP assembly; single excursion; three significant exposures. Two physicists were working on the top of the research reactor. A technician raising the water level in the reactor with the pump control had instructions to stop at a predetermined water level. One of the physicists asked the technician to bring a tool to the top of the reactor. Not wanting to lose time and in direct contravention of instructions, the technician inserted a chip of wood into the pump control button so the timer would reset each time it ran out. He then went to the reactor top and became involved in the work being done there, while the heavy water level continued to rise. The reactor became critical and scrammed as designed. The three people on the reactor top each received doses in excess of the quarterly permissible limit and, perhaps, above the annual limit. (A different version of the same accident − or it may have been a separate accident − is provided in the second of the websites listed below.)

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

http://media.cns-snc.ca/history/ZEEP/ZEEP_CNSBulletin_Fall1995.html

the 1950s

1950

NORTHWEST AUSTRALIA

Heavy rainfall breached the earth wall of a uranium mine's tailings dam in northern Australia and radioactive material was released into surrounding water systems. To date details are still secret. The mine was connected with the British and U.S. nuclear weapons programs.

AAP/AP, West Australian - 11 January 1980

1950-1977

WINDSCALE, U.K.

Between 1950 and mid-1977, there were 194 accidents at Windscale (now called Sellafield), eleven involving fires and explosions. Forty-five released plutonium.

Nucleus - 25 July 1979, p.17; The New Ecologist - March/April 1978

1950, February 13

PACIFIC OCEAN, USA

A B-36 which developed serious mechanical difficulties on a simulated combat mission, dropped a nuclear weapon from 8,000 ft. over the Pacific Ocean before crashing. Luckily only the weapon's explosive material detonated. Nothing is known of attempts to recover the nuclear weapon and presumably it is still in the ocean.

The Defence Monitor Vol.X No.5 1981 Washington D.C.; National Times - 15 March 1981

1950, April 11

NEW MEXICO, USA

A B-29 crashed into a mountain on Manzano Base approximately three minutes after take-off. The bomb case was demolished and some high explosive material burned. The nuclear components of the weapon were recovered and returned to the Atomic Energy Commission.

The Defence Monitor - Vol.X No.5 19981 Washington D.C.; National Times - 15 March 1981

1950, July 13

OHIO, USA

A B-50 on a training mission crashed killing 16 crewmen. The high explosive portion of the nuclear weapon aboard detonated on impact (but there was no nuclear explosion).

The Defence Monitor - Vol.X No.5 1981 Washington D.C.; National Times - 15 March 1981

1950, August 5

CALIFORNIA, USA

A B-29 carrying a nuclear weapon crashed on take-off and the high explosive material detonated.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.; National Times - 15 March 1981

1950, November 10

USA

Due to an in-flight aircraft emergency, a weapon containing a capsule of nuclear material was jettisoned over water from an altitude of 10,500 feet. A high-explosive detonation was observed. No specific location was reported.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.

1950, December

CHALK RIVER, CANADA

A worker named Stephen Whelan died when a container of ammonium nitrate exploded in a plutonium separation plant at the Chalk River nuclear site.

www.nuclearfaq.ca/cnf_sectionD.htm#x

1951-1963

NUCLEAR TESTS, NEVADA USA

Martha B. Laird's husband and son developed leukaemia. The son died and other children developed rashes and the burns to the eyes.

'During this time, our cows got white spots on them and developed cancer eyes.' Mrs. Laird wrote to the Government. 'One letter came back saying I was Communistically inspired.' Another said: 'Persons in fallout path were a small sacrifice.'

The Herald - 24 April 1979

1951, February 1

LOS ALAMOS SCIENTIFIC LABORATORY, USA

Criticality accident in metal assembly − Critical separation experiment, two large uranium-235 metal masses in water; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1951, November 16

HANFORD WORKS, USA

Criticality accident in fissile solution − Plutonium solution assembly; cadmium rod removed too rapidly; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1952, April 18

LOS ALAMOS, NEW MEXICO, USA

Criticality accident in metal assembly − Jemima, cylindrical, unreflected uranium-235 metal assembly; excursion history unknown; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1952, June 2

ARGONNE NATIONAL LABORATORY, USA

Criticality accident (moderated metal or oxide systems) − UO2 particles in plastic; water moderated; single excursion; 4 significant exposures. This accident occurred in a light water moderated core. The experiment in progress at the time of the accident consisted of making comparisons of the worth of central control rods of different design. The system became superprompt critical following an attempt (contrary to operating procedures) to replace the central control rod when the normal amount of water was in the core. Peripheral poison rods were in position but were inadequate to prevent criticality.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1952, December 12

CHALK RIVER LABORATORY, AECL, CANADA

A power surge and partial loss of coolant in the NRX reactor (used for research and weapons production) resulted in significant damage to the core. The control rods could not be lowered into the core, because of mechanical problems and human errors. The core and fuel element support structure were damaged beyond repair as a result of core meltdown and explosions. Some 10,000 Curies (370 TBq) of long-lived fission products were carried to the basement by a flood of one million gallons of cooling water. Future US President Jimmy Carter was among the hundreds of people involved in the clean-up. No one died or was seriously injured as an immediate result of the accident. Some people were exposed to high radiation levels. A 1982 study estimated that people involved in the clean-up were exposed to a total of 20.21 Sv (a level of exposure which suggests the incident may have led to one cancer death).

http://media.cns-snc.ca/history/nrx.html

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

http://en.wikipedia.org/wiki/Chalk_River_Laboratories

www.ccnr.org/paulson_legacy.html

www.nuclearfaq.ca/cnf_sectionD.htm#x

1953, March 15

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Plutonium nitrate solution in an interim storage vessel; single excursion; one serious exposure, one significant exposure.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1953, April 9

SAROV (ARZAMAS-16), USSR

Criticality accident in metal assembly − Plutonium, natural uranium reflected, assembly; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1954, February 3

LOS ALAMOS, NEW MEXICO, USA

Criticality accident in metal assembly − Lady Godiva reactor; bare uranium-235 sphere; control rod incorrectly operated; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1954, May 26

OAK RIDGE NATIONAL LABORATORY, USA

Criticality accident in fissile solution − Uranium solution assembly, central poison cylinder tilted from proper position; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1954, July 22

NATIONAL REACTOR TESTING STATION, IDAHO, USA

Criticality accident (moderated metal or oxide systems) − BORAX reactor, aluminium uranium alloy, water moderated; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1954, September 14

TOTSKOYE TESTING RANGE, USSR

Approximately 45,000 Soviet soldiers and officers were deliberately exposed to radiation from a nuclear bomb test explosion. The bomb exploded 1,200 feet above Totskoye testing range near the provincial town of Orenburg. The military personnel were not issued any protective gear. Moments after the blast, 600 tanks, 600 armoured personnel carriers and 320 planes were ordered to move forward to the epicentre in order to stage a mock battle. The experiment was designed to test the performance of military hardware and soldiers in the event of a nuclear war.

http://en.wikipedia.org/wiki/Totskoye_range_nuclear_tests

1955, November 29

IDAHO FALLS EBR-1, USA

Design of the EBR-1 fast neutron reactor was started in 1948 with the objectives of establishing possible breeding values and demonstrating the feasibility of cooling a metal fueled reactor with liquid metals. An experiment on 29 November 1955 resulted in accidental melting of nearly half the core of the reactor, and vaporised NaK forced some of the molten alloy into the reflector. During this accident no-one received more than trivial radiation from airborne fission products.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1956, February 1

OAK RIDGE NATIONAL LABORATORY, USA

Criticality accident in fissile solution − Uranium solution assembly; wave motion created by falling cadmium sheet; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1956, March 10

USA, MEDITERRANEAN SEA

A B-47 carrying 'two capsules of nuclear weapons material' from MacDill Air Force Base to an overseas base disappeared in clouds. 'An extensive search failed to locate any traces of the missing aircraft or crew'. A nuclear detonation was not possible.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.; National Times - 15 March 1981

1956, July 3

LOS ALAMOS SCIENTIFIC LABORATORY

Criticality accident − Honeycomb critical assembly; highly-enriched uranium (93%) metal foils moderated with graphite; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1956, July 26

USA AND ENGLAND

An American B-47 with weapons aboard crashed into a storage igloo in the UK containing several nuclear weapons. The bombs did not burn or detonate. The crash occurred when a B-47 bomber skidded on the runway and burst into flames. Blazing jet fumes gushed towards a shelter housing three nuclear bombs.

The Age' 10 August 1981; The Defence Monitor - Vol.X No.5 1981 Washington D.C.; 'The National Times.- 15 March 1981

1957, February 12

LOS ALAMOS, NEW MEXICO, USA

Criticality accident in metal assembly − Lady Godiva reactor; bare uranium-235 sphere; added reflection; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1957, April 21

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Uranium precipitate, 90% enriched uranium, build-up in a filtrate receiving vessel; excursion history unknown; one fatality, 10 other significant exposures. The accident occurred in a glovebox assembly within which uranium solution was

precipitated into vessels. For several reasons, an unexpectedly large amount of uranium precipitate accumulated in a filter receiving vessel. The operator at the glovebox observed the filter vessel to bulge prior to ejection of gas and some solution and precipitate from the vessel within the glovebox. The operator gathered some precipitate by (gloved) hand and returned it to the vessel; within seconds she began to feel ill. It was not recognised that a criticality excursion had occurred until the radiation control officer made measurements 15-20 minutes later. The operator received a whole body dose of 3,000 rad or 4,600 rad, developed nausea, vomiting, headache, and fatigue within 20-30 minutes, and died 12 days later. The other five operators in the room at the time received doses over 300 rad, and five other individuals sustained doses up to 100 rad; the five operators developed radiation sickness (one report suggests all ten did). All ten (3 male, 7 female) recovered.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

www.johnstonsarchive.net/nuclear/radevents/1957USSR1.html

1957, May 22

NEW MEXICO, USA

A B-36 ferrying a nuclear weapon from Biggs Air Force Base, Texas to Kirtland accidentally discharged a bomb in the New Mexico desert. The high explosive material detonated, completely destroying the weapon and making a crater approximately 25 ft in diameter and 12 ft deep. Radiological survey of the area disclosed no radioactivity beyond the lip of the crater at which point the level was 0.5 milliroentgens. Both the weapon and capsule were on board the aircraft but the capsule was not inserted for safety reasons − thus preventing a nuclear detonation.

The Defence Monitor Vol.X No.5 1981 Washington D.C.; National Times - 15 March 1981

1957, July 28

USA, ATLANTIC OCEAN

A C-124 aircraft en-route from Dover Air Force Base, Delaware, lost power in two engines and jettisoned two nuclear weapons over the ocean. 'No detonation occurred from either weapon'. The weapons were never found.

The Defence Monitor Vol.X No.6 1981 Washington D.C.; National Times - 15 March 1981

1957, September 29

CHELYABINSK, USSR

This explosion of a liquid high-level nuclear waste tank led to a 'significant release of radioactive material to the environment' according to the International Atomic Energy Agency. It was rated Level 6 ('serious accident') on the 7-point International Nuclear Event Scale.

The event occurred at the Ozyorsk/Mayak nuclear plant (also known as Chelyabinsk) near the town of Kyshtym. Following removal of plutonium, liquid high-level wastes were stored in underground steel tanks in concrete trenches, surrounded by coolers. Failure to repair a cooling system in one of the tanks led to an increase in temperature and eventually − after about one year − to a chemical explosion. The design of the cooling system did not allow for repair in the event of damage. A concrete lid weighing 145 tonnes was thrown into the air and the explosion released about 60-70 tonnes of nuclear wastes.

The contamination was 'very serious' according to Soviet scientists. The total release was of the order of 740,000 terabecquerels (20 megacuries) with about 90% deposited in the immediate area and 10% widely dispersed. The accident resulted in long-term contamination of more than 800 sq kms, primarily with caesium-137 and strontium-90; this area is referred to as the East-Ural Radioactive Trace.

Over 10,000 people were evacuated in the 18 months following the accident. Over 1,000 sq kms of land in Chelyabinsk province and Sverdlovsk province were removed from agricultural use. Soviet scientists noted that clean-up measures were 'inadequately effective' and produced 'comparatively poor results'. Nevertheless, all but 220 sq kms were returned to agricultural use between 1961 and 1978.

The accident was shrouded in secrecy as Chelyabinsk was a secret military site and not marked on maps. It was not until 1976 that the disaster was officially acknowledged.

It is estimated that direct exposure to radiation from the accident caused at least 200 long-term cancer deaths − although other estimates put the figure significantly higher and others significantly lower.

Over 50 years after the disaster, victims are continuing with their political and legal battle for proper compensation. 'They are paying us huge,' a Chelyabinsk liquidator said (ironically) at a 2008 protest. 'We receive a rouble daily allowance. At a security firm, a guard dog can count on 80 roubles a day.'

Victims are also leading a fight to prevent the construction of a reactor in the area. They said in a 2008 statement: 'As all of the problems that have come about as a result of he 1957 accident have not been solved, as long as Mayak continues to experience accidents, as long as children suffer and their children and their children are ill, it is nor even worth thinking about the construction of a new radioactively dangerous installation.'

http://www.bellona.org/articles/articles_2008/kyshtym_memorial

www.iaea.org/Publications/Documents/Infcircs/Others/inf368.shtml

www.johnstonsarchive.net/nuclear/radevents/1957USSR1.html

'Soviets Tell About Nuclear Plant Disaster; 1957 Reactor Mishap May Be Worst Ever', 'The Washington Post', R. Jeffrey Smith, 10 July 1989

http://en.wikipedia.org/wiki/Kyshtym_disaster

http://www.fas.org/news/russia/1995/fbust037_95011.htm

http://www.iaea.org/Publications/Factsheets/English/ines.pdf

1957, October 10

WINDSCALE NO. 1, U.K.

A fire in one of the graphite-moderated, air-cooled reactors at Windscale burned for 16 hours, releasing substantial radioactive contamination. Only a day before, plutonium from the Windscale site had been used in the last of the 12 nuclear bomb tests carried out by the British government in Australia.

The reactor was being operated beyond its design limits in order to produce tritium for nuclear weapons. Operators responded to an increase in the temperature of the reactor core by increasing airflow − but this fed more oxygen to the fire and fanned the flames. Water was pumped into the reactor and the crisis was slowly brought under control.

The reactor was beyond repair and was never used again. The accident is classified as Level 5 ('accident with off-site risk') on the 7-point International Nuclear Event Scale.

Bans on milk consumption were imposed for six weeks after the fire, extending over an area of about 500 sq kms.

Radioactive contamination from the fire was detected as far away as south-east England and even on mainland Europe. A canister of polonium-210 burned in the fire and contributed significantly to the off-site radiation release.

Estimates of non-fatal cancers vary from none to 248 and for fatal cancers between 10 and 100 (and the death toll may be still higher because of the polonium-210 release). The fire released an estimated 740 terabecquerels of iodine-131, 22 TBq of caesium-137 and 12,000 TBq of xenon-133, along with other radionuclides.

Windscale: A nuclear disaster:
http://news.bbc.co.uk/2/hi/science/nature/7030281.stm

Windscale fallout underestimated:
http://news.bbc.co.uk/2/hi/science/nature/7030536.stm

1957 Board of Enquiry Report:
http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/05_10_07_ukaea.pdf

'Contaminated evidence':
http://society.guardian.co.uk/societyguardian/story/0,,2186910,00.html

1957, October 11

FLORIDA, USA

A B-47 crashed shortly after take-off with a nuclear weapon and a nuclear capsule on board. 'Two low order detonations occurred during the burning' (but they were not nuclear detonations).

The National Times' - 15 March 1981

1958, January 2

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Uranyl nitrate solution, 90% enriched uranium, in an experiment vessel; one prompt critical burst; three fatalities plus one serious exposure.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1958, January 31

USA, OVERSEAS BASE

A B-47 crashed and burned during take-off with one nuclear weapon in 'strike configuration' There was 'some contamination' in the immediate area of the crash.

National Times - 15 March 1981

1958, February 5

GEORGIA, USA

Midair collision between an F-86 aircraft and a B-47 on a simulated combat mission out of Homestead Air Force Base, Florida. The B-47 jettisoned the nuclear weapon, which was not found.

National Times - 15th March 1981

1958, March 11

SOUTH CAROLINA, USA

A B-47 left Hunter Air Force Base, Georgia with three other B-47s en route to an overseas base. The aircraft accidentally jettisoned an unarmed nuclear weapon which impacted in a sparsely populated area 10 kms east of Florence, South Carolina. The bomb's high explosive material exploded on impact (but there was no nuclear detonation)

National Times - 15th March 1981

1958, May 24

CHALK RIVER, CANADA

A damaged fuel rod caught fire and was torn in two as it was removed from the 200 MW NRU research reactor which was in its first year of operation. At the time the reactor was shut down and undergoing an operation to remove failed fuel from its core. While being removed the failed fuel rod did not receive adequate cooling and began burning. The fuel also broke apart, leaving one section in the bottom of the reactor and another section stuck in the transfer flask. As the transfer flask moved across the reactor bridge towards the fuel storage area beside the reactor, a one-metre section of the stuck fuel rod dropped from the flask into a maintenance pit on the bridge, where it continued to burn.

The fire was extinguished relatively quickly (about 15 minutes), but not before it had significantly contaminated the inside of the NRU building and an area (approximately 0.4 square km) of the Chalk River site. Extinguishing the fire was distinctly low-tech − a relay team running past the radioactive fire dumping buckets of wet sand on the burning uranium fuel.

In 2007, the Canadian Government announced it would pay up to $24,000 to each person who was involved in the clean-up or in the testing of nuclear weapons in the Cold War. In 2009, retired military personnel who were exposed to radiation during the clean-up, as well as their surviving dependents, filed a class-action lawsuit against Atomic Energy and the defence minister.

www.nuclearfaq.ca/cnf_sectionD.htm#nru1958

www.ccnr.org/paulson_legacy.html

1958, June 16

OAK RIDGE Y-12 PLANT, USA

Criticality process accident − Uranyl nitrate solution, 93% enriched uranium, in a water collection drum; multiple excursions; seven significant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1958, October 15

BORIS KIDRICH INSTITUTE, VINCA, YUGOSLAVIA

Criticality accident (moderated metal or oxide systems) − Unreflected, D2O moderated, natural uranium assembly, unshielded. Nuclear research reactor accident. Six scientists were heavily irradiated − one died, five recovered after severe radiation sickness. The five survivors all received experimental bone marrow transplants, which were rejected in all patients.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf
www.johnstonsarchive.net/nuclear/radevents/1958YUG1.html

1958, November 4

TEXAS, USA

B-47 caught fire on take-off and crashed. The high explosive in the nuclear weapon on board exploded leaving 'a crater 35 ft in diameter and 6 ft deep'. Nuclear materials were recovered near the crash site.

Defence Monitor - Vol.X No.5 1981 Washington D.C.; 'The National Times', 15 March 1981

1958, November 18

NATIONAL REACTOR TESTING STATION, IDAHO, USA

Criticality accident − HTRE Reactor; instrumentation failure; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1958, December 30

LOS ALAMOS SCIENTIFIC LABORATORY, USA

Criticality process accident − Plutonium organic solution in an organic treatment tank; single excursion; one fatality, two significant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1958-1959

COLORADO, USA

Animas River near uranium mills at Darango, Colorado measured three times safe maximum daily level for radium. Crops on farms in area irrigated by river had twice the radioactivity of other crops.

'Nucleus' - 25 July 1979 p.11

1959, July 6

LOUSIANA, USA

A C-124 crashed on take-off. The aircraft was destroyed by fire which also destroyed one weapon. Limited contamination was present over a small area.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.; National Times - 15 March 1981

1959, July 12−26

SIMI VALLEY, CALIFORNIA, USA

The Sodium Reactor Experiment was a pioneering nuclear power plant built by Atomics International at the Santa Susana Field Laboratory, nearby Simi Valley, California. The purpose was to demonstrate the feasibility of a sodium-cooled reactor as a heat source for a commercial power reactor to produce electricity. A secondary objective was to obtain operational data on slightly enriched fuel and uranium thorium fuel mixtures. The reactor operated from 1957 to 1964 and supplied power to the grid at times. In July 1959, the reactor suffered a serious incident in which the reactor core was damaged causing the releases of radioactive gas to the atmosphere − the extent of those releases is contested.

http://en.wikipedia.org/wiki/Sodium_Reactor_Experiment

1959, October 15

KENTUCKY, USA

A B-52 and KC-135 operating out of Columbia Air Force Base, Mississippi, collided during refuelling. Two unarmed nuclear weapons were recovered undamaged.

National Times - 15 March 1981

1959, October 16

IDAHO CHEMICAL PROCESSING PLANT, USA

Criticality process accident − Uranyl nitrate solution, 91% enriched uranium, in a waste receiving tank; multiple excursions; two significant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

the 1960s

1960, March 15

CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE

Criticality accident (moderated metal or oxide systems) − UO2 rods, water moderated and reflected, assembly; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1960, June 7

NEW JERSEY, USA

A Bomarc air defense missile in ready storage condition (permitting launch in two minutes) was destroyed by an explosion and fire. The warhead was also destroyed by the fire although the high explosive did not detonate. 'Contamination was restricted to an area... approximately 100 ft long.'

National Times - 15 March 1981

1960, June 17

LOS ALAMOS, NEW MEXICO, USA

Criticality accident in metal assembly − uranium-235 metal, graphite reflected, assembly; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1960, December 5

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Plutonium carbonate solution in a holding vessel; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1961, January 3

NATIONAL REACTOR TESTING STATION, IDAHO, USA

Criticality accident (moderated metal or oxide systems) − SL–1 reactor; aluminium uranium alloy; water moderated; single excursion; three fatalities. An explosion occurred after a control rod was removed too far. Three men were killed instantly. Rescuers received high radiation doses and it took years to disassemble the wrecked plant.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1961, January 24

GOLDSBORO, NORTH CAROLINA, USA

A B-52 crashed during an airborne alert mission and dropped two nuclear weapons near Goldsboro, North Carolina. A portion of one weapon containing uranium could not be recovered despite excavation in the waterlogged farmland to a depth of 50 feet. The Department of Defence summary does not mention the fact that five of six interlocking safety triggers on the bomb failed. 'Only a single switch', reported Dr Ralph Lapp, head of the nuclear physics branch of the Office of Naval Research, 'prevented the 24-megaton bomb from detonating and spreading fire over a wide area'.

National Times - 15 March 1981

1961, January 25

IDAHO CHEMICAL PROCESSING PLANT, USA

Criticality process accident − Uranyl nitrate solution, 90% enriched uranium, in a vapour disengagement vessel; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1961, March 14

CALIFORNIA, USA

A B-52 carrying two nuclear weapons crashed. The high explosive did not detonate. No nuclear contamination.

National Times - 15 March 1981

1961, July 14

SIBERIAN CHEMICAL COMBINE, USSR

Criticality process accident − Uranium hexafluoride, 22.6% enriched uranium, accumulation in a vacuum pump oil reservoir; two excursions; one significant exposure.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1961 September

WASHINGTON, USA

Robert McNamara, U.S. Defence Secretary under Presidents Kennedy and Johnson, said the US and USSR. were close to war in 1967 at the time of the Middle East War. He also said a nuclear bomb almost exploded in 1961 when a B-52 crashed (see above entry).

Daily News 15 September 1983

1961, November 10

OAK RIDGE NATIONAL LABORATORY, USA

Criticality accident in metal assembly − uranium-235 metal, paraffin reflected, assembly; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1962, April 7

HANFORD WORKS, USA

Criticality process accident − Plutonium solution in a transfer vessel; multiple excursions; three significant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1962, September 7

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Plutonium nitrate solution in a dissolution vessel; three excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1962, November 5

NATIONAL REACTOR TESTING STATION, IDAHO, USA

Criticality accident (moderated metal or oxide systems) − Assembly of spent fuel elements; single non-nuclear excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1962, December 11

LOS ALAMOS SCIENTIFIC LABORATORY

Criticality accident − Zepo critical assembly; uranium-235 foils, graphite moderated; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1963

CALDER HILL NUCLEAR REACTOR, U.K.

Turbine failure resulted from inability to locate a piece of steel shot which should have been visible to the naked eye in the steam lines.

Charles Wakstein, 'The Myth of Nuclear Safety,' The Ecologist, 7/1977

1963, January 30

SIBERIAN CHEMICAL COMBINE, USSR

Criticality process accident − Uranyl nitrate solution, 90% enriched uranium, in a collection vessel; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1963, March 11

SAROV (ARZAMAS-16), USSR

Criticality accident in metal assembly − Plutonium, lithium deuteride reflected assembly; inadvertent closure; single excursion; two serious exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1963, March 26

LAWRENCE LIVERMORE LABORATORY, USA

Criticality accident in metal assembly − uranium-235 metal, beryllium reflected, assembly; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1963, April

NUCLEAR SUBMARINE, USA

Submarine disappeared on a deep test dive; 112 navy men and 17 civilians on board. From 1963−1976, 32 accidents and incidents involving nuclear submarines were reported.

S.I.P.R.I. Year Book, 1977, p.6

1963, November 13

TEXAS, USA

An explosion involving 123,000 lbs of high explosive components of nuclear weapons caused minor injuries to three US Atomic Energy Commission employees. There was little contamination from the nuclear components stored elsewhere in the building. The components were from obsolete weapons being disassembled.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.

1963, December 2

SIBERIAN CHEMICAL COMBINE, USSR

Criticality process accident − Uranium organic solution, 90% enriched uranium, in a vacuum system holding vessel; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1945-1963

WORLDWIDE

Austrian engineer Erich N. Schulz notes that from 1945−1963 there were more than 1,000 accidents in the nuclear industry.

Vorkomnisse and Strahlenung Falls in Kerntechnischen Anlagen' K. Thiemig ed 1966 Munich.

1964

SHIPPING PORT, PITTSBURGH, PENNSYLVANIA, USA

Inadequately designed steam generators were installed, but the pipes to them could not carry the new load. As a result 'hangers' were installed to hold the pipes. The hangers broke and fortunately a worker noticed the sagging pipes. At risk was a loss-of-coolant accident.

R.E. Webb, 1976, 'The accident hazards of nuclear power plants', University of Massachusetts Press, p.192

1964

WOOD RIVER, USA

The accident occurred at a facility which reprocessed for recovery highly enriched uranium in scrap material from fuel element production. A tank containing uranium (93% U-235) in sodium carbonate solution was being agitated by a stirrer. A worker, intending to add a bottle of trichloroethane to remove organics, erroneously added a bottle of uranium solution to the tank, producing a criticality excursion accompanied by a flash of light and the splashing of about 20% of the tank's contents (about 10 litres out of 40-50 litres, including the bottle contents) out of the tank. The worker fled to the site's emergency building. Two plant administrators returned to the building; one turned off the agitator, producing a lesser criticality excursion that was not recognised until their dosimeters were examined. The administrators incurred doses of 100 rads and 60 rads. The worker absorbed about 10,000 rads and died 49 hours after the accident.

www.johnstonsarchive.net/nuclear/radevents/1964USA1.html

1964, January 13

MARYLAND, USA

A B-52D, en route from Westover Air Force Base, Massachusetts, to its home base at Turner Air Force Base, Georgia, crashed with two unarmed nuclear weapons on board, which were recovered 'relatively intact'.

National Times - 15 March 1981

1964, July 24

UNITED NUCLEAR FUELS RECOVERY PLANT, USA

Criticality process accident − Uranyl nitrate solution, 93% enriched uranium, in a carbonate reagent makeup vessel; two excursions; one fatality, two significant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1964, December 5

SOUTH DAKOTA, USA

An LGM 30B Minuteman 1 missile was on strategic alert when a 'retrorocket' accidentally fired during repairs. There was considerable damage but 'no detonation or radioactive contamination'.

National Times - 15 March 1981.

1964, December 8

BUNKER HILL AFB., INDIANA, USA

A B-58 crashed while preparing for take-off on an icy runway at Bunker Hill Air Force Base, Indiana. 'Portions of the nuclear weapon burnt; contamination was limited to the immediate area of the crash and was subsequently removed.'

National Times - 15 March 1981

1965

INDIAN POINT, USA

According to J. Laurent, a Swiss researcher, infant mortality within 15 kms of the reactor complex rose from 1961 to 1965 while it dropped nationally.

Energia Nucleare, No5; West Australian

1965

ROCKY FLATS, COLORADO, USA

Fire exposed 400 workers to high levels of plutonium released in the atmosphere. 25 people got 17 times the permissible annual radiation dosage. The plant makes plutonium triggers for nuclear bombs.

Nucleus - 25 July 1979

1965, May 28

WHITE SANDS MISSILE RANGE, NEW MEXICO, USA

Criticality accident in metal assembly − Unreflected uranium–molybdenum metal fast burst reactor; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1965, November 3

ELECTROSTAL MACHINE BUILDING PLANT, USSR

Criticality process accident − Uranium oxide slurry, 6.5% enriched uranium, in a vacuum system vessel; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1965, December 5

PACIFIC OCEAN, USA.

An A-4 aircraft loaded with one nuclear weapon rolled off the elevator of a US aircraft carrier and fell into the sea. The pilot, aircraft and weapon were lost.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.

1965, December 16

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Uranyl nitrate solution, 90% enriched uranium, in a dissolution vessel; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1965, December 30

MOL, BELGIUM

Criticality accident (moderated metal or oxide systems) − VENUS assembly; 7% enriched UO2 rods in H2O–D2O; single excursion; one serious exposure.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1966

NUGGET FILE, USA

The Nugget File, containing excerpts from the U.S. Government's internal file on nuclear power plant accidents, was obtained by the Union of Concerned Scientists under the Freedom of Information Act. The file lists three accidents in nuclear power plants in the U.S. for 1966. In 1967, two accidents in U.S. nuclear power plants were reported in the file. In 1970, seven accidents were listed. In 1974, 14 accidents were listed. Seventeen accidents were recorded in the Nugget File for 1976 − the postscript concluded: 'What is really distressing is that despite the vast amount of specific technical information concerning the frailties and defects of critically important safety apparatus, the Federal agency in charge of nuclear safety has not taken adequate measures to prevent these recurring safety lapses.'

1966, January 17

SPAIN (U.S. AIR FORCE)

A U.S. B-52 bomber and a KC-135 tanker collided during mid-air refuelling 31,000 feet over the Mediterranean Sea off the coast of Spain. The tanker was destroyed in the incident and the B52 broke apart, dropping four hydrogen bombs onto the ground and into the sea. The non-nuclear explosive component in two of the bombs exploded on impact with the ground, contaminating a two square kilometre area with radioactive plutonium. Officials say that approximately 1,400 tonnes of slightly contaminated soil were removed to the U.S. for storage. The Department of Defence reported that the clean-up operation cost US$50 million. The Palomares area was still being monitored for radiation in 2009.

National Times - 15 March 1981

1966, May 7

KELEKESS, USSR

Power excursion in the 62 MW prototype BWR at Kelekess. A health physicist and a shift supervisor are irradiated. The chain reaction stops when two sacks of boric acid are thrown on the reactor.

Nucleonics Week 31 May 1990; WISE #334 22 June 1990

1966 - October 5

ENRICO FERMI (FAST BREEDER) REACTOR, MICHIGAN, USA

In October 1966, a blockage of the flow of sodium through part of the core caused a partial core meltdown. The accident was attributed to a zirconium plate that had become unfastened and obstructed the sodium flow into a fuel assembly. Two of the 105 fuel assemblies melted during the incident, but no contamination was recorded outside the containment vessel. Damage to the reactor and fuel assemblies took approximately four years to repair. In May 1970, the reactor was ready to resume operation, but a sodium explosion delayed start-up until July. In October, the reactor finally reached a power level of 200 MWt. During 1971, it only generated 19.4 gigawatt-hours (GWh) of electricity, however, corresponding to an average capacity factor of 3.4 percent. In August of 1972, upon denial of the extension of its operating license, shutdown of the plant was initiated. In the early 1970s, John G. Fuller, one of the engineers who witnessed the meltdown, published a book about the partial meltdown titled 'We Almost Lost Detroit'.

Cochran, T., et al, 2010, 'Fast Breeder Reactor Programs: History and Status', www.fissilematerials.org

1967, January

WINDSCALE, U.K.

Leak of radioactive waste at Windscale after tank overflowed and contaminated beach.

Charles Wakstein, 'The Myth of Nuclear Safety,' The Ecologist, 7/1977; Nucleus - 25 July 1979, p.11

1967, November 7

GRENOBLE, FRANCE

Leak of 55,000 curies of iodine-131 and caesium-138 into the reactor pool and 2,000 curies into the atmosphere via the chimney.

La Guele Ouverte - April 1974

1968, January 21

GREENLAND (U.S. AIR FORCE)

A B-52 from Plattsburgh Air Force Base, New York, crashed and burnt 11 kms south-west of the runway at Thule Air Force Base, Greenland. The bomber carried four nuclear weapons, all of which were destroyed by fire. Some 237,000 cubic feet of contaminated ice, snow and water, along with crash debris, were removed to a storage site in the United States.

National Times - 15 March 1981

1968, January 30

OAK RIDGE NATIONAL LABORATORY, USA

Criticality accident in fissile solution − U-233 solution assembly; reactivity added by air bubble movement; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1968, April 5

CHELYABINSK-70, USSR

Criticality accident in metal assembly − highly-enriched uranium (90%) metal, natural uranium reflected, assembly; single excursion, two fatalities.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1968, May

ATLANTIC OCEAN (U.S. NAVY)

Although this incident remains classified, the Centre for Defense Information suggests it probably refers to the nuclear-powered and nuclear-armed attack submarine U.S.S. Scorpion. The Scorpion was last heard from on May 21, 1968. It sank 640−720 kms south-west of the Azores. Initial suspicion that the Soviets were somehow involved was allayed when the research ship Mizar photographed the wreckage lying at 10,000 feet on the sea floor. Ninety-nine men were lost.

The Defence Monitor - Vol.X No.5 1981 Washington D.C.

1968, September 6

ABERDEEN PROVING GROUND, MARYLAND, USA

Criticality accident in metal assembly − Uranium–molybdenum metal fast burst reactor; single excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1968, October 2-3

THE HAGUE, FRANCE

Leak of iodine-131 from UP-2 reprocessing plant.

'Les Amis de la Terre'

1968, October 8

JAPAN (U.S.S. SWORDFISH, USA)

High readings of radiation near U.S. nuclear submarine 'Swordfish' indicated a discharge of reactor coolant near Sasobe, Japan.

The Sun 8 October 1976, p.23.

1968, December 10

MAYAK PRODUCTION ASSOCIATION, USSR

Criticality process accident − Plutonium solutions (aqueous and organic) in a 60 litre vessel; three excursions; one fatality, one serious exposure.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1969

LINGEN, GERMANY

Leak in the primary circuit. Effluent was discharged into the River Ems resulting in a radioactivity level 13 times above the permitted annual quantity.

1969, January 21

LUCENS, VAUD, SWITZERLAND

A small pilot nuclear reactor was destroyed by an accident in 1969. The heavy-water moderated, carbon dioxide gas-cooled, reactor was built in an underground cavern and produced 30 megawatts of heat (which was used to generate 8.3 megawatts of electricity). During a startup on January 21, 1969, it suffered a loss-of-coolant accident, leading to a partial core meltdown and massive radioactive contamination of the cavern, which was then sealed. Water condensation led to corrosion of fuel element components, which impeded the flow of carbon dioxide coolant leading to fuel melting and a fire. No irradiation of workers or the population occurred, though the cavern containing the reactor was seriously contaminated. The cavern was decontaminated and the reactor dismantled over the next few years.

http://en.wikipedia.org/wiki/Lucens_reactor; R.E. Webb, 1976, 'The accident hazards of nuclear power plants', University of Massachusetts Press, p.201

1969, March

USA

Three uranium hexaflouoride shipments lost in transit in U.S.

Nucleus - 25 July 1979

1969, April 10

USA

An 8,500 pound shipment of enriched uranium in transit from Goodyear Atomic Corp. to New York turned up in Cleveland, Ohio.

Nucleus -25 July 1979

1969, May 11

ROCKY FLATS, COLORADO, USA

Plutonium spontaneously ignited in a container of nearly 600 tonnes of combustible material. The fire released plutonium oxide, exposing 400 workers to radiation, and caused approximately US$45 million worth of damage.

www.cdphe.state.co.us/rf/1969fire.htm

1969, July

WINDSCALE, U.K.

Leak of plutonium at Windscale reprocessing plant. Beaches contaminated. The information was not made public until 1974.

Nucleus - 25 July 1979

1969, October 17

SAINT LAURENT-DES-EAUX, FRANCE

On October 17, 1969 50 kgs of uranium in one of the gas cooled reactors began to melt. This event was classified at 4 on the International Nuclear Event Scale.

http://en.wikipedia.org/wiki/Saint-Laurent_Nuclear_Power_Plant

the 1970s

1970

OKLAHOMA, USA

Workers were contaminated when a radioactive storage vessel was left open for three days.

Nucleus - 25 July 1979

1970, April

USSR

Apparent sinking of a Soviet nuclear powered submarine in waters north-west of Spain − reported by Pentagon.

WISE News Communique #262, 31 October 1986

1970, April

PACIFIC OCEAN, USA

A nuclear generating device containing plutonium crashed from the Apollo 13 moonshot in the sea near Norfolk Island. Records show that it contained 3.78 kgs of plutonium-238. N.A.S.A. does not know the location of the module component and there has been no attempt to locate or recover it. Information about the plutonium content was withheld until July, 1980.

The Australian - 31 July, 1980

1970, June 5

INDIAN POINT, NEW YORK, USA

Reactor had a major plumbing problem which required the use of 700 men (for a few minutes each) over a seven-month period to weld in the radioactive area.

'Les Amis de la Terre'; 'L`Escroquerie Nucleaire'

1970, June 5

DRESDEN 2, ILLINOIS, USA

A spurious signal started off a series of mistakes by technicians and equipment failure. The reactor was out of control for two hours, pressure built up inside until it released radioactive iodine-131 to the dry well.

Jean Geue (Australian Atomic Energy Commission)

1970, August 24

WINDSCALE, UK

Criticality process accident − Plutonium organic solution in a transfer vessel; one excursion; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1970, September

FRANCE

Captain Jacques Cousteau, speaking to the Council of Europe, said of barrels of radioactive waste lying at the bottom of the sea: 'They have been photographed lying open yawning like oysters'.

Nick Thieberger, 1980, 'From under the rug: a list of nuclear accidents', p.4

1970, September 30

HANFORD, USA

A loss of coolant automatically started the primary SCRAM system (the rapid reinsertion of control rods). The system failed due to a short circuit. The backup SCRAM system worked. General Electric calculated that the probability of a failure in SCRAM was one in ten billion; the actual rate so far has been one in ten thousand. Past accidents at Hanford occurred on 3 October 1954, 4 January 1955, and 6 January 1966.

Jean Geue (Australian Atomic Energy Commission); R.E. Webb, 1976, 'The accident hazards of nuclear power plants', University of Massachusetts Press, pp.192-193

1970, October 18

WYLFA, U.K.

The plant was stopped after a power excursion accident.

'Noun allons tous Craver', J.Pignero - 1 April, 1974; 'Les Amis de la Terre'

1971

WINDSCALE, U.K.

Malcolm Patterson, aged 36, died of leukemia after working for 13 years at the Windscale plant. The British nuclear power company, British Nuclear Fuels Ltd., admitted liability and agreed to pay $120,000 damages to his widow. The company told the Court that, although it admitted liability, the case should not be seen as a precedent.

West Australian - 16 November, 1979

1971

HINKLEY POINT, SOMERSET, U.K.

A former welder alleged that some of pipe repairs were not properly made, on the instruction of his superiors. He also claimed that x-rays of good welds were used to cover the deception.

The Guardian, 25 February 1987

1971

CONNECTICUT, USA

Five hundred gallons of radioactive primary coolant was inadvertently discharged into Thames River, near New London, Connecticut, from a nuclear-powered submarine.

Melbourne Sun - 8 Oct 1976, p.23

1971, January

OKLAHOMA, USA

Defective equipment allowed plutonium oxide to escape into the atmosphere at Oklahoma City, U.S.A. Twenty-two workers were contaminated.

Nucleus - 15 July 1979

1971, February 15

KURCHATOV INSTITUTE, USSR

Criticality accident (moderated metal or oxide systems) − UO2 fuel rod (20% enriched), iron and beryllium reflected, assembly; multiple excursions; two serious exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1971, May

WATERFORD, CONNECTICUT, USA

The Millstone boiling water reactor suffered a malfunction of the steam valve which caused the radioactivity and power level to rise beyond the rated power level. The SCRAM, or reactor safety system, went into action.

R.E. Webb, 1976, 'The accident hazards of nuclear power plants', University of Massachusetts Press, pp.193-194

1971, May 26

KURCHATOV INSTITUTE, USSR

Criticality accident (moderated metal or oxide systems) − highly-enriched uranium (90%) fuel rod, water reflected, assembly; single excursion; two fatalities; two serious exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1971, mid-year

CLINTON, TENNESSEE, USA

The manufacturer of sealed radioactive sources abandoned a plant site leaving a significantly contaminated area. The cost of decontamination fell, by default, on the Federal and State Governments.

'A Landscape of Nuclear Tombs', Alexic Parks

1971, August

GULF OF GASCOYNE

4,000 tonnes of radioactive waste dumped in the Gulf.

Agence de Press, Rehabilitation Ecologique, Repertoire dea Accidents Nucleaires, Paris 1974, 1976

1971, August

VERMONT YANKEE, USA

The Bulletin of the Atomic Scientists (1974) reported that in August 1971 an intruder penetrated past guard towers and fences to enter the grounds of the Vermont Yankee Nuclear Plant at Vernon, Vermont.

Nucleus - 25 July 1979

1971, October 10

BUGERY, FRANCE

Fire under the control room just before the reactor was put into service.

'Le Monde', 12 August, 1972

1971, November

INDIAN POINT, NEW YORK, USA

The *Bulletin of the Atomic Scientists* (1974) reported that in November 1971, arson caused $5-10 million damage at the Indian Point No.2 plant at Buchanan, New York.

Nucleus - 25 July 1979

1971, November 19

MINNESOTA, USA

The reactor's waste storage space was full, so the company began spilling radioactive waste into Mississippi River. By 21 November about 50,000 gallons of wastes had been dumped into the river and some were sucked into the domestic water intake for St. Paul.

'Record on Nuclear Safety', Saskatchewan Coalition Against Nuclear Development in Anna Gyorgy, 1979, 'No Nukes: Everyone's Guide to Nuclear Power', http://tiny.cc/0ngmv, p.120

1971, December

WINDSCALE, U.K.

Radioactive wastes released into the sea, equivalent to 200,000 curies, 16 times the predicted levels.

Nucleus, 26 July, 1977

1971, December 10

LA HAGUE, FRANCE

Rupture of the pipes carrying radioactive materials, and contamination of the pool and drinking water, at the La Hague plant. Work periods of three minutes were set for the welders repairing the damage in order to limit radiation exposure.

Rayonnement, CFDT CEA, July, 1972

1972

SURRY I, VIRGINIA, USA

On 27 July 1972, two workers were fatally scalded at this nuclear power plant, after a routine valve adjustment led to a steam release in a gap in a vent line.

http://en.wikipedia.org/wiki/Surry_Nuclear_Power_Plant

1972, March 8

INDIAN POINT, NEW YORK, USA

Pressures in the primary cooling circuit increased by 30%. Water released subsequently killed an estimated 150,000 fish in the Hudson River.

New York Times - 16 June 1974

1972, April

WURKGASSEN, WEST GERMANY

Pressure relief valve opened and stuck. Steam poured out and destroyed reinforcement structures. Important reactor control instruments failed to function and about 1050 tonnes of radioactive water flowed into the River Weser. After months of repair the plant re-opened only to close down again in February 1973, and again in February 1974.

Lebensahutz - April 1974

1972, September

MILLSTONE 1 REACTOR, USA

Condenser tubes made of aluminium alloy corroded, allowing sea water into the cooling system.

Jean Geue (Australian Atomic Energy Commission); 'Boston Globe' - 14 October 1974

1972, November 23

TENNESSEE, USA

A hijacked DC-9 circled the Oak Ridge nuclear plant for two hours. Hijackers demanded $10 million. Oak Ridge was shut down and most staff evacuated. Hijackers demands were met and they flew to Cuba.

Nucleus - 25 July 1979

1972, December 8

SICN, ANNECY, FRANCE

Fire in the SICN plant, which produced nuclear fuel. A further explosion and fire occurred on 22 December 1972 and a fire on 9 October 1973.

SICN - Societe Induatrialle de Combustible Nucleaire; Jean Geue (Australian Atomic Energy Commission)

1972, December 21

PERPIGNAN, FRANCE

Children found playing with boxes containing strontium-90 which they found in a field near the local airport.

Jean Geue (Australian Atomic Energy Commission)

1973

VERMONT YANKEE, USA

The following failures were listed in the A.C.R. Annual Report for 1973: emergency core cooling system sensors pressure component failure; four radiation monitors were not source calibrated at three months intervals; area gamma monitor on the perimeter fence became inoperable; instrument lines monitoring suppression chamber were incorrectly tubed to differential pressure sensors; radioactive gases released − exact cause unidentified.

Anna Gyorgy, 1979, 'No Nukes: Everyone's Guide to Nuclear Power', http://tiny.cc/0ngmv, p.107

1973, January

CHOOZ, BELGIUM

Radioactive elements from the nuclear plant entered River Meuse near Vise. Water remained abnormally radioactive for about six months.

La Nouvelle Republique - 10 January 1973

1973, January 15

VERMONT YANKEE, U.S.A.

Vermont Yankee reactor emitted 100 times the permitted level of radiation as a result of cracks in tubes carrying radioactive material.

Times Record - 23 April 1974

1973, March 26

ARGENTINA

Terrorists entered the Argentinean reactor and planted a phosphorous bomb in a nuclear plant. The bomb was extinguished before the plant was destroyed.

Agence de Presse, Rehabilitation Ecologigue, Repertoire des Accidents Nucleaires, Paris 1974, 1976

1973, April 17

MILLSTONE 1, CONN., U.S.A.

Numerous cracks were discovered in the pipes of the cooling system. Radioactive mist escaped and activated radiation alarms on nuclear submarines docked at Waterford.

Wall Street Journal - 3 May 1973

1973, April 20

HANFORD, WA., USA

100,000,000 gallons of wastes stored in containers with a life span of 30-40 years. A leak was discovered on 20 April, but wastes were still poured into the tanks, resulting in a leakage of 115,000 gallons before 8 June, when pouring stopped.

Work Circle Environ. Protection; Penelope Coleing, 'Accidents, Near Accidents And Leaks in the Nuclear Industry', Sydney M.A.U.M.

1973, June

HANFORD, WA. USA

460,000 litres of radioactive liquid spilled on the ground surrounding the reprocessing plant.

Los Angeles Times -5 July 1973

July 1, 1973 - June 30, 1974

USA

The Atomic Energy Commission found a total of 3,333 safety violations at the 1,288 nuclear facilities it inspected. 98 of these posed a threat to radiation exposure to public or workers. Punishment was imposed by the AEC for eight of these violations.

'Record on Nuclear Safety', Saskatchewan Coalition Against Nuclear Development, in Anna Gyorgy, 1979, 'No Nukes: Everyone's Guide to Nuclear Power', http://tiny.cc/0ngmv

1973, September

LA HAGUE, FRANCE

Radioactive gas escaped, 35 employees contaminated, seven seriously.

Jean Geue (Australian Atomic Energy Commission); 'Los Echos' - 24 September 1973

1973, September

WINDSCALE, U.K.

Radiation leak in the reprocessing plant; 34 workers were irradiated following an inadvertent attempt to fill a vessel already containing highly active residues. The accident was rated Level 4 ('accident with local consequences') on the 7-point International Nuclear Event Scale because of its on-site impact.

Ian Breach, Windscale Fallout, p.37; Jean Geue (Australian Atomic Energy Commission)

1973, September

MILLSTONE, CONNECTICUT, USA

Corrosion of alloy condenser tubes in Millstone 1 reactor allowing sea water into cooling system.

Boston Globe, October 1974

1973, October 9

ANNECY, FRANCE

Fire in the SICN plant, which produced nuclear fuel.

SICN - Societe Industrialle de Combustible Nucleaire - Jean Geue (Australian Atomic Energy Commission)

1973, October 22

SAN ONOFRE, CA, USA

Malfunction of turbine generator led to shutdown of reactor. Increased vibration led operators to shut down faster than normal, causing overheating; this in turn activated the primary coolant system which caused a drop in pressure, normally indicating a blocked coolant pipe. The emergency system cut in and flooded the reactor with cooling water which hit the valves with too much force since the coolant was already there; pipes broke and it took six months to repair the damage.

The Observer, 2 October 1973

1973, December 14

HANFORD, USA

35,000 litres of radioactive waste leak. Jack-rabbits in the area excrete radioactive 'hot' pellets and coyotes, which eat the rabbits, die of radiation poisoning. By the end of 1977 half a million gallons of waste had leaked from Hanford site.

Les Amis de la Terre

1974 - 1975

USA

Over a one-year period 15−20 nuclear power reactors were (temporarily) closed by the Nuclear Regulatory Commission due to cracks in the water cooling system.

Work Circle Environmental Protection

1974

KERR MCGEE FUEL FABRICATION PLANT, OKLAHOMA, USA

Karen Silkwood had gathered evidence on the unsafe working conditions at the plant and was on her way to deliver these to a newspaper reporter and a union official when she died in mysterious circumstances.

ABC Four Corners - 21 July 1979

1974, January 7

LENINGRAD-I, USSR

Explosion of a reinforced concrete tank containing radioactive gases at Leningrad-I.

Nucleonics Week - 31 May 1990;
http://greenworld.org.ru/?q=ang_lnpp1_main

1974, January 23

CHERBOURG, FRANCE

An appeal sent out by radio: 'Urgent notice for navigators from Cherbourg - blue container, two metres long, containing radioactive material is lost... In case of discovery do not open, and immediately inform Coast Guard Aberdeen'.

Nucleus - 15 July 1979

1974, February

WURGASSEN, GERMANY

Violent vibrations in the turbines caused most of the vanes to break off.

Lebensachultz- April 1974; L'Escroquerie Nucleaire; Nucleus - 25 July 1979

1974, February 6

LENINGRAD-1, USSR

Explosion of the tertiary circuit at Leningrad-1 from hydraulic shocks induced by violent boiling. Three people dead. Release into the environment of highly radioactive water containing filter wastes.

Nucleonics Week 31 May 1990; WISE#334 - 22 June 1990

1974, March 14

HANFORD, WA., USA

Leak of 115,000 gallons of highly radioactive waste. Defective storage tank.

Nucleus - 25 July 1979; Penelope Coleing, 'Accidents, Near Accidents And Leaks in the Nuclear Industry', Sydney M.A.U.M.

1974, April

USA

The Nuclear Regulatory Commission recorded 1,421 anomalies in U.S. reactors in 1974, of which 529 were 'potentially significant'.

Gen. Nuclear Review, Vol.1 No.1 1970

1974, April 6

N.S.P.C., MINNESOTA, USA

Northern States Power Company reactor dumped 10,000 gallons of radioactive water into the Mississippi River causing Minneapolis to close its water intake gates. From 1969-1974 the Atomic Energy Commission made a total of 10,320 inspections and found 3,704 installations with one or more violations (the AEC imposed civil penalties or some other action a total of 22 times).

Donald E. Reardon, Deputy Manager ERDA, S.F. Office, at Warren Committee hearing in November 1975; N.Y. Times, 26 August 1974

1974, May

MIAMISBURG, OHIO, USA

Atomic Energy Commission laboratory leaked plutonium, contaminating the Erie Canal.

Boston Globe - 14 May 1974

1974, May

INDIA

Police arrested five personnel at a uranium enrichment plant and discovered 3.6 kgs of uranium. Enquiries revealed the gang which stole uranium transported it through Nepal to eventually end up in Hong Kong.

Nucleus - 25 July 1979

1974, May 2

SAVANNAH RIVER, SOUTH CAROLINA, USA

A radioactive cloud of tritium formed after a leak in a pipe at nuclear reactor.

Le Monde 5 June 1974

1974, May 3-4

HANFORD, WA, USA

1,900 to 7,600 litres of liquid radioactive waste containing 600-2400 curies of caesium-137 and 10-40 curies of strontium-90 leaked from underground storage tank No. 111, which is 40 metres above the water table.

Penelope Coleing, 'Accidents, Near Accidents And Leaks in the Nuclear Industry', Sydney M.A.U.M.; Nucleus - 25 July 1990

1974, May 8

POKHRAN TEST RANGE, RAJASTHAN STATE, INDIA

The world was shocked when India tested its first nuclear weapon in 1974. Scientists and politicians used the codename 'Operation Smiling Buddha' for the program while the army used the term 'Operation Happy Krishna'.

India's nuclear research and power programs laid the foundation for the weapons program and the 1974 test. The explosion used plutonium produced in the 40 MW research reactor known as CIRUS (Canada-India-Reactor-United-States). Canada supplied the reactor while the US supplied heavy water (used as a moderator).

The CIRUS reactor was supplied on the condition that it would be used for peaceful purposes only. India violated that condition, offering the disingenuous explanation that the 1974 test was a 'peaceful nuclear explosion' related to India's interest in the use of nuclear explosives for civil engineering projects. A former director of India's nuclear program later said: 'An explosion is an explosion, a gun is a gun ... the test was not all that peaceful.'

India's refusal to allow safeguards to apply to eight out of 22 power reactors strongly suggests that they are used in support of India's weapons program − or that India wants to leave open the option of using those reactors for weapons production.

India's 1974 weapons test strengthened Pakistan's resolve to develop nuclear weapons (an 'Islamic bomb') − both countries tested nuclear weapons in 1998 and they are still engaged in a nuclear arms race. Other consequences included the strengthening of export controls (though they have been weakened by the 2008 US-India Nuclear Cooperation Agreement) and the complete discrediting of the concept of 'peaceful nuclear explosives'.

1974, May 28

USA

The U.S. Atomic Energy Commission said that 'there were 861 irregularities in the industry in 1973 in the 42 reactors which were working. Of those, 371 had some potential of being hazardous, 18 were hazardous and 12 actually leaked radioactivity in the atmosphere'.

Nucleus 25 July 1979; Les Amis de la Terre

1974, July 11

QUAD CITIES, ILLINOIS, USA

Radioactive vapour escaped after a valve on the primary circuit ruptured. Reactor had been working at 25% capacity.

Chicago Sun Times - 11 July 1974

1974, August

GRENOBLE ISKRE, FRANCE

Leak into the reactor pool of 2,500 curies.

Le Monde, 29 September 1974

1974, August

ANS, MATSU, JAPAN

The crew of this nuclear-powered cargo vessel discovered a leak in pipes carrying radioactive materials after leaving Japan. Because of the potential danger they were unable to re-enter Japanese waters. Operators used boiled rice and old socks to try to block the leak.

Les Amis de la Terre; L'Escroguerie Nucleaire'

1974, September and December

ILLINOIS AND CONNECTICUT, USA

A crack about 7.6 cms long was discovered at the Dresden Plant in Norris. As a result of this discovery, 60 others were found. Plants of similar type were investigated (Millstone, Quad-Cities, Dresden 2) and two Japanese facilities were found to have experienced the same problem.

Nucleus- 25 July 1979

1974, September 3

LOS ALAMOS, NEW MEXICO, USA

1,900 to 3,800 litres of radioactive liquid escaped into the environment onto one of the main streets and into a parking lot. The area was closed off, parts of the road were replaced. Past accidents at Los Alamos occurred on 21 August 1945, 25 May 1946 and 30 December 1958.

Nucleus - 25 July 1979

1974, September 19

RINGHALS, SWEDEN

Three pumps of the primary cooling system broke down. Reactor had to work at 30% capacity after the accident.

L'Escroquerie Nucleaire

1974, October 18

CON EDISON TRI-CITIES PLANT, USA

Radioactive gas released, exceeding the Atomic Energy Commission limit by 33%. In 4,000 shipments of radioactive fuel in 1975, 400 reported accidents occurred in which 150 released 'small amounts' of radioactivity and two 'potentially dangerous' amounts.

Robert Barker, N.R.C. Department of Transportation, in his summary of WASH 1238 at Warren Committee hearings in November, 1975

1974, November

WINDSCALE, UK

Monitoring failure at reprocessing plant. Worker allowed to leave with plutonium on his shoes.

Charles Wakstein, 'The Myth of Nuclear Safety,' The Ecologist, 7/1977; Nucleus - 25 July 1979, p.15

1974, November 10

SAINT LAURENT DES EAUX, FRANCE

Fire in electrical panel of the SL2 reactor.

Journal du dimanche - 10 November 1974

1974, November 23

SACLAY, FRANCE

Chemical explosion occurred during the cleaning of pipes at the Osiris reactor, injuring six people. No radioactive leak.

Le Figaro - 24 November 1974

1974, December

TENNESSEE, USA

Radiation levels at one Tennessee reactor lunch room measured at eight times normal level.

Nucleus - 25 July 1979, p.15

1974, December

WIEDERRICHBACH, GERMANY

Experimental Siemens reactor abandoned in Niederrichbach. Cost A$66 million.

Nucleus - 25 July 1979

1975

LA HAGUE, FRANCE

572 incidents of radioactive contamination of workers including 205 incidents of internal contamination (over a period of some years).

Nucleus - 25 July 1979, p.1

1975, March 22

BROWN'S FERRY, ALABAMA, USA

Fire caused by a worker checking for air flow with candle. Destruction of 2,000 cables. All Unit 1 emergency core cooling systems were disabled. Operators manually shut down the reactor and cooled it using remote operation of the relief valves, a condensate booster pump, and the control rod drive system pumps. A Senate investigation revealed that the final reactor design had been approved even though it did not meet regulatory requirements. The total cost of the accident was at least US$150 million.

http://en.wikipedia.org/wiki/Browns_Ferry_Nuclear_Power_Plant; R.E. Webb, 1976, 'The accident hazards of nuclear power plants', University of Massachusetts Press, p.198; Anna Gyorgy, 1979, 'No Nukes: Everyone's Guide to Nuclear Power', http://tiny.cc/0ngmv, p.120

1975

GUNDREMINGEN, FEDERAL REPUBLIC OF GERMANY

Two deaths followed leak of 800 litres of radioactive steam during vent repairs.

Work Circle Environmontal Protection

1975, January

DRESDEN 2, ILLINOIS, USA

The Dresden No 2 boiling water reactor was shut down after cracks were found in the high-pressure piping of the emergency core cooling system. The cracks penetrated the full thickness of the piping resulting in a water coolant leakage. The cracks were discovered by accident. 'Large cracks had occurred in other unrelated piping, which leaked noticeable quantities of water and similar cracks were then found in many boiling water reactors in the same piping.'

R.E. Webb, 1976, 'The accident hazards of nuclear power plants', University of Massachusetts Press, p.201

1975, January 8

MIHAMA 2, JAPAN

Leak in pipes of steam generator of the Mihama 2 power reactor caused radioactive gas to escape.

Nuclear News - March 1975; L'Escroguerie Nucleaire

1975, January 30

USA

U.S. Nuclear Regulatory Commission orders the closure of twenty-three boiling water reactors, because of hairline cracks found in coolant pipes at Dresden. Second time in nine months that U.S. plants closed.

Nucleus - 25 July 1979

1975, March 27

NORTHWEST UTILITIES, CONNECTICUT, USA

Nearly 1,200 workers had to be evacuated from the Northwest Utilities Nuclear Plant because of a radioactive water spill. Some of the contaminated water entered Long Island Sound. Twenty workers had to wade through 4,000 litres of spilt radioactive water to safety.

Penelope Coleing, 'Accidents, Near Accidents And Leaks in the Nuclear Industry', Sydney M.A.U.M.

1975, May 6

TSURUGA, JAPAN

It was disclosed that a radioactive leak occurred at the Japan Atomic Power Company's Tsuruga Power Plant. The company said the accident was discovered on the 10th of January 1975, when 13 tonnes of radioactive water leaked from a crack in a pipe. The company said 37 workers were exposed.

The Age - 6 May 1981

1975, May 22

CON EDISON INDIAN POINT, A.E.C., USA

Inspection shows that, despite corrective measures taken for earlier violations, reactor workers are still exposed to above maximum permissible levels set by the Atomic Energy Commission.

Nucleus - 25 July 1979, p.16

1975, June 6

ZION, USA

15,000 gallons of radioactive water leaked from the cooling system into the reactor containment building. The NRC blamed the leak on an open valve caused by failure to observe proper procedures. Zion has had the highest rate and number of abnormal occurrences of any nuclear power plant in the US.

Penelope Coleing; 'The 10 Most Dangerous Nuclear Power Plants', The Elements, Feb. 1977, in Anna Gyorgy, 1979, 'No Nukes: Everyone's Guide to Nuclear Power', http://tiny.cc/0ngmv, p.120

1975, July

VERMONT YANKEE PLANT, USA

Faulty valves allowed 300,000 litres of radioactive water to spill into the river.

Nucleus - 25 July 1979, p.15

1975, September

JAPAN

Nuclear-powered ship MUTSU found leaking radioactivity due to faulty design of reactor shield.

Nucleus - 25 July 1979, p.15

1975, November

LENINGRAD, USSR

In November 1975 the core of one of the reactors at the Soviet Union's Leningrad nuclear power plant was partially destroyed. Radioactive gases were vented to the exterior over a period of a month as part of the emergency cleaning.

http://www.physicstoday.org/daily_edition/points_of_view/appendix_specific_accidents

WISE News Communique 336 - 20 July 1990

1975, December

U.K.

Nuclear waste train derailed in town on transit from Barrow to Windscale reprocessing plant.

Times - 20 December 1975, p.1

1976, January

WINDSCALE, U.K.

Leak of radioactive waste in storage tank caused by corrosion.

Parliamentary Research Service Paper, Parliamentary Library, Canberra

1976, January 5

JASLOVSKÈ BOHUNICE, CZECHOSLOVAKIA

Extensive leakage of radioactive gas. Two workers died. The emergency exit which they tried to escape from was locked 'to prevent frequent thefts'. The public were not warned of the dangers and workers at the plant were not allowed to know the level of radiation they had absorbed.

1976, January 12

KENTUCKY, USA

Six drums containing radioactive waste burst open after they rolled off tractor-trailer trucks in Ashfield, Kentucky. Two drivers were slightly injured. When the highway was cleaned, checks indicated radioactivity.

Legislative Research Service Paper, Parliamentary Library, Canberra

1976, February 21

JASLOVSKÈ BOHUNICE REACTOR, CZECHOSLOVAKIA

Primary circuit overheated while new fuel rods were mounted, rupturing steam generator; primary and secondary circuit and working area contaminated.

'New Ecologist', January/February 1979

1976, April

WINDSCALE, U.K.

Leak of radioactive waste from still drums caused by corrosion.

Parliamentary Legislative Research Service Paper, Parliamentary Library, Canberra

1976, July

PORT HOPE, CANADA

Discovery that in the town of Port Hope, Canada, radiation levels in some buildings are 100 times higher than safe levels. Bone marrow abnormalities found in town residents. The area has hosted plants to extract radium from uranium ore and to process uranium for use in weapons and power plants.

Nucleus - 25 July 1979, p.18

1976, July

LA HAGUE, FRANCE

Leak at reprocessing plant and discharge into sewerage system. Eight workers inhale plutonium dust (concentration of plutonium 1,000 times greater than permissable dosage in parts of plant). Took seven months to repair.

1976, mid-July

VERMONT YANKEE, USA

Faulty valve caused 300,000 litres of tritium contaminated water to spill into the Connecticut River. This was the second of three spills.

Anna Gyorgy, 1979, 'No Nukes: Everyone's Guide to Nuclear Power', http://tiny.cc/0ngmv, p.120

1976, October

WINDSCALE, U.K.

One hundred gallons per day of contaminated water leaking from an old waste storage silo. This incident was not reported to the Government for two months, and eventually led to the Windscale Public Enquiry.

Parliamentary Legistative Research Service Paper, Parliament House, Canberra

1976, October 13

PARIS, FRANCE

France's most advanced nuclear reactor had been closed for an indefinite period because of a leak in one of the three devices that transferred heat from one fluid to another, an Atomic Energy Official reported.

AAP; Reuters

1976, November

PILGRIM PLANT, USA

Boston Edison stated that 16,000 herring were killed at the nuclear power plant at Cape Cod Bay, probably by thermal shock (the heat of water discharged from the reactor) or by screens at the water intake.

The Lewiston Daily Sun - 27/11/76

1976, November

WINDSCALE, U.K.

Leak of radioactive waste. Beach contaminated by tritium.

Parliamentary Legislative Research Service Paper, Parliament House, Canberra

1977

BELOYARSK 2, USSR

Half of the fuel assemblies melt at Beloyarsk 2. Irradiation of staff during repairs, which last a year.

Nucleonics Week - 31 May 1990; WISE 22 June 1990

1977

VALIENCITOS, CALIFORNIA, USA

General Electric's small reactor closed because Federal officials found a seismic fault near the plant.

Financial Review - 28 February 1979

1977, May

WINCHESTER, U.K.

Semi-trailer carrying a 15-tonne container of nuclear fuel overturned near Winchester. Five people injured.

Legislative Research Service Paper, Parliamentary Library, Canberra

1977, July

HINKLEY POINT, USA

Power plant shutdown until December when a pipe supplying feedwater to the main coolant system fractured.

Ian Breach, 'Windscale Fallout', p.39

1977, October 7

COLORADO, USA

Nuclear alert declared near Springfield after 19 tonnes of powdered uranium-oxide fell from the back of a truck after an accident. The material was being transported from Wyoming to Oklahoma for processing. Colorado State Department later urged the NRC to review its safety standards.

West Australian - 7 October 1977

1977, November

PIERRKLATE, FRANCE

Highly toxic gas leaked into the air from a commercial uranium fuel factory. No-one was contaminated and the situation was quickly controlled. The leak of uranium hexaflouoride at the Comurex factory is where a similar accident took place in July.

The Herald - 26 November 1977

1977, December

MILLSTONE, CONNECTICUT, USA

Two hydrogen/oxygen explosions in the waste radioactive gas stream. Chimney door blew off. One worker slightly injured and helpers contaminated with radioactivity. Reactor shut down.

Parliamentary Legislative Research Service paper, Parliament Library, Canberra

1977 December

HUNTERSTON B, U.K.

1,000 gallons of sea water leaked into the reactor. Cost of accident: four million pounds.

Ian Breach, 'Windscale Fallout', p.139

1977, December

BARODA, INDIA

Heavy water factory at Baroda, 480 kms north of Bombay, was partially destroyed by a series of explosions following fire. 20 injured.

Nucleus - 25 July 1979, p.17

1977, December

COLORADO, USA

10,000 lbs. of uranium concentrate spreads over a large area after a truck crashes. Wrong decontamination equipment sent to area. Twelve hours before health specialist on scene.

Nation Review, 3 May 1979

1977, December 18

LEMONIZ NUCLEAR POWER PLANT, SPAIN

On 18 December 1977, Basque ETA separatists set off bombs damaging the reactor vessel and a steam generator at the Lemoniz nuclear power plant under construction in Spain. Two workers died and one of the terrorists sustained fatal injuries.

On 17 March 1978, ETA planted another bomb in the plant, again causing the death of two workers and inflicting substantial damage to the plant. The explosives were smuggled into the plant by site workers.

On 3 June 1979, an anti-nuclear activist was killed by police during a peaceful protest (the peaceful public movement against Lemoniz attracted as many as 150,000 people to protest rallies).

On 13 June 1979, ETA planted another bomb inside the plant and the explosion caused the death of one worker.

On 11 November 1979, ETA kidnapped guards and exploded bombs at another nuclear plant, causing extensive damage.

On 29 January 1981, ETA kidnapped the chief engineer of the Lemoniz nuclear plant and later killed him.

ETA also destroyed hundreds of electricity pylons connected to the site.

In 1983, the Spanish nuclear power expansion program was cancelled following a change of government and construction of the Lemoniz plant was never completed.

http://en.wikipedia.org/wiki/Lemoniz_Nuclear_Power_Plant

http://nvdatabase.swarthmore.edu/content/basque-citizens-end-construction-lemoniz-nuclear-power-plant-1976-1978

1978

LUCAS HEIGHTS, AUSTRALIA

Two leaks occurred in primary cooling system in the HIFAR research reactor at Lucas Heights.

WISE No 5, p.14

1978

IDAHO FALLS, ID, USA

Nuclear waste dug up after seven years because it was leaking from the barrels in which it had been buried, causing a threat to the water supply.

Penelope Coleing, 'Accidents, Near Accidents And Leaks in the Nuclear Industry', Sydney M.A.U.M.

1978

NINE MILE POINT-1, OSWEGO, NEW YORK, USA

In 1989 the US Nuclear Regulatory Commission investigates a radioactive spill that happened at the Nine Mile Point 1 nuclear power plant in Oswego, New York. The contaminated area was in a radioactive waste building near the reactor according to a confidential company report. The report said that a 4,000 square foot area in the building was so radioactive that no-one had been allowed inside since 1978. Radiation levels of up to 400 rems (4,000 mSv) per hour make it impossible for people to enter the area and the utility has only gained access to the area with a robot. The confidential report said that about 150 barrels, many of them containing highly radioactive sludge, had fallen off their pallets, emptying some of their contents on floors and wells.

Solstice magazine via Greennet 28 August 1989; WISE #318 29 September 1989

1978, January

USSR / NORTHERN CANADA

The nuclear-powered Soviet satellite Cosmos 954 fell out of its orbit and plunged into the tundra of Northern Canada, spreading radioactive material over a wide area.

Nucleus - 14 June 1978; Burleson, C.W., 'The Day the Bomb Fell', Great Britain, 1980, pp.227-245

1978, January 23

COLORADO, USA

Newly built reactor belches radioactive helium gas 56 kms from Denver, Colorado. Fifteen workers suffered 'light contamination'. Reactor shut down.

The Herald - 24 January 1978

1978, January 25

BRUSSELS, TIHANGE, BELGIUM

Contamination of up to 80 people by iodine-131 while the reactor was being cooled for replacement of fuel.

WISE, Brussels

1978, February 14

BAVARIA, WEST GERMANY

Small amount of radioactive steam escaped from a nuclear plant being tested in Bavaria.

The Age - 15 February 1978

1978, March

CRYSTAL RIVER, FLORIDA, USA

Crystal River 3 plant closed for six months after defects in equipment controlling radioactivity levels in reactor.

Nation Review - 3 May 1979

1978, April

OREGON, USA

Two workers exposed to high levels of radiation when monitoring devices fail at Jan Plant, Rainier.

Nucleus - 15 July 1979, p.17

1978, April

INDIA

It was revealed that a C.I.A. electronic spy-station was destroyed in an avalanche. It contained 1.3 kg of a plutonium isotope. The station had been placed on Nanda Deve, a mountain of the Himalayas to spy on Chinese missile bases. The Nanda Deve snow waters run into the River Ganges.

The Australian - 12 April 1978

1978, mid-June

TIHANGE, BELGIUM

At the Pressurised Water Reactor at Tihange, a joint gave way on the primary cooling circuit, releasing radioactive steam. Workers in protective clothing tried for several days to stop the breach. Finally French specialists were brought in. The news was leaked by an anonymous phone call to Belgium Friends of the Earth. The reactor authorities denied that there had been an explosion.

WISE No 2, p.13

1978, June 19

BRUNSBUTTLE, GERMANY

Reactor steam circuit broke. At least 100 tonnes of radioactive steam escaped. News of the accident got out through an anonymous phone call. Later measurements indicated that 4,000 curies (148 TBq) of radioactive inert gases escaped (against a yearly authorised level of 3,500 curies).

ABC. Radio News - 25 June 1978

1978, August 26

TITAN II NUCLEAR BASE, KANSAS, USA

One man was killed and six injured when deadly fumes leaked from an intercontinental ballistic missile which was being filled with propellant. When the accident was reported gas was still leaking, forcing the evacuation of residents of Udall Rock.

West Australian - 26 August 1978

1978, August 28

ALDERMASTON, U.K.

Britain's main nuclear research station and Atomic Weapons Research Establishment was closed by the Ministry of Defence after 12 workers were contaminated with plutonium dust. Unions believed that the plutonium dust may have leaked through the plant's ventilation system. Three laundry women suffered plutonium contamination of the lungs. The laundry deals with protective clothing in the 'active' area. One of the women has not worked in the laundry for some years but she still carries a lung burden of plutonium above the permitted maximum. Women in the laundry are not considered as radiation workers and are not required by law to be regularly monitored for radioactivity.

WISE No 4, March, 1979; West Australian - 26 August 1978

1978, September

TOKAIMURA, JAPAN

Japan's nuclear reprocessing plant at Tokaimura closed because of leakage of radioactive waste.

Legislative Research Service Paper, Parliamentary Library, Canberra

1978, October 17

IDAHO CHEMICAL PROCESSING PLANT, USA

Criticality process accident − Uranyl nitrate solution, 82% enriched uranium, in a lower disengagement section of a scrubbing column; excursion history unknown; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1978, October 21

MURUROA ATOLL, SOUTH PACIFIC

Fifteen Tahitians had been secretly isolated in a hospital at Mururoa Atoll for treatment for radiation sickness, following French nuclear tests in the area, according to Mr. Oscar Temaru, a Tahitian politician.

West Australian - 21 October 1979

1978, December 13

SIBERIAN CHEMICAL COMBINE, USSR

Criticality process accident − Plutonium metal ingots in a storage container; single excursion; one serious exposure, seven significant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1978, December 31

BELOYARSK-2, USSR

Fire at Beloyarak-2 caused by the collapse of the turbine building roof. The control cable is completely burned and the reactor cannot be controlled. Eight people are irradiated while trying to inject coolant into the reactor.

Nucleonics Week 31/5/90; WISB-334 22/6/90

1979 − Present

CHURCH ROCK, NEW MEXICO, USA

Church Rock Uranium Mill, New Mexico, continues to leak 40,000 to 80,000 gallons of radioactive waste per month into underground aquifers and streams. New Mexico officials' attempts to stop contamination resulting from a uranium tailings spill two years ago is considered ineffective by local residents.

WISE Vol 3, No.4 September 1981 p.18

1979

GRAND JUNCTION, COLORADO, USA

Significant levels of radon have been found in houses, schools, etc., where tailings were used for landfill and building foundations. Infant death rate for Grand Junction is 50% higher than the state average.

Penelope Coleing, 'Accidents, Near Accidents And Leaks in the Nuclear Industry', Sydney M.A.U.M.

1979

IRISH SEA

The second annual survey of radioactive discharges by the Department of the Environment noted a marked increase in discharges of plutonium-241 during 1979. Levels of strontium discharges also doubled last year. In 1978, 11 tonnes of uranium were dumped into the sea.

WISE

1979

CRYSTAL RIVER, USA

The nuclear plant was shut down for six weeks for refuelling, but the Nuclear Regulatory Commission ordered the plant to remain closed until equipment and procedure changes were made. It was four months before it began operating again.

The Australian - 28 February 1978

1979

USA

Critical Mass Energy Project - Washington compiled a list of the 2,000 nuclear mishaps that occurred in 1979 at US nuclear reactors.

1979, January

WINDSCALE, U.K.

Residents living near the Windscale nuclear plant are exposed to radiation levels fifteen times greater than previously indicated; levels are double the long-term value recommended by the International Commission on Radiological Protection.

New Ecologist, January/February 1979

1979, February

U.K.

British dockyard workers exposed to radiation while working on nuclear submarines show a greater than normal incidence of damaged chromosomes. These results are based on a ten-year study. Damage occurs even when radiation exposures are below internationally agreed safety standards.

New Scientist - 15 February 1979

1979, February 2

SWEDEN

A blocked pipe at a nuclear power station almost caused a disastrous accident. The blockage caused enriched uranium liquid to leak into a transport container reaching criticality of 0.83 by the time the accident was discovered. If it had reach 1, an atomic chain reaction would have been triggered off. Workers at the station say that management tried to get them to keep quiet about the accident. The management said it had no idea such accidents could happen when it established the station. A plant supervisor said that such accidents happen all the time: 'only last week we had to sweep up contaminated snow after radioactive dust blew up the chimney.'

Tribune - 7 March 1979

1979, February 2

NORTH CAROLINA, USA

The Federal Bureau of Investigation recovered 68 kgs of uranium stolen by an employee at General Electric's plant at Wilmington, North Carolina.

Sydney Morning Herald - 3 September 1979

1979, March 14

USA

The US government orders the temporary closure of five large nuclear plants because of concerns over their ability to withstand earthquakes.

Sydney Morning Herald - 15 March 1979

1979, March 27

KARI, SOUTH KOREA

Nuclear reactor at Kari (near Pusan) closed because of leakage of contaminated radioactive water. Has had cooling system troubles in the past.

West Australian - 4 April 1979

1979, March 28

THREE MILE ISLAND, PENNSYLVANIA, USA

A malfunction in the secondary cooling circuit of the Three Mile Island #2 pressurised-water reactor caused the temperature in the primary coolant to rise. The reactor shut down automatically. A relief valve failed to close, but instrumentation did not reveal that fact. Much of the primary coolant drained away so heat in the reactor core was not removed and the core suffered severe meltdown with around 18 tonnes of fuel forming a mass at the bottom of the pressure vessel. The reactor vessel maintained integrity, thus greatly reducing radiation releases.

The accident was caused by a combination of operator error, design deficiencies, and component failures. Metropolitan Edison pled guilty to charges of falsifying safety test results prior to the accident.

The accident was rated Level 5 ('accident with off -site risk') on the 7-point International Nuclear Event Scale.

The Governor of Pennsylvania advised the evacuation of pregnant women and pre-school age children within a 8 sq km radius, later extended to 32 kms. An estimated 140,000 people left the area.

About 150,000 litres of radioactive waste water was (deliberately) released into the Susquehanna River. Government and industry sources state that approximately 2.5 million curies (92,500 TBq) of radioactive noble gases and 15 curies (0.56 TBq) of radioiodines were released. They further claim that although around two million people were exposed to radiation from the accident, the average dose was extremely small − figures cited range from 1.4 to 8 millirem (0.014 to 0.08 mSv). Those claims are disputed by some scientists on the basis of radiation monitoring data and epidemiological evidence of increased disease rates among exposed populations. There is however no dispute that radiation releases and exposures were several orders of magnitude lower than those arising from the Chernobyl disaster.

Clean-up operations officially ended in 1993 − 14 years after the accident − but the reactor will not be decommissioned for some decades to come.

Valve failures, most leading to coolant escape, had been observed on 11 occasions prior to the Three Mile Island meltdown; indeed the initial causal sequence of events at Three Mile Island had taken place 18 months earlier at another Babcock and Wilcox reactor. Preventive and precautionary measures ought to have been taken which would have prevented the Three Mile Island meltdown − but they were not.

http://threemileisland.org

Report of the President's Commission on the Accident at Three Mile Island, 1979, www.pddoc.com/tmi2/kemeny

Science for sale: TMI and the University of Pittsburgh, WISE/NIRS Nuclear Monitor #576, 8 November 2002, www10.antenna.nl/wise/index.html?http://www10.antenna.nl/wise/576/5457.html

1979, April

USA

US Nuclear Regulatory Commission ordered the temporary closure of all Babcock and Wilcox reactors.

West Australian - 30 April 1979

1979, April

ZION, ILLINOIS, USA

Radioactive gas escaped into the air and released 3,200 litres of radioactive water within the plant. Three men were sprayed; 'all wore protective clothing and tests had shown no traces of contamination,' a company spokesman said.

West Australian - 3 May 1979

1979, April

LUCAS HEIGHTS, AUSTRALIA

In the controversy caused by Three Mile Island, a previously unpublished report came to light. Two million gallons of radioactive cooling water from the research reactor have been dumped into the local Woronora River every month for the past 19 years. The reactor closed down in mid-September 1979 for repairs, especially to two leaks which occurred in the primary cooling system in 1978. Workers have threatened to refuse to start the reactor as it is old, understaffed and has inadequate monitoring devices.

WISE No.5 p.14; Daily News - 4 April 1979

1979, April 2

TOKAIMURA, JAPAN

Two workers are exposed to radioactivity.

WISE No.5 May-June 1979, p.14

1979, April 11

GRENOBLE, FRANCE

Grenoble reactor automatically shuts down as radioactive gas escapes.

WISE No.5, 5/1979, p.14

1979, April 13

BARSEBACK 1, SWEDEN

Fire in Barseback 1 generator − shut down for six months with US$50 million damage.

WISE

1979, April 20

BIG ROCK, MICHIGAN, USA

Leak of highly radioactive water in cooling system forces indefinite shut-down.

WISE

1979, April 20

BORSSKLEN, NETHERLANDS

Holland's only commercial reactor closes after turbine springs leak.

Nucleus - 25 July 1979, p.17

1979, May 1

ZION, ILLINOIS, USA

Technical defect releases radioactive gas together with 650 gallons of water.

WISE No.5 5/1979

1979, May 5

DUNGENESS, ENGLAND

Dungeness plant closed after cracks found in cooling system.

West Australian- 7 May 1979

1979, May 7

BROWN'S FERRY, ALABAMA, USA

Radioactivity released into the Tennessee River as a result of a leak in the cooling system at Brown's Ferry Nuclear Plant.

West Australian- 7 May 1979

1979, May 9

SURRY, VIRGINIA, USA

Nuclear sabotage attempt at Surry Nuclear Power Plant. Caustic substance dumped into 62 of the 64 fuel elements through manhole-like openings in the floor of the fuel storage building.

The Age - 10 May 1979

1979, May 11

GERMANY

Fire swept through a nuclear research centre, 100 metres from the nuclear reactor. Radioactive material was threatened by flames, which burned for ten hours.

West Australian- 14 May 1979

1979, May-June

USSR

Reports of prisoners dying through radiation exposure according to A. Shifrin, the director of a centre that investigates concentration camps and psychiatric prisons in the USSR. Some of these camps are near atomic submarine bases. Prisoners from camps reportedly clean highly-radioactive parts of the submarines and receive lethal doses of radiation. Other prisoners work in uranium mines and refineries where they are exposed to radiation.

Baltic News- May-June 1979, based on an article 'Novoye Rusakoye Siovas'

1979, June 4

MILLSTONE 2, WATERFORD, CONNECTICUT, USA

Millstone 2 (828 P.W.R.) in Waterford shut down to repair broken valve that had leaked radioactive steam.

WISE

1979, June 6

CADARACHE, FRANCE

French Atomic Energy Commission reported leak in experimental reactor at Cadarache Nuclear Research Centre in southern France.

Daily News - 6 June 1979

1979, June 19

SURRY, VIRGINIA, USA

Two men claim responsibility for sabotaging plant to underscore lack of security.

Newport News, AAP/AP; Sydney Morning Herald- 19 June 1979; Nucleus - 25 July 1979, p.17

1979, June 22

PEACH BOTTOM 3, PENNSYLVANIA, USA

Second uncontrolled release of radioactive gas in two days at Peach Bottom, Pennsylvania Unit 3 (1065 PWR) nuclear reactor.

WISE

1979, June 25

DC COOK 2, MICHIGAN, USA

1,000 gallons of radioactive coolant water spray over upper level of containment building at DC Cook No. 2 reactor (1,049 MW PWR). The reactor was being tested prior to its being put back online after it was closed on May 19 when cracks were discovered in the feed water piping system. DC Cook No. 1 reactor undergoing repairs for cracked pipes.

WISE

1979, July

RADIUM HILL, SOUTH AUSTRALIA

A NSW Government report on workers at Radium Hill finds a high rate of cancer deaths. Safety standards at Radium Hill were sub-standard. [Later, an epidemiological study finds a statistically-significant increase in cancers among former Radium Hill mine workers.]

Nationwide, ABC - 23 July 1979

1979, July 10

GENTILLY 1 POWER STATION, TROS RIVIERES, CANADA

Quebec's only nuclear power station shut down indefinitely. Hugh Spence of the Atomic Energy Control Board said that this reactor was fraught with problems from the beginning. The generating plant − condemned by some scientists as a 'lemon' − has functioned for only 10 days since opening in May, 1977.

West Australian - 11 July 1979

1979, July 16

CHURCH ROCK, NEW MEXICO, USA

Tailings pond dam breaks near Church Rock, spilling 1,100 tons of uranium tailings.

WISE

1979, July 17

WINDSCALE, U.K.

Six men contaminated by radiation when fire broke out. A spokesman for the plant said the contamination was 'very minor' but more tests were being made on the men. Staff were evacuated and given medical checks.

Reuters; Sydney Morning Herald - 18 July 1979

1979, July 23

ALDERMASTON, U.K.

Government scientist Peter Allen killed in an explosion at Aldermaston Atomic Weapons Research Station.

WISE No 6, October 1979

1979, July 25

ONTARIO, CANADA

Plant shut near Bruce, Ontario, after 90,000 litres of heavy water leaked.

WISE

1979, July 27

PILGRIM 1 MASSACHUSETTS, USA

Pilgrim 1 (670 BWR) reactor shut-down automatically because two valves failed to function properly when the reactor was struck by lightning.

WISE

1979, July 30

RIO PUERCO, NEW MEXICO, USA

Accident in uranium processing plant. Flash flood washed radioactive material an estimated 130 kms down the Rio Puerco River, which flows past a Navajo Indian Reservation. New York Times reported that the 100 million gallons of water and 1,100 tonnes of uranium tailings mishap is considered the largest such release in the U.S. Residue from the plant goes into a large dam which then bursts.

ABC Australia 30 July 1979; N.Y. Times - 28 July 1979

1979, August

CRYSTAL RIVER, FL, USA

The Nuclear Regulatory Commission ordered the Crystal River Plant to operate at 50% capacity following a series of brief shutdowns that the company said were caused by equipment failures.

The Australian - 28 February 1980

1979, August

TIHANGE, BELIGIUM

Tihange Nuclear Power Plant shut down because of cracked pipes. Information did not reach the press until 20 September.

Les Amis de la Terre in WISE Vol.2 No.2 p.18

1979, August 6

DOEL, BELGIUM

Two nuclear power plants at Doel, Belgium were closed after a cooling water pipe burst and flooded a machine room basement.

AAP Reuters; Sydney Morning Herald - 7 August 1979

1979, August 8

THE HAGUE, NETHERLANDS

The only commercial nuclear power station in the Netherlands closed after a turbine steam bellows sprang a leak.

West Australian - 9 August 1979

1979, August 15

VIRGINIA, U.S.A.

The Virginia Electric and Power Company is fined $15,000 by the US Nuclear Regulatory Commission for a safety violation involving a worker who voluntarily exposed himself to more than three times the permitted dose of radiation.

Washington Post - 16 August 1979

1979, August 16

MARALINGA, SOUTH AUSTRALIA

The former British atomic test site at Maralinga will not be considered safe until 2029 according to a report by the Australian Ionizing Radiation Advisory Council. Six drums of plutonium-contaminated waste have been dug up and returned to Britain. The site is still contaminated and is likely to remain so indefinitely

www.foe.org.au/anti-nuclear/issues/oz/britbombs/clean-up

West Australian - 16 August 1979

1979, August 29

OLKILUOTO, FINLAND

50,000 litres of radioactive water leaked onto the floor of the reactor building causing a shutdown for six days.

WISE Vol.2 No.2, p.18

1979, September

OLKILUTO 1, FINLAND

15,000 litres of radioactive water leaked at the reactor. The company withheld information from the public.

WISE Vol.2 No.2 p.18

1979, September

LOVIISA PLANT, FINLAND

The state-owned power company at Loviisa announced that cracks in the mantle inside the reactor vessel had been discovered in February 1978, but had been neglected.

WISE Vol.2 No.2

1979, September 3

U.S.A.

A Government study of 3,500 uranium miners found 200 to have already died of cancer against a rate of fewer than 40 deaths that could be expected among 3,500 people elsewhere. Most cases of miners afflicted with lung cancer, silicosia and fibrosis have not been compensated by the Government.

AAP; New York Times; West Australian - 3 September 1970

1979, September 29

TUCSON, ARIZONA, USA

Governor Bruce Babbit of Arizona declared a State of emergency and sent the National Guard to clean out radioactive tritium at the plant which he claimed had been leaking recurrently. Chocolate cake made in the school across the road was found to have elevated levels of radioactive tritium, almost three times the official limit.

Nucleus - Vol.2 No.1 Nov/Dec 1979, p.19

1979, October

WINDSCALE, U.K.

In Britain, Government scientists will investigate whether an rise in the incidence of blood cancer in Northern England is due to radioactive pollution from the nearby Windscale nuclear plant. Doctors diagnosed 12 cases of leukemia in one area. Scientists at Manchester University found a marked rise in leukemia deaths in the Blackpool, Burnley, Lancaster and Preston areas surrounding Windscale. Another university team discovered levels of radioactivity in the adjoining Irish Sea hundreds of times greater than in other coastal regions.

Daily News - 3 October 1979

1979, October

RED ROCK NAVAJO RESERVATION, ARIZONA, USA

Reports of high death rates amongst uranium miners in the Navajo Reservation. Seventeen have died and 45−50 miners have pulmonary fibrosis. Dr. Joseph Wagoner's estimates of the toll up to 1978 is about 200 deaths. That is 160 more than would be expected in the general population 'making 160 people who needlessly died due to lung cancer because we did not accept the published data that was already there for our use in the 1950's'. 'The data clearly indicates the inadequacy of current standards of radiation exposure in the mines.'

NS October, 1979 p.81; Daily News - 6 June 1980

1979, October

THREE MILE ISLAND, PENNSYLVANIA, USA

Metropolitan Edison, operator at Three Mile Island nuclear plant, was fined $150,000 by the NRC. The company was found guilty of 17 safety violations.

WISE Vol.2 No.2 p.18

1979, October 13

WEST BERLIN, GERMANY

A nuclear power plant at Hoexter re-opened after a seven month closure over technical problems. It was shut down again on this day because of a faulty water pump.

The Advertiser - 13 October 1979, p.2

1979, October 15

FORT ST. URAIN, DENVER, USA

The Fort St. Urain reactor, 22 kms from Denver, was shut down after a malfunction released radioactive gas into the atmosphere. The shutdown was the third in two years due to 'equipment malfunction'. A spokesman for the Public Service Company of Colorado, which operates the plant, said the shutdown occurred after helium, the primary coolant, seeped into a back-up water system.

The Australian - 16 October 1979

1979, October 24

TRICASTIN, FRANCE

Sidier Duez was killed by an abnormal concentration of nitrogen and lack of ventilation at the Tricastin nuclear power plant in France.

La Guele Overte in WISE Vol.2 No.2 p.18

1979, October 30

LUCAS HEIGHTS, AUSTRALIA

The N.S.W. Premier, Mr. Wran criticised the Federal Government for its lack of communication over a leak at Lucas Heights. The Australian Atomic Energy Commission said the leak had been isolated and the parts involved would be replaced. He said nothing had escaped from the reactor.

The Australian - 30 October 1979

1979, November

IDAHO FALLS, IDAHO, USA

The Lewiston Morning Tribunal, an Idaho newspaper, quoted an unpublished 1974 Federal report saying that a water supply beneath a US Energy Department laboratory near Idaho Falls had been contaminated by radioactive waste. It was also claimed that large amounts of hexavelant chromium − a non-radioactive cancer-causing agent − had been released into the Snake River aquifer through injection wells. The aquifer covers 290 kms and is used for human consumption and irrigation.

AAP/AP; West Australian - 12 November 1979

1979 November

FFTF, HANFORD, WA., USA

Faulty fuel rods built are scheduled for use at the Fast Flux Test Facility (FFTF) at Hanford, Washington. The Environmental Policy Institute in Washington, D.C. uncovered evidence that the FFTF had not met the quality assurance criteria for the reactor; had not sufficiently answered inquiries by the Advisory Committee on Reactor Safeguards of the Nuclear Regulatory Commission about containment; had no evacuation plan; and that radioactive materials would continuously leak during the expected 20 years of operating life.

Public documents, as well as the transcripts of the SILKWOOD v KERR McGEE civil suit, attest that fuel pellets were not properly manufactured and abuses by quality assurance employees were common. Defects in welds, quality assurance irregularities, improper record keeping and improper shipping practices by Kerr McGee were confirmed.

WISE November/December 1979

1979, November

USA

Babcock and Wilcox, builders of the Crystal River and Three Mile Island plants made a US$1.1 million out-of-court settlement in addition to providing two new cooling pumps after the Florida Power Company filed a suit charging the firm with installing equipment 'not fit for the production of nuclear energy'.

Human error evidently played a large part in the Three Mile Island accident. The Nuclear Regulatory Commission conducted a survey that revealed that 20 of the 107 senior operators at US nuclear plants were not licensed. Ten others were licensed at the wrong plants. Of all nuclear operators at 66 nuclear reactors, 53 had failed written examinations. 448 scored low enough to be required to attend special lectures to improve their abilities. The NRC called for tougher training.

Critical Mass Journal; WISE Vol.2 No.2 p.8; The Australian - 28 February 1980

1979, November

WINDSCALE, U.K.

The widow of a Windscale worker whose husband died of leukemia at the age of 36 was awarded 67,000 pounds by the Carlisle Crown Court. This was the first case of its type. On two previous occasions, British Nuclear Fuels Ltd. settled out of court while refusing to accept liability. All three cases were started by the General and Municipal Workers.

WISE

1979, November 2

OHU 1, WEST GERMANY

Ohu 1 nuclear reactor near Landshut was shut down for two days because of leaks.

WISE Vol.2 No.2 p.18

1979, November 4

TAKAHAMA II, JAPAN

'Simple' mistakes caused 80 tonnes of radioactive water to escape from the primary cooling system at the Takahama 11 reactor near Fukui. The reactor was shut down for one month.

The Australian - 5 November 1979; West Australian - 5 November 1979

1979, November 5

SWITZERLAND

An explosion at Switzerland's newest and biggest nuclear power station destroyed a 100-metre high pylon. The station was due to be opened later in the month.

West Australian - 5 November 1979

1979, November 10

BUGEY, FRANCE

Chief solderer died at Bugey nuclear power plant in steam generator room filled with nitrogen. He had not been warned and was not wearing a mask.

La Guenle Dverte in WISE Vol.2 No.2 p.18

1979, November 12

MICHIGAN, USA

The US Nuclear Regulatory Commission proposed a fine of $402,750, the largest in its history, for a Michigan power company which failed to close the valve on a pipe leading from a reactor containment building.

West Australian - 12 November 1979

1979, December

PALISADES, MICHIGAN, USA

The Nuclear Regulatory Commission fined Michigan's Palisades nuclear power plant US$45,000 for safety violations which caused radioactive leakage over an 18 month period.

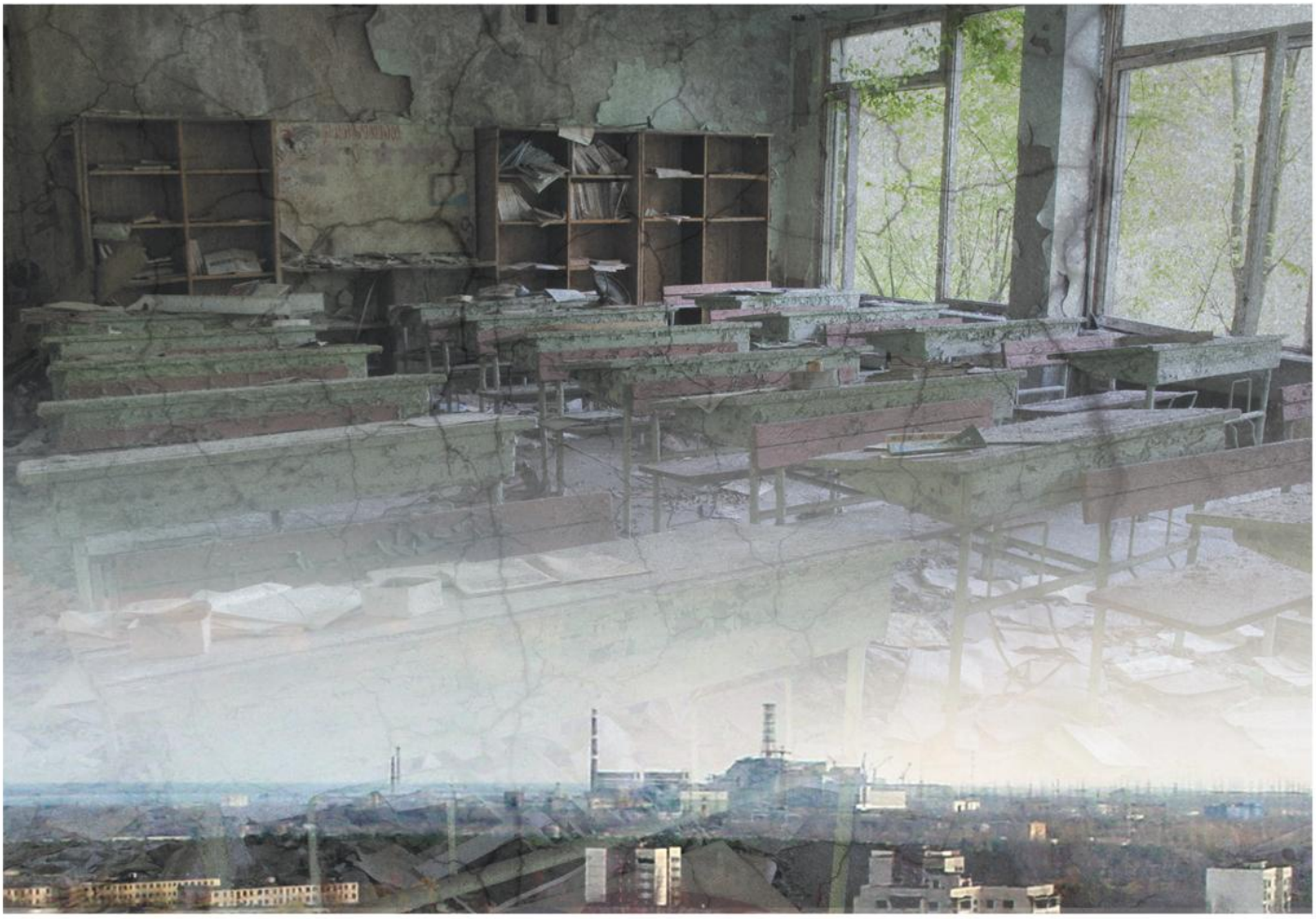
www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/accidents/accidents-1970's.htm

1979, December 11

HANFORD, WASHINGTON, USA

Two former Hanford employees claim, during U.S. Senate hearings, that the Energy Department and Hanford covered up reports of leaking underground nuclear waste at the Hanford site. Stephen Stalos and Allen Wegle resigned from their jobs at Hanford because of nuclear safety management techniques. They said some leaks continue undetected while others are detected but not labelled as leaks by management. In further testimony, it was stated that between 1956 and 1976 at least 20 out of the 150 storage tanks leaked over 50,000 gallons of liquid waste into the soil.

WISE



the 1980s

1980

USA

According to a report released by the Environmental Policy Institute, workers at the 69 operating U.S. nuclear power plants received 35% more radiation in 1980 than in 1979, even though only one new nuclear power plant went into operation during that time. The study was compiled from data supplied by the Nuclear Regulatory Commission. It states that 80,200 workers were exposed to 53,797 person-rems in 1980 compared to 64,073 workers exposed to 39,759 person-rems in 1979.

1980

DIABLO CANYON, CALIFORNIA, USA

The opening of the $1.5 billion Diablo Canyon plant has been suspended following the discovery of an earthquake fault five kms from the plant in the ocean floor.

International Nuclear News Service No.12 p.33

1980 - 1985

CHINA

Careless handling of radioactive materials killed 20 people and injured 1,200 in nuclear accidents in China from 1980 to 1985 according to the China Daily, which quotes an official from the State Environmental Protection Bureau, Luo Guozhen, saying that China needs stricter measures on the handling of radioactive materials.

The Guardian (U.K.) 7/8/89; WISE 317 8/9/89

1980, January

LAWRENCE LIVERMORE, CA., USA

An earthquake caused a split in a storage tank holding low-level radioactive waste at California's Lawrence Livermore Nuclear Weapons Research Laboratory. The laboratory, which stores about 150 kgs of plutonium, is 110 kms from San Francisco.

The Australian - 21 April 1980; The Age - 24 April 1980

1980, February 11

BRADWELL 1, U.K.

The No.1 reactor at Bradwell has been closed for inspection since last summer and found to be suffering from major cracks in its primary cooling circuits. The affected primary circuit contains high pressure carbon dioxide which transfers heat from the reactor to the steam generators.

The Guardian - 11 February 1980; International Nuclear News Service No.12 January/April 1980

1980, February 11

THREE MILE ISLAND, PA., USA

4,500 litres of radioactive water leaked from the Three Mile Island reactor.

WISE

1980, February 12

THREE MILE ISLAND, PA., USA

The radioactive gas krypton-85 escaped from Three Mile Island for 16 hours.

WISE

1980, February 12

BRADWELL, U.K.

British authorities have closed the Bradwell Plant after electronic scans showed welding cracks in the cooling system of the No.1 reactor. Failure of the primary coolant could cause critical overheating in the reactor core and possible release of radioactive materials.

Financial Review - 12 February 1980

1980, February 27

CRYSTAL RIVER, FL., USA

Crystal River reactor shut down after a malfunction triggered an emergency cooling system. A 'Class B' emergency was declared. Some contaminated water spilled into the containment building which housed the reactor.

The Australian - 28 February 1980; WISE; Financial Review - 28 February 1980

1980, March

SANTA MARIA DE GARONA, SPAIN

Nine tubes ruptured and caused primary coolant to leak out. New cracks in the primary cooling system were later discovered. The plant will be shut down for six months and repairs will be slow as they will have to take place in the centre of the reactor building.

WISE

1980, March

OYSTER CREEK, USA

The Oyster Creek reactor in New Jersey leaked 160 gallons of low-level radioactive water. The leak, caused by a faulty valve, was discovered three days after it began filling a concrete catch basin.

Los Angeles Times - 20 March 1980; WISE

1980, March

CALVERT CLIFF, MD., USA

Radioactive gas leaked for five minutes from a waste gas storage tank at Calvert Cliff Nuclear Power Plant. Fifty-five employees were evacuated from the plant for 45 minutes.

Los Angeles Times - 28 March 1980; WISE

1980, March 4

BRUNSBUTTEL, GERMANY

150,000 litres of 'lightly contaminated' radioactive water escaped into the reactor containment building as pipes were being cleaned at Brunebuttel Nuclear Reactor in West Germany. The plant had been shut down since an accident there in mid-1978.

WISE Vol.2 No.4 p.19

1980, March 13

SAINT LAURENT-DES-EAUX, FRANCE

On March 13, 1980 some annealing occurred in the graphite of one of the power reactors, causing a brief excursion and damage to the reactor core. Rated Level 4 ('accident with local consequences') on the 7-point International Nuclear Event Scale, based on the on-site impact.

http://en.wikipedia.org/wiki/Saint-Laurent_Nuclear_Power_Plant

1980, March 27

ISAR, GERMANY

The Isar nuclear plant in Ohu shut down after radioactive gas escaped.

WISE

1980, April

LA HAGUE, FRANCE

For the second time in a month, divers completed repairs to a faulty undersea pipeline which carries radioactive water from the nuclear treatment plant. This time the breach occurred in calm water and spilt radioactive water into the channel. This is the 39th time the pipe has broken. Unionists have called for a six-month closure of the factory claiming the equipment is 'decrepit'.

International Nuclear News Service, No.12 p.12

1980, April

FESSENHEIM, FRANCE

According to Mr Etemad, a nuclear expert who used to work with the French reactor building company Framatome, there are cracks in the Fessenheim nuclear power plant where 10 relatively minor accidents have occurred. The director of the plant admitted that faulty parts had been built into the reactor. Mr Etemad expresses concern about potential cracks in pipe / reactor vessel connections.

WISE Vol.2 No.3 p.9

1980, April

LOVIISA 2, FINLAND

A faulty reactor vessel was delivered by the USSR for Loviisa 2. Although cracks were discovered, the reactor was accepted. Experts say it is impossible to repair. The owners of Loviisa ordered an investigation following the discovery of more cracks, to be carried out by the German Kraftwerk Union.

WISE Vol.2 No.3 p.8

1980, April

LAWRENCE LIVERMORE, SAN FRANCISCO, CA., USA

An earthquake in San Francisco caused the evacuation of the Lawrence Livermore Atomic Weapons Laboratory. The earthquake caused minor injuries, disrupted power and gas lines and ruptured a tank holding 30,000 gallons of low-level radioactive liquid. Tritium-contaminated water was leaked at the rate of a quart a minute.

International Nuclear News Service (South Australia) No.12 p.33

1980, April 15

LA HAGUE, FRANCE

Fire caused a breakdown of the cooling system at the waste reprocessing plant at La Hague. Plant operators found replacement generators from elsewhere.

WISE Vol.2 No.4 p.15

1980, April 20

LAWRENCE LIVERMORE, CA., USA

A second leak within eight days occurred at the Lawrence Livermore Nuclear Weapons Research Laboratory. Both leaks were in rooms where plutonium was being kept in glove boxes − sealed containers used to hold highly-radioactive substances during experiments.

The Age - 24 March 1980; The Australian - 21 April 1980

1980, May

SAVANNAH RIVER, S.C., USA

Approximately 100 workers were evacuated from the Savannah River Nuclear Materials Plant for two days after hydrogen sulphide was found to be leaking from the plant.

WISE

1980, May

DUNGENESS, SCOTLAND

Dungeness Reactor 2 was closed down when cracks were discovered in the primary cooling circuit.

The Guardian - 5 January 1980

1980, May 9

MELBOURNE, AUSTRALIA

The Korean and South-East Asian Forces Association is demanding compensation for alleged cancer-causing effects of radioactive water used in soft drinks supplied to the Australian troops in Korea. The Association's President, Mr. George Campbell, said: 'we believe that at least half of the occupation forces were affected in some way by the radioactive fallout at Hiroshima'.

West Australian - 9 May 1980

1980, May 11

ARKANSAS 2, NEW YORK, USA

Reactor shut down after radioactive water 45.7 cms deep covered the floor of a reactor building at Unit 1 of the Arkansas Nuclear 1 power plant. The leak had not been plugged when a seal on the coolant pump failed. By noon, 160,000 litres of water covered the floor of the reactor building.

West Australian - 12 May 1980; WISE Vol.2 No.5 July/September 1980 p.27

1980, May 12

ZION, ILLINOIS, USA

Eight workers were contaminated during an accident at the Zion Nuclear Plant's Unit 2 when a hose connected to an incorrect valve ruptured, spilling 10,000 gallons of contaminated water.

WISE

1980, May 17

KARLSRUHE, WEST GERMANY

Research reprocessing plant at Karlsruhe inoperative for approximately one year due to an accident; cause unknown. Plant radioactively contaminated. Accident confirmed by G.W.K., the German reprocessing company.

WISE

1980, May 21

LA HAGUE, FRANCE

300-500 litres of liquid containing plutonium (1 to 20 grams/litre) was spilt on concrete floor.

WISE

1980, May 22

NORTH ANNA 1, USA

North Anna 1 Nuclear Plant malfunctioned and was shut down when operators were unable to close a valve. Second malfunction two hours later caused an activation of the emergency cooling system.

WISE

1980, May 22

BRUNSWICK, NEW JERSEY, USA

Brunswick Nuclear Plant accidentally released a small amount of radioactive caesium, forcing the plant to shut down. Surrounding vegetation showed a high amount of radioactivity.

WISE

1980, June

SACAVEN, PORTUGAL

Research reactor Sacavem near Lisbon shut down due to a water leak from cooling pool. A year ago the plant had to be shut down for the same reason.

WISE

1980, June

BROWN'S FERRY 3, ALABAMA, USA

The Brown's Ferry Unit 3 reactor was closed in June when its emergency shutdown system (SCRAM) failed to operate properly. During a routine maintenance shutdown, 75 of the 185 boron control rods that halt the nuclear reaction would not descend into the core of the reactor. After three manual attempts failed the automatic SCRAM finally moved the rods, and a serious accident was averted.

WISE Vol.3 no.4 September 1981 p.9

1980, June

SOUTH DAKOTA, USA

Serious contamination found in the water at Pine Ridge Indian Reservation. W.A.R.N. (Women of all Red Nations) report showed that in one month in 1979, 38% of pregnancies reported to the Public Health Service Hospital in Pine Ridge resulted in spontaneous abortions and excessive bleeding. Of the children born, 60-70% suffer breathing complications as a result of underdeveloped lungs and/or jaundice. Children have been born with cleft palates, club feet, diseases uncommon to the Dakota people. Pine Ridge Reservation lies south-east of Black Hills, the site of extensive uranium drilling and mining from the late 1940s to the early 1970s.

WISE Vol.2 No.4 p.5

1980, June 5

MARCOULE, FRANCE

Two workers irradiated during an explosion at the nuclear factory in Marcoule. Similar accident occurred two weeks earlier.

WISE Vol.2 No.5 July/September 1980 p.27

1980, June 18

WINDSCALE, U.K.

175 workers at Windscale became ill after drinking contaminated water. Fault in the system allowed water from the polluted River Eben, which is used to cool the reactor, to enter the drinking water.

A.A.P. Daily News 18 June 1980; West Australian - 19 June 1980

1980, June 23

BELGIUM

Worker contaminated and burnt when radioactive steam suddenly released.

WISE

1980, June 28

BROWN'S FERRY 3, AL., USA

For 12 minutes, operators were unable to stop the chain reaction at Brown's Ferry No. 3 nuclear plant at Alabama. It took four attempts to insert all control rods into the core. There were 17 accidents and incidents at the plant in 1979.

WISE Vol.2 No.6 October/November 1980 p.10

1980, June 29

THREE MILE ISLAND 2, HARRISBURG, PA., USA

More than 40,000 litres of radioactive water leaked from a reactor at the Three Mile Island nuclear power station. The leak in the No.2 reactor started in a cooling system.

The Australian - 30 June 1980

1980, July

TRAWSFYNYDD, WALES, U.K.

Water leaking into the core of a reactor containing radioactive fuel rods caused shutdown of the nuclear power station at Trawsfynydd in North Wales.

WISE Vol.2 No.5 July/September 1980, p.27

1980, July

USA

The US Nuclear Regulatory Commission ordered the shutdown of 24 of the country's 67 nuclear power stations for tests following the failure of a key safety system in an Alabama plant. The tests are phased to avoid disrupting power supplies.

Sydney Morning Herald - 10 July 1980

1980, July 3

PRAIRIE ISLAND, MN, USA

Prairie Island plant on the Mississippi River closed after it began leaking radioactive water and gas.

A.A.P. Reuters / West Australian - 3 July 1980

1980, July 4

THREE MILE ISLAND 1, HARRISBURG, PA, USA

Spill of 45,000 litres of radioactive water at Three Mile Island's undamaged but idle No.1 reactor during preparations to vent radioactive krypton gas. According to Metropolitan Edison Company no radiation was released to the outside environment.

Weekend News - 28 July 1980

1980, July 18

PACIFIC OCEAN, USA

Records found indicating that more than 12,000 barrels of radioactive waste were dumped in the Pacific Ocean at previously undisclosed sites by the US Atomic Energy Commission. A US Environmental Protection Agency official said the Atomic Energy Commission had dumped waste at 10 sites. The only previously acknowledged dump was south of the Faralion Islands where 25% of the 47,000 barrels have burst, spilling radioactive waste onto the ocean floor.

Daily News - 18 July 1980, p.19

1980, August

USSR, IN WATERS OFF JAPAN

Fire aboard a Soviet Echo-class nuclear submarine in waters off Japan reportedly killed at least nine crewmen.

WISE News Communique #262 31 October 1986

1980, August

BARSEBACK 1, SWEDEN

During the yearly inspection of Unit 1 reactor at the Barseback plant in Sweden, cracks were found in the T-formed pipes, which connect the auxiliary feed water system and the shutdown cooling system with the main feed water system.

WISE Vol.2 No.6 Dec 1980 p.10

1980, August 8

FESSENHEIM 1 AND 2, FRANCE

Both units at the Fessenheim nuclear reactor in France were shut down after a defect in Unit 1 caused the leakage of 'some water.' News of the breakdown was withheld from the press for one day because the plant operators did not want to 'worry the public'.

WISE vol..2 No.6 October/December 1980 p.10

1980, August 8

MARY KATHLEEN, AUSTRALIA

Process workers were charged with stealing 2,200 kilograms of uranium oxide worth $145,200 between April 1977 and July 1978 from Mary Kathleen Uranium Ltd. Following this incident, the Federal Government admitted the existing system of monitoring uranium stocks was deficient and strict new checks on mining, milling and processing of uranium at all stages would be undertaken. 'The alleged disappearance of more than 2,200 kgs of yellowcake comes as a serious embarrassment to the Prime Minister and senior officials who have repeatedly claimed that Australia's export safeguards are 'second to none''. Another man was charged with the theft of 220 grams of uranium oxide from Mary Kathleen Uranium Ltd.

West Australian - 16 August, 1980; The Australian - 12 August 1980; West Australian - 13 August 1980

1980, August 8

RINGHALS 1, SWEDEN

Ringhals 1 reactor shut down after the breakdown of a pump in the cooling system. Replacement of defective parts expected to take up to two months.

A.A.P. Daily News - 8 August 1980

1980, August 13

AUSTRALIA

Up to 30 drums of radioactive waste from atomic bomb tests were dumped off Queensland in the mid 1950's. Mr Noel Freeman, a R.A.A.F. veteran, said the waste came from four Lincoln bombers that flew through radioactive clouds and monitored the fallout of British atomic bomb tests at Emu Field and the Monte Bello Islands. Mr. Freeman was a service technician with the team which decontaminated the planes. The pilot of the aircraft that dumped the waste said several of the 20−30 drums exploded on impact. Radioactive waste cleaned from the planes and radioactive chunks of the plane had been sealed in 200-litre drums and dropped at sea. Mr. Freeman said he was breaking his silence about the project in an effort to help fellow workers of the decontamination team, who were suffering ill health, to obtain compensation.

West Australian - 13 August 1980

1980, August 14

SEQUOYAH, TENNESSEE, USA

The Sequoyah Nuclear Plant in Tennessee shut down after operators were unable to control one of the four banks of control rods. Nevertheless the Nuclear Regulatory Commission approved a full power license a month later. On the 3rd October, 90 minutes after it began generating for the first time, the Sequoyah Plant was forced to shut down because the water level in a drainage tank for a steam turbine became too high.

WISE Vol.2 No.6 October/December 1980 p.10

1980, August 14

RINGHALS 2, SWEDEN

Unit 2 of the Ringhals Nuclear Plant in Sweden shut down after a breakdown of a pump in the cooling system. Unit 1 had been shut down at the end of July after cracks were discovered in the pipes of the cooling system.

WISE Vol.2 No.6 October/December 1980 p.10

1980, August 21

USSR NEAR OKINAWA, JAPAN

At least nine crew members died and another three were injured in a fire on a Soviet Echo Class nuclear submarine off the coast of Japan. Grave fears were expressed that the submarine, lying crippled in the Pacific Ocean 140 kms east of Okinawa, was leaking radioactive material. Ships and aircraft were warned to stay out of the area.

Daily News - 21 July 1980 p.4; West Australian - 22 August 1980 p.1

1980, September

DOUNREAY, SCOTLAND

A BBC television program alleged that plutonium was lost from an experimental reactor at Dounreay in 1973 and 1977. The director of Dounreay, although not sure of the whereabouts of the fuel rods, remains adamant that the fuel rods were not stolen.

The Age - 9 September 1980

1980, September

JAPAN

Fishermen in northern Japan have protested against the Government's plan to return Japan's only nuclear-powered ship to Port Ominato, which refused the ship after it developed a radiation leak in its 1974 test run. The 'Mutsu' has been docked for repairs in Sasebo since 1978 and has been idle since a defective radioactive shield caused a leak in its reactor a week after it first left port.

1980, September 8

ILLINOIS, USA

The Nuclear Regulatory Commission is investigating the possibility that 1,400 kilolitres of radioactive water may have leaked from the nuclear power plant near Morris, Illinois. 'We think it's a paper loss − a faulty gauge or some problem in monitoring.' said a spokesperson from the operator, Commonwealth Edison.

West Australian - 8 September 1980

1980, September 19

CENTRAL ARKANSAS, USA

An explosion rocked a remote Air Force missile site in central Arkansas, injuring ten people. The explosion occurred as a maintenance crew tried to stop a fuel leak in a giant Titan missile - part of the United States' nuclear strike force. Residents living within 1.5 kms of the missile site had been evacuated before the explosion, but after the blast, all people within 8 kms were moved out of the area. The Titan missile site is one of 18 located in Arkansas. During routine maintenance in a Titan II missile silo, an Air Force repairman dropped a socket wrench which punctured a fuel tank and caused an explosion. The spanner pierced the missile's fuel tank blowing the nuclear warhead apart from the rest of the missile. It was recovered intact. Twenty-two workers were injured and 1,400 people from the surrounding area were evacuated.

National Times - 15 March 1981; The Herald - 20 September 1980; The Age - 20 September 1980

1980, September 22

LA HAGUE, FRANCE

An accident, which occurred at the plant's temporary waste storage site, resulted in the release of large quantities of radioactive water. Although workers discovered the leak immediately on September 22, it was not until October 1st that the plant's Director admitted the failure of the pump but denied that any contamination had taken place. On 3 October the leading trade union at La Hague distributed a written statement concerning the seriousness of the accident to all plant employees. The union also charged that the plant officials had attempted to cover up the contamination in an effort to downplay the seriousness of the accident.

WISE Vol.2 No.6 October/December, 1980 p.21

1980, September 26

NEVADA, USA

'Small amounts' of radioactive gas escaped from the site of underground nuclear tests north-west of Las Vegas, Nevada. A Department of Energy spokesperson claims that the gas is 'not expected to pose a health hazard'.

WISE Vol.2 No.6 October/December 1980 p.10

1980, September 28

OLKILUOTO, FINLAND

100,000 litres of low-level radioactive water leaked due to a defective valve at the Olkiluoto nuclear power plant in Western Finland. This is the biggest leak yet in a Finnish nuclear power plant. The automatic alarm system did not go off.

WISE Vol.2 No.6 p.10

1980, October 7

HANFORD, WA., USA

Eight workers at the Hanford nuclear reservation in Washington were exposed to plutonium oxide when a container ignited, scattering the powdery radioactive material. Doctors at the reservation claim that those exposed should 'suffer no ill effects'.

WISE Vol.2 No.6 p.10

1980, October 17

INDIAN POINT 2, NY, USA

Indian Point Unit 2 reactor (50 kms from New York City) shut down due to a number of mishaps which began on 3 October. The accident resulted in the leakage of 100,000 gallons of water from the secondary cooling system into the reactor containment building. Indian Point officials failed to report the accident until several days after the reactor was finally closed.

WISE Vol.2 No.6 p.10

1980, December

U.K.

Nine people have been accidentally affected by radioactive substances while working in Britain's power stations, according to a quarterly report by the Health and Safety Executive. The report lists 13 incidents and says other workers were exposed to possible radiation from contamination of floors, corridors and other surfaces.

West Australian - 1 December 1980

1980, December 4

PORT MACQUARIE, AUSTRALIA

An accident near Port Macquarie involved a truck carrying a 60-litre drum labelled 'danger radioactive - Americium 241', plus a smaller container labeled 'Caesium 137' and foodstuffs. When Sydney police called the Atomic Energy Commission at Lucas Heights for advice, they were told to call back later 'when the AEC opens'. Dr. John McKay of Port Macquarie claimed that 16 people who attended the accident are suffering from symptoms of radioactive poisoning. Dr. McKay has accused the AEC of a cover-up regarding the dangers of the accident, and has claimed that this lack of concern may endanger the 8,000 people in nearby Laurieton if radiation poisons the town's water supply. The NSW Minister for Public Health accused Dr. McKay of 'causing public mischief'. The Minister said the Health Commission report had found that, although the protective containers of the radioactive material were damaged, both were considered to be safe with no spillage or leakage of radioactivity.

Sydney Morning Herald - 16 April 1981; Canberra Times - 11 March 1981; WISE Vol.3 No.3 June/July 1981 p.16; Canberra Times - 11 March 1981

1945-1981

OAK RIDGE, TENNESSEE, USA

The Government-owned Oak Ridge Gaseous Diffusion Plant accidentally released 11,270 pounds of radioactive uranium into the environment in 121 separate incidents since 1945. In one such incident in May 1981, 52 workers were exposed to radioactive 'mist'.

WISE Vol.3 No.4 September 1981 p.18

1981, January

CHERBOURG, FRANCE

Radioactive material has escaped from a nuclear reprocessing plant at Cherbourg for the second time in a fortnight.

The Western Mail - 17 January 1981

1981, January 10

TSURUGA, JAPAN

Over 16 days from the 8th of March, 138 people were exposed to a maximum of 155 millirems a day. The company sets the maximum permissible amount of radioactivity at 100 millirems over one day, 1,000 millirems over three months and 5,000 millirems (50 mSv) over a year.

The Age - 28 April 1981

1981, January 12

TOKAIMURA, JAPAN

Two workers at the Tokaimura reprocessing plant in Japan were exposed to radiation on their hands last December.

WISE Vol.3 No.1 April/May 1981 p.18

1981, January 15

INDIAN POINT, NY, USA

Small amounts of radiation found leaking, possibly since early December, into auxiliary steam system and then into Hudson River from Indian Point Plant in New York State.

WISE Vol.3 No.2 p.18

1981, January 19

SEQUOYAH, TN, USA

Generator tube malfunction forced a shutdown of Tennessee Valley Authority's Sequoyah nuclear power plant − for the second time in two days.

WISE Vol.3 No.1 p.18

1981, January 21

JAPAN

Four workers at the Oarai Engineering Centre of Japan Fuel Co-operative exposed to radiation.

WISE Vol.3 No.2 p.18

1981, January 30

TROJAN, OREGON, USA

Trojan nuclear plant in Oregon shut down for two weeks to repair a 300 gallon-a-day water leak that has allowed a small amount of radioactive gas to escape.

WISE Vol.3 No.2 p.18

1981, February

BRUNSBETTEI, PHILLIPSBURG 1 AND ISAR 1, WEST GERMANY

The West German Government has ordered the temporary closure of four nuclear power stations. The closures follow the shutdown four years ago of the large boiling water reactor at Gundremingen, where two operators were killed by a steam valve failure.

Canberra Times - 23 February 1981

1981, February

THREE MILE ISLAND, PENNSYLVANIA, USA

Evidence of radioactive rodents has been found in a building near the damaged reactor at Three Mile Island. Plant officials said contaminated rodents would pose almost no danger to the public. Exterminating crews have been instructed to catch the rodents so that they could be tested for radioactivity.

Weekend News - 28 February 1981

1981, February

ADELAIDE, SOUTH AUSTRALIA

A survey by the Australian Atomic Energy Commission said levels of radon concentration from two tailing dams at Port Pirie were high, although the readings were below the recommended maximum levels. The AAEC report said there was cause for continuing Government concern about the radiation levels.

The News, Northern Territory - 6 February 1981

1981, February 6

TOKAIMURA, JAPAN

A small fire at the plutonium reprocessing plant in Tokaimura forced the evacuation of 86 workers. In another accident on the same day, steam was discovered leaking

from a pipe in the nuclear fuel reprocessing plant. Another accident occurred on February 4 in the plutonium extracting process, forcing suspension of operations at the plant. As a result of the February 6 accident, operations at the plant were suspended again.

Japan Times - 8 February 1981

1981, February 11

SEQUOYAH, TN, USA

Operator error triggered an emergency alert, sending 100,000 gallons of 'slightly' radioactive water raining down on the heads of 14 workers at the Sequoyah nuclear plant in Tennessee. The accident occurred whilst the plant was shut down for maintenance. The plant uses slightly contaminated water for emergency coolant, because clean water would raise costs 'needlessly'.

WISE Vol.3 No.2 p.18

1981, February 14

SACAVEM, PORTUGAL

The nuclear reactor at Sacavem, Portugal, shut down after a leak was discovered and 200 litres of radioactive water had escaped.

WISE Vol.3 No.2 p.18

1981, February 17

QUEENSLAND, AUSTRALIA

A small creek near the Minatome uranium stockpile at Ben Lomond in Northern Queensland showed radiation at twice the acceptable level during heavy rain in February 1981. Officials said the leak occurred when a cement cover cracked during heavy rain. Tests showed unacceptable radiation levels in Keel Bottom Creek, a tributary of the Burdekin River which feeds the Charters Towers town water supply.

The Age - 20 May 1981

1981, February 19

THREE MILE ISLAND, PA, USA

Metropolitan Edison (Met.Ed), which owns and operates the Three Mile Island nuclear power plant, released information which indicates that higher than normal levels of radioactive caesium-137 was found at one of the monitoring stations. Met.Ed. stated that on February 11, one of the 15 monitoring stations registered the level at 371 picocuries/litre. The highest level of caesium-137 previously recorded at Three Mile Island was 88 picocuries/litre.

WISE Vol.3 No.2 p.14

1981, March

USA

Government lawyers are drafting a court brief to rebut charges that radiation leaks from underground nuclear explosions have left a legacy of cancer in south-western States. U.S. officials recently disclosed at a Congressional hearing that 40 such leaks, known as 'ventings', had occurred since 1963 − more than twice as many as previously admitted. Justice Department lawyers have contended that the radiation leaks pose no known danger. Their brief urges a Federal Judge not to award damages to the survivors of workers who were exposed to radiation leaks at the Nevada test site and who subsequently died of cancer.

Daily News - 5 March 1981

1981, March

AUSTRALIA

A container of radioactive material has been missing from the University of Sydney for more than a month. Police said the substance disappeared from the University on January 30, but was only reported stolen on March 17.

Sun-Pictorial, Melbourne - 19 March 1981

1981, March 2

USA

A report from the Washington-based Centre for Defence Information says that 99% of the most dangerous nuclear wastes are produced by the military and are not stored safely enough because the military is not subject to the same storage safety standards as the nuclear power industry.

The Age - 2 March 1981

1981, March 6

BORSSELE, NETHERLANDS

Shortly after the changing of fuel rods at the Borssele nuclear power plant in the Netherlands, light radioactive material was found under the transport crane in the reactor building.

WISE Vol.3 No.2 April/May 1981 p.18

1981, March 6

NARBALEK, AUSTRALIA

A holding pond containing radioactive waste overflowed at Narbalek uranium mine in Australia's Northern Territory. Radiation measures after the leak were several hundred times above the normal level. Heavy rainfall from Cyclone Max on March 6 caused the overflow. The leak was first made public in August 1981 by State Labor politician, Bob Collins. The overflow was first detected by the company on 7 March 1981, but Queensland Mines did not report it to the supervising scientist until 14 July 1981.

Financial Review - 16 October 1981; WISE Vol.3 No.6 November 1981 p.18.

1981, March 8

TSURUGA, JAPAN

Japanese officials announced on April 18 that an accident occurred on March 8 at the Japan Atomic Power Corporation's Tsuruga plant on the coast about 80 kms from Osaka. At least 4,000 gallons of highly radioactive water had leaked from the plant through a manhole and a crack in the floor of the waste processing building. Fifty-six workers were exposed to radioactivity in connection with the accident. The water, which leaked for three hours before being noticed by workers, eventually wound up in Urazoko Bay outside the plant, where high levels of cobalt-60 and manganese-54 were discovered in the bay's edible seaweed. Shortly after the accident was disclosed to the public, six plant executives, including the director, were immediately replaced because of their role in the cover-up. It was also revealed that a number of other accidents had occurred at the plant, including incidents on the 10th, 19th and 24th of January.

278 workers exposed to radiation while repairing leaking pipes at the Tsuruga plant in 1981. The Natural Resources and Energy Agency has ordered the power company to make a full report on all cases of radioactive leaks. The Agency said that there were four instances of nuclear waste leakage at the station between 10th January and 8th March 1981. Following the April 18th revelations, the Japanese Government ordered a check on all of Japan's 22 nuclear power plants. The Japan Atomic Power Company would later be ordered to close Tsuruga for six months for its failure to report a series of radioactive spills at the facility this year. It is the first time the Japanese Government has taken such action against an atomic power company.

WISE Vol.3 No.3 June/July 1981 p.14; Financial Review - 20 May 1981; The Age - 28 April 1981; The Age - 22 April 1981

1981, March 12

SALEM 1, NEW JERSEY, USA

Ten workers were evacuated from an auxiliary building at the Salem 1 nuclear power plant in southern New Jersey when low levels of radioactive material began to leak from a waste gas compressor pump.

West Australian - 13 March 1981

1981, March 16

DUANE, PALO, IOWA, USA

A radioactive gas leak at the Duane Arnold Nuclear Plant went unreported. The US Nuclear Regulatory Commission will issue a citation to operators, claiming a report should have been made to NRC officials in Washington within one hour of the incident.

Daily Iowan - 6 May 1981

1981, March 22

TIHANGE, BELGIUM

The 870 MW Tihange 1 reactor in West Belgium reported that radioactive liquid leaked from ruptured tanks and escaped the containment building.

WISE Vol.3 No.3 June/July 1981 p.5

1981, April

AUSTRALIA

Cancer deaths in 1975 among victims of British nuclear bomb tests in Australia during the 1950's and early 1960's apparently were more than four times higher than in the overall population, it has been claimed. A spokesperson for the Australian Nuclear Veterans Association said the cancer death rate among about 2,000 Australians involved in the tests was four deaths per 1,000 compared with 0.69 per 1,000 for the whole population. A Government spokesperson said that it would be impossible to gauge the significance of such statistics without further knowledge. A pilot study was announced by the Government to assess the health of 200 personnel who were involved in the UK atomic programs at Monte Bello, Emu and Maralinga in the 1950s.

West Australian - 22 March 1981

1981, April

JAPAN

Nuclear power plants in Japan are using squads of untrained labourers for dangerous work, according to a newspaper report. The Fukui Shimbun, quoting sub-contractors who supply labour to nuclear plants in Fukui Prefecture, said that labourers were imported from Osaka, 140 kms to the south, when radioactive levels for specific operations were considered too high for regular workers to be exposed to over an extended period.

West Australian - 29 April 1981

1981, April 2

TSURUGA, JAPAN

An atomic power plant in Western Japan has been shut down because the Japan Atomic Power Company failed to report a small hair crack in the turbine that resulted in radioactive water leaking from the cooling system. A team of specialists had been sent to Tsuruga No.1 power plant to investigate the accident, which occurred in January, but it was only reported on April 2 after an employee disclosed the incident to the Nuclear Safety Commission in Tokyo.

The Age - 3 April 1981

1981, April 13

BRISBANE, AUSTRALIA

A panel van carrying infectious and radioactive waste and a quantity of the pesticide 245T was stolen in Brisbane. Police said it contained one drum of radioactive waste.

The Courier Mail - 14 April 1981

1981, May

U.K.

The British nuclear submarine, Valiant, is undergoing repairs for a minor leak in its reactor cooling system. A naval spokesman said the source of the leak had been identified and was being repaired.

The Age - 21 May 1981

1981, May

JAPAN

Nearly 10% of construction workers surveyed at Japanese atomic power plants have been exposed to 100 millirems of radiation daily − a level exceeding the radiation control allowance unofficially set by the atomic power industry, a union official has claimed.

Financial Review - 15 May 1981

1981, May

USA

The US Department of Transportation has admitted it has never inspected any irradiated nuclear fuel shipping casks or any facilities shipping nuclear fuel. The Nuclear Regulatory Commission conducted a total of two inspections of shipping casks in 1980 − both showed non-compliance with NRC regulations.

WISE Vol.3 No.4 Sept. 1981 p.12

1981, May 22

BROWN'S FERRY 3, ALABAMA, USA

The Brown's Ferry Unit 3 nuclear reactor in Alabama was shut down on May 22 when a leak was discovered in the primary containment building. The leak was releasing 27 gallons per minute. By the time the leak was located the following day, close to 10,000 gallons had been collected in the containment building.

West Australian - 25 May 1981; WISE Vol.3 No.4 September 1981 p.9

1981, June

U.K.

In Britain 96,000 pounds sterling was paid out by British Nuclear Fuels Ltd. to two families and a worker who is still employed at the Windscale reprocessing plant. The two workers died from cancer of the pancreas and leukemia. The man still employed at BNFL received 5,000 pounds sterling for pain and suffers from cataracts in both eyes and a kidney tumour. These payments are out-of-court settlements of cases financed by the General and Municipal Workers Union.

WISE Vol 3. No.4 p.6

1981, June 2

USA

In the US around $620,000 was awarded to the family of Leyroy Drumback who worked for 15 years at the Rocky Flats nuclear weapons facility which produces plutonium triggers for nuclear warheads. He died of cancer of the colon in January 1974 and his case is the first in which damages were awarded for cancer caused by radiation at Rocky Flats. Dow Chemical Company, the plant operator where Krumback worked, is appealing against the decision.

WISE Vol.3 No.4 p.6

1981, June 7

AL TUWAITHA NUCLEAR CENTRE, IRAQ

On 7 June 1981, Israeli fighter planes destroyed the French-supplied 'Osiraq' (or 'Osirak' or 'Tammuz 1') 40 MW research reactor located at the Al Tuwaitha Nuclear Centre, 17 kms from Baghdad.

Ten Iraqi soldiers and one French civilian were killed in the attack, and three Israeli army personnel died during training for the mission. Other than those deaths, the attack was of little public health or environmental

consequence as the reactor had not begun operating and had not been loaded with nuclear fuel.

The significance of the attack (and surrounding events) was that it so starkly demonstrated the *realpolitik* of nuclear weapons proliferation − Iraq's pursuit of weapons under cover of a 'peaceful' nuclear program and Israel's willingness to respond with a 'pre-emptive' military strike.

The safeguards system of the International Atomic Energy Agency was put to the test and was found wanting. IAEA inspections failed to uncover Iraq's weapons program and other research reactors were later found to have been used in various ways to advance Iraq's weapons program. Israel clearly had no faith in the IAEA safeguards system as demonstrated by its attack on Osiraq (and more recently with its attack on a suspected reactor site in Syria in 2007).

In April 1979, Israeli agents in France allegedly planted a bomb that damaged the partially-built Osiraq reactor while it was awaiting shipment to Iraq. Israel is also alleged to have murdered a scientist working on Iraq's nuclear program in June 1980 and to have bombed several of the French and Italian companies it suspected of working on the project.

The Iranian military also attacked and damaged the Al Tuwaitha Nuclear Centre with air strikes on September 30, 1980, shortly after the outbreak of the Iran-Iraq War. And Al Tuwaitha was bombed during the 1991 Gulf war and yet again during the 2003 Gulf war.

http://en.wikipedia.org/wiki/Operation_Opera

Dan Reiter, 2005, 'Preventive Attacks against Nuclear Programs and the 'Success' at Osiraq', Nonproliferation Review, www.diplomatie.gouv.fr/fr/IMG/pdf/Osirak.pdf

1981, June 7

SPICE 2, NEW JERSEY, USA

Salem 2 in New Jersey shut down because of a faulty valve just two days after beginning operations. While shut down for repairs, a faulty weld caused the valve to open and 3,000 gallons of radioactive water to spill into a containment basin.

WISE Vol.3 No.4 p.18

1981, June 16

LOVIISA 1, FINLAND

Fault discovered in fuel rod case at Loviisa 1 nuclear plant, 100 kms north-east of Helsinki. Operators acknowledge that a faulty rod case caused higher than normal levels of radioactivity in the unit's primary cooling water circuit but said no repairs would be made until rods are changed.

WISE Vol.3 No.4 p.18

1981, July

USA

A Department of Energy study found that nuclear reactor operators have not applied many of the safety lessons learnt from the Three Mile Island accident. The inquiry panel said, 'While the committee found no evidence that the reactors reviewed were being operated in an unsafe manner, the number and type of deficiencies noted give cause for a number of concerns.'

Canberra Times - 8 July 1981

1981, July

NELSON PARADE, NSW, AUSTRALIA

Radioactive soil dumped in Nelson Parade, Hunters Hill, about four years ago is in rotting broken plastic bags. Sixty years ago Nelson Parade was the site of a factory where uranium was treated. The NSW Government has considered dumping the soil at two sites in NSW, but public opposition or technical problems prevented the plan going ahead.

The Sydney Morning Herald - 3 July 1981

1981, July

USA

A former industrial radiographer died of radiation poisoning. Douglas Crofut (38) died in a hospital in Tulsa Oklahoma, July 1981, six months after he first sought medical attention for radiation burns on his chest and left arm.

West Australian - 31 July 1981

1981, July

OCONEE, USA

54 workers at Oconee nuclear station were contaminated with radioactive water during refuelling operations this month. The contamination occurred when cooling water leaked during refuelling of one of the power plant's reactors between June 28 and July 10, 1981.

West Australian - 30 July 1981

1981, July

USA

A report released at the end of July by Critical Mass Energy Project claims there were more than 3,804 mishaps at US nuclear power plants in 1980. This is a 20% increase over the number of accidents reported in

1979. The study attributes 20% of the incidents to human error, 161 to design flaws and 57% to equipment failure.

WISE Vol.3 No.4 September 1981 p.9

1981, July 7

USA

Approximately one half of the more than 70 US nuclear plants have failed to comply with a rule that plants must acquire the means to alert residents within a 16 km radius of an accident within 15 minutes of its occurrence. The deadline for compliance with the rule was July 1.

WISE Vol.3 No.4 p.4

1981, July 14

SAN ONOFRE, CALIFORNIA, USA

A fire at the San Onofre nuclear plant in California, that occurred during routine testing, knocked out one of the power plant's two back-up diesel generators. The plant was shut down for several weeks beginning 17th July. One month previously, the facility was returned to service after a 14-month shutdown for $67 million in repairs to 6,000 leaky and corroded tubes in three steam generators. An accidental ignition of hydrogen gases in a holding tank caused an explosion which bent the bolts of an inspection hatch on the tank, allowing radioactive gases to escape.

WISE Vol.3 No.4 p.18

1981, July 21

HAMAOKA, JAPAN

40 workers were exposed to minor levels of radioactivity when one tonne of radioactive waste water leaked at the Hamaoka nuclear power plant in Shizuoka Prefecture.

West Australian - 22 July 1981

1981, July 23

HARWELL, U.K.

A leak of low-level radioactive liquid has been discovered at Harwell atomic research station in Oxfordshire, the Atomic Energy Authority reported.

The Age - 24 July 1981; Daily News - 23 July 1981

1981, August 12

MURUROA ATOLL, SOUTH PACIFIC

On August 12, the French authorities in French Polynesia issued a communique declaring the temporary closure of the beach in the eastern part of the Mururoa Atoll against the possibility that 'residues of the atmospheric tests conducted prior to 1975' might have been deposited there following bad weather.

The News (NT) - 25 September 1981; WISE Vol.3 No.6/11/1981 p.16

1981, September

JAPAN

Kazuyuki Iwesa, a subcontractor for Japan Atomic Power Co., appealed to the Osaka High Court against a district court ruling which denies him compensation for an illness which he claims was caused by radiation exposure. At the High Court hearing, Iwesa claimed that the district court ruling had been based on the company's unfounded argument that strict safety measures had been in force at the plant. Since then, forgery of plant operation day books, discharge of radioactive waste water to public sewage systems and other malpractices at the plant have been discovered.

WISE Vol.3 No.4, 9/1981 p.6

1981, September 22

TOKAIMURA, JAPAN

The Japanese reprocessing plant at Tokaimura, 120 kms north-east of Tokyo, was closed down because of trouble in the rectifying tower and an interim holding tank. The holding tank problem appeared some time between September 12 and 14 when unusually high concentrations of plutonium were detected.

WISE Vol.3 No.6 November 1981 p.18

1981, October 4

WINDSCALE, U.K.

British Nuclear Fuels Ltd (BNFL) announced on October 8 that a release of iodine-131 occurred on October 4 from the Windscale reprocessing plant. The company did not inform the public of the leak until four days after it happened. The radiation leak contaminated milk supplies within a 3 km radius of the plant. The plant was shut down for 24 hours.

Sydney Horning Herald - 10 October 1981

1981, November

DIABLO CANYON, CA, USA

Pacific Gas and Electric told the Nuclear Regulatory Commission (NRC) Reactor Inquiry that start-up of its Diablo Canyon Nuclear Power Plant will be indefinitely postponed. Shortly before, Abalone Alliance announced the end of the blockade of the Power Plant, which involved approximately 1,900 arrests. PG & E cited problems with one of the structures in the plant's cooling systems. They have now confirmed that blueprints for the Unit 1 reactor, now completed, had somehow been switched with plans for the second unit now under construction. The switched diagrams are used in stress analysis of piping hanger systems and the mix-up has apparently affected both reactors' construction. One NRC official called it 'a first rate screw up'. Delay due to the mix-up could be as much as six months. The NRC is also investigating improper construction and the plant's ability to withstand an earthquake.

WISE Vol.3 No.6 November 1981 p.9

1981, November

RANGER, AUSTRALIA

The operators of the Ranger Uranium Mine, which was closed by the Northern Territory Government on 23 November 1981, had been warned the previous month that the mine could be shut down because of an apparent safety breach involving the discovery of a large island in the tailings pond. The island appeared on November 3 and remained until November 24. The company did not report the matter either to the Director of Mines or to the Supervising Scientist. Under environmental guidelines the tailings have to be covered by at least two metres of water. This warning followed an incident in October when two employees waded in a radioactive and acidic solution at the mine. Though both employees had been concerned about entering the solution, they were told by the supervisor that there was no risk.

The Age - November 25 1981

1981, November

UK AND FRANCE

In a recently released report, a team of British scientists, who were investigating seaweed around the Channel Islands, claim that radionuclides were concentrated 100 to 10,000 times. They conclude that although these concentrations are quite low, potential problems arise because large quantities of seaweed are used widely on farmland and small holdings as fertiliser. Thousands of fruit and vegetables already sold in the UK have been affected. One of the Channel Islands is only 8 kms away from the reprocessing plant at La Hague, France.

WISE Vol.3 No.6 November 1981 p.16

1981, December

AUSTRALIA

The widow of an atomic airman who died of throat cancer in 1972 after working on planes contaminated by nuclear radiation at South Australian atomic bomb tests in 1953 has been awarded $14,500 compensation. A precedent was set on bomb-test claims in August this year (1981) when a retired RAAF squadron leader, who tracked radioactive clouds in a bomber at Maralinga, became the first living person to win such a case. He suffers from cancer of the thyroid. The decision by the Commonwealth Employees Compensation Commission in the latest case has been seen as a landmark because the compensation was made solely on documentary evidence and opinion.

West Australian - 4 December 1981

1981, November 8

CRYSTAL RIVER, FLORIDA, USA

Florida Power Company officials said they have recovered 3,750 litres of radioactive water spilt at the company's reactor in Crystal River, Florida. The spill occurred when the reactor was shut down for routine refuelling. The Crystal river plant, cited earlier this year by the Nuclear Regulatory Commission as being poorly managed, has been shut down since September 27 for refuelling and maintenance. Crystal River had a similar accident a year ago when 115,000 litres of radioactive water spilt. That spill was also contained.

West Australian - 9 November 1981

1981, December

LAPORTE, WESTERN AUSTRALIA

Radioactivity has been found in the shells of crabs caught near Australind. It has also been found in effluent ponds around the Laporte chemical plant there. The radioactivity was found in a study by the Australian Radiation Laboratory. The study was requested by the WA Radiological Council.

Daily News - 28 December 1981

1981, December 8

WESTERN AUSTRALIA

Waste containing five radioactive isotopes which were accidentally included in scrap metal sold to a steel company in Singapore by Western Mining Corporation, has been returned to Perth. The shipment and final storage of the waste, 35 kms south of Kambalda, has ended more than three years of haggling between Australia and Singapore over which country should be responsible for it. Although Western Mining Corporation

has never officially accepted responsibility, it has agreed to store the waste material and has built a concrete bunker to take it.

West Australian - 26 November and 8 December 1981

1981, December 20

AUSTRALIA

The South Australian Minister for Health, Jennifer Adamson, has called for a report on an incident involving workers handling uranium-contaminated equipment at an Adelaide laboratory. It has been alleged that two workers had their arms covered in yellowcake dust which spilled out of a container on December 7. The laboratory, known as 'Amdel', was set up by State and Federal Governments at the time of the Maralinga atomic tests in 1956.

The Age - 21 December 1981

1982

HYDERBAD, INDIA

A five-year-old girl and her three-year-old brother have died of severe burns after touching waste material dumped outside a nuclear-fuel complex in Hyderbad, South India.

West Australian - 9 March 1982

1982, January

BYRON BAY, AUSTRALIA

The New South Wales Health Commission will investigate high levels of radioactivity in sand-mining waste at Byron Bay, on the far north coast. The contaminated waste was uncovered in a reclaimed swamp in the centre of the tourist town last month.

West Australian - 12 January 1982

1982, January 19

FRANCE

Five rockets were fired into a nuclear power station being built near Lyons. The police said that the rockets, stolen from the French Army, smashed into the 80 m high concrete wells which will hold the reactor's core. No-one was hurt and there were only minor damages.

West Australian - 20 January 1982

1982, January 26

GINNA, NY, USA

Radioactive steam leaked into the air when a tube ruptured at the Ginna Nuclear Plant on Lake Ontario, 25 kms from New York State's third largest city. The leak led to the declaration of a site emergency. Mild radioactive contamination had been detected on 12 workers at the nuclear power plant since the leak, according to officials. None of the contaminated workers required hospital treatment, a spokesman said. Ginna Nuclear Plant officials said they hoped to get their first look at any damage inside the steam generator by Saturday.

West Australian - 29 January 1982; Daily News - 26 January 1982

1982, March 9

CHALK RIVER, TORONTO, CANADA

Exposure to radiation on the job was the most probable cause of death of an Ontario nuclear-plant worker, according to a spokesman for Atomic Energy of Canada Ltd. A second worker at a nuclear plant has won a disability award for cancer believed to have been caused or aggravated by radiation. Both victims had been long-time employees at the A.E.C.L. nuclear reactor research centre at Chalk River, Ontario, near Ottawa.

Canberra Times - 6 March 1982

1982, April

SURRY, VIRGINIA, USA

Fire damaged a storage building at the Surry nuclear plant of the Virginia Electric Power Company, causing what was described as a minor release of radiation into the air and the James River. Utility officials said that no-one was injured and there was no danger from the radioactivity.

West Australian - 20 April 1982

1982, April

USA

Forty nuclear power plants in the United States have weak tubes in their steam generators and it is virtually impossible to make the needed design changes, according to a recent report by the U.S. Nuclear Regulatory Commission. The tube problem is causing higher operating costs and is exposing plant staff to radiation.

The Australian - April 1982

1982, April

LOS ALAMOS, NEW MEXICO, USA

Mislabelling of radioactive materials in containers at the Los Alamos National Laboratory resulted in radioactive contamination of 15 people in October 1981. A four-member investigation team of the U.S. Department of Energy has listed three major factors that led to the incident last October. In addition to a container being labelled ambiguously, the report says that the container was opened and handled in an area of the laboratory that is not designed for handling plutonium. Then a contaminated worker accidentally spread radioactive material outside the laboratory - to a van and residences.

West Australian - 13 April 1982

1982, May

AUSTRALIA

Tests have detected radioactive material up to 60 times that of normal levels in a rainwater tank. The Australian Radiation Laboratory, a division of the Federal Department of Health, made the discovery after analysing rainwater and sludge from a tank from the Australian Mineral Development Laboratories at Thebarton in suburban Adelaide. The tests, which had been requested by Federal Labour M.P. John Scott, found that the sludge in the bottom of the rainwater tank contained about 60 times the normal level of caesium-137. The laboratory also found that levels of uranium in the tank were 10 times higher than normal and levels of radioactive thorium were three times higher. Levels were compared with those normally found in soil samples. (The British government conducted nine nuclear bomb tests in South Australia in the 1950s.)

The Australian - 15 May 1982

1982, June

KOZLOKUJ, BELGIUM

A reactor was allowed to operate at 75% capacity during maintenance of a main cooling pump. Coolant escaped through an undetected leak for three hours before the reactor was shut down.

Der Spiegel - 20 April 1987; WISE News Communique #275 12 June 1987

1982 September

CHERNOBYL, UKRAINE, USSR

Partial core melt at Chernobyl-1 following an incorrect action by operating staff. Release of radioactive material into the industrial zone and the city of Pripyat; irradiation of staff involved in repairing the core.

Nucleonics Week - 31 May 1990; WISE News Communique #334

1982, October

LITTON SYSTEMS, TORONTO, CANADA

A bomb blew up part of the Litton Systems Canada plant which makes components for cruise missiles.

West Australian - 16 October 1982

1982, October

ARMENIA 1, USSR

An explosion at the generator of Armenia-1 (WER440) set fire to the turbine building. The operating staff managed to keep the coolant flowing.

Nucleonics Week - 31 May 1990; WISE #334 22 June 1990

1982, October

BRISBANE, AUSTRALIA

Potentially dangerous levels of radiation found at a disused mineral sands mining site on Queensland's Gold Coast. Wastes from mineral sands operations at Stadroke Island have been used to fill sand pits in some Queensland kindergartens. Parents are concerned.

Daily News - 18 October 1982; West Australian - 16/10/1982

1982, November

SELLAFIELD AND DOUNREAY, U.K.

10 kgs of plutonium produced at the Sellafield nuclear reprocessing plant is unaccounted for. The report said that between 1970 and 1980, 94 kgs of uranium was missing from Dounreay and 47 kgs of plutonium from Windscale (now renamed Sellafield).

West Australian - 8 November 1982

1982, November

TULLAHOMA TENNESSEE, USA

Four men were killed in an MX missile silo during a flash fire. Sixteen other men were injured. The Tullahoma centre is a 17,000 hectare missile test area, the largest in the US. A 27,000 kg second-stage engine for the MX exploded 10 days before the fire and the men killed had been cleaning up after that event.

The Age and West Australian - 30 November 1982

1982, December

USA

The U.S. civil nuclear industry is facing growing economic, legal, political and technical problems. Last month, incidents included: the Ohio River plant, under construction for a decade, closed down by regulatory authorities for safety violations; the owners of the Yankee plant in Vermont fined $40,000 over an incident similar to the event at Three Mile Island; the Virginia Electric Power Company decided to write off $540 million instead of bringing the Surry plant into operation; public outcry at attempts to restore the undamaged reactor at Three Mile Island; a slinging match in Court between the builders and the operators over culpability at Three Mile Island. David Freeman, Managing Director of the Tennessee Valley Authority, said: 'we should be fundamentally re-examining the nuclear option. It is time to confess that we went too far, too fast in deploying the large-scale design of a reactor type we knew too little about.'

The Age - 14/15 December 1982

1983, January

BORSELES, AMSTERDAM

The Borseles nuclear reactor was shut down and evacuated after a leak in the secondary system was found. Radioactive water escaped but was not considered dangerous.

Financial Review - 5 January 1982

1983, January

BROWN'S FERRY, TENNESSEE, USA

The biggest nuclear power station in the U.S. leaked radioactive water at a rate of 2,200 litres per minute into the Tennessee River. The Browns Ferry plant, owned by the Tennessee Valley Authority, was put on alert when the water, used for cooling the reactor, leaked.

West Australian - 18 January 1983

1983, February

WINDSCALE, U.K.

The 1957 Windscale reactor disaster − Britain's worst nuclear accident − may have caused up to 260 cases of thyroid cancer, 13 of them fatal, according to the National Radiological Protection Board.

Daily News - 21 February 1983

1983, March

NINE MILE POINT, N.Y., USA

Workers evacuated the reactor building at the Nine-Mile Point nuclear plant when a five-hour alert was caused by a radioactive spill.

West Australian - 17 March 1983

1983, March

NEW YORK, USA

The Nuclear Regulatory Commission said the failure of a New Jersey plant to shut down automatically twice last month was the industry's worst safety mishap since Three Mile Island.

West Australian and The Age - 17/3/1983

1983, March

BRISBANE, AUSTRALIA

The Federal Government will investigate the disposal of radioactive sands in Queensland after 'hot' sand was found in a school playground.

Daily News - 28 March 1982

1983, April

MARALINGA, AUSTRALIA

British journalists claim they have evidence that Indigenous people were exposed to nuclear fallout during the British A-bomb tests between 1953 and 1962. They say the people were blinded, burnt and may have died in some cases, because of contamination. Classified documents say radioactive cobalt-60 pellets were left scattered around the test site and the Ministry of Defence admitted that fallout from 'Totem 1' tests passed over Aboriginal encampments 160 kms to the north-east of the test site.

West Australian - 4/4/1983

1983, April

INDIAN POINT, NY, USA

The U.S. Federal Emergency Management Agency reported that plans for coping with an accident at the Indian Point nuclear reactors near New York have two major flaws. The plants have already missed deadlines for correcting flaws.

Financial Review - 19 April 1983

1983, April

SAN FRANCISCO, CA., USA

The multi-billion dollar nuclear powered and nuclear armed aircraft carrier U.S.S. Enterprise ran aground in San Francisco Bay. The whole ship's company of 3,000 men stood on one side of the ship to try to re-distribute the weight and float it off.

West Australian - 30 April 1983

1983, April

MURUROA ATOLL, SOUTH PACIFIC

The French start a new series of tests at Mururoa Atoll. Ninety-one explosions have occurred so far and the atoll is showing signs of structural damage. Stories of radioactive waste leaks and increased cancer rates in local inhabitants continue to be reported from the area.

Daily News 21st April 1983; West Australian 22nd April 1983; Sunday Independent 24th April 1983

1983, May

RANGER MINE, AUSTRALIA

Mussels taken from billabongs in the Alligator River's uranium province contain high radium concentrations. It is not yet known whether the high concentrations are natural or from the nearby Ranger uranium mine.

West Australian and The Age - 25 May 1983

1983, June 24

USSR, NORTH PACIFIC

A Soviet nuclear submarine sank in the North Pacific, killing 90 on board, the Associated Press reported, citing US Intelligence officials.

WISE News Communique 262 31/10/86

1983, July

THREE MILE ISLAND, PA, USA

Around 2,500 litres of radioactive water spilt in an accident at the Three Mile Island nuclear plant. No workers were reported contaminated.

West Australian - 12 July 1983

1983, July

USA

Nuclear Regulatory Commission findings have revealed small cracks in the cooling pipes of 13 nuclear power plants. Although the plants can resume operations after patching the cracks, a permanent solution involving replacement of the pipes will cost hundreds of millions of dollars. All the reactors were made by General Electric. Another five reactors suspected of having the same problem were advised to shut down within 30 days for inspection. The shutdowns were the first ordered by the NRC since 1979.

West Australian and The Age - 16 July 1983

1983, July

TENNESSEE, USA

A plane carrying low-level radioactive materials crashed and burnt on landing in Tennessee.

The Age - 18/7/1983

1983, July

USA

A private research group in the U.S., the Fund for Constitutional Government, reported that U.S. nuclear ships have leaked radiation at least 37 times. The leaks contaminated coastal and inshore waters of Japan, Britain, and the U.S.. The report accused the U.S. Navy of 'suppressing information about a 30 year history of radiation accidents and safety problems'. The U.S. Navy rebutted cover-up claims.

The Age 22nd April 1983; The Age and West Australian - 21 July 1983

1983, August

U.K.

The latest nuclear power station built in Britain had shut for a week only five days after starting operations due to a steam leak. A spokesman said there was no radiation or threat to the public. The cost of the plant has risen from the original $A425 million to $A1156 million and the Central Electricity Generating Board said the plant would have to operate for 30 years at full power to pay for itself.

The Age 9th April 1983

1983, August

USSR

C.B.S. reported that a Russian nuclear submarine sank with around 90 men on board. C.B.S. said the hull has been raised. The Soviets lost a nuclear submarine in 1970 and a diesel-powered submarine in 1974. The U.S. lost nuclear submarines in 1963 (U.S.S. 'Thresher') and 1968 (U.S.S. 'Scorpion') with a total loss of 228 men.

West Australian - 12 August 1983

1983, August

CANADA

3,700 litres of radioactive tritium leaked into Lake Huron and Lake Ontario from Canadian nuclear power stations.

Financial Review and The Age 8/8/1983

1983, August

THREE MILE ISLAND, PA, USA

Records of radioactive leak tests at the undamaged reactor at Three Mile Island may have been tampered with, according to an Nuclear Regulatory Commission report.

The Age - 8 August 1983

1983, September

WINDSCALE, U.K.

An official report said 33 people may have died from the Windscale nuclear plant accident in 1957.

West Australian - 29 September 1983

1983, September

RANGER, NORTHERN TERRITORY, AUSTRALIA

About 200 employees at the Ranger uranium mine went on strike for a week over safety issues. Workers were concerned about dust levels.

Financial Review - 4 September 1983

1983, September 23

RA-2 FACILITY, BUENOS AIRES, ARGENTINA

Criticality accident (moderated metal or oxide systems) − MTR–type fuel element, water reflected, assembly; single excursion; one fatality, two significant exposures. An accidental power excursion due to non-observance of safety rules during a core modification sequence, resulting in the death of the operator, who was probably 3−4 metres away. The event is classified as Level 4 ('accident with local consequences') on the 7-point International Nuclear Event Scale, based on the on-site impact.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1983, October

LONDON, U.K.

British nuclear waste will be stored in a disused chemical mine beneath homes and factories at Billingham, near Riddlesborough and also 95 kms from London. Residents of the area are unhappy.

West Australian - 24tand 27 October 1983

1983, October

ONTARIO, CANADA

A nuclear reactor in Ontario will be closed for at least 10 days after springing a leak. The reactor opened six months ago.

Daily News - 31/10/1983

1983, November

THREE MILE ISLAND, PA, USA

The Metropolitan Edison Power Company, former operators of the Three Mile Island nuclear power plant, has been charged on 11 counts of criminally faking test results before the accident in 1979.

Daily News 8/11/1983; West Australian and The Age and Financial Review - 9 November 1983

1983, November

NEW DELHI, INDIA

Jellyfish closed a nuclear power plant in India by blocking pipes bringing coolant from the sea.

West Australian - 9 November 1983

1983, November

RANGER, AUSTRALIA

Home Affairs and Environment Minister Cohen reported one major accident at the Ranger mine between April 1982 and June 1983. Two workers were knocked over by

a spillage of yellowcake in the packaging room. They received a radiation dose of around a year's allowance. Eight other minor incidents were reported at Ranger and two at Narbalek.

West Australian - 10 November 1983

1983, November

LUCAS HEIGHTS, AUSTRALIA

Nine sticks of gelignite, 25 kg of ammonium nitrate, three detonators and an igniter were found in an electrical substation inside the boundary fence. A detonator was set off but did not detonate the main explosives. Two people were charged.

West Australian - 18 November 1983

1983, November

SELLAFIELD, U.K.

A stretch of coast near the Sellafield (formerly Windscale) nuclear reprocessing plant has been contaminated by radioactive waste.

Financial Review and West Australian 21/11/83; The Age 22 November 1983

1983, November

ATOMASH, MOSCOW, USSR

Bad planning and erosion problems threaten the USSR's biggest nuclear reactor manufacturing plant, Atomsah.

The Age - 30 November 1983

1983, December

ATOMIC CITY, PEKING

China admitted to a serious nuclear accident at Atomic City in the Gobi Desert in 1969. Twenty workers were exposed to radiation.

The Age - 7/12/1983

1983, December 6

JUAREZ, MEXICO

A scrap yard in Ciudad Juarez obtained a used medical teletherapy unit containing cobalt-60, totalling over 400 curies (14.8 TBq). On 6 December the source container was deliberately ruptured, scattering pellets throughout the yard. A magnetic loader further dispersed the pellets, many of which ended up in scrap metal converted into steel products. Products included steel rebar from a Chihuahua plant, table pedestals from Falcon Products Company in Juarez (some of both items were shipped to the USA), products from a foundry in Torreon, and products from a producer in Guadalajara.

The contamination was undetected until 16 January 1984, when a truck carrying contaminated rebar took a wrong turn at the Los Alamos Scientific Laboratory in New Mexico, triggering automatic radiation sensors. Later that day five other trucks carrying contaminated steel were stopped at a border crossing at El Paso, Texas. Efforts to collect contaminated steel progressed over the next few weeks, with about 450−850 tonnes estimated to have entered the USA. In late January contaminated steel was traced to a table manufacturer in St. Louis, Missouri, and 2,500 castings were recalled from 40 states and replaced; most tables were in warehouses but some were removed from restaurants. In February Mexican authorities reported three or four individuals had received doses of 100−450 rem (1,000 to 4,500 mSv).

The U.S. DOE assisted Mexico in aerial surveys 20-26 March which identified 21 contaminated areas. One contaminated pickup truck was found in a residential neighbourhood with children playing in it. In Sinaloa Mexican authorities demolished 109 houses built with contaminated rebar. One worker subsequently died of bone cancer, with another four injured. A total of at least 10 individuals received significant exposures.

www.johnstonsarchive.net/nuclear/radevents/1983MEX1.html

1984

BOHUMICE, SWITZERLAND

There were four accidents within one year, including the escape of radioactive coolant from the primary circuit into the safety area.

Der Spiegel 20/4/88; WISE 12/6/87

1984, January

USA

The US Supreme Court reinstated damages of $10.5 million to the family of Karen Silkwood. It was ruled Ms Silkwood's family was entitled to the money from Kerr-McGee Corporation because of radiation exposure to Ms Silkwood.

Financial Review - 13/1/1984

1984, January

NEW YORK, USA

Thirty-six crewmen of the US aircraft carrier U.S.S. Independence were tried over the use of LSD on the ship. Drug use by military personnel involved with the use of nuclear weapons is not uncommon. Between 1975 and 1977, 15,067 military personnel were removed from access to nuclear weapons: of those, 4,809 were removed for drug abuse.

Daily News - 13 January 1984

1984, January

NEVADA, USA

Mormons living near nuclear testing grounds in Nevada have shown unusually high incidence of cancer. Mormons normally have an unusually low cancer rate due to diet and lifestyle.

West Australian 14/1/1984

1984, January

BYRON, IL, USA

US Government safety officials refused an operating license to the Byron nuclear plant near Rockford, Illinois. The plant, worth $3.7 billion, was rejected because of a lack of assurance in quality due to a history of non-compliance with Nuclear Regulatory Commission requirements. The decision by the NRC is the first time an application for an operating license has been rejected.

West Australian - 16/1/1984

1984, January

USA

The world nuclear power industry received a blow in January after President Reagan decided to pull out of President Carter's plan for energy self-sufficiency based on nuclear power. The Carter plan required an increase in nuclear power generation and the development of a breeder reactor program, but the breeder program failed to get Congressional support in 1983. The Marble Hill plant, where $2.5 billion has already been spent, has been abandoned − the costliest failure in US nuclear industry history. The Byron plant has also been halted. The Shoreham plant of the Long Island Lighting Co., The Zimmer Plant of Cincinatti Gas and Electric Co. and the two Seabrook plants in New Hampshire are also expected to fail. The US nuclear industry is now at a virtual standstill. The closures in the US will cut uranium demand and is likely to cause price falls. These developments will affect Australian uranium projects.

Financial Review - 18 January 1984

1984, January

BROWNS FERRY PLANT, USA

Hundreds of workers at the US's largest nuclear plant have been laid off and a reactor closed down because of concerns about maintenance and repair capabilities. The workers at the Browns Ferry plant in Alabama were laid off due to numerous violations of NRC rules.

Financial Review - 25 January 1984

1984, February

NEW YORK, USA

A 25 cent coin caused a loss of $150 million in revenue when it fell into the generator of a nuclear power plant.

The Age 2/2/1984

1984, February

DIABLO CANYON, SAN FRANCISCO, USA

The future of the Diablo Canyon nuclear power plant is still uncertain. The Nuclear Regulatory Commission is due to vote in 10 days time on whether to restore the plant's operating license, but firstly has to determine the validity of employees' charges of design and construction errors. Although this project was launched 17 years ago, no power has as yet been generated.

The Age - 8 February 1984

1984, February

INDIAN 2, NY, USA

The Indian II nuclear power plant in Buchanan was shut down after radioactive water started to leak into its steam generating system.

Daily News - 13 February 1984

1984, February

KUALA LUMPUR, MALAYSIA

Malaysia has announced a five-year ban on the export of monkeys after the discovery that many of the animals were being used in nuclear and chemical warfare experiments. Malaysian export policy is based on agreements signed with importing institutes that monkeys are only used for pharmaceutical experiments. However, investigations have revealed that some Malaysian monkeys were used in US air force experiments in which they were exposed to massive doses of neutron radiation, subjected to varying degrees of electric shocks and forced to run on treadmills until they died.

The Age - 17/2/1984

1984, February

SELLAFIELD, U.K.

A stretch of Cumbrian beach contaminated by radioactive waste last November is still closed as a precaution. According to reports, the contamination was exacerbated by inadequate instruments to monitor the plants operations, and poor communications between staff.

The Age - 16 February 1980

1984, February

NEVADA, USA

A nuclear accident in the Nevada desert has left one man critically ill and eight others in hospital. It occurred during an underground nuclear test and involved technicians who were measuring the effects of the blast. The accident happened when the explosion caused a delayed cave-in.

Daily News - 17/1/1984

1984, March

DAVIS-BESSE, OHIO, USA

A mishap at the Davis-Besse nuclear plant in Ohio triggered siren alarms, installed at governmental direction following the Three Mile Island accident in March 1979. The siren was set off by a failed valve which stuck in an open position after the reactor tripped because of another malfunction. A Nuclear Regulatory Commission official said that 'because the valve stuck open, the steam generator was emptied of water normally circulated through the reactor to keep it at a safe temperature'. The official said the plant is in a 'stable' condition due to the excess heat being removed through an identical sister steam generator.

West Australian - 5/3/1984

1984, March

USSR, USA - OFF KOREA

A US Navy aircraft carrier collided with a Soviet nuclear submarine off South Korea.

The Age - 23 March 1984

1984, March

MELBOURNE, AUSTRALIA

Monash University has refused to release confidential documents under the Freedom of Information Act. The documents relate to 46 students who were exposed to excessive doses of radiation during experiments into the effects of snake bite. The University's registrar has refused to provide any documents which reveal personal details of the volunteers on the grounds of confidentiality and that publication would be contrary to public interest. The Monash Association of Students has appealed to the County Court.

The Age - 29 March 1984

1984, March

SEABROOK, NEW HAMPSHIRE, USA

Although 23 per cent completed, the second reactor at the Seabrook nuclear power plant in New Hampshire appears to be close to cancellation. The unit has already cost a consortium of 16 New England utilities more than $2.5 billion, but some analysts say that the original projected $1 billion cost could soar as high as $8.5billion. If construction is terminated, financial pressure will have done what thousands of protestors failed to achieve during the 1970's.

Financial Review - 20 March 1984

1984, May

NEW YORK, USA

A Federal Judge has ruled that nuclear tests in Nevada caused cancer amongst some people who lived downwind. The tests were carried out between 1951 and 1962 .

Daily News - 11/5/1984

1984, May

MARALINGA, ADELAIDE, AUSTRALIA

According to a 1979 report by the ecological Survey Unit of the SA Department of Environment, rabbits are almost certain to burrow into pits containing plutonium at Maralinga.

National Times - ll-17 May 1984

1984, May

ROXBY DOWNS, ADELAIDE, AUSTRALIA

One of the 15 containers of uranium-copper ore from Roxby Downs, due to be loaded on a ship bound for Finland, is leaking. Some of the containers were also inadequately labelled.

West Australian 19/5/1984

1984, May

USA, OFF U.K.

A U.S. nuclear-powered submarine collided with barrels containing nuclear waste dumped on the seabed off the South West coast of England.

The Age and Daily News - 29 May 1984

1984, May

USSR

A massive explosion in mid-May at the Soviet Union's Northern fleet is believed to have destroyed a quarter to a third of the fleet's surface-to-air missile stockpile and several cruise missiles.

The Age 23/6/84, Sunday Times 24/6/84, West Australian 25/6/1984

1984, June

STOCKHOLM, SWEDEN

Sweden has begun the construction of the world's first nuclear waste depot under the seabed.

The Age - 7 June 1984

1984, June

MARALINGA, AUSTRALIA

Radiation experts will check two halls and a school bulldozer which Coober Pedy residents fear could be contaminated from the atomic tests at Maralinga.

Daily News 18th June 1984; The Age and West Australian 18th June 1984

1984, June

FORKED RIVER, NEW JERSEY, USA

The first ever sale of an abandoned nuclear plant began yesterday at the Forked River plant in New Jersey. The plant was abandoned after $455 million had been spent on the project.

West Australian - 21 June 1984

1984, June

MARALINGA, AUSTRALIA

More than 90 radioactive 'hot spots' have been identified on the British atomic bomb test site at Maralinga.

West Australian - 30 June 1984

1984, July

PERTH, AUSTRALIA

An inquiry commissioned by the State Government into the mineral sands industry has called for more vigour in keeping radiation levels as low as possible. The report said that tailings had been spread and used as landfill at Capel and Geraldton. Radiation levels at Wonnerup were 10 times the limit.

Financial Review and West Australian - 27 July 1984

1984, August

LUCAS HEIGHTS, AUSTRALIA

Toxic gas escaped from the Lucas Heights atomic research centre through a ventilation shaft last month.

The Age - 6 August 1984

1984, August

PERTH, AUSTRALIA

A British Airways jumbo jet was grounded at Perth Airport due to fears that a radioactive package may have leaked. The Public Health Department has concluded that possibly one person was exposed to radiation from the iridium consignment taken from a London-bound jet.

West Australian 10/8/1984; Daily News 7/8/84; The Age and West Australian 8/8/84; West Australian 9/8/1984

1984, September

BELGIUM

The sunken French freighter, Hont Louis, has broken open and spilt some of its cargo in rough seas. Greenpeace members have found a container of uranium hexafluoride on a beach near Dehaan, 10 kilometres north of Ostend, Belgium. The container is presumed to be part of the cargo of the sunken Mont Louis.

The Age and West Australian - 12/9/84; Daily News 13/9/84; Daily News 11 September 1984

1984, September

MARALINGA, AUSTRALIA

The President of the Royal Commission into the British bomb tests, Mr. Justice McClelland, was surprised to find that there was so much radioactive material outside fenced areas at the Maralinga test site. On visiting the atom-bomb test sites, he said that the radioactive material was in areas that had been declared safe in 1967.

The Age and West Australian - 13/9/1984

1984, September

USSR, OFF JAPAN

A possible nuclear disaster was prevented yesterday when a Soviet nuclear-armed submarine was forced to surface in the sea of Japan after a suspected fire in its missile silos. It appears that the crew had narrowly prevented the missiles from launching themselves.

The Age - 22 and 24 September 1984

1984, October

WILUNA, WESTERN AUSTRALIA

Crumbling drums of uranium ore have been abandoned on Aboriginal hunting grounds near Wiluna, 750 kms north-east of Perth.

Daily News 19-23/10/84; West Australian 31/10/84

1984, October 10

MARALINGA, AUSTRALIA

Two unused atomic bombs were buried in the desert in South Australia, the Royal Commission into British atomic testing in Australia was told today.

Daily News - 10/10/84; The Age and West Australian - 11/10/84

1984, October 12

BRISBANE, AUSTRALIA

Up to 130 44-gallon drums containing radioactive waste may have been dumped off the Queensland coast, the McClelland Royal Commission into British atomic testing was told.

The Age and West Australian 12/10/84, The Age. 13/10/85

1984, November

USA / AUSTRALIA

Radioactive fall-out was recorded in Australia, but kept secret by the U.S. Government, after a suspected South African nuclear bomb test in 1979.

National Times - 2-8/11/84

1984, November

KALKAR, WEST GERMANY

A sodium fire occurred at the fast breeder reactor under construction at Kalkar in Germany near the Dutch border. According to official reports, the accident occurred when argon gas was vented from a sodium holding tank and drew 190 litres of sodium with it to the roof of the reactor building. When the sodium came into contact with the moisture it ignited and 100 sq m of the temporary roofing caught fire.

'Atom' Mar/Apr 85; WISE News Communique 223 1/3/85

1985-98

SUPERPHENIX CREYS-MARVILLE, FRANCE

Accidents at the French Superphenix fast breeder reactor, which operated intermittently from 1985-98, included a large sodium leak, the collapse of the roof of the turbine hall and an argon leak.

Superphenix is an example of a multi-billion-dollar 'white elephant' − a plant that failed spectacularly to meet its promised performance levels. Superphenix was promoted as the first commercial-scale plutonium-fuelled 'fast breeder' reactor in the world. However it was shut down more often than not from its 1985 start-up until it supplied the grid for the last time in 1996, and it was permanently shut down in 1998. The reactor's lifetime load factor − the ratio of electricity generated compared to the amount that would have been generated if operated continually at full capacity − was a paltry 7 percent, making it one of the worst-performing reactors in history. The construction cost was about $9.5 billion (in 2008 US dollars). Total costs (including decommissioning) are estimated at $23.75 billion (in 2008 US dollars).

France used the Phenix breeder reactor (but not Superphenix) to make weapon-grade plutonium.

International Panel on Fissile Materials, 2010, 'Fast Breeder Reactor Programs: History and Status', www.ipfmlibrary.org/rr08.pdf

http://en.wikipedia.org/wiki/Superphénix

1985

KARRATHA, AUSTRALIA

A mechanical engineer has told the McClelland Royal Commission on British nuclear weapons tests in Australia that geiger counter readings of the fallout levels near Marble Bar were 'off-the-scale'.

West Australian and The Age 6/8/85

1985, January

KANUPP, PAKISTAN

While radioactive wastes were being transferred into containers, a rubber hose leaked and heavy water escaped. Initially, the hose was repaired with masking tape; later a new hose was installed.

Der Spiegel 20/4/87; WISE News Communique 275 12/6/87

1985, January 4

AUSTRALIA

The Royal Commission into nuclear tests was told that 30 leaking drums of radioactive waste were dumped off the Western Australian coast. The Commission was also told that Robert Menzies had sent a message to the British Prime Minister asking, 'What the bloody hell is going on, the cloud is drifting over the mainland?'

The Age and West Australian 5/1/85; Sunday Times 6/1/85

1985, January 17

LENIN, USSR

'Jane's Defence Weekly' has reported that up to 30 Soviet sailors were killed when the nuclear-powered ice-breaker 'Lenin' had a meltdown of its reactor in 1967.

West Australian - 17 January 1985

1985, February

RHEINSBERG, GERMANY

Radioactive coolant escaped during placement of measuring instruments in the core.

Der Spiegel 20/4/87; W1SE News Communique #275 12/6/87

1985, February

MARALINGA, AUSTRALIA

The McClelland Royal Commission was told that 100 Aborigines walked barefoot over nuclear-contaminated ground because boots they had been given didn't fit. The 1953 British nuclear test that allegedly caused the 'black mist' phenomenon in South Australia should not have been fired and the fallout was about three times more than forecast, according to a scientist who was involved in the tests.

The Age and West Australian 13/2/1985; Daily News 5/2/85; West Australian; The Age 6/2/85

1985, March

TEHRAN, IRAN

Iraqi aircraft have attacked an unfinished Iranian nuclear plant and a steel plant, killing at least 11 people.

Daily News - 5 March 1985

1985, April

MARALINGA, AUSTRALIA

According to a special report on an investigation of residual radioactive contamination, about 100,000 metal fragments contaminated with plutonium still litter the Maralinga atomic test range − 25 years after the atomic tests which caused them.

West Australian - 26/4/85

1985, April

TIANGE, BELGIUM

A blocked drain pipe caused a waste tank to overflow and radioactive liquids got into the auxiliary building.

Der Spiegel 20 Apr 87; WISE News Communique #275 12 June 1987

1985, May

AUSTRALIA

Details released under the US Freedom of Information Act have revealed that some sheep in Victoria had six times the normal amount of radioactivity after the suspected explosion of a South African nuclear device.

Daily News 21/5/85; West Australian 22/5/85

1985, June

MARSHALL ISLANDS, SOUTH PACIFIC

A new film by Australian Dennis O'Rourke finds that America willingly allowed hundreds of Pacific Islanders to be exposed to radiation as an experiment during the first US hydrogen bomb explosion 30 years ago.

National Times - 21-27/6/85

1985, June 27

BALAKOVO-1, USSR

There was an accident at Balakovo-1 (VVER-1000) during initial startup, when the pressuriser relief valve opened suddenly and steam at 300 degrees C is sprayed into a staff work area. Fourteen people died. The accident is blamed on errors on the part of inexperienced, nervous operating staff.

Nucleonics Week 31/5/90; WISE #334 22/6/90

1985, July

PARIS, FRANCE

A French magazine claims that one of its journalists was able to buy enough uranium and plutonium on the black market to make a nuclear bomb.

Daily News 19/7/85; West Australian 20/7/85

1985, July

NEW YORK, USA

Officials have found a small increase in the amount of deadly plutonium in the city's water supply after threats that the water would be poisoned unless charges against a subway gunman were dropped.

Sunday Times 28/7/85; West Australian 29/7/85

1985, July

LUCAS HEIGHTS, AUSTRALIA

Tritium has been leaking into the storm water drainage system at Lucas Heights and from there into two rivers used for swimming and oyster farming, for more than 10 years.

The Age 30/7/85

1985, July

PINTUNG, TAIWAN

The Pintung nuclear power plant has been shut down for further safety checks following a fire which damaged a generator. The damaged plant was completed two months ago at a cost of $US2.4 billion.

Financial Review 9/7/85

1985, July 15

COPENHAGEN, DENMARK

A barrel from a freighter that sank with a radioactive nuclear cargo has washed up on the Danish coast.

West Australian 16/7/85

1985, August 10

VLADIVOSTOCK, U.S.S.R.

During refuelling in the port of Vladivostok, Russia, an Echo II class submarine suffered an explosion, sending a radioactive cloud of gas into the air. Ten sailors were killed in the incident and 49 people received radiation injuries.

1985, September 26

RANGER, AUSTRALIA

Following a leakage of contaminated water into Kakadu National Park, the Northern Territory Government has ordered the Ranger uranium mine not to use its tailings pipeline until a replacement has been installed.

The Age 26/9/85; West Australian 26/9/85

1985, October

CANBERRA, AUSTRALIA

The operators of the Ranger uranium mine have again been warned by the Government over the accidental spillage of contaminated water following the second such incident in less than a month.

The Age 11/10/85

1985, October

BERWICK, PA, USA

About 38,000 litres of mildly radioactive water have spilt inside the Pennsylvania Power and Light Company's nuclear power plant near Berwick.

West Australian 28/10/85

1985, December

HINKLEY POINT, U.K.

Five hundred workers were given anti-radiation pills after a gas leak at the Hinkley Point B nuclear power station in South-West Britain.

The Daily News 4/12/85

1985, December

USA

The future of the U.S. nuclear power program is being called into question: 75 plants have been cancelled since 1978, including 28 already under construction. There are approximately another six cancellations in progress.

National Times 27/12/85 and 2/1/86

1986

CHERNOBYL / WORLD

The arrival in the Philippines and other countries of milk products from Western Europe with higher than the permitted levels of radioactivity. In Singapore, officials rejected 240 consignments from Belgium, Holland, Denmark, Ireland and France. Sri Lanka banned the sale of many varieties of jam imported from Poland, Bulgaria and Holland. Argentina scrapped plans to import chickens from Hungary and certain canned goods from West Germany and Scandinavian countries.

Nucleonics Week 30/10/86; WISE News Communique 264 5/12/86

1986, January

MADRID, SPAIN

It is revealed that 20 years ago a US B52 bomber collided with a KC-135 tanker during an in-flight refuelling over remote Spanish village, Palomares. Four 25-megatonne nuclear bombs dropped on the village, exposing the 1200 inhabitants to plutonium-239.

West Australian 20/1/86

1986, January 4

OREGON, USA

A cylinder of uranium hexafluoride, a chemical used in nuclear fuel production, is improperly heated at a Kerr-McGee plant at Gore, Oregon. One worker dies and 100 are hospitalised.

http://www.nuclearfiles.org/menu/timeline/timeline_page.php?year=1986

1986, January 15

USA

The US navy has recorded 630 safety 'incidents' related to nuclear weapons aboard ships and aircraft and at on-shore sites from 1965 to 1985, and two 'accidents'.

West Australian and The Age 17/1/86; West Australian 20/1/86

1986, February

TRAWSFYNYDD 1, WALES, U.K.

A pressure valve opened on top of one of the two heat exchangers which generate steam at the No 1 reactor at Trawsfynydd nuclear power station. Thirteen tonnes of coolant carbon dioxide were released to the atmosphere in 14 minutes before the valve was manually closed. Small quantities of neutron induced radioactivity (not fission products) escaped in the gas. The Central Electricity Generating Board (CEGB) which operates the plant, described the accident as 'minor'. According to The Guardian newspaper (March 7) the radiation released by the accident was estimated to have extended 5-19 kms downwind from the plant.

SCRAM Journal Apr/May 86; 'Western Maila' 3 Mar 86; The Guardian 7 Mar 86; WISE News Communique 254 13/6/86

1986, February

RANGER, AUSTRALIA

Contaminated water from the Ranger Uranium mine has been released into Magela Creek in the Kakadu National Park after the Northern Territory Government gave ERA permission to release two million cubic metres of water from a retention pond.

The Age 3/2/86; The Age 6/2/86

1986, February

SELLAFIELD, U.K.

A plutonium mist has leaked at Britain's only nuclear reprocessing plant at Sellafield.

The Daily News 6/2/86; The Age 7/3/86

1986, February

SELLAFIELD, U.K.

Britain's only nuclear reprocessing plant has had its second radioactive leak this month amid complaints from Irish officials over the discharge of uranium from the plant into the Irish Sea.

The Age and West Australian 20/2/86

1986, March

SELLAFIELD, U.K.

Another five workers were contaminated with radioactivity in another leak at the Sellafield nuclear processing plant in Cumbria. This is the fourth incident in the past five weeks.

West Australian 18/3/86; The Age 3/3/86; West Australian 4/3/86

1986, March 13

USA, OFF IRISH SEA

The nuclear powered submarine U.S.S. 'Nathan AEC / Greene' ran aground in the Irish Sea and was severely damaged.

WISE News Communique 262 31/10/86

1986, March

EMBALSE, ARGENTINA

Local concern over leaking water is apparently why Argentina's Commission National de Energia Atomica (CNEA) shut down its Embulse nuclear power reactor. Officials denied that there was any direct discharge of heavy water into a nearby reservoir, but admitted 'light amounts of heavy water did apparently mix with reservoir water,' and suggested the CNEA shut down the plant for political rather than safety reasons.

Nucleonics Week - 20 Mar 86; WISE News Communique 252 16 May 1986

1986, April 26

CHERNOBYL, UKRAINE, USSR

The Chernobyl #4 reactor accident on 26 April 1986 was the world's worst nuclear disaster and is rated Level 7 ('major accident') on the 7-point International Nuclear Events (INES) scale.

The accident occurred when a safety test went badly wrong. Operators switched off important control systems and allowed the reactor to reach unstable, low-power conditions. A sudden and uncontrollable power surge resulted in violent explosions and a graphite fire which burned for 10 days. The release of radioactive gases, aerosols and fragmented nuclear fuel particles was 'extremely high in quantity' as the OECD's Nuclear Energy Agency stated.

An estimated 8.4 million people were exposed to radiation across Europe, with the worst effects in Belarus, Ukraine and Russia. Estimates of the long-term Chernobyl cancer death toll range from 9,000 (in the most heavily contaminated areas) to 93,000 (across Europe). The disaster resulted in more than 6,000 cases of thyroid cancer in children and adolescents who were exposed at the time of the accident, with a fatality rate of approximately 1%.

The broader social impacts included those resulting from the permanent relocation of about 400,000 people and from widespread and long-lasting restrictions on agriculture and fishing in former Soviet states and in many European and Scandinavian countries.

To give a sense of the distances involved, if the Chernobyl disaster took place at Western Port, Victoria, permanent evacuation of locations as distant as Shepparton would be required in addition to evacuation of parts of Melbourne and radiological control zones stretching as far as Wollongong, south of Sydney. If Chernobyl happened at Port Botany, permanent evacuation of people as distant as Tarree would be necessary. (See the interactive map at www.choosenuclearfree.net/energy/chernobyl)

For Belarus alone, the total economic cost of the disaster is estimated at a staggering US$235 billion (in 2005 dollars).

Mikhail Gorbachev, president of the Soviet Union at the time of the disaster, said in 2006: 'Chernobyl opened my eyes like nothing else: it showed the horrible consequences of nuclear power, even when it is used for non-military purposes. ... The 20th anniversary of the Chernobyl catastrophe reminds us we should not forget the horrible lesson taught to the world in 1986. We should do everything in our power to make all nuclear facilities safe and secure. We should also start seriously working on the production of alternative sources of energy.'

1986, May

SELLAFIELD, U.K.

In another leak at the Sellafield nuclear reprocessing plant, two workers were exposed to plutonium oxide during routine maintenance. Over the past 34 years the Sellafield plant has dumped a quarter of a tonne of plutonium into the Irish Sea; scientists claim the Irish Sea is the most radioactive sea in the world. Radioactive house dust in the area is up to 6,000 times the level in other parts of the country and plutonium levels in river estuaries are up to 27,000 times higher than other British rivers.

National Times 30/5/86 and 5/6/86; The Age and West Australian 23/5/86

1986, May

USA

A report released on May 3 by Public Citizen's Critical Mass Energy Project reveals more than 20,000 accidents and other mishaps have occurred at licensed U.S. commercial nuclear power plants since the Three Mile Island Accident in 1979. Moreover, the nuclear industry's overall safety record is worsening. In 1979 there were 2,310 mishaps at the nation's nuclear power plants, including a meltdown at the Three Mile Island reactor. The number increased to 3,804 in 1980, 4,060 in 1981 and 4,500 in 1982 and over 5,000 in 1983.

WISE News Communique 252 16 May 1986

1986, May

USA, EUROPE

Two U.S. nuclear submarines went aground off Europe during the past month and one has been damaged so badly that it may have to be scrapped.

The Age 3/5/86

1986, May

USA

A recently-released secret report by the US General Accounting Office states that since 1971 there have been 151 'significant nuclear safety accidents' in 14 countries.

The National Times - 9-15/5/86

1986, May 14

NEVADA, USA

Radiation in a tunnel containing test equipment at the Nevada underground nuclear test site is so high following a nuclear 'mishap' that monitors are registering about 25 rads per hour.

The Age 15/5/86; West Australian 16/5/86

1986, May 18

U.K.

Two Greenpeace members have boarded a British ship carrying spent nuclear fuel in an attempt to highlight the ship's vulnerability to attack.

West Australian 19/5/86

1986, May 22

LA HAGUE, FRANCE

Five workers at the French nuclear reprocessing plant at Le Hague in Normandy were exposed to radiation after an accident at the plant.

The Age and West Australian - 22/5/86

1986, June

GLASGOW, SCOTLAND, U.K.

A fire at a Scottish nuclear power station complex has triggered an automatic reactor shutdown.

Daily News 17/6/86; West Australian 18/6/86

1986, June

LA SALLE 2, ILLINOIS, USA

At La Salle-2 plant in Seneca, Illinois, the plant failed to shut down in response to a mechanical malfunction. Commonwealth Edison, the nation's largest nuclear utility, failed to alert Government officials or the local population of the potential danger for more than 12 hours.

Public Citizen Critical Mass Energy Project; WISE News Communique 12 June 1987

1986, June 1

USA

Recently declassified Pentagon documents show that the US Navy accidentally released nuclear weapons during 1965, 1968, 1969 and 1970. The navy experienced 381 nuclear weapon accidents and incidents between 1965 and 1977.

The Age 2/6/86; The Age and West Australian 3/6/86

1986, June 2

BONN, GERMANY

A West German nuclear power plant has been shut down pending an investigation into a radiation leak a month ago.

The Age, Financial Review, West Australian 3/6/86

1986, June 13

CATAWBA, CLOVER, SOUTH CAROLINA, USA

On 13 June 1986, control room operators at the Catawba Unit 1 pressurised water reactor in Clover, South Carolina received indications of a reactor coolant system leak exceeding one gallon per minute. The normal makeup pumps could provide sufficient water to the reactor coolant system to compensate for this leakage. Five hours after the initial indication, the leak rate jumped to nearly 130 gallons per minute. This leak rate exceeded the makeup capacity of the pumps. As the water level in the pressuriser dropped due to more water leaving the reactor coolant system than was being added, the operators manually shut down the reactor. The operators also took

steps to reduce the leak rate and measures to recover the pressuriser water level. It was later determined that a weld on the letdown or bleed system piping had cracked to cause the initial leak. The letdown system allows a continuous flow of about 45 gallons per minute of reactor cooling water to go to a system that purifies it and adjusts its chemical parameters as necessary. Five hours later, the nameplate — a metal label identifying the manufacturer and operating parameters — vibrated loose from a power transformer and fell onto an electrical circuit board. The nameplate caused an electrical short that, among other things, caused the flow control valve in the letdown piping to fully open. The higher flow rate through the letdown piping caused the crack to propagate. The NRC calculated the severe core damage risk from this event to be 3 x 10-3 or 0.3% per reactor year.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1986, August

USA

A US Army audit says that nuclear and chemical weapon sites have been guarded by men considered to be mentally ill, as well as others who were convicts, drug users and medically disabled.

West Australian 11/8/86

1986, August

SELLAFIELD, U.K.

The New Scientist magazine reported on August 14 that autopsies on the bodies of former workers at the Sellafield nuclear plant have revealed concentrations of plutonium hundreds and in one case thousands of times higher than the general public. The study by Dr. Popplewell from the U.K. National Radiological Protection Board also found that concentrations of plutonium in the bodies of Cumbrians who did not work at the plant average 25−50 percent higher than elsewhere in Britain. High levels of cancer have been found in the population around Sellafield.

Cumbrians Opposed to a Radioactive Environment; WISE News Communique 257 22 Aug 86

1986, August

JAPAN

Two women researchers received internal radiation at the Science and Technology Agency's Institute of Physical & Chemical Research in Japan. They breathed radioactive air while cleaning a room contaminated with radioactive equipment left there for more than a year.

Japan Times 19/9/86; WISE News Communique 262 31/10/86

1986, August

NEW MEXICO, USA

The US Air Force admitted to an accident 30 years ago where a nuclear bomb was dropped from a bomber while landing in New Mexico. The conventional explosive component exploded but no-one was injured.

The Australian 29/8/86

1986, September 10

COLOMBO, SRI LANKA/ NETHERLANDS

Sri Lankan health authorities have destroyed 68 tonnes of imported Dutch milk that was found to be contaminated by nuclear radiation.

West Australian 11/9/86

1986, October

THREE MILE ISLAND, PA, USA

A full report on the 1979 meltdown of Three Mile Island Unit 2 reactor was released in a highly 'diluted' form, according to Jane Rickover, daughter-in-law of the late Admiral Hyman G. Rickover. According to her statement, her father-in-law said that, had the full report been released, it would have destroyed the civilian nuclear industry because the accident was more dangerous than was ever made public.

WISE #262 31/10/86

1986, October

CHERNOBYL / NETHERLANDS

Scientists working at the Nuclear Research Institute of the University of Croningen in the Netherlands have found plutonium on the clothing of Dutch citizens who visited Russia. The researchers found plutonium on jeans of a Dutch citizen who was in Kiev at the time of the Chernobyl accident and radioactive material on the shoe of a child who visited Minsk and Smolenak.

Nucleonics Week 26/9/86; WISE News Communique 260 3/19/86

1986, October

CHERNOBYL / SWEDEN / U.K.

According to the Swedish News, high levels of radioactivity have been measured among farmers living in an area of Sweden contaminated by fallout from Chernobyl. Radioactive contamination of soil and vegetation following Chernobyl is proving more persistent than expected in the U.K..

New Scientist 23/10/86'; WISE News Communique 263 31/11/86

1986, October

TIHANGE, BELGIUM

Several leaks occurred at the Tihange nuclear power plant on the Meuee River in Belgium early in October − 30,000 litres of water leaked from the primary cooling system due to a faulty packing ring or gasket in a pump; radioactive gases were discharged through the stack; 600 litres of contaminated water leaked due to a broken valve; and a fire.

WISE News Communique 262, 31/10/86

1986, October

HOPE CREEK, NEW JERSEY, USA

A system to protect against the release of radioactivity in an accident at a nuclear power plant at Hope Creek was installed backwards. The error was discovered while the plant was operating at 20% testing power.

'Randleaf' 10/86; WISE News Communique 262 31/10/86

1986, October

HANFORD, WA, USA

Two military plutonium plants at the Hanford nuclear reservation in the State of Washington were shut down in mid-October by the Department of Energy due to safety violations.

Nature 16/10/86; WISE News Communique 262 31/11/86

1986, October

USA

A General Accounting Office report has found potentially dangerous soil and ground water levels of solvents, nitrates, chloride, tritium, strontium, cadmium, selenium, mercury, iodine, arsenic and chromium at eight of nine US Department of Energy facilities which it investigated.

Nucleonics Week 2/10/86; WISE News Communique 262 31/10/86

1986, October 5

WASHINGTON, USA

Hundreds of US and Soviet crew members have died in nuclear powered submarine accidents since the first 'U.S.S. Nautilus' was launched in 1954 − a list has now been disclosed to the public.

West Australian 6/10/86

1986, October 7

USSR, ATLANTIC

The Pentagon reported that the Soviet nuclear-powered submarine, which had a fire yesterday and lost three crewmen, has sunk in the Atlantic today. The remaining 120 crew have been evacuated.

West Australian, The Australian, Sydney Morning Herald 7/10/86

1986, October 12

SNAKE RIVER, USA

A truck carrying 16 tonnes of uranium pellets crashed into the Snake River in western U.S. when the driver swerved to avoid a slow moving farm combine. The uranium was being shipped from Ohio to Hanford Nuclear Reservation where it is made into fuel elements that go into the Hanford nuclear reactor.

The Washington Post 14/10/86; WISE News Communique 262 31/11/86

1986, November

SAVANNAH RIVER, SC, USA

According to an Environmental Policy Institute study, highly radioactive and toxic wastes are polluting soil and water at a nuclear fuel plant in South Carolina. The study examined the Savannah River plant tank farm, where radioactive wastes from more than 30 years of nuclear bomb production are stored. 'Routine discharges of radioactive wastes into the soil as well as leaks and other accidents have severely contaminated the soil and shallow aquifers on the site. This poses a threat to the Tuscaloosa aquifer, which is the region's most important source of underground water supply.'

International Herald Tribune 10/86; Wall Street Journal 24/7/86; WISE News Communique 263 21/11/86

1986, November

CHERNOBYL, UKRAINE, USSR

Radionuclides in the food chain are now causing ornithologists concern. There are fears that the wetlands of the Ukraine are a likely feeding ground for many migratory birds. Radioactive isotopes concentrated in the bird's tissues could be passed on to people who eat the birds in other areas.

'Discover' 11/86; WISE News Communique 263 21/11/86

1986, November

HINKLEY POINT, SOMERSET, U.K.

Corrosion problems found during a regular shutdown of one of the Magnox reactors at Hinkley Point, Somerset, have called into question whether the Central Electricity Generating Board should continue with its policy of extending the lifetime of these old reactors from 25-30 years. The corrosion problem was until recently thought to be 'impossible'.

Times 6/11/86 and 7/11/86; WISE News Communique 263 21/11/86

1986, November

OKLAHOMA, USA

The Oklahoma State Dept of Agriculture has now licensed the use of treated 'nuclear waste' called raffinate as fertiliser. There are calls for a public hearing and a write-in campaign to have the license rescinded.

WISE News Communique 263 21/11/86

1986, November

PALUEL 3, FRANCE

An employee of the French Energy Agency Electricite de France (EDF) and five employees of a subcontracted firm were contaminated at 'unknown' rates during work on Section 3 of the Paluel power station in Seine Maritime. The accident 'is the most serious' since commissioning in 1984, according to a trade union source. The employees were overhauling pipes and fittings when they inhaled airborne radioactive particles for several hours.

WISE-Paris Bulletin 30 Nov/15 Dec 1986

1986, November 28

SELLAFIELD, U.K.

An investigation was launched into how 230,000 litres of low-level radioactive waste were accidentally discharged into the Irish Sea from the Sellafield nuclear reprocessing plant.

The Age 29/11/86

1986, December

CHERNOBYL / NORWAY

The damage caused by caesium fallout from Chernobyl is proving more serious than expected in many countries. In Norway, massive contamination in reindeer has caused the Norwegian authorities to raise the acceptable levels of radioactivity for consumption to 10 times the previous level.

Maria Rault, Eindhoven; WISE News Communique 265 19/12/86

1986, December

SURREY 2, RICHMOND, VA., USA

Four workers died and two others were severely burnt at the Surrey-2 plant when they were sprayed with scalding water from a burst pipe.

Public Citizen Critical Mass Energy Project; WISE News Communique 275 12/6/87

1986, December

FERNALD, OHIO, USA

Uranium and toxic chemicals seeping through waste pits at Feed Materials Production Centre in Fernald Ohio, which makes uranium products for nuclear warheads, have contaminated the Great Miami Aquifer. The Aquifer is the main source of water for residents of south eastern Ohio.

Northern Sun News 10/86; WISE News Communique 264 5/10/86

1986, December 3

EDWIN 1 HATCH, GEORGIA, USA

The Edwin 1 Hatch nuclear power plant near Baxley, Georgia has experienced what has been described as the worst accident at a temporary facility for high level radioactive waste in US commercial nuclear power history. Approx. 141,000 gallons of radioactive water leaked out of storage pools containing spent fuel rods from the plant. An estimated 84,000 gallons passed through storm drains into the wetlands area located on plant property. Following the accident, Georgia Power issued a press statement claiming that only 5,000 gallons of water had leaked and assured the public that the accident posed no health threat.

Public Citizen - Dec 1986; WISE News Communique 266 16 Jan 87

1986, December 5

SCARABEE, FRANCE

One of the four control rods at the Scarabee reactor at the Nuclear Research Centre in Cadarache, France, jammed in a raised position and failed to drop when ordered to do so. The incident was considered 'significant for safety' by the Service Central de Surete den Installations Nucleaires.

WISE, Paris

1986, December 9

SURRY, VIRGINIA, USA

A steam explosion in Unit 2 of this nuclear power plant killed 4 workers.

http://en.wikipedia.org/wiki/Surry_Nuclear_Power_Plant

1986, December 17

THREE MILE ISLAND, PA, USA

A clean-up worker at Three Mile Island nuclear plant was injured and contaminated by radiation after being hit by lead shielding in the reactor containment building.

West Australian 18/12/86

1986, December 27

TURKEY POINT, FLORIDA CITY, USA

The control room operators at the Turkey Point Unit 3 reactor manually shut down the reactor after a malfunction in the turbine control system caused an unplanned, undesired rapid power increase. The condition should have caused an automatic shut down of the reactor, but there was a failure in the reactor protection circuit that forced the operators to respond. Shortly after the reactor shut down, the pressure in the reactor coolant system increased. A power-operated relief valve opened to limit the pressure increase by discharging some water from the system. The valve successfully curbed the pressure rise, but it failed to re-close when pressure dropped. Reactor cooling water poured out through the valve, as it had done during the March 1979 reactor meltdown at Three Mile Island. Unlike at Three Mile Island, the operators at Turkey Point Unit 3 recognised the problem and promptly closed a second valve downstream of the stuck open valve to terminate the loss of coolant accident. The combination of the reactor's failure to automatically shut down when conditions warranted it and an equipment failure causing a loss of coolant accident were key factors in the NRC calculating the severe core damage risk from this event to be 0.1% per reactor-year.

www.ecology.at/nni/index.php?p=site&s=288; Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1987

USA

US commercial nuclear reactors reported nearly 3,000 'mishaps' and at least 430 emergency shutdowns in 1987, according to the Public Citizen's Annual Nuclear Power Safety Report. These 'mishaps' are Licensee Event Reports made to the Nuclear Regulatory Commission (NRC) by the nuclear utilities themselves. According to NRC guidelines, they provide descriptions of 'potentially significant safety events' that 'might lead to serious accidents'.

According to the NRC at least 493 violations of safety regulations occurred at US plants during that year. The Public Citizen report notes that much of the data which the NRC chooses to make public represents only the 'tip of the iceberg'. The NRC, for instance, doesn't release key safety data such as 'single-component failure' records and a comprehensive listing of all emergency plant shutdowns.

Public Citizens Critical Mass Energy Project; WISE 307 24/1/89

1987, January

SELLAFIELD, U.K.

Twelve workers at the Sellafield nuclear reprocessing plant in Cumbria have been affected by a leak of radioactivity, according to British Nuclear Fuels.

The Daily News 21/1/87

1987, January 9

CHERNOBYL / JAPAN

Japan has turned back three consignments of food from Europe because they were contaminated by radioactivity from Chernobyl. One consignment was carrying hazelnuts from Turkey, another was carrying reindeer from Sweden, and one was carrying spices from Turkey.

Japan Times 10/1/87 and 14/2/87; WISE News Communique 270 13 Mar 87 p.9-10

1987, January 12

CHINON-B3, FRANCE

The particularly cold conditions during the winter of 1986-87 led to the freezing of several materials and systems significant for the safety of the Chinon nuclear plant, in particular the level of feed water intake from the Loire River.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1987, January 25

HONG KONG

The principal of Jesuit Wah Yen College, in the Wan Chai district in central Hong Kong, says that he is angry that a nuclear waste dump site has existed under the school for more than two decades without public knowledge. Jesuit Father Marciano Saptiata was informed of the waste site by the Friends of the Earth, Hong Kong.

FOE, Hong Kong; WISE News Communique 271 27/3/87

1987, January 25

SAINT LAURENT, FRANCE

On January 25, nearly 300,000 customers experienced a power cut of nearly an hour, following a fire in a transformer. The plant also had to be shut down on January 12 because of ice.

FT European Energy Report; WISE News Communique 270 13 Mar 87 p.10

1987, February

TRICASTIN 4, FRANCE

The management of Unit 4 of Electricite de France's (EDF) Tricantin nuclear power station failed to notify either EDF central management or French nuclear regulatory authorities of a crack detected on auxiliary piping in the safety injection circuits.

Nucleonics Week - 2 April 87; WISE News Communique 276 3 Jul 1987

1987, February

CIEMAT, MADRID, SPAIN

It was revealed recently that 132 tonnes of nuclear waste are being stored in central Madrid, in the heart of the university area and surrounded by densely populated neighbourhoods. The waste came from an experimental reactor and reprocessing facility for Spain's Centre for Energy, Environment and Technology Research (CIEMAT) formerly Junta de Energia Nuclear (JEN). Despite claims by CIEMAT's director that 'no contamination would find its way beyond the centre's installations', two accidents have been attributed to JEN. The first in 1970 when 300 litres of liquids contaminated with strontium-90 and caesium-137 found their way into the Manzanares, Jarama and Tajo Rivers. The second in 1984 when 450 litres of less contaminated water were spilled into the city sewers.

WISE News Communique 271 March 1987

1987, February

CHERNOBYL / EGYPTIAN WATERS

An Egyptian frigate escorted two cargo ships out of Alexandria after they were found to be carrying radioactive contaminated food from Chernobyl. One ship was carrying herbs from Lebanon and one ship was carrying ground nuts from Turkey.

Japan Times 10/1-14/2/87; WISE News Communique 270 13 Mar 87 p.9-10

1987, February 3

CHERNOBYL / GERMANY

West German anti-nuclear activists broke into train cars filled with radioactive powdered milk, throwing milk-filled sacks into the snow. The activists wanted to make sure the milk, which West German environmental minister Wallman said still had 'commercial value', would not be used. The milk powder came from Bavaria. Shortly after Chernobyl, milk producers were ordered to turn their milk into powder and were compensated for their losses.

WISE News Communique 268 13/2/87

1987, March

NUKEM, WEST GERMANY

At least eight employees at the fuel element plant Nukem, in Hanau, West Germany have been contaminated with plutonium above the allowed yearly dose. Nukem processes uranium for the manufacture of fuel rods for reactors. A batch of uranium sent from Nuclear Research Centre in Karlruhe to the Hanau plant was contaminated with plutonium.

WISE News Communique 272 3/1987

1987, March

HARTLEPOOLE, U.K.

A boiler tube leak at one of the twin Hartlepool advanced gas cooled reactors (AGRs) in the UK allowed about eight metric tonnes of water to escape into the carbon dioxide coolant.

Nucleonics Weeks - 2 April 87; WISE News Communique 276 3 Jul 87

1987, March 2

USA

Pentagon officials, who requested anonymity, said that one of the US Navy's nuclear powered submarines incurred damage estimated at more than $4 million last November in what was probably a collision with a Soviet submarine.

West Australian - 3/3/87

1987, March 8

LUCAS HEIGHTS, AUSTRALIA

Fire destroyed a laboratory cell used for processing isotopes. Nearby fire brigades scrambled to the Lucas Heights reactor and nuclear complex, but were kept away from the cell by reactor staff. Iodine, krypton and xenon were released.

WISE News Communique 271 March 1987; West Australian 27/3/87; West Australian 19/3/87

1987, March 8

SUPERPHENIX, CREYSMELVILLE, FRANCE

Sodium leaked from a cooling tank at the Superphenix fast breeder reactor in Creys-Malville and engineers have been unable to trace the source of the leak. Sodium is used to cool the fuel rods and is inflammable on contact with air and explosive in contact with water.

La Monde 11/4/87; Guardian 13/4/87; WISE April 1987

1987, April

FRANCE

Seven unnamed reactors experienced 'SCRAM' failures. 'SCRAM' is the sudden insertion of the control rods into the reactor core to stop the fission reaction in case of an emergency.

Der Spiegel 20/4/87; WISE News Communique 275 12/6/87

1987, April

HANAU, GERMANY

Uranium hexafluoride leaked into the control room of the Reaktor Brennelement Union fuel fabrication plant in Hanau in April. Twenty-three workers were tested for contamination and the government has temporarily closed the affected part of the plant.

SCRAM Journal - WISE News Communique 279 18/9/87

1987, May

PALISADES, MICHIGAN, USA

A series of equipment malfunctions forced the Palisades plant to shut down; the Nuclear Regulatory Commission found a backlog of 3,000 required repairs that were not completed.

Public Citizens Critical Mass Energy Project; WISE News Communique 275 12/6/87

1987, May

PETTEN, HOLLAND

Overheating of the cooling water at the European Commission's nuclear reactor at Petten in Holland caused a radioactive leak in May.

SCRAM Journal, July/Aug 1987; WISE News Communique 279 10/9/87

1987, May 7

USA

A freight train carrying 192 pounds of low-level radioactive materials derailed in the Columbia Gorge in northwestern US.

NW Alert; WISE News Communique 277/24 July 1987

1987, May 12

GORLEBEN, GERMANY

There was a serious accident in the high-level waste repository under construction in Gorleben. Six workers were injured by a falling support as the shaft collapsed. One of the workers later died.

'TAZ' May 20/21; WISE News Communique 275 12/6/87

1987, June

USA

More than 23,000 mishaps have occurred at US commercial reactor power plants since the Three Mile Island accident in 1979, according to Public Citizen. 1979 - 2,310 mishaps. 1980 - 3,804 mishaps. 1981 - 4,060 mishaps. 1982 - 4,500 mishaps. 1983 - 5,000 mishaps. 1984 - 2,417 mishaps. 1985 - 2,974 mishaps. 1986 - 3,000 mishaps.

Public Citizen Critical Mass Energy Project; WISE News Communique 275 June 87

1987, June

CHERNOBYL / SWEDEN

Swedish scientists from the University of UMEA, in collaboration with the Swedish military, are studying the health effects of radioactive caesium ingestion using Samia, who are eating meat contaminated by the Chernobyl fallout.

WISE News Communique 277 24/7/87

1987, June

WNP 2, USA

Electrical problems caused the WNP-2 nuclear plant to scram five times within 10 days after its June 22 restart from its annual refuelling and maintenance outage.

Nucleonics Week 16 July 1987, WISE News Communique 279, 18/9/87

1987, June 3

NUKEM, HANAU, GERMANY

The new Conservative Environment Minister in the German State of Hesse, Farlheinz Neiman, has found serious safety problems at the Nukem plutonium processing plant in Hanau.

Diet Simon, Cologne, WISE News Communique 276 3 Jul 87

1987, June 8

BERKELEY, U.K.

A fire in the turbine hall of the Berkeley reactor in Britain closed the reactor.

SCRAM Journal July/Aug 1987 - WISE News Communique 279 10/9/87

1987, June 14

LA HAGUE, FRANCE

Six storage halls of the nuclear reprocessing plant at La Hague on the French Channel coast were contaminated by radioactive steam due to a ventilation system breakdown. There was reportedly no one in the halls at the time of the mishap, which management said was only noticed a day later and publicly disclosed three days later.

Diet Simon, Cologne. WISE NC 276 3/7/1987

1987, June 16

NORTH ANNA 1, USA

Tubing inside a steam generator of North Anna's Unit 1 in the U.S. ruptured releasing small amounts of radioactivity into the atmosphere and forcing a shutdown of the reactor.

The Washington Post 18/7/87; WISE News Communique 278 14/8/87

1987, June 24

DUNGENESS, U.K.

A container of irradiated fuel was derailed in a siding while leaving Dungeness A.

SCRAM Journal July/Aug 1987 - WISE News Communique 279, 10/9/87

1987, June 26

ANGRA 1, BRAZIL

Brazil's only nuclear power plant was off line from June 26 to August 6. Angra I had been in production since April 3, after being down for most of the previous four months. The reason for the present shut-down is a leakage of radioactive water from a valve in the primary system. Brazil's Minister of Energy and Mining, Aurelio Chavea, will negotiate with Westinghouse, supplier of Angra I, about the $6 million in production losses caused by the defects of the plant.

'O Globo' - 1 July 1987; WISE News Communique 279 18 September 1987

1987, July

USA

Engineers from the US General Electric Co (GE) recommended that the company stop selling its nuclear reactors because of safety shortcomings in the design. This was reported in a document which was allegedly kept from the public following a secret agreement between GE and the Nuclear Regulatory Commission.

The Nuclear Monitor 15 Jun 87; WISE News Communique 276 3 Jul 87

1987, July

MAGNOX ANGLESEY, U.K.

One of the Magnox reactors at Wylfa in Anglesey has been shut down for three months because of a failure in the fuel loading machine.

SCRAM Journal July/Aug 1987; WISE News Communique 18/9/87

1987, July

NORTH ANNA, USA

Leak of radioactive water has forced the shutdown of a reactor at the North Anna nuclear power plant in Virginia.

West Australian 17/7/87

1987, July

KORI 1 AND KNU 1, SOUTH KOREA

Kori-1 was in a forced outage in July for 36 hours due to a typhoon that defaulted the turbine generator. KNU-7 was also shut down for 248 hours during the same month due to high levels in the steam generator and excessive cooling hydrogen in the main generator.

WISE News Communique 279 18 September 1987

1987, July

CALVERT CLIFFS 1 AND 2, BYRON 1, DRESDEN 2 AND 3, USA

Forced outages in U.S. reactors include:

- Calvert Cliffs 1 − shut down for 20 hours due to inadvertent boration caused by initial overcooking of the steam generator through a failed high pressure feedwater heater isolation valve and failure of boric acid pump.
- Calvert Cliffs 2 − one of four outages was due to excess reactor coolant system leakage from regenerative heat exchanger drain valves. Byron-1 was forced to shut down for 46 hours after being struck by lightning.
- Dresden 2 and 3 were forced to shut down due to feedwater regulator valve problems.

SCRAM Journal - WISE News Communique 279 18/9/87

1987, July 20

FERMI 2, USA

Fermi-2 scrammed automatically due to high turbine vibration readings.

Nucleonics Week, 23/ 7/87; WISE News Communique 279 18/9/87

1987, August

U.K.

A contaminated railway wagon in the UK travelled from Sellafield to Heysham where it stood for four months before radioactive rust fell onto the tracks and was detected during a 'routine check' in August. A confidential CEGB report, revealed in The Guardian newspaper (27/8/87), says that 108 flasks and flatrols used to carry them are contaminated.

SCRAM Journal (Scotland) Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, August

BERKELEY, U.K.

Two workers received contamination to their skin during maintenance work on the secondary shielding at the Berkeley reactor.

SCRAM Journal (Scotland) Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, August

TRAWSFYNYDD, U.K.

Two recent accidents at the Trawsfynydd Magnox Station have fuelled criticism of the Central Electricity Generating Board's (CEGB) 'open information policy'. The first occurred on 1 August when 100 gallons of liquid waste spilled from a pipe carrying it to a storage tank. On 10 August, an explosion in the turbine hall put two gas circulators in one of the reactors out of action. The CEGB originally denied there had been an explosion, although they later confirmed that the blast had blown a door off its hinges and caused 20,000 pounds worth of damage.

SCRAM Journal Sept/Oct 1987; WISE News Communique 279 18/9/87

1987, August

SELLAFIELD, U.K.

An accident halted reprocessing less than one week after it had restarted following a three month break.

SCRAM Journal Sept/Oct 1987; WISE News Communique 279 18/9/87

1987, August 15

HUNTERSTON, U.K.

Approximately two tonnes of 'mildly radioactive' gas leaked from the gas treatment plant.

SCRAM Journal, Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, August 22

USA

The United States Navy has ordered Pacific Commanders to 'remove evidence' in case of a nuclear weapons accident aboard and treat it as one involving conventional explosives, it was revealed in a document obtained by a private research organisation.

The Australian - 24/8/87

1987, September

EMBALSE, ARGENTINA

The Embalse nuclear power plant was shut down for repairs. According to CNRA president Ferreira, Embalse faced technical 'malfunctions' leading to a leak of heavy water into the area surrounding the plant.

'Clarin' 1 September 1987; WISE 279 18 September 1987

1987, September

HARWELL, U.K.

A spillage of radioactive material at the U.K. Atomic Energy Agency's Harwell Laboratory led to the intake of plutonium-238 by a research scientist who was working at a glove box in the main radiochemistry building.

WISE News Communique 279 18/9/87

1987, September 4

SELLAFIELD, U.K.

Workers at Sellafield took 80 minutes to find a leak of radioactive carbon dioxide. The incident led to contamination of an area near the Calder Hall reactor.

SCRAM Journal, Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, September 13

GOIANIA, BRAZIL

Two people stole a radiotherapy source from a disused medical clinic on 12 September 1987. A security did not show up to work at the clinic that day; he went instead to the local cinema to see 'Herbie Goes Bananas'

The radiotherapy source − a 5-cm diameter capsule − contained 93 grams of caesium-137. It was sold to a junkyard dealer. Many people were exposed to the radioactive caesium and they spread the contamination to other sites within and beyond the town.

With many people sick by 28 September, the radioactive source was taken on a bus to a hospital. The following day, authorities began identifying contaminated areas and organising treatment of injured people in facilities set up in the Olympic stadium. About 112,800 people were examined, of whom about 250 were contaminated.

Five people died from exposure to the small radiation source; an additional 23 people suffered radiation burns, several requiring amputations; nine suffered bone marrow depression with three displaying symptoms of acute radiation sickness.

The incident was rated Level 5 ('accident with off-site risk') on the 7-point International Nuclear Event Scale.

www.johnstonsarchive.net/nuclear/radevents/1987BRAZ1.html

Decontamination of the urban environment: www-pub.iaea.org/MTCD/publications/PDF/te_1131_prn.pdf

IAEA, 1988, The Radiological Accident in Goiania, www-pub.iaea.org/MTCD/publications/PDF/Pub815_web.pdf

http://en.wikipedia.org/wiki/Goi%C3%A2nia_accident

1987, October

OYSTER CREEK, USA

The US Nuclear Regulatory Commission shut down the Oyster Creek nuclear plant after discovering plant operators had disabled key safety valves during a test, and then destroyed the records of the violation in a coverup.

1987, October

CANADA

An environment ministry official in Canada says the town of Port Hope, Ontario is 'walking a tight rope' as sewage treatment plant officials wait for a place to dump uranium-tainted sludge. The contamination is due to uranium that has leaked from the Altered Resources Ltd refinery. The untreated sewage is in danger of flowing over a weir toward Lake Ontario. The uranium was discovered in the sewers two years ago, and has built up to more than 75,000 cubic feet since then.

The Star (Ontario) - 7 October 1987

1987, October

HEYSHAM 2, U.K.

Reactor 2 was scrammed because of a fault on the main electrical system.

SCRAM Journal Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, October

DUNGENESS, U.K.

The Dungeness Magnox reactors in the UK had to be closed down during a storm on 16 October. It was originally reported that grid failures had caused the system frequency to increase and the generators to run too fast.

SCRAM Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, October

DOUNREAY, U.K.

The Prototype Fast Reactor at Dounreay had to reduce power in early October because seaweed had entered the cooling water pump house. It had passed through a special seaweed barrier, built only last year at a cost of two million pounds.

SCRAM Journal (Scotland) Nov/Dec 1987; WISE 283 20/11/87

1987, October

NEW ZEALAND

Residents of Otahuhu, New Zealand and two dozen steel workers were evacuated around midnight on the 10th of October after electricians at the Pacific Steel Plant noticed that molten steel had spilled onto a canister containing radioactive caesium-137.

RWC Waste Paper (US) Winter 1987/1988

1987, October 3

FORT ST. VRAINS, USA

A 20 minute oil fire in Fort St. Vrain's turbine building caused 'definite substantial damage' to several components at the plant. The fire burnt some cables, causing one entire circulation loop to trip and forcing operators to manually trip the reactor.

Nucleonics Week 15 Oct 1987; WISE News Communique 283 20/11/87

1987, November

BROWNS FERRY, AL, USA

A fire of unknown origin is being viewed as serious by the Nuclear Regulatory Commission. The plant has been shut down since September 1984, first for refuelling and then because of safety concerns.

Nucleonics Week 12/11/1987

1987 November

PILGRIM, MASSACHUSETTS, USA

In two separate incidents, five plant workers at the Pilgrim nuclear power plant were contaminated. In a third accident, a valve on a chemical waste pump leaked, contaminating an area of the plant. All three accidents occurred within a 48-hour period.

Nucleonics Week 12/11/ 1987

1987, November

GERMANY

334 'incidents' at 19 operating West German nuclear plants were recorded by nuclear reactor operators in 1986.

Nucleonics Week 12/11/1987

1987, November

HANFORD, USA

Safety violations and worker exposures have been revealed at the U.S. Government's nuclear weapons reactors in a draft Congressional memorandum obtained by the New York Post. One of its findings is that workers at Hanford, Washington State, were exposed to maximum allowable radiation doses. Also at Hanford, radiation alarms were turned off in a high-level waste store because they were being set off by high winds.

SCRAM Journal Nov/Dec 1987; WISE News Communique 283 20/11/87

1987, December

NEW MEXICO, USA

On December 16, a team of scientists and policy specialists from the University of New Mexico revealed that they had discovered water leaks at the U.S. Dept of Energy's Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. Documents obtained from the US Department of Energy showed that when one of the ventilation shafts was drilled for the 1250-foot deep WIPP, an aquifer was pierced.

Guardian (US) 30/12/87, WISE 285, Nov 87

1987, December 4

CHERNOBYL, UKRAINE, USSR

It was reported in a Soviet newspaper that there have been more fatal accidents at the Chernobyl nuclear power plant since the April 1986 disaster. According to the report, sloppiness and inadequate supervision over the last 10 months have led to 36 accidents. Three resulted in deaths. It is not known how many people died or what the causes of death were. It remains unclear how many of the accidents involved radiation and incorrect handling of radioactive fuel. Apparently disciplinary measures have been taken against certain officials.

'Volkskrant' - 5 Dec 1987; WISE News Communique 284 14/12/87

1987, December 17

EMBALSE, ARGENTINA

Commission Nacional de Energia (CNEA) has confirmed that its 600 MW Embalse nuclear station is leaking heavy water into the Rio Tercero Reservoir in Argentina's Cordoba Province.

Nucleonics Week (US) - 17 December 1987

1987, December 31

HANFORD, USA

A truck hauling low-level radioactive waste overturned near the Hanford Nuclear Reservation spilling some of its load. One of six containers on the truck carrying about 41,000 pounds of waste broke open, spilling its contents.

Chicago Tribune - 1 Jan 1988

1988, January

MARALINGA, AUSTRALIA

According to New Scientist magazine, a group of six army officers were deliberately exposed to radiation in 1956 at Britain's nuclear testing site at Maralinga, Australia. The officer in charge, Major Duncan Janisch, decided that his men should not wear protective clothing in order to have some idea of the amount of contamination picked up by the average survey party and of the degree to which this contamination can be removed by brushing and other simple means. The documents are the first to confirm that servicemen were deliberately exposed to radiation in the UK tests.

'British Nuclear Tests Veterans', New Scientist' - 7 Jan 88; WISE 287 19 Feb 88

1988, January

CHERNOBYL / MEXICO

Mexico has returned 3,000 tonnes of radioactive milk powder to Northern Ireland.

'LaVoz del Interior' 31/1/88; WISE News Communique 288 4/3/88

1988, January 23

DUNGENESS, AGR-2, U.K.

Two tonnes of radioactive carbon dioxide used to cool the No.2 AGR at Dungeness on the south-east coast of England leaked from a broken seal. A CEGB spokesperson said that 'it was a very low level of radioactivity − a very normal kind of industrial accident'. The reactor was kept running and no site emergency was announced.

WISE London

1988, February

HAMAOKA 1, JAPAN

The two recirculation pumps in the primary coolant circuit at Hamaoka Unit 1 in Shizuoka Prefecture stopped simultaneously, due to the failure of an electromagnetic relay in the power line. The accident, which occurred on 1 February 1988, should have resulted in an emergency shutdown. However, the reactor did not shut down automatically and the operating crew failed to respond quickly to shut it down manually.

Nuke Info Japan - Mar/Apr 1988

1988, February

GORLEBEN, GERMANY

In the intermediate waste disposal site at Gorleben, cracks were found in two barrels filled with irradiated metal parts from a research reactor.

TAZ 3 February 1988

1988, February

U.K.

British Nuclear Fuels is planning to fly regular consignments of plutonium to Japan from Prestwick in Glasgow, beginning in 1992. The decision is despite fears of accidents or terrorist attacks.

Financial Times Energy Economist; SCRAM Journal; WISE News Communique 287 19/2/88

1988, February 2

RANGER, AUSTRALIA

There was a spill of contaminated material at the Ranger uranium mine in the Northern Territory, only hours before a Senate team came to inspect the mine.

WISE Glen Aplin

1988, February 8

MULHHEIM KAHRLICH, GERMANY

Near the nuclear plant Muhlheim Kahrlich, FRG, a 54% increase of radioactivity was measured by the environmental group ARGUS, who have surrounded the nuclear plant with four monitoring instruments.

TAZ - 8 February 1988

1988, March

TASMANIA, AUSTRALIA

Tasmanian Minister for Environment, Peter Hodgman, has imposed a ban on flushing low-level radioactive isotopes used in Antarctic Research into the Derwent River. Seventy other Tasmanian institutions will now be included in the ban. Tasmania plans to return the radioactive isotopes to Lucas Heights.

Times - 6 March 1988

1988, March/April

BARODA, INDIA

An explosion and fire occurred between two synthesis gas purifiers at the Baroda heavy water plant in India. The plant will be shut down for two months for investigation into the cause of the accident. Baroda has a history of problems.

Nucleonics Week (US) - 24 March 1988

1988, April

U.K.

British Defence Ministry officials admit they have no idea how or when to dispose of the Navy's outdated nuclear submarines. Although the nuclear reactors will be removed, the hulls will still be radioactive.

Sydney Morning Herald - 1/4/88

1988, April 11

USSR NAVAL / NORWAY

The reactor in the Soviet nuclear submarine that sank off the north coast of Norway on the 11th of April has been reported by Soviet authorities to contain 2 kg plutonium-239, 420,000 curies of strontium-90 and some caesium-137. The submarine sank in water 2 kms deep.

'Aftenposten' Norway 12/2/90; WISE 329 9/3/90

1988, April 20

BIBLIS B, GERMANY

Following the explosion of a switch in a 220 kilowatt line in the nuclear plant at Biblis, Unit 8 underwent emergency shutdown.

WISE - 6 May 1988

1988, May

USA, ATLANTIC

A 14-tonne canister of uranium gas en route to the U.S. rolled overboard in rough waters in the mid-Atlantic.

'Waste Paper' (US) - Fall 1988; WISE News Communique 25/11/88

1988, May

SCK, BELGIUM

The Belgium Committee for Security and Health (SCK) has revealed the existence of several 'irregularities' involving a waste water tank at the Nuclear Research Centre in Belgium. Water leaking from the tank has caused contamination of groundwater. Eighty tonnes of radioactive slime was found on the bottom of the leaking tank, showing a contamination of 37 GBq or 16 grammes of plutonium.

De Standeard' Belgium - 27/29 May 1988; WISE 15/7/1988

1988, May

USA

The U.S. nuclear industry, helped by pro-nuclear Senators, is trying to make taxpayers pay for the $8.8 billion in unpaid fees accrued by nuclear utility companies. That's the figure the U.S. Department of Energy says utilities owe for the cost of enriching uranium fuel for nuclear reactors since 1984. That figure does not include decommissioning costs for three Federal uranium enrichment plants, estimated to be about $3 billion.

Redwood Alliance, Eco News, May 1988; WISE 292 6 May 88

1988, May 13

USA

According to the US Nuclear Regulatory Commission a radioactive device containing 40 curies (1.5 TBq) of iridium-192 dropped out of a moving truck.

'Waste Paper' (US) Fall 1988, WISE News Communique 302, p7, 25/11/88

1988, May 25

PROJECT 1, 3, TEXAS

Houston Lighting & Power Co's South Texas Project 1 nuclear plant has been shut down for an undetermined period after an accident on May 25. The shaft at one of the unit's three steam driven main feed water pumps sheared off, sending debris flying 'all over the place'.

Nucleonics Week - 2/6/88; WISE 15/7/88

1988, June, July

USA

The Radioactive Waste Campaign, a public interest group based in New York, has released a 170-page report documenting the massive contamination problems at all

16 of the Department of Energy's (DOE) major production facilities for nuclear weapons in the U.S. The report was released just about the same time the DOE was itself releasing estimates on the massive costs of cleaning up those sites − $US40−100 billion. Included in the report's findings:

- Billions of litres of radioactive water are dumped routinely into the ground each year at the Hanford reservation, in Washington State, contaminating the Columbia River.
- Similar dumping at the Savannah River plant in South Carolina; radioactive fluids are poured into seepage basins designed to leak at a steady rate.
- Underground nuclear explosions are contaminating the aquifers near the Nevada test site and some radioactive fallout has drifted as far as Salt Lake City.

A two-year study by nine researchers concluded that there is 'a pattern of gross mismanagement by the department, which is allowing radioactivity to leak out of the sites through soil, water and air − in many cases intentionally'. The costs of clean-up, even at their highest, have already been found by Congressional researchers to be far too low, as they don't reflect costs such as the tens of billions of dollars needed to dispose of radioactive waste from the production of the bombs, or from decontamination of the reactors producing the bomb fuel.

'Waste Paper' Summer 1988; 'Toronto Globe & Mail' 7/6/88; New York Times 2 - 13 July 88; WISE News Communique 298 23/9/88

1988, June

CHERNOBYL / ITALY

According to the radiation measurements of ENEA (Italian Directorate Nuclear Safety Health Protection) of June 1988, meat, noodles, bread, milk and cheese are still contaminated by Chernobyl fallout.

AMICI delis Terra, Italy, MA Nuova, Ecologia, Italy, Lega per l'Ambiente, Italy; WISE News Communique 291 22 Apr 88

1988, June

AKEM, HANAU, GERMANY

A worker was contaminated with uranium and plutonium-oxide at a fuel fabrication plant Akem at Hanau, West Germany.

TAZ (FRG) 28 Jun 88; WISE 6 Jul 88

1988, June

KAPL, NEW YORK, USA

A parking lot at Knolls Atomic Power Lab (KAPL) in New York is contaminated with radioactive waste. Yet workers have been permitted to work there, even though the Atomic Energy Commission and the US Dept. of Energy knew the radioactivity was above Federal and State limits and may pose a health hazard.

'Schenectady Gazette' (US) 22/1/88; WISE News Communique 303 9/12/88

1988, June

VARENNES, CANADA

A company in Varennes, Canada has temporarily stopped selling radioactive waste as landfill because news reports about the practice have worried people in the area, said director of the plant Jacques Bureau. 'We're doing this', he added 'out of respect for the people here, but we hope to start selling the material again soon.' According to a Canadian Environment Department official, the waste is five times more radioactive than the minimum level at which a product can qualify as a 'toxic waste' under provincial and Federal regulations.

Montreal Gazette 19/6/88; WISE News Communique 300 21/10/88

1988, June 2

KANSAI, JAPAN

A Japanese prefectural government spokesman disclosed that a routine safety inspection at three pressurised water reactors at the Kansai Electric Power Co revealed a total of 174 cracked bolts in the primary cooling systems.

Japan Times - 2 Jun 88; WISE 291 2/9/88

1988, June 6

GENKAI, JAPAN

Primary cooling water was discovered leaking inside the container building of the No. 1 reactor at Genkai Nuclear Power Plant in Genkai Saga Prefecture. The leak was due to a crack in a piping system caused by metal fatigue.

Japan Times 15 Jul 88; WISE News Communique 297 2/9/88; Japan Times - 8/6/88; WISE 6/7/88

1988, June 18

TIHANGE-1, BELGIUM

On 18 June 1988, while the pressurised water power reactor was operating, a leak occurred in a section of emergency core cooling system piping. The leak rate was around 1,300 litres per hour. The source of leakage was a crack 9 cm long. The risk of a pipe rupture in the emergency core cooling system is considerable if the emergency safety injection system is activated, because large quantities of cooling water are injected in case of a loss of coolant accident in an already degraded safety situation.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1988, July

OAK RIDGE, TN, USA

Commercial shipments of tritium from Oak Ridge were suspended in July 1988, while the Department of Energy and the U.S. Nuclear Regulatory Commission were conducting investigations into the discrepancies between the amount that was recorded shipped and the amount actually received by customers. The discrepancies dated back to 1985 and the difference amounted to approximately five grammes. No explanation has ever been found for these losses.

J.D. Mann via Greennet, 28/10/89 and Robert Burns, Assoc. Press via Greennet 26/10/89; WISE 320 3/11/89

1988, July

PALO VERDE, AZ, USA

A fire in an auxiliary transformer at Palo Verde-1 cut off power to all four reactor coolant pumps in early July.

Nucleonics Week (US) 14 Jul 88; WISE News Communique 299 7/10/88

1988, July

ARIZONA, USA

The radioactive contamination of the Rio Puerco River in Arizona is still being studied. The results of a report released in July concluded that the Rio Puerco has so much radioactivity in its sediment that drinking from it would pose a health risk at certain times. There is a long history of uranium waste water being dumped into the Rio Puerco. On the Western side of the Navajo reservation, water there is also unsafe to drink − a result of another uranium mine.

Gallup Indep 19/7/88; WISE News Communique 299 7/10/88

1988, July 13

ALMARAZ 1, SPAIN

A 200 litre-an-hour radioactive gas leak was detected in a steam generator at the Almaraz 1 reactor in South-West Spain.

'Power in Europe' (U.K.) 15 Sep 88; Nucleonics Week (US) 21 Jul/18 Aug 88; WISE News Communique 299 7/10/88

1988, August

NINE MILE POINT 1, NEW YORK, USA

A worker at the Nine Mile Point-1 reactor in New York apparently swallowed a small radioactive particle of cobalt-60. The particle, approximately one microcurie, was detected after the worker set off an alarm when leaving the radiation area. The utility operating the plant is trying to determine the source of origin of the material and how the worker, who was wearing a face shield, came to ingest it.

Nucleonics Week 11 Aug 88; WISE 297 2/9/88

1988 August

NORMANDY, FRANCE

A vehicle transporting a gamatron containing caesium-137, intended for use in the verification of solders, disappeared in Normandy France at the beginning of August. A week later the van had still not been found, but the gamatron had been located, intact, in a local garbage dump.

Le Monde (France) 10/8/88; Liberation (France) 11/8/88; WISE News Communique 298 23/9/88

1988, August

USA

A study written by a firm involved with the Shippingport reactor dismantling project says that decommissioning the current generation of Light Water Reactors in the U.S. could produce 81.5 million cubic feet of low-level radioactive waste by the year 2034.

Nucleonics Week - 4/8/88

1988, August 11

OAK RIDGE, TN, USA

The U. S. Department of Energy (DOE) has suspended commercial shipments of tritium for the second time in four months because of another unexplained loss of the material. The decision came after the government released documents showing that three quarters of a test shipment of tritium (a key ingredient in nuclear weapons) was lost at the Oak Ridge National Laboratory in Tennessee. According to later documents, released on 25 October 1989, investigators did not rule out theft as a cause of the disappearance.

JD Mann via Greennet, 28/10/89 and Robert Burns, Assoc. Press via Greennet 26/10/89; WISE 320 3/11/89

1988, August 13

CATTENOOM 1, FRANCE

Cattenoom-1 experienced three 'anomalies' during its first 'complete' inspection outage in August. On August 13, a leak was detected on one of the containment overpressure valves, most likely due to failure of a seal. On August 17, the spent fuel storage pool was mistakenly connected to the water storage tank, resulting in the emptying of approximately 120 cubic metres of pool water and the lowering of its level from 14 metres to less than 13 metres before operators noticed the problem and rectified it.

Nucleonics Week (US) 6/10/88; WISE News Communique 302 25/11/88

1988, September

MAPS 2, INDIA

A heavy water leak inside the reactor vessel shut MAPS-2, the second unit of the Madras Atomic Power Station in India.

Nucleonics Week (US) 6/10/88; WISE News Communique 302 25/11/88

1988, September

LONDON, U.K.

Recently leaked documents have forced the UK's Central Electric Generating Board (CEGB) to admit to serious problems with its Advanced Gas Cooled Reactors. The documents report on the problem of severe vibrations in the fuel rods if they are removed while the reactor is running at full power. The vibrations are so violent that there is a risk that the fuel rods could break and fall to the bottom of the reactor where they could cause a serious accident.

'NENIG Briefing No 15; WISE News Communique 297 2/9/88

1988 September - 1989 September

EUROPE

584 'major' incidents have been reported to the International Atomic Energy Agency since it began its inter-governmental reporting system.

'Herman Damveld' The Netherlands; WISE 323/324 22/12/89

1988, September 1

TOKAI, JAPAN

Seven workers at the nuclear processing facility in Tokaimura, Japan were contaminated with plutonium and caesium while working near a room used to machine-process enriched uranium.

Japan Times 3/9/88; WISE News Communique 298 23/9/88

1988, September 4

LITHUANIA, USSR

A fire at the Ignalina nuclear power station in Lithuania severed cables used to control and monitor the reactor, triggering an automatic shutdown. A Soviet official, quoted by the Tass news agency, said there were no injuries and there was no radiation leak.

Charles Mitchell, UPI, 5 Sept 87; WISE News Communique 298 23/9/88

1988, September 17

TAKAHAMA 2, JAPAN

A radioactive leak occurred at Kansai Electric Power Co's Takahama 2 reactor in Fukui Prefecture, when primary cooling water leaked into the secondary cooling water due to cracks developing in the small tubes of one of the three steam generators. The leaks caused radioactive gas to be released into the air.

Nuke Info Tokyo - Sept/Oct 88; WISE News Communique 300 21/10/88

1988, October

CALIFORNIA, USA

Mono Lake, a high desert lake in east California, has been polluted by dumping of nuclear waste, according to a recent study conducted by Columbia University researchers. Their report suggests that nuclear waste was dumped into the lake during the 1950s and perhaps again 10−15 years later.

Citizen Alert; WISE News Communique 302 21/10/88

1988, October 11

BERKELEY MAGNOX, GLOUCESTERSHIRE, U.K.

A worker was injured when fire broke out at one of the two Berkeley Magnox reactors in Gloucestershire in the U.K.

Western Daily Press (U.K.) 13/10/88; WISE News Communique 302 25/11/88

1988, October 26

SAVANNAH RIVER, SC, USA

At the Savannah River nuclear materials plant in the U.S., traces of plutonium were found on 18 employees. Plant officials suspect an exhaust stack leak was responsible.

Greenpeace via Greenlink 21/11/88; Greennet Nuclear 21/11/88; WISE News Communique 302 25/11/88

1988, October 27

KANSAI 1, JAPAN

The No. 1 reactor at Electric Power Co's nuclear power station in Fukui Prefecture was manually shut down because radiation leaked into the secondary coolant from a steam generator. Ultimately some of radiation leaked into the environment through the steam generator.

Japan Times 28/10/88; WISE News Communique 303 Dec 88

1988, October 27

DARLINGTON, CANADA

Three weeks after start up, the Darlington Tritium Recovery Facility in Canada had its first accident. A spill of tritium gas into three unoccupied rooms at the facility caused the evacuation of the entire plant. According to a utility spokesman, workers were not exposed and the tritium 'puff'.

'Nuclear Awareness Project Newsletter' Canada, Fall 1988; WISE 305 20/1/89

1988, November

TOTTORI, JAPAN

According to information received by Kyodo News Service, a high incidence of deaths from lung cancer has been observed among miners and local residents living near former uranium mines in Tottori Prefecture, Japan.

Japan Times 8/11/88; WISE NC 303 9/12/88

1988, November

RANGER URANIUM MINE, AUSTRALIA

Just under half a million tonnes of higher-level radioactive waste has been dumped in an area reserved for low-level radioactive waste as a result of equipment failure, which went unnoticed for six months. This equipment was supposed to indicate if a load was radioactive or not. It is claimed that radioactive water will contaminate release pond no. 4, which is periodically pumped into the environment and the Alligator River region. It has been declared as a serious accident by the Office of the Supervisory Scientist. The Director, Dr Glen Riley, said: 'I regard this situation as the most serious deficiency shown by the Ranger in the long series of malfunctions and operational shortcomings since the mine opened'. Dr Riley wants Ranger prosecuted. The accident was originally dismissed as trivial by the Northern Territory Mines and Energy Minister, Barry Coulter.

ABC 7.30 Report - 21/24 January 1989

1988, November 11

MURMANSK, USSR

The official Soviet trade newspaper Vodhy Transport reported on February 18 that the melting of nuclear fuel aboard the twin reactor nuclear icebreaker 'Rossiya' had been narrowly averted, preventing a nuclear accident in the northern port of Murmansk.

'UPI' press report (via Greenpeace, Greenlink) 20/2/1989; WISE 309 24/3/89

1988, December

U.K.

There are 1,250 nuclear sites licensed by the UK's Department of Environment to discharge radioactivity into the environment on a routine basis. However, because of a secrecy clause in the 1960 Radioactive Substances Act the public is unaware that these sites exist and there is no published data on the amount of radiation discharged.

WISE News Communique 303

1988 December

USA

Ten employees at a U.S. irradiation facility were exposed to radiation. Three had measurable radioactive contamination on their clothes, in their cars and in their homes. Radioactive contamination was also found in the administrative offices. 70,000 medical supply containers and milk containers were recalled. The complex houses a total of over 12 million curies in the 252 capsules of caesium-133 it uses as its radioactive source system to sterilise medical supplies. Due to abnormal discolouration in the vicinity of the welds at the end of the capsules, 129 of these capsules are suspected to be leaking.

RWC Waste Paper (US); WISE News Communique 303 9/12/88

1988, December

BURGHFIELD, BERKSHIRE, U.K.

An explosion occurred at the Burghfield Atomic Weapons establishment in Berkshire. This facility assembles and dismantles nuclear warheads.

The Guardian U.K. 3/12/88; WISE News Communique 303 9/12/88

1988, December 8

CHALK RIVER, CANADA

An estimated 500 litres of heavy water spilled into the Ottawa River at Chalk River Nuclear Laboratories in Canada. The river supplies drinking water to Canada's capital city, Ottawa, and surrounding communities.

Edmonton Journal, Canada 17/12/88; WISE 305 20/1/89

1989

DIABLO CANYON-2, CA., USA

Unit 2 of the Diablo Canyon Nuclear Power Plant was shut down and an 'unusual' event was declared.

'Diablo Monitor' via GreenNet; WISE 328 2/90

1989, January 1-6

FUKUSHIMA DAINI 3, JAPAN

Fragments of a broken recirculation pump found their way into the reactor vessel at the Fukushima Daini 3 BWR (1,100 MW). According to officials, this is the first incident of this kind in Japan. The unit first experienced minor vibrations on January 1. On January 6, one of its two recirculation pumps developed wild vibrations. By the end of February, engineers found that a 100 kg bearing in the pump was dislocated and damaged and part of the turbine components were destroyed. At least 10 fragments were found at the bottom of the reactor vessel, and 13 more inside the jet pump. Metallic elements were found on 61 of the reactor's 764 fuel assemblies.

It is now believed that the damage is even more serious than reported previously. Tokyo Electric Power Company's investigation has discovered that metal pieces have been found on 122 of the 764 fuel assemblies, and not 61 as originally reported by industry newsletter, Nucleonics Week (9/3/89).

Investigators have found an additional 91 loose pieces of metal inside the reactor, as well as metal dust on an additional 15 fuel assemblies. If the pump had been kept operating longer it could have resulted in a loss of coolant accident (LOCA).

Nucleonics Week (US) 9/3/89; WISE 310 14/4/89; Nuke Info Tokyo (Japan) Mar/Apr 1989; Japan Times 8/4/89; WISE 311 28/4/89

1989, January 18

SAVANNAH RIVER, AIKEN, SC, USA

Eight workers were contaminated with radiation at the Savannah River Plant in Aiken, South Carolina. Six construction workers, a Department of Energy inspector and a Health Department employee picked up radioactive particles on their shoes and in their hair. Neither the source of the contamination nor the type of radioactive material have been identified.

'Guardian' US 1/2/89; Public Citizen. 2/89; Greenlink 17/25/28 Feb and 4/2/89; WISE 307 24/2/89

1989, February

SAN SALVADOR, EL SALVADOR

Three employees of the Delmed Company, which operates a medical steriliser in San Salvador, received whole body radiation doses of 400−600 rads, enough to cause acute radiation sickness. More individuals may have been exposed. The exposures resulted after one component of the radiation source had fallen out of the source rack and was lying unshielded in the irradiation room. Since the radiation monitors had been disabled, workers entering the room unknowingly received a high radiation dose.

'RWC Waste Paper' US, Spring 89; WISE 317 8/9/89

1989, February

GRAFENRHEINFELD, SCHWEINFURT, BAVARIA

An incident at the 1300 MW Grafenrheinfeld nuclear power station was reported in the 'urgent' category after a defect was discovered in one of the reactor containment control systems. The 'urgent' category is used in West Germany to describe a fault that could have 'potential but not immediate effects'. A few days before the incident it had been reported that radioactivity in the primary circulation at the same plant was raised because of a damaged fuel element, 'with the result that more radioactive inert gas had been released into the environment'.

'Power in Europe' (U.K.) 16/2/89; WISE 309 24/3/89

1989, February

FMPC, FERNALD, OHIO, USA

Contamination of two employees from the U.S. Environmental Protection Agency (EPA) at a Department of Energy (DOE) weapons facility have led to an order barring all EPA inspectors from that plant. The plant, the Feed Materials Production Centre in Fernald, Ohio, processes uranium for nuclear weapons. The EPA placed the plant off-limits to its inspectors on February 9 after

tests showed that agency personnel attending meetings at Fernald had been exposed to uranium oxide.

'Guardian' US 1/2/89; Public Citizen 2/89; Greenlink 17/25/28 Feb and 4/2/89; WISE 307 24/2/89

1989, February 25

NORTH ANNA 1, VIRGINIA, USA

North Anna-1 tripped off because of failure of a feedwater control valve air line.

Nucleonics Week 2/23 Mar 89; WISE News Communique 309 24/3/89

1989, March

PALO VERDE 2, ARIZONA, USA

Palo Verde-2 tripped because of the failure of one of its two master feedwater controllers which caused rapid fluctuations in steam generator levels and an apparent overcooking of the primary system.

Nucleonics Week 2/3/89; WISE 310 14/4/89

1989, March 9

BIBLIS, GERMANY

The Ministry for the Environment and Reactor Security in the state of Hessian said emergency water pumps used to cool one of the Biblis nuclear reactors, plus part of the reactor's emergency power supply, were found to be defective. The defects were found when technicians tried to fix a leak in a water pump.

WISE News Communique 308; TAZ (FRG) 11/3/89; Greenpeace Press (Greenlink) 13/3/89; WISE News Communique 309 24/3/89

1989, April

IKATA-1, JAPAN

Twenty-two of the 48 fixing bolts of the primary coolant pump outlet vanes were found to have developed cracks and there was damage to twelve steam generator tubes. Also, nine of the control rods of the unit had to be replaced during a periodic inspection made by the owner Shikoku Electric Power Co. following a sit-in by citizens' groups at the company's head office demanding a halt to the reactor's operations.

Nuke Info Tokyo May/June and Jul/Aug 89; 'Nuclear Power Reactors in the World' Apr 1898; WISE 320 3/11/89

1989, April 7

SOVIET SUBMARINE, OFF NORWAY

The Soviet submarine which caught fire on April 7 and sank off the coast of Norway carried two nuclear-armed torpedoes as well as its nuclear reactor. Fourty-two of the 69-member crew died in the disaster.

UPI via Greenlink 20/4/89; WISE 311 28/4/89

1989, April 19

LITHUANIA, USSR

An accident was reported to have taken place on April 19 at the USSR's biggest nuclear power station, the Ignalina plant in Lithuania. According to a Lithuanian journalist quoted in the Dutch newspaper Volkskrant, a fuel rod was dropped during loading, causing a hole in the bottom of the cooling water reservoir.

'Volkskrant' (No) 22/4/89; WISE 311 28/4/89

1989, June 1

TOKAI, JAPAN

Uranium in three polyethylene bottles caught fire in the nuclear fuel storage room of a uranium enrichment laboratory in Tokai, Ibaragi Prefecture, Japan. The three bottles contained 10−30 kgs of waste uranium.

The Japan Times - 1/6/89; WISE 315 7/7/89

1989, June 4

FUKUSHIMA-2, NORTHERN JAPAN

On June 4, 4,080 litres of radioactive cooling water leaked from a boiling water reactor at Tokyo Electric Power Co's Fukushima No. 2 nuclear plant in northern Japan. The reactor was shut down manually, but not until 6 a.m. the following morning.

The Japan Times 5/6/10 and 21/6/89; WISE 315 7/7/89

1989, June 12

OHIO, USA

The US Nuclear Regulatory Commission imposed its first ever infringement against a military organisation on the 12th of June. It fined the US Air Force $102,500 for failing to report a nuclear spill. Drums of americium-241, stored in a shed at Wright-Patterson Air Force Base, contaminated at least one employee, who opened the drum during an inventory. Clean-up costs exceeded $2 million and the bases' radiation safety director was placed on a two-year probation for knowingly storing the substance.

'RadBull' (US) Aug. 1989; WISE 319 20/10/89

1989, June 13

DOUNREAY, U.K.

A seepage of liquid was discovered from a sludge settling tank containing uranium and plutonium.

Atom (U.K.), Jan 1990; WISE 326 9/2/1990

1989, June 18

HONG KONG AIRPORT

On June 18, news reports said Hong Kong airport was put on full alert after a jet flying in from London reported a leak from a container of radioactive material.

'MTS Bulletin' via Greenlink 18/6/89; WISE 315 7/7/89

1989, June 26

SOVIET SUBMARINE, OFF NORWAY

The Soviet nuclear-powered submarine Echo II, which caught fire at sea on June 26, returned to its Arctic base with a damaged reactor. The reactor failed while it was submerged about 110 kms off the Norwegian coast. The Soviet navy commander, Admiral Vladimir Chernavin, confirmed that there were nuclear weapons on board the submarine, but they were 'safe' and had not been effected by the accident. According to Soviet Defence Minister, Dimitri Yazov, the primary cooling circuit in one of its twin pressurised water reactors failed while the sub was submerged. The Soviet news agency Tass talked earlier of an air-tight seal failing in the primary circuit.

Large amounts of radioactive iodine are now known to have been released when the submarine caught fire. Fallout from the fire was measured as far away as Vardo, in the far north near the Soviet-Norwegian border. Researcher Finn Ugletveit at the Norwegian radiation institute has been reported in the press as stating, 'Our emergency preparedness is worse than people think. We're not properly equipped to tackle crisis situations'.

It is less than three months since another Soviet nuclear submarine caught fire and sank in the same area (the Barents Sea), taking 42 crew with it. When the Soviet Mike-class sub sank, its two reactors became the eight and ninth reactors known to be abandoned on the ocean floor.

TT Swedish News Service - 6/9/89; WISE 318 29/9/89; 'Naval Accidents 1945-1988' - June 1988; Guardian 27/6/89; 'North Atlantic Network General Conf' 21/6/89; WISE 315 7/7/89

1989, August

MILLSTONE, USA

The U.S. sub-committee on nuclear regulations has requested that the Nuclear Regulatory Commission focus its investigations on US $15,000 offered by North East Utilities to John Delcore, a worker who exposed poor safety practices, to silence him. Another focus will be the Texas Utility Electric Company which gave a nuclear builder $15,000 and his attorney $20,000 to keep quiet about problems at the Comenchi Peak Nuclear Plant.

The Committee's chair, Senator John Breaux, said that 'it turns the licensing process into a sham, if witnesses can be paid money to withhold their testimony'. The NRC did levy a US $50, 000 fine on Millstone in April 1989 for failing to complete safety modifications required since the Three Mile Island accident, three years after the modifications were to have been made.

A recently released report by the Nuclear Information and Resource Service shows that over a half (59 out of 112) of the operating nuclear powered reactors in the US have not completed these modifications.

'Radiation & Alternatives Bulletin' RadBull Aug.89; WISE 319 20/10/89

1989, August

USA

A recent US General Accounting Office (GAO) report has found severe radioactive contamination at civilian nuclear sites which had been declared decommissioned or decontaminated. Contamination levels were discovered to range between two and 730 times above federal standards. The sites included Westinghouse Fuel Fabrication Plant in Cheswick, Pennsylvania; Combination Engineering Site in Hematight, Missouri; Texas Instruments Plant, south of Boston; Gulf United Nuclear Corporation Fabrication Plant near Pawling, New York; the Kerr McGee plant in Cushing, Oklahoma; and the Nuclear Fuel Services site in Erwin, Tennessee (which had contamination levels 730 times above drinking water standards).

Nuclear Monitor 21/8/89; WISE 319 20/10/89

1989, August 9

PICKERING, CANADA

A Canadian mechanic was exposed to six times the yearly legal radiation limit in an accident at the Pickering nuclear plant. Another worker, who was standing nearby, was also exposed. The workers were replacing a radioactive control rod when a radiation detection device went off the scale. It was later discovered that the equipment being used by the men was designed for training and did not contain lead, which shields workers from radiation.

The Oshawa Times, Canada 14/8/89; WISE 318 29/9/89

1989, August 16

GRAVELINES-1, FRANCE

The mounting of an inappropriate type of screws onto pressure relief valves on the primary circuit rendered the overpressure protection system inefficient. The valves would have opened and closed significantly later than under design basis conditions. The operators did not agree to the INES Level 3 rating ('serious incident') and initiated, in vain, a procedure to get it downgraded to Level 2 ('incident').

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1989, September

INDIA

In September, the Indian newspaper 'The Independent' reported that a survey by a team of scientists from the Bhabha Atomic Research Centre (BARC) found an unusually high concentration of radioactive iodine in marine algae near the Tarapur Atomic Power Station. Researchers found iodine-129 in marine algae near Tarapur at 740 times the normal concentration. They published their findings in the Indian Journal for Marine Sciences.

'Anumukti' India Oct 1989; WISE 323/324 22/12/89

1989, September 5

TURKEY POINT 4, FLORIDA, USA

A turbine trip at Turkey Point 4 resulted in numerous complications. The reactor began to automatically insert control rods to scram the reactor, but stopped before insertion of the rods was complete.

Nuclear Monitor (US) 2/10/89; WISE 319 20/10/89

1989, September 21

CHERNOBYL / PAKISTAN

The Pakistani government released for consumption 496 tonnes of powdered Dutch milk which had been contaminated by the Chernobyl accident, then said it had made a mistake. An analysis of the imported milk samples made by the Pakistan Atomic Energy Commission detected caesium-134 and caesium-137 in the milk, on average 22% above Indian limits. The milk had been seized by Customs in December 1988 and released in June 1989 following appeals by importers, who promised to dilute it with uncontaminated milk in a 1 to 10 proportion to comply with Euratom standards for reconstituted products.

Nucleonics Week US 21/9/89; WISE 319 20/10/89

1989, September 27

THREE MILE ISLAND-2, PA, USA

Two workers helping with the clean-up of Three Mile Island Unit-2 unintentionally picked up a piece of the damaged core. Measurements of the material found it to be highly radioactive. One of the workers received a dose of between 75−375 rem (750−3750 mSv) to the hand; the other received a dose of between 18.75 to 75 rem (187.5 to 750 mSv). After realising the error, other workers picked up the material with long handled tools and placed it in the reactor vessel.

Nuclear Monitor US 16/10/89; WISE 320 3/11/89

1989, October

LAGUNA VERDE, MEXICO

922,629 litres of radioactive liquids were dumped into the ocean from the 1st April to 24th August 1989. Also, radioactive gas emissions have increased radioactivity around this General Electric reactor. Furthermore, 16 scrams have occurred during periods of testing at this plant from October 1988 to May 1990.

'Excelsior' Mexico City 8/9/89. Nuclear Monitor US 16/10/89; WISE 320 3/11/89

1989, October

DARLINGTON, CANADA

In early October, a mix-up resulted in workers mistakenly putting tritium-contaminated heavy water into the heat transport system of the Unit 2 reactor at the Darlington nuclear station in Canada.

'The Anti-Nuclear Review' Canada Summer/Fall 1989; WISE 322 1/12/89

1989, October

NINE MILE-2, NEW YORK, USA

A problem in the cooling system at Nine Mile Point 2 will keep the plant from reopening on schedule. The plant had shut down earlier in the month because of a malfunctioning electronic system which occurred when a condenser valve was mistakenly closed during maintenance work on the plant's electrical system.

'Solstice Magazine' via GreenNet - 29/10/89; WISE 320 3/11/89

1989, October 19

VANDELLOS 1, TARRATOGA, SPAIN

Unit 1 of the Vandellos nuclear power plant, a gas-graphite moderated reactor in Spain, suffered a turbine failure and subsequent turbine hall fire. Suppression of the fire took six hours. During the fire, a rubber expansion joint in the turbine hall failed, resulting in seawater flooding of the lower levels of both the turbine hall and the reactor building (in the latter case, this flooding occurred due to violation of administration controls that left a door open). Considerable equipment failures ensued, including failure of two of four main coolant circulators, two feedwater pumps, the turbine building sump pumps, the control air system, area lighting in many plant buildings, the shutdown heat exchanger, the public address system and the condenser control valves. Smoke entered the control room, and fire suppression systems were automatically actuated in numerous areas despite the lack of fire in those areas. Rated Level 3 ('serious incident') on the 7-point International Nuclear Event Scale. The resulting damage was so significant that it was decided to permanently close and decommission the plant.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1989, October 24

ASEA BROWN BOVERI, SWEDEN

At the Asea Brown Boveri (ABB) fuel fabrication plant in Vasteras Sweden, an accident occurred during the routine emptying of a uranium hexafluoride sample cylinder. The supposedly airtight glove box in which the cylinder was being manipulated leaked, resulting in a worker breathing in poisonous fluorine gas. A spokesman for ABB said they do not know what caused the accident, but suspect blockage of a ventilation pipe.

'Vestermanlands Lans Tidning' Vasteras, Sweden 27/10/89; WISE 320 3/11/89

1989, October 24

HANFORD, WA, USA

The are unconfirmed reports of an explosion in a single-shell storage tank containing highly radioactive wastes. It has led the governor of Washington State to order an in-depth investigation of potential chemical explosions involving other similar storage tanks at the Hanford nuclear reservation.

UPI via GreenNet 24/10/89; WISE 320 3/11/89

1989, October 27

CHERNOBYL / U.K.

Fish contaminated by the Chernobyl accident are still being found in British rivers three years after the explosion took place, according to the UK's Agriculture Ministry. It said that brown trout caught by anglers throughout Britain contain the highest levels of caesium-134 and caesium-137. Pike and perch were also affected, but not as badly.

Japan Times - 27/10/89; WISE 321 17/11/89

1989, November

CHINON AND ST. LAURENT DES EAUX, FRANCE

Two nuclear power stations in France, at Chinon and St. Laurent des Eaux, had to be shut down for several weeks earlier this year because of the hot, dry summer. The Loire River was too warm to be used for cooling purposes.

'Tribune' Australia 27/9/89; WI SE 319 20/10/89

1989, November

RANCHO SECO, CA, USA

The US Nuclear Regulatory Commission delayed the removal of nuclear fuel, scheduled to begin this month at the Rancho Seco nuclear plant in California, due to a leak through the plant's pool.

'UPI' via GreenNet 20/11/89; WISE 322 1/12/89

1989, November

ROCKY FLATS, COLORADO, USA

Investigators from Scientec Inc., an engineering management company, discovered several kilograms of accumulated plutonium-239 in a pipe that serves as an exhaust ventilation duct in a plutonium processing building. It was found 'outside the normal envelope used to control' plutonium inventories and the quantity was 'more than enough' for an accidental chain reaction which could produce a lethal dose to workers at close range and could, in some circumstances, release radioactive materials into the environment. Rocky Flats had been warned by a former Rockwell employee, who designed the ventilator systems, that the ducts were a probable location for dangerous quantities of plutonium to collect. But managers did nothing to identify and correct plutonium accumulations in the ventilation systems.

Rocky Flats officials have already been under investigation and raided by the FBI for possible criminal violation of environmental laws in the past including improper waste disposal.

Nuclear Monitor US 4/9/89; Guardian US 11/10/89; Greenpeace via GreenNet 20 and 23/9/89, 7,11,23/10/89; WISE 321 17/11/89

1989, November 7

RABBIT LAKE, SASKATCHEWAN, CANADA

A leak of about two million litres of radioactive and heavy metal contaminated water occurred at the Rabbit Lake uranium mine and mill area in northern Saskatchewan, Canada. The water burst from a faulty valve on a 10 km long pipeline that carries run-off and groundwater seepage from the Collin's Bay open pit uranium mine to the Rabbit Lake uranium mill. The water had spilled 300 metres towards Collin's Creek, which flows into Collin's Bay on Wollaston Lake.

'Survival Office Saskatchewan'; 'Saskatoon Star Phoenix', Saskatoon, Saskatchewan 9 and 11/11/89; 'Edmonton Journal' Edmonton, Nov 89; WISE 322 1/12/89

1989, November 8

MAINE YANKEE, USA

What was described as 'slightly contaminated' air was vented from the Maine Yankee nuclear plant as part of shutdown operations. This was so repairs could be made on a faulty pump seal that had caused several thousand gallons of contaminated water to leak inside the plant.

'UPI' via GreenNet, 9/11/89; WISE 322 1/12/89

1989, November 9

CHERNOBYL / MOSCOW, USSR

Moscow News today stated that more than 250 people who were at work at the time of the 1986 Chernobyl explosion or worked on the clean-up have already died. A spokesman for the government agency that is responsible for the clean-up acknowledged the figure of 250 deaths but said only 31 could be traced directly to the disaster. The Government newspaper Izvestia did agree that 'many of those who worked a long time in conditions that were dangerous to their health need help today'. A report released by the Associated Press in March stated that almost a quarter of a million people were still living on land so contaminated that they cannot eat food grown on it, and that three years after the accident officials are still evacuating more people from the area surrounding the plant.

'AP' via Greennet 9/11/89; WISE 321 17/11/89

1989, November 24

GREIFSWALD, GERMANY

In order to test the emergency switch system of the new fifth block of this East German nuclear power plant, three of the six cooling water pumps were switched off, at which point the fourth pump broke down and the reactor went out of control. When it was finally switched off manually, the staff discovered that 10 fuel elements had been damaged − a local meltdown. The triggers to the missing automatic switch-off were, according to the official investigation commission, sticky contacts of relays which were sloppily constructed.

This accident was the last in a series of other dangerous incidents:

- In 1974 only a hastily spread jumping-sheet prevented some control rods from falling into the fully loaded centre of the reactor.
- In the mid-1970s, all main water pumps broke down. Workers had forgotten to reinstall six lids during a check-up.
- In 1981, deionised water got into the active zone of the reactor leading to a temperature increase.
- In 1976, following a fire within the reactor, the cooling system broke down. Also concerning were the everyday conditions − drunken staff, a leaking and unstable reactor building, poor quality welding seams, missing containments, missing replacement and construction materials, chaos in cable connections, sinking foundations and radiation levels well in excess of acceptable levels. Aware of the obsolete equipment and the bad conditions, workers renamed the plant 'Chernobyl North'.

TAZ (FRG) 29/1/1990; Dagena Nyheter (Sweden) 28/1/1990; WISE-Stockholm; WISE 326/7 9/2/1990

1989, December

NAVY, CUMBRIA, U.K.

30 gallons of contaminated cooling liquid spilled from a nuclear submarine into the VSEL shipyard in Barrow-in Furneac, Cumbria.

Anti-Nuclear Network Newsletter Feb/Mar 90; WISE 328 2/90

1989, December

USSR

On February 9, 'Komsomolakaya Pravda' revealed that a Soviet nuclear submarine armed with intercontinental ballistic missiles suffered a major accident involving the release of radioactivity during a weapons test last December.

WISE 333 1/6/90

1989, December

SELLAFIELD, U.K.

Radioactive contamination was detected at the Fairlie station where spent fuel flasks from Hunterston are transferred to flat bed railway trucks on their way to

Sellafield. Caesium-137 levels were 30 times greater than the highest post-Chernobyl concentrations and 100 times the levels found in Strathalyde, where the station is located.

SCRAM Scotland Dec 1989/Jan 1990; WISE 323/324 22/12/1989

1989, December 21

EMBALSE, ARGENTINA

This 600 MW plant reportedly suffered three scrams in four days after the 9th of December. The CNEA (Comission National de Energia Atomica) refused to answer reports, fuelling speculation in the local press that the reactor had been sabotaged. According to private industry sources the reactor was first shut down automatically because of valve problems. It was restarted but shut down at least twice.

Nucleonics Week - 21/12/89; WISE 326/7 9/2/1990

1981-1989

SASKATCHEWAN, CANADA

A total of 153 spills have been reported at three uranium mines in Saskatchewan Canada since mid-1981. Amoc Mining reported 62 spills, Cameco 48 and Key Lake 43. (Three quarters of these are estimated to be radioactive). The spill totals were requested after Cameco's Rabbit Lake mine reported a spill of two million litres of radium- and arsenic-contaminated water.

MediaScan Canada, 10/11/89; WISE 323/324 22/12/89


R242
1K
C*1
102
C*2
102
IC206
TA7809F
IC205
IC213
MB1511
IC212
TA8158F
IC200
MC3372
Q200
Q207
Q208
Q211
Q212
R239
R240
R249
R247
R248
C263
C257
C256

the 1990s

1990, January 16

ILLINOIS, USA

Loss of off-site power causes multiple equipment failures at the Dresden nuclear power plant in Morris, Illinois.

archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, January 23

BRUCE A, CANADA

The Atomic Energy Control Board says that 'a long standing error' in the computer software that controls the fuelling machine at the Bruce A nuclear station in Ontario was responsible for an accident at the station's unit 4. Some 12,000 litres of heavy water coolant spilled into the reactor vault after all four brakes on the fuelling machine bridge were suddenly released during the fuelling process.

Nucleonics Week 31/5/90; WISE 335 6/7/90

1990, January 31

NAVAL REACTOR, U.K.

The U.K. Department of Defence revealed that it has discovered a crack in the nuclear reactor of the H.M.S. Warsprite. The Department admitted that, had it not been detected, the crack could have led to a large release of radiation. As a result, officials have ordered tests on all nuclear vessels to ascertain if similar defects exist in their reactors.

ABC Radio National - 31/1/90

1990, February 8

USSR

Soviet newspaper Pravda published details of a nuclear submarine accident in December 1989. The submarine was testing ballistic missiles when the accident occurred, releasing what was quoted as 'massive amounts of radiation'.

ABC Radio News - 8/2/90

1990, February 15

THREE MILE ISLAND, USA

A metal sample cut from Three Mile Island's reactor vessel shows a crack extending at least two inches into the five-inch-thick vessel bottom. The find raises questions about just how close the vessel was to being breached during the core melt accident in March 1979.

Nucleonics Week 15/2/90; WISE 329 9/3/90

1990, February 20

POINT LEPREAU, CANADA

Eight employees receive radiation exposure at the Point Lepreau nuclear power plant in Canada.

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, February 23

OKLAHOMA, USA

An undated, but apparently recent accident at Seguoyah Fuels Facility in Gore, Oklahoma resulted in a spill of 10,000 to 20,000 pounds of depleted uranium tetrafluoride powder.

The Nuclear Monitor - 26/2/90; WISE 329 9/3/90

1990, February 25

CREYS-MAVILLE, FRANCE

A capsule containing two GBq of krypton-79 broke during experiments at the French Superphenix fast breeder reactor in Creys-Maville, near the Swiss border.

DeVolksrant (Netherlands) 23/2/90; WISE 331 27/4/90

1990, March

BELGIUM

Failure of core cooling equipment at the Doel nuclear power plant in Belgium.

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, March 15

BALTIC SEA, GERMANY

The West German transport ship, MS Godewind, collided with a corn transport ship in the Baltic Sea, 10 kms from the island of Rugen (GDR). MS Godewind is used to transport nuclear fuel and radioactive scrap material to Sweden.

'TAZ' FRG 375/90; WISE 333 1/6/90

1990, March 20

GEORGIA, USA

The Alvin W. Vogtle Unit 1 pressurised water reactor was in the 25th day of a refuelling outage. A single residual heat removal pump circulated water through the reactor core to remove decay heat, maintaining the water temperature at approximately 90F. One of the two main power transformers and one of the two emergency diesel generators were out of service for maintenance.

A truck in the plant's electrical switchyard backed into a support column for a transmission line providing power to the in-service transformer. A phase-to-ground electrical fault de-energised the transformer and disconnected the reactor from its electrical grid. The only available emergency diesel generator automatically started on the loss of offsite power, but it shut down about 80 seconds later due to sensor problems in its control circuit. The operators declared a Site Area Emergency when power had not been restored 15 minutes into the event.

About 18 minutes into the event, operators manually restarted the available emergency diesel generator, but it shut down about 70 seconds later. About 36 minutes into the event, operators manually restarted the available emergency diesel generator in emergency mode, which bypassed most of the protective trips for the generator. They connected the emergency diesel generator to its electrical bus and restarted the residual heat removal pump to re-establish reactor core cooling.

In the 41 minutes it took to restore reactor cooling, the reactor water temperature increased from 90F to 136F.

Workers closed the containment equipment hatch about 80 minutes into the event. The interruption of reactor core cooling coupled with delay in re-establishing containment integrity represented a risky situation because things could have led to a reactor meltdown without a barrier against release of radioactivity to the environment. The NRC calculated the severe core damage risk from this event to be 0.1% per reactor-year.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1990, April

DOUNREAY, SCOTLAND

The Dounreay fast breeder reactor was closed down after liquid sodium leaked from the secondary cooling system and burnt on contact with air.

NENIG Briefing (P.A.) 5/90; WISE 333 1/6/90.

1990, April 25

SLOVAKIA

Increased coolant level at the Bohunice nuclear power plant in Slovakia leads to flooding of the reactor building.

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, May 13

BLIND RIVER, CANADA

Leak shuts down the Canadian refinery. Approximately 178 kgs of radioactive uranium dust leaked from CAMECO's Blind River Uranium Refinery into the air over a 30-hour period during the week of the 13th May. The filter system was bypassed accidentally and officials are unsure whether it was a mechanical or human error.

'Nuclear Awareness News' Canada, Spring 1990; WISE 335 6/7/90

1990, May 21

RINGHALS-2, SWEDEN

A serious incident occurred at Ringhala-2 Sweden, a Westinghouse built reactor. Operators were unable to turn on both the main pump and the two reserve pumps for the cooling system of a basin in which the fuel elements had been placed during the reactor's annual inspection.

'Aftonblade' TV News Prog. (Sweden) 21/5/90; 'Dagens Nyheter', 22/5/90; WISE 333 1/6/90.

1990, May 28

LOVIISA, FINLAND

A break in a thinned feedwater pipe shuts Finnish PWRs. Both units at the Loviisa Nuclear Power Plant were stopped due to a rupture of a feedwater pipe at Loviisa-1.

Nucleonics Week US 31/5/90; WISE 335 6/7/90

1990, June

MURUROA ATOLL, PACIFIC

Radioactive waste from French underground nuclear tests at Mururoa Atoll in the Pacific is seeping towards the surface faster than has previously been claimed, warns Professor Manfred Nochstein, director of Auckland University's Geothermal Institute. He believes the waste could come to the top of the Atoll in about 30 years − not the thousands of years claimed by French authorities.

Greenpeace (via Greennet 25/5/90); WISE 333 1/6/90

1990, June

U.S. NAVY, U.K.

A U.S. nuclear weapons carrier ship, the T-AK 286 Vega, was damaged in a collision with a barge at Holy Loch (U.K.).

Scotland on Sunday (U.K.) - 24/6/90

1990, June

CHERNOBYL / IRELAND

According to the Irish Nuclear Energy Board, the radioactive caesium levels in mountain sheep which graze in upland pastures have not decreased significantly since the Chernobyl accident in 1986. In fact, its report on sheep monitoring for 1989, which covered more than 25,000 animals, showed a slight increase compared with 1988 levels.

Nuclear Energy Board; Irish Times - 19/6/90; WISE 336 20/7/90

1990, June 6

BIBLIS A., GERMANY

A nuclear 'incident' rated in the category 'urgent' occurred at the RUE nuclear power station Biblis A. While the block was shut down for maintenance, and the fuel elements removed from the reactor pressure vessel, electricity supply for reactor protection was mistakenly switched off for three minutes before it was noticed.

'Power in Europe' - 21/6/90; WISE 335 6/7/90

1990, June 7

SPAIN

A leak of water into the containment vessel, at the rate of 280 litres per hour, began the night of 7th June and lasted approximately 10 hours.

WISE Tarragona 11/7/90; Trouw (NL)

1990, June 24

SOREQ, ISRAEL

An operator at a commercial irradiation facility bypassed the safety systems on the JS6500 sterilizer to clear a jam in the product conveyor area. The one to two minute exposure resulted in a whole body dose estimated at 10 Gy or more. He died 36 days later despite extensive medical care.

http://en.wikipedia.org/wiki/List_of_civilian_radiation_accidents

1990, August

LENINGRAD, USSR

Soviet newspapers have reported that radioactive waste has been dumped in the Leningrad area, even in city parks. According to the newspaper, Komsomolskaya Pravda, there are at least 1,500 places in Leningrad where levels of radon exceed allowed levels. About 150,000 cubic metres of soil are known to be contaminated. The newspaper also reported that radioactivity has seeped down into groundwater and out into the Bay of Finland.

Dagena Nyheter (Sweden) 16/8/90; WISE 338 14/9/90

1990, August 27

CHERNOBYL, UKRAINE

Cable fire causes loss of control of the position of control rods at Chernobyl nuclear power plant (Ukraine)

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, September 12

UST-KAMEMOGORSK, KAZAKHSTAN, USSR

The official Soviet news agency Tass has reported that an explosion took place at a Soviet fuel fabrication plant in Ust-Kamenogorak in Kazakhstan. The city has a population of half a million people and is located near the border of the USSR, Mongolia and China. No fatalities occurred, but many people are said to be injured.

TAZ (FRG) 14/9/90; VLT (Sweden) 14/9/90; WISE 339 28/9/90

1990, September 16

CREYS-MALVILLE, FRANCE

The French Government has been forced to close a fast breeder nuclear power reactor in Creys-Malville after a series of technical problems led to a reduction of power and automatic shutdown. It was thought that a bubble of argon gas in the reactor core was causing the problem.

The Australian - 19/9/90; Nuclear News - August 1991

1990, September 30

MICHIGAN, USA

Reactor core cooling system fails at Palisades nuclear power plant in South Haven, Michigan.

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, October

GERMANY

The German Government has informed Moscow that it will shut down five VVER 230 nuclear power reactors in former East Germany because they are unsafe. A Nuclear Energy Agency spokesperson was quoted as saying that

'those machines are incredibly far off our own regulations and requirements.' At least 26 similar reactors are scattered across Czeckoslovakia, Hungary, Bulgaria and the Soviet Union. Pressure continues to build for these to be closed also.

Sydney Morning Herald - 22/10/90

1990, October

HANFORD, WASHINGTON STATE, USA

A potentially explosive situation was reported by safety inspectors at a nuclear waste tank (codenamed 101-SY) at Hanford. The waste slurry had formed a thick crust which is trapping hydrogen being continuously generated underneath. The tank has uncertain chemistry and contents. Up to 66 tanks at Hanford are believed to be leaking, 22 are accumulating hydrogen and a further 22 are potentially explosive.

New Scientist, October 1990; Canberra Times - 28/12/90

1990, October 30

CRUAS-4, FRANCE

The explosion of a 6.6 kV commutator caused a fire that entailed the loss of one of the two electrical safety circuits. The destruction of the commutator was caused by the degradation of elastic washers due to the exposure to heat. Subsequently, the second line was found to be affected in the same way. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1990, November 3

BELGIUM

Failure of core cooling equipment at Doel nuclear power plant in Belgium.

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, November 21

FARALLON ISLANDS, OFF USA

Marine scientists have produced visual evidence that drums of radioactive waste are leaking in parts of the northwest Pacific, which is a rich fishing area and a marine reserve. At least 47,500 drums are known to have been dumped near the Farallon Islands, 50 kms off San Francisco, between 1946 and 1970. Images show fish swimming among corroded and collapsed drums scattered over an area of 48 sq kms.

The Age - 22/11/90

1990, December 4

FRANCE

Two workers are irradiated during refuelling at Blayais nuclear power plant in France.

http://archive.greenpeace.org/comms/nukes/chernob/rep02.html

1990, December 18

HEMATITE, MISSOURI, USA

One worker was slightly injured and 25 evacuated following a release of uranium hexafluoride at a nuclear fuel fabrication plant. The spill occurred after an employee failed to turn off a valve before disconnecting sampling equipment from a cylinder being tested for degree of enrichment.

Nuclear News - February 1991

1991, February

ERZGEBIRGE, FORMER EAST GERMANY

Details were released of the size and possible cost of the task of cleaning up the 1000 sq kms of former uranium mines in the Erzgebirge region. There are hundreds of slag heaps which must be levelled or covered and greened. There are 1,600 kms of mine workings to be filled in or flooded; plus more than 300 shafts and tunnels, 85 ventilation shafts and 18 waste ponds to be decontaminated and closed off or reclaimed. The equivalent of 2−5 billion pounds sterling was said to be needed to pay for the clean-up.

New Scientist, 2/2/91; The Weekend Australian - 27-28/4/91

1991, February

NORTH WALES, U.K.

The Trawsfynydd nuclear power plant was shut down because of fears expressed by Britain's Nuclear Installations Inspectorate that the two 25-year old reactors there were operating with weakened welds in their pressure vessels.

New Scientist - 9 February 1991.

1991, February 9

MIHAMA, FUKUI, JAPAN

A serious accident occurred in the Mihama nuclear power plant. A pipe in the steam generator burst, leaking 55 tonnes of radioactive primary (reactor) coolant water into the secondary steam-generating circuit. Some radioactivity was released to the atmosphere and the plant's emergency core cooling system was required. MITI reported later that the accident was caused by human error − some anti-vibration bars were wrongly installed by workers and sawn off short to make them fit.

Nuclear News - August 1991; The Age - 23/2/91; Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1991, February 9

MIHAMA-2, JAPAN

A steam generator tube rupture occurred at the Mihama-2 pressurised water reactor. The emergency core cooling system was activated.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1991, April 3

SHEARON HARRIS, USA

Workers at the Shearon Harris pressurised water reactor in New Hill, North Carolina, discovered damaged piping and valves within the alternate minimum flow system provided for the pumps in the emergency core cooling system. The piping and valve damage was serious, and had an accident occurred, the water needed to cool the reactor core would have instead poured out onto the floor through the ends of broken components. The Nuclear Regulatory Commission calculated the severe core damage risk from this event to be 0.6% per reactor-year.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1991, April 25

CHERNOBYL, UKRAINE, USSR

The head of a Ukranian parliamentary committee on Chernobyl reported that the concrete and steel casing built around the reactor devastated in 1986 is in danger of collapsing. A more detailed appraisal was given simultaneously by a team of Soviet scientists at a conference in Paris. The sarcophagus is deteriorating faster than expected, increasing the risk of water penetration and dust escape. Water entering the still-hot reactor could cause explosions. There is even a risk that, as parts of the structure collapse, radioactive fuel still inside the building may form a critical mass, prompting a self-sustaining fission reaction. At present the sarcophagus contains 180 tonnes of uranium, 570 kgs of plutonium and significant quantities of other transuranic elements.

New Scientist, 27 April 1991; Canberra Times, 27/4/91

1991, May

WILMINGTON, N.C., USA

A potential criticality incident occurred at GE's nuclear fuel fabrication plant in Wilmington. The Nuclear Regulatory Commission later found that workers and managers at the plant were complacent on safety matters and that there had been a general deterioration of safety.

Nuclear News, September 1991

1991, June 17

HANAU, GERMANY

Mixed oxide nuclear fuel fabrication plant closed down as the result of a plutonium leak. Three workers suffered slight contamination. The plutonium leakage was from a damaged container and was graded as a 'B' (urgent) incident. A plant investigation has been ordered.

Nuclear Engineering International, August 1991

1991, June 22

BELLEVILLE-2 PWR, FRANCE

Two incidents within a month were rated Level 2 on the 7-point International Nuclear Event Scale. Faulty welds were discovered in the crucial low pressure auxiliary primary coolant system. The earlier Level 2 incident involved failure of two primary water level measuring systems.

Nuclear Engineering International - August 1991

1991, July 1

SLOVENIA, YUGOSLAVIA

The country's only nuclear power plant was closed down for fear of military attack after three federal jet fighters 'buzzed' the facility.

Nuclear News - August 1991

1991, July 10

BALLEVILLE-2, FRANCE

Reports of another incident at Belleville-2 rated Level 2 on the 7-point International Nuclear Event Scale. This time, ten cubic metres of pure (i.e. unboronated) water was allowed to enter the primary circuit through human error. A prescribed level of boron is required in the circuit to keep the reactor core subcritical.

Nuclear News, September 1991

1991, August 10

CHERNOBYL-2, USSR

An incident occurred in which several cubic metres of cooling water leaked while the reactor was shut down for maintenance work. The leak was caused by failure of a pipe seal near the main circulation pumps. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Nuclear News - September 1991

1991, August 13

NEW YORK STATE, USA

A three-year-old nuclear power reactor at Nine Mile Point malfunctioned and was closed down the following day. A Nuclear Regulatory Commission investigation was begun into reasons why a control room warning system and its backup power supply failed.

The Australian - 15/8/91

1991, August 23

KARLSRUHE, GERMANY

Workers at the Nuclear Research Centre, Karlsruhe, discovered that an entire nuclear fuel assembly consisting of 37 fuel rods had somehow been switched with a dummy (training) assembly. The most likely fate of the active assembly was considered to have been destruction and placement in nuclear waste drums. However, theft of the nuclear material was not ruled out.

New Scientist - 5 October 1991

1991, September

RAWATBHATA, INDIA

Findings by a medical team that villagers living nearby a power station in Rajasthan are suffering from unusual health problems. These include spontaneous abortions, sterility, deformed children and rare skin diseases. The plant, commissioned in 1973, was shut down at least 250 times during its first decade and has had serious leakage problems throughout the 1980's. A more detailed study of the villagers would become available after six months.

The Age 23/9/91

1991, September 23

BUGEY-3, FRANCE

A leak was identified during a primary circuit pressure test on the support of the control rod drive mechanisms that was going through the reactor vessel head. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1991, September 23

MURMANSK, USSR

Andrei Zolotkov, a national parliamentarian from Murmansk, claims that waste is being dumped off the northern shores of the USSR. He said that the waste, in leaky containers, was dumped in shallow waters for more than 20 years. It included the damaged reactor core from the nuclear-powered icebreaker Lenin, which suffered a meltdown in 1966.

Sydney Morning Herald - 25/9/91

1991, October 11

CHERNOBYL, UKRAINE

In 1991, a turbine hall fire occurred at Unit 2 of the Chernobyl nuclear power plant in Ukraine due to an electrical short circuit. This resulted in turbine rotor displacement, and release of hydrogen from the generator cooling system and release of lubricating oil from the turbine systems. As a result of the lack of smoke discharge provisions in the turbine hall and insufficient cooling of steel structures, the turbine hall roof collapsed. The collapse resulted in the disabling of three of the five main feedwater pumps and one of three emergency feedwater pumps. Ultimately, both main and emergency feedwater were totally disabled before the fire could be suppressed. Reactor cooling was maintained only by increasing main circulating pump seal cooling flow. The fire was suppressed three and a half hours after it began. According to the Finnish safety authority STUK, 'only some very extraordinary measures to remove residual heat saved the plant unit, with a small margin, from a severe reactor accident.' Ultimately, the decision was taken to permanently close and decommission the unit owing to fire damage.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1991, October

HANAU, GERMANY

At the Siemens nuclear fuel plant, a release of ammonia caused a 'blue fog' and affected nearby forest workers. The chemical section of the main fuel fabrication plant was closed down by the Hesse Government.

Nuclear News, October 1991

1991, October

VLADIVOSTOK, USSR

Information was released concerning a serious accident on a Soviet nuclear submarine which took place on the 10th August, 1985 during refuelling. Vital control rods were mistakenly pulled out of the vessel's reactor, causing an explosion which killed ten sailors and sent radioactive materials into the air and sea.

Sydney Morning Herald, 26/10/91

1991, October 21

FASLANE, SCOTLAND, U.K.

An alert was sparked by a fire on the nuclear powered submarine HMS Sceptre at the Faslane submarine base. The fire, which required two fire engines to extinguish, was later described as occurring in a non-essential switchboard area of the vessel.

Canberra Times, 22/10/91

1992

TURKEY POINT NUCLEAR POWER PLANT, USA

Hurricane Andrew struck the Turkey Point nuclear power plant in the United States in 1992, with sustained winds of 233 km per hour. Owing to the lead-time available before the hurricane reached the site area, drains were plugged to prevent water entering the plant, and operators were stationed in the diesel generator building as a precaution. Although safety related structures did not suffer any damage, offsite power was lost to the site for five days. During this time period, one of the diesel generators had to be shut down due to overheating. Offsite communication was lost and plant access roads were blocked by debris. Helicopters had to be used to bring fuel and consumables to the plant site. A water tower collapsed causing major damage to the fire protection system piping, the water supply system, electrical services, and instrumentation. Some non-safety-related buildings were destroyed during the storm. In addition, an effluent stack at a fossil-fired unit at the Turkey Point site structurally failed. Over US$90 million in damage was caused at the plant site.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1992, January

INDIA

Four tonnes of heavy water spilt at the Rajasthan nuclear power plant.

1992, January 19

KOLA, RUSSIA

Radioactive leak led to a reactor shut down at Kola nuclear power plant.

1992, February 11

USA/RUSSIA

The nuclear-powered attack submarine Baton Rouge (SSN-689) collides with the Russian Barracuda, a Sierra class nuclear-powered attack submarine. Although able to return to base under its own power, the Barracuda is damaged so severely that it is never restored to service.

http://en.wikipedia.org/wiki/USS_Baton_Rouge_(SSN-689)

1992, March 9

KOLA, RUSSIA

Fire at the Kola nuclear power plant.

1992, March 24

ST PETERSBURG, RUSSIA

Radioactive noble gases and iodine escaped into the atmosphere from reactor number three in the nuclear power plant at Sosnovy Bar, 100 kms west of St Petersburg. The accident happened when contaminated steam escaped from one of the 1,690 fuel channels in the reactor's core, either because the channel ruptured or, more likely, because a seal on the channel gave way.

'The perils of ex-Soviet nuclear power', Economist 28/03/92

1992, June

RUSSIA

An explosion aboard a nuclear submarine killed an officer and injured four crewmen while the ship was being repaired on the Kola Peninsula in northern Russia.

1992, June 2

SMOLENSK, RUSSIA

Total failure of centralised control system at the Smolensk nuclear power plant.

1992, June 19

LENINGRAD, RUSSIA

Leak in pipe conducting seawater to cooling system at Leningrad nuclear power plant.

1992, July 14

NOVOVORONEZH, RUSSIA

Reactor shut down due to failure of cooling system at Novovoronezh nuclear power plant.

1992, July 22

DAMPIERRE, FRANCE

Two workers contaminated at Dampierre nuclear power plant.

1992, July 28

BARSEBACK-2, SWEDEN

A leaking pilot valve in the boiling water reactor in Barseback initiated, automatically, safety functions like reactor scram, high-pressure safety injection, core spray and containment spray systems. The steam jet from an open safety valve was impinging on thermally insulated equipment. Insulating material was washed into the suppression pool and affected the emergency core cooling system, which is essential for heat removal in case of a reactor coolant leak. Similar incidents occurred in several countries and the problem turned out to apply to many light water reactors around the world.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1992, August 2

TORONTO, CANADA

Pickering reactor 1 had a heavy water leak from a heat exchanger that resulted in a release of 2,300 terabecquerels of radioactive tritium into Lake Ontario. This was the worst-ever tritium release from a CANDU reactor (Canadian designed reactor), and resulted in increased levels of tritium in drinking water from Whitby to Burlington.

Canadian Coalition for Nuclear Responsibility, Nuclear Awareness Project, www.ccnr.org/nucaware_hydroletter.html

1992, September 8

SELLAFIELD, U.K.

A failure occurred in a pipe connected to the plutonium evaporation system in the building used for reprocessing irradiated nuclear fuel, known as B205. This resulted in a leak of plutonium nitrate into the secondary containment cell and an accumulation of material at the base of the evaporator, which remained sub-critical. The company said no one was affected by radiation as a result of the leak. The plant was shutdown for seven weeks. Rated Level 3 ('serious incident') on the 7-point International Nuclear Event Scale.

Independent 19/11/92; UK Government press release 4/1/93

1992, October 15

IGNALINA, LITHUANIA

The Ignalina power station nuclear reactor was found to have an expanding fracture in a steam pipe and the plant was shut down. The leakage was radioactive but there was no acknowledged damage to the environment.

Reuters News Service, 24/10/1992

1992, November 16

INDIANA, USA

An 82-year-old female patient was undergoing radiotherapy at the Indiana Regional Cancer Center. An iridium-192 source was dislodged from equipment and accidentally left in the patient; this went unrecognised since the staff failed to perform required checks to secure sources. The patient was returned to the nursing home and died 93 hours later due to the radiation injury from the embedded source. The catheter containing the source was removed by the nursing home staff and disposed of as medical waste. The waste disposal company discovered the source during routine checks for radioisotopes. The ensuing Nuclear Regulatory Commission investigation concluded that exposures of 0.34 to 25.7 mSv were incurred by 94 individuals, including clinic staff, nursing home staff, nursing home residents and visitors, and waste disposal company employees.

www.johnstonsarchive.net/nuclear/radevents/1992USA1.html

1992, November 24

OKLAHOMA, USA

The Sequoyah Fuels Corporation uranium processing factory in Gore, Oklahoma closed after repeated citations by the Government for violations of nuclear safety and environmental rules. Its record during 22 years of operation included an accident in 1986 that killed one worker and injured dozens of others and the contamination of the Arkansas River and groundwater.

The Sequoyah Fuels plant had been shut down a week before by the Nuclear Regulatory Commission when an accident resulted in the release of toxic gas. Thirty-four people sought medical attention as a result of the accident. The plant had also been shut down the year before when unusually high concentrations of uranium were detected in water in a nearby construction pit.

A Government investigation revealed that the company had known for years that uranium was leaking into the ground at levels 35,000 times higher than Federal law allows; Carol Couch, the plant's environmental manager, was cited by the Government for obstructing the investigation and knowingly giving Federal agents false information.

www.lutins.org/nukes.html

1992, November 26

DESSEL, BELGIUM

A mechanical robot broke a rod containing radioactive material. Eight people were contaminated with radioactive material at the plutonium nuclear fuel fabrication plant in northern Belgium. Labour Minister Miet Smet told the Belgian parliament that seven employees at the plant in Dessel had received 'slight external contamination' and one had 'internal contamination.'

Reuters News Service, 26/11/1992

1993, January 12

SELLAFIELD, U.K.

Plutonium-bearing solvent liquor leaked from a sample cabinet onto the floor. No personnel were contaminated and there was no release of airborne radioactivity. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Health and Safety Executive, Statement of nuclear incidents at nuclear installations, UK Government Press release - 30/6/1993

1993, January 12

CHERNOBYL, UKRAINE

A technical fault in an auxiliary shed between two reactors caused a fire.

New Chernobyl fire underscores Ukraine's nuclear problems, Reuters News Service, 13/1/1993

1993, January 16

PERRY UNIT 1, USA

In 1993, at Perry Unit 1 (USA), the emergency core cooling system (ECCS) strainers twice became plugged with debris. On 16 January 1993, ECCS strainers were plugged with suppression pool particulate matter, and on 14 April 1993, an ECCS strainer was plugged with glass fibre from ventilation filters that had fallen into the suppression pool.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1993, February 2

KOLA, RUSSIA

The Kola 1 reactor plant experienced a station blackout after a storm knocked out off-site power and the emergency diesel generation failed.

Bradley, Don J, Behind the nuclear curtain: radioactive waste management in the former Soviet Union, Battelle Press, 1997, p 623

1993, February 7

THREE MILE ISLAND, USA

An unauthorised vehicle entered the owner-controlled area (OCA) of the Three Mile Island (TMI) nuclear power plant. No physical barriers were present to delay access. The vehicle continued to the protected area of the nuclear plant, smashed one of the entry gates, before crashing through a corrugated metal door and entering the turbine building of the Unit 1 reactor, which was operating at full power. The vehicle stopped 19 metres inside the turbine building, striking and damaging the insulation on an auxiliary steam line. A Site Area Emergency, the second highest emergency classification level, was declared. This was the second time this had occurred at the TMI plant (the first being the TMI Unit 2 meltdown in 1979). The intruder hid and was not apprehended until four hours after he entered the site.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1993, February 25

NEW JERSEY, USA

A catastrophe at the Salem 1 reactor in New Jersey was averted by just 90 seconds when the plant was shut down manually, following the failure of automatic shutdown systems to act properly. The same automatic systems had failed to respond in an incident three days before. Past problems at this plant include a 3,000 gallon leak of

radioactive water in June 1981 at the Salem 2 reactor, a 23,000 gallon leak of 'mildly' radioactive water (which splashed onto 16 workers) in February 1982, and radioactive gas leaks in March 1981 and September 1982 from Salem 1.

www.lutins.org/nukes.html

1993, March 18

CHERNOBYL, UKRAINE

A technical fault shuts down one of two reactors still operating at the Chernobyl nuclear power station. The incident was the latest of a series since the beginning of the year to interrupt the functioning of the power plant. Although none affected the nuclear processes, they included two fires and an oil leak in January. One reactor at the station was shut for four days earlier this month after a minor leak in a back-up pump.

Reuters News Service - 18/3/1993

1993, March 24

LENINGRAD, RUSSIA

A faulty control valve choked coolant flow and ruptured a fuel channel at the Leningrad 3 reactor.

Bradley, Don J, Behind the nuclear curtain: radioactive waste management in the former Soviet Union, Battelle Press, 1997, p 622

1993, March 31

NARORA, INDIA

In 1993, a turbine hall fire at the Narora nuclear power plant in India resulted in a prolonged station blackout. The fire burned for more than 10 hours before it was suppressed. During the course of the fire, smoke entered the main control room. No control room indications were available due to the loss of electrical power. Emergency control panel indications were also blacked out. The main control room was evacuated. The plant remained shut down for repairs from March 1993 until January 1995. The fire was rated Level 3 ('serious incident') on the 7-point International Nuclear Event Scale. (Turbine hall fires resulting in prolonged shutdowns also occurred at the Salem reactor in 1991, and at the Fermi Unit 2 in 1993, both plants in the United States. In both cases, turbine failures were the initial event leading to the fires. The Salem event resulted in generation of turbine ejected debris missiles that impacted numerous plant structures.)

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1993, March 31

KUOSHENG, TAIWAN

Workers are exposed to radiation during three accidents at Kuosheng nuclear power plant in Taiwan.

http://archive.greenpeace.org/comms/97/nuclear/reactor/calendar/standard/cal_mar.html

1993, April 6

TOMSK-7, SIBERIA

The Tomsk military plant comprises several nuclear reactors and chemical plants for separation, enrichment, and reprocessing of uranium and plutonium. A tank containing a blend of paraffin and tributyl phosphate exploded on 6 April 1993, resulting in the release of uranium, plutonium, niobium, zirconium and ruthenium. The tank held 25 m3 of solution. The solution contained 8773 kg of uranium and about 310 kg of plutonium. The total amount of radiation in the solution was approximately 20.7 TBq (559.3 Ci).

The explosion was so violent that the walls on two floors of the building collapsed. A fire broke out on the roof after the electrical system shorted. The release from the tank was estimated to be 4.3 TBq (115 Ci) of long-lived isotopes. Radioactive material spread to the north-east and fallout was detected over an area of 120 km3. Gamma radiation 20 times higher than the norm was measured in the area that received the most fallout. Rated Level 4 ('accident with local consequences') on the 7-point International Nuclear Event Scale.

www.wentz.net/radiate/tomsk/index.htm

www10.antenna.nl/wise/390/3797.html

1993, May 28

USA

The Nuclear Regulatory Commission released a warning to the operators of 34 nuclear reactors around the country that the instruments used to measure levels of water in the reactor could give false readings during routine shutdowns and therefore fail to detect important leaks. An engineer at Northeast Utilities in Connecticut first brought the problem to light. The flawed instruments at boiling-water reactors designed by General Electric utilise pipes which were prone to being blocked by gas bubbles; a failure to detect falling water levels could have resulted, potentially leading to a meltdown.

www.lutins.org/nukes.html

1993, July 17

CHELYABINSK-65, RUSSIA

A small amount of radioactive plutonium leaked into the air from plutonium factory Chelyabinsk-65, but no-one was harmed according to an official at the atomic energy ministry. Deputy information chief Vitaly Nasonov said a storage tank in a workshop in the Mayak plant had suddenly ruptured and released 20 litres of plutonium-238 into the atmosphere. Radiation levels in the plant were only three percent of the maximum daily allowed amount because the plant's ventilation system had automatically sucked out the plutonium into the air.

Russian factory leaks small amount of radiation, Reuters News Service, 19/7/1993

1993, July 31

WYLFA, U.K.

At Wylfa nuclear power station, a 'grab' broke from a crane used to refuel the reactor and crashed down more than 25 feet onto the reactor core. It was classified as a Level 2 incident on the International Nuclear Event Scale. Radioactive sulphur-35 and carbon-14 gases were deliberately vented. Nuclear Electric was fined over the incident.

Independent on Sunday, 17/9/95, p.3

1994, January 29

BUGEY-5, FRANCE

The reactor was shut down and the primary coolant level was decreased to working level in order to carry out some maintenance operations. The water flow level at the primary pumps and the motor intensity fluctuated for eight hours without any operator intervention. The technical specifications explicitly require close supervision of these parameters under these operational conditions because fluctuation can indicate the degradation of the primary pumps leading to their potential loss and thus the risk of core degradation. The safety authorities identified 'significant malfunctioning': the manual was erroneous, the operators had not received any specific training for this 'particularly delicate' operation, the situation has been considered falsely as 'normal and safe', the visit of the safety engineer in the control room did not lead to any corrective action. The event had originally been rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale but was later rated Level 2.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1994, March 3

KOLA 2, RUSSIA

At the Kola 2 plant, a pipe ruptured causing a large fraction of primary coolant inventory to leak (approximately 11,000 gallons). Operators mistakenly turned off emergency core cooling for 15 minutes. The plant had just been shutdown, thereby averting core damage.

Bradley, Don J, Behind the nuclear curtain: radioactive waste management in the former Soviet Union, Battelle Press, 1997, p.623

1994, March 31

RAPSODIE FAST REACTOR, FRANCE

Dismantling of this experimental reactor was almost complete when an accident occurred on March 31, 1994. A temporary storage tank, located next to Rapsodie and containing 100 kgs of sodium residues from the primary circuit of the reactor, exploded. The tank was being cleaned and the sodium treated with ethyl-carbitol. The explosion tore the tank, damaged the circular gallery around the reactor and a part of the room's thick concrete roof collapsed. The accident killed one person and injured four.

www.francenuc.org/en_sites/prov_cadar3_e.htm

1994, March 31

NEW YORK, USA

Fire at a nuclear research facility on Long Island, New York resulted in the radiation contamination of three fire fighters, three reactor operators, and one technician. Measurable amounts of radioactive substances were released into the immediate environment.

www.lutins.org/nukes.html

1994, May 6

BELOYARSK, RUSSIA

A fire broke out at the Beloyarsk nuclear power station in the Urals. Non-radioactive sodium leaked from a secondary circuit in the machine room and ignited.

'Fire at Urals nuclear power station classed as a minor incident', BBC Monitoring Service, 13/5/1994

1994, June 6

BELOYARSK, RUSSIA

Fire at Beloyarsk nuclear power plant.

1994, September 17

BURLINGTON, USA

Operators at the Wolf Creek pressurised water reactor in Burlington, Kansas, made mistakes as they opened and closed valves. The reactor had been shut down 28 hours earlier for refuelling. The residual heat removal system was being used to remove the large amount of decay heat still being produced by the irradiated fuel in the shut down reactor core. The erroneous valve line-up allowed nearly 9,200 gallons of reactor cooling water to flow to the refuelling water storage tank. The inadvertent drainage of reactor coolant water was stopped after about one minute by an operator, who closed a valve. The Nuclear Regulatory Commission investigated the event and concluded that, had operator intervention not occurred, the reactor core cooling by the residual heat removal system would have failed in about three minutes. The NRC rated it Level 2 on the 7-point International Nuclear Event Scale.

www.ecology.at/nni/index.php?p=site&s=301; Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1994, October

TAMMIKU, ESTONIA

In October 1994 three members of the public entered the radioactive waste repository at Tammiku, Estonia, without authorization and removed a metal container enclosing a radiation source, which one of them placed in his pocket. This action resulted in the death of one person and injury to a number of others.

www-pub.iaea.org/books/IAEABooks/4738/The-Radiological-Accident-in-Tammiku

1994, December 10

TORONTO, CANADA

Pickering reactor 2 had a loss of coolant accident. A pipe break resulted in a spill of 185 tonnes of heavy water. For the first time ever at a CANDU (Canadian designed reactor), the Emergency Core Cooling System was used to prevent a meltdown. The emergency coolant injection system pumped about 140 tonnes of water into the core over several hours to prevent overheating and melting of the fuel. Workers stopped the leak after 90 minutes by manually closing all liquid relief valves on the core cooling system. About 200 workers were involved in the clean-up. The reactor was restarted on February 14, 1996.

Nuclear Watchdog Bulletin #1, June 1995; Canadian Coalition for Nuclear Responsibility - Nuclear Awareness www.ccnr.org/nucaware_hydroletter.html

1995, February 11

DOUNREAY, UNITED KINGDOM

At the Residue Recovery Plant, radiation monitoring alarms sounded. The pressure in the main glovebox (which contained plutonium) was discovered to be increasing gradually. This caused the air activity alarms to sound. The plant was shut down. Two of the seven workers received radiation doses, approximately half the annual limit, and the other five received smaller doses. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Health and Safety Executive - statement of nuclear incidents at nuclear installations, UK government Press Release, 30/6/1995

1995, April 17-18

ZAPOROZHYE, UKRAINE

A fault in a circulation pump supplying the reactor with cooling water caused the automatic shut down at the Zaporozhye nuclear power station

'Fault reduces capacity of Zaporozhye generating set', BBC Monitoring Service, 21/4/1995

1995, May 14

BRUCE REACTOR 5, CANADA

This accident was the result of a liquid relief valve leading from the reactor cooling system to the bleed condenser sticking open while the reactor was running at 88% of full power. The reactor shut down automatically, despite efforts by the operators to reduce the reactor power levels slowly. Unexpectedly, the cooling system pressure increased, causing two bleed condenser relief valves to open, dumping heavy water coolant into the reactor building sump. Eighty-seven tonnes of heavy water were spilled and 68 tonnes were automatically recycled back into the cooling system during the accident. Most of the remaining 19 tonnes were recovered later by clean-up crews. About 20 staff were involved in the clean-up. Tritium releases to the air during May 14, 15 and 16 totalled 180 GBq.

Nuclear Watchdog Bulletin #1, June 1995

1995, November 21

GERMANY

The German High Court rules that the license for the Mülheim-Kärlich nuclear power plant was issued illegally, due to insufficient consideration of earthquake hazards.

http://archive.greenpeace.org/comms/97/nuclear/reactor/calendar/standard/cal_nov.html

1995, November 27

CHERNOBYL, UKRAINE

A seal failure occurred in a fuel element. One worker received the equivalent of a year's permitted radiation.

'Serious November incident understated at Chernobyl', Reuters News Service, 8/3/1996

1995, December 8

MONJU REACTOR, TOKYO, JAPAN

Japan's prototype fast-breeder, sodium- cooled reactor Monju (280 MWe) was built at a cost of about US$5 billion and was designed to burn a combination of plutonium-uranium mixed oxide fuel and to produce more plutonium than it consumes. After a decade of technical delays and costly preparations Monju started operation in April 1994 and was connected to the grid in August 1995. On 8 December 1995, when running at 40% of nominal power, about 750 kgs of liquid sodium leaked from the secondary cooling system and caused a subsequent fire. The leaked sodium melted parts such as a ventilation duct and a catwalk, and was piled up on the floor, covering some 4,400 sq m. The sodium leak was the largest ever from a fast breeder reactor. The cause for the incident was the faulty design of the temperature sensor pocket in the sodium coolant pipes. In the 1995 accident one of these pockets had broken off, which started the leaking of the pipe. Other pockets also were found with signs of cracks. The investigations of the incident discovered questionable operating procedures, inadequate manuals, and sloppy crisis management − all rendering the Monju case a result of failed detailed design and inadequate institutional controls and quality assurance.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1996, February 1

CENTRAL RUSSIA

A cloud of radioactive gas and steam contaminated an area of about 10 sq kms, following an incident at an experimental reactor in Dimitrovgrad in Central Russia.

Promt, Europe Energy, 9/2/1996

1996, February 6

CATAWBA 2, CLOVER, SOUTH CAROLINA

On 6 February 1996, the Catawba Unit 2 pressurised water reactor in Clover, South Carolina automatically shut down from 100 percent power after main transformer problems disconnected the reactor from the electrical grid. The loss of offsite power signalled both of the emergency diesel generators to start and provide electricity to vital equipment needed to cool the reactor core. One of the emergency diesel generators started and powered its assigned equipment, but the second diesel generator failed due to a faulty capacitor in its battery charger. Workers repaired this diesel generator and connected it to its loads about three hours into the event. Workers repaired the transformer and reconnected the reactor to its electrical grid about 37 hours into the event. The loss of offsite power deprived the reactor of all the equipment normally used to cool the reactor core. The initial failure of one emergency diesel generator deprived the reactor of half of the emergency equipment used to cool the reactor core during accidents. The Nuclear Regulatory Commission calculated the severe core damage risk from this event to be 0.21% per reactor-year and rated it Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1996, March 28

DIMONA, ISRAEL

Reports of radioactive leaks at the Dimona plant.

'Egypt reportedly declares 'radioactive emergency' due to Israeli leak risk', Reuters News Service, 28/3/1996

1996, April

RUSSIA

On 13 occasions during the month there were unscheduled reductions in capacity or shutdowns of individual generating units at nuclear power stations. Automatic protection went into action five times at the Kalinin, Leningrad and Balakovo power stations. The duty personnel had to switch off the No 2 unit at the Kursk station and the turbo-generator at Kalinin. Unloading of reactors was carried out a total of six times at the Novovoronezhskaya, Balakovo, Kalinin and Kola stations. In all cases, the cause of the disruption to normal operation was unsound equipment.

BBC Monitoring Service, 3/5/1996

1996, April 4

PALO VERDE NUCLEAR POWER PLANT, USA

A fire at Unit 2 of the Palo Verde plant resulted from an electrical grounding design error. The result of the error was simultaneous fires in the main control room and in the safe shutdown equipment room. Damage from the control room fire resulted in loss of one train of control room emergency lighting circuits, some general plant essential

lighting, and the loss of plant fire detection and alarm panels. The fire in the safe shutdown equipment room affected equipment that supported post-fire safe shutdown capability in event of a control room fire. Investigation of the fire resulted in the discovery that the same design error had been made on all three units at Palo Verde. The Palo Verde incident involved elements of lack of redundancy and diversity.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1996, April 15

PICKERING, TORONTO, CANADA

Pickering reactor 4 had a heavy water leak from a heat exchanger that resulted in the release of 50 TBq of tritium into Lake Ontario. The level of tritium in local drinking water peaked at about 100 times the usual level.

Canadian Coalition for Nuclear Responsibility www.ccnr.org/nucaware_hydroletter.html

1996, April 23

NEAR CHERNOBYL, UKRAINE

A brush fire that engulfed five deserted villages near the Chernobyl nuclear plant was extinguished, but not before it spread leftover radioactive particles from the 1986 accident into the air. The blaze, about 10 kms north-west of the power plant, was well within the 30-km exclusionary zone around the plant. The cause of the fire and the amount of radioactivity carried off in clouds of smoke were not immediately clear. There were no reported injuries. The fire burned for more than seven hours.

'Fire near Chernobyl reported out: Experts downplay danger of new radioactivity', CNN, 23/4/1996

1996, April 25

CHERNOBYL, UKRAINE

An incident at the Chernobyl nuclear power station caused a minor release of radiation. Oleg Goloskokov, a spokesman for the station, said the incident occurred when staff were changing filters used to pump air from inside the sarcophagus encasing the fourth reactor, which exploded on April 26, 1986. 'Radioactivity fell in four places in the machine room of the third reactor,' he said. 'The radiation was observed in good time and cleaned up overnight. There was no radiation of staff beyond norms but people could well have been radiated. We view this as a serious violation.' The incident rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

'Radiation release at Chernobyl before anniversary', Reuters News Service, 25/4/1996

1996, April 30

KHMELNITSKY, UKRAINE

On the evening of April 30, the radiation level inside the Ukrainian nuclear reactor at Khmelnitsky (270 kms west of Kiev) rose above normal when the cooling system malfunctioned. According to the state atomic energy committee, Goskomatom, no increase in radiation was recorded outside the reactor and none of the staff was injured. The staff used the reserve cooling system to bring the reactor's temperature back to normal, and the main system was repaired within three hours, according to Goskomatom. The accident was rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

AP press release, 1 May 1996; WISE News Communique 452, May 17, 1996

1996, July

SPAIN

Spain's nuclear sector is under close scrutiny following a series of tragedies and mishaps. It began with the deaths of two workers in an accident at the Almaraz I nuclear plant as work continued on a project to replace three defective Westinghouse steam generators. The accident coincided with an escape of water in the primary circuit at the Almaraz II plant. The reactor was shut down for several hours after the water escaped. The Nuclear Safety Council (CSN) said that three workers were contaminated. Ecologists, however, claim 10 people were contaminated. During the same weekend, the Vandellos II plant was disconnected from the grid after problems were detected in a turbine valve.

Power in Europe, 26 July 1996; WISE News Communique 457 30/8/96

1996, July 10

ZAPORIZHA, UKRAINE

A defective temperature gauge shut down a pump in a reactor undergoing maintenance at Ukraine's Zaporizha nuclear power station but there was no radiation release according to officials. A statement by Ukraine's nuclear authority said the incident rated Level 1 ('anomoly') on the International Nuclear Event Scale. It said the shutdown was caused by a defect in a temperature gauge and a reserve pump was put in place.

'Pump shuts down at Ukraine nuclear plant', Reuters News Service, 10/7/1996

1996, July 24

GILAN, IRAN

A radiographer used an iridium-192 source for checking boiler welds at a fossil fuel power plant. The source became detached from the radiography device cable and fell into a trench, unknown to the operator. The next day a worker discovered the pencil-sized source and put it in a chest pocket. He occasionally removed it and examined it over the next 90 minutes, at which time he began to experience dizziness, nausea, lethagy, and a burning feeling in the chest; he then returned the source to where he had found it. The exposed worker received a whole body dose of 4,500 mSv, requiring plastic surgery.

www.johnstonsarchive.net/nuclear/radevents/1996IRAN1.html

1996, July 25

KHMELNYTSKY, RUSSIA

An accident at the Khmelnytsky nuclear power plant on July 25 killed an employee and leaked radiation inside the station. The incident occurred as the station's only working reactor was being tested for a planned restart after it was shut down on April 20 for maintenance. The employee sustained fatal burns when a steam pipe burst during the testing. Several hours later, radioactive water leaked into a nitrogen storage area after workers failed to make a safety check. Plant managers said the radioactive contamination was limited to the interior of the plant. The incident/s were rated Level 3 ('serious incident') on the 7-point International Nuclear Event Scale.

Ecodefense (Russia), no 92, July/August 1996; WISE News Communique 457 August 30, 1996

1996, October 31

TIHANGE, BELGIUM

Explosion with subsequent fire in 'non-nuclear island' at the Tihange nuclear power plant: 4 workers injured, one of these died in hospital.

www.ecology.at/nni/index.php?p=site&s=273

1997, January

RUSSIA

Water seeped into a faulty fuel rod and reacted with uranium at a Siberian plant, forcing the closure of the nuclear reactor.

'Russia closes faulty reactor at chemical plant', Reuters News service, 18/1/1997

1997, February 2

SELLAFIELD, U.K.

The Magnox reprocessing plant was shut down in December 1996 for routine maintenance. While a piece of equipment was being moved into a shielded container, it came into contact with a girder, disturbing dust and causing air radioactivity levels to rise. This triggered a building evacuation alarm. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Health and Safety Executive − statement of nuclear incidents at nuclear installations, UK Government Press Release, 30/6/1997

1997, February 4

SELLAFIELD, U.K.

Radioactivity was detected in the surface water drainage system. The source was found to be a leak in the roof of a radioactive liquid storage facility. There were no significant effects for the workforce. It was classified as a Level 2 incident on the 7-point International Nuclear Event Scale.

Health and Safety Executive - statement of nuclear incidents at nuclear installations, UK Government Press Release, 30/6/1997

1997, March

LA HAGUE, FRANCE

In March 1997, Greenpeace and the independent CRII-RAD took measurements which showed that radiation from the discharge pipe at the La Hague reprocessing plant was as much as 3,900 times higher than background levels. The pipe was uncovered during an extreme low-tide. After a complaint, Cogéma closed part of the beach near the area of the pipeline.

http://www10.antenna.nl/wise/475/4713.html

www10.antenna.nl/wise/473/4685.html

1997, March 11

TOKAIMURA, JAPAN

A fire at the Tokai nuclear reprocessing plant was not extinguished properly and caused an explosion 10 hours later. Thirty-seven workers were exposed to small doses of radiation.

'Profile of Japan's troubled nuclear corporation', Reuters News Service, 26/8/1997; www.cnn.com/WORLD/9704/16/japan.nuclear

1997, April 14,

FUKUI (NEAR MONJU), JAPAN

The Fugen advanced thermal reactor leaked radioactive tritium and exposed 11 workers to radiation. The reactor was shut down.

Reuters News Service, 26/8/1997; BBC Monitoring Service, 17/4/1997

1997, May 14

HANFORD, WA, USA

A chemical explosion at the Hanford Nuclear Reservation released plutonium and other hazardous chemicals. It was followed by a breakdown in emergency response. The flawed response was detailed in a report filed by the manager of the Washington State nuclear facility. The report concludes that chaos reigned in the aftermath of the explosion and that emergency response procedures were non-existent or ignored. Workers were exposed to a toxic plume, drove themselves to the hospital four hours after the explosion and their radiological tests were not scrutinised until a month after the accident. Fluor Daniel Hanford, operator of the Hanford site, was cited for violations of the Department of Energy's nuclear safety rules and fined $140,625.

CNN, 26/7/1997, www.cnn.com/US/9707/26/hanford.nuclear/index.html

1997, May 15

NOVOSIBIRSK, USSR

Criticality process accident − Uranium oxide slurry and crust, 70% enriched uranium, in the lower regions of two parallel vessels; multiple excursions; insignificant exposures.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1997, June

ARZAMAS-16, SAROV, RUSSIA

Criticality accident in metal assembly − highly-enriched uranium (90%) metal, copper reflected, assembly; multiple excursions; one fatality. Alexander Zakharov, 42, died three days after receiving a high dose of radiation calculated at more than 600 roentgen at the Arzamas-16 nuclear research centre. Zakharov was conducting a weapons-related test involving a controlled nuclear chain reaction using small amounts of uranium when what the ministry called 'a serious breach of the rules' caused 'an irregular radiation situation involving the emission of neutron rays.' Zakharov was not wearing any protective gear.

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf; RIA-Novosti; Reuters

1997, August 20

PAKS, HUNGARY

One of four 460 MW reactors at the Paks plant, which provides 40 percent of Hungary's electricity output, automatically shut down after what operators called 'a small operational disturbance.' The reactor had shut itself off because water levels in one of the steam generators had risen too high. One of 37 protection rods used to cool the reactor did not fully enter the core. It was rated as a Level 2 incident on the 7-point International Nuclear Event Scale.

'Faulty Hungary reactor to restart early September', Reuters News Service, 28/8/1997

1997, August 27

TOKAIMURA, JAPAN

About 2,000 steel barrels leaked low-level radioactive waste at a state-run nuclear facility north of Tokyo, officials admitted Tuesday. 'We believe that the leaked material was extremely low-level in terms of radiation and not dangerous, but it was in fact radioactive,' said a spokesman for the Power Reactor and Nuclear Fuel Development Corp which operates the nuclear reprocessing plant at Tokaimura.

'Japan plant leaks radioactive waste', CNN, 26/8/97, www.cnn.com/WORLD/9708/26/japan/

1997, October

GEORGIA

Many unsecured radioactive sources have been found in the Republic of Georgia. The local authorities first requested international assistance in October 1997, when a group of border guards undergoing training at a centre in Lilo near Tbilisi, become ill and showed signs of radiation-induced skin disease. Eleven servicemen were transferred to specialised hospitals in France and Germany. The cause of the exposures was found to be several caesium-137 and cobalt-60 sources of various intensities, abandoned in military barracks. In July 1998, three more abandoned sources were found in Matkhoji, an agricultural village about 300 kms west of Tbilisi. At the same time, another military base in the city of Poti, close to the Black Sea, was found to contain two further radioactive sources. In October 1998, two powerful sources were discovered in Khaishi, western Georgia. A cobalt-60 source was found on 21 June 1999 and on 5 July 1999, two caesium-137 sources were found in the town of Rustavi, close to Tbilisi.

http://www.nuclear.com/materials_licensees/index-source_horrors.html

1998

DAVIS-BESSE, OHIO, USA

A Fujita Scale 2 tornado passed near the Davis-Besse nuclear power plant in the United States in 1998. Although the wind speed experienced at the plant site was within

the design basis, significant damage occurred to the plant electrical switchyard and to non-safety related buildings. Lightning strikes resulted in opening and closing of breakers. A total loss of off-site power occurred, and two of three emergency response communications systems were disabled. The plant computer system also failed due to loss of power. Rain entered the turbine hall owing to large holes in the turbine hall roof caused by storm damage. (Other examples of severe weather affecting nuclear plants include: two tornadoes passed near to the Calvert Cliffs nuclear power station on 28 April 2002; a tornado affected the Quad Cities site in the United States in 1996.)

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1998, January 28

SELLAFIELD, U.K.

BNFL confirmed that 13 workers were evacuated when alarms were activated after a polythene package containing a plutonium-contaminated filter was damaged. It was classified as a Level 1 incident ('anomaly') on the 7-point International Nuclear Event Scale.

A second accident occurred on January 23 when a litre of nitric acid leaked onto the floor of the operation area.

On January 15, in a breach of a specified maintenance schedule, BNFL failed to carry out tests on two emergency diesel generators at Calder Hall (at the same site). This was also classified as a Level 1 incident on the 7-point International Nuclear Event Scale.

These three incidents follow four others; a leak of sulphur-35 from a boiler tube in a heat-exchanger at Calder Hall on January 4; the accidental release of low-level liquid waste into the Irish Sea on December 23, 1997; the failure of a cross-site pneumatic pipe system on January 3 1998; and the derailment of wagons on a nuclear flask train at Harwich on January 8, 1998.

CORE Briefing 2/98, 2 February 1998; WISE News Communique 486, 6 February, 1998

1998, March 19

NSW, AUSTRALIA

A semi-trailer overturned on the Olympic Way spilling its cargo of radioactive isotopes.

AAP - 19/3/1998

1998, April 6

JAPAN

A cooling pump stopped working at a nuclear reactor at the world's largest nuclear power plant about 220 kms north-west of Tokyo. The reactor was shut down. The Tokyo Electric Power Co. reported no radiation leak.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=1998

1998, May

KOZLODUY, BULGARIA

At Unit 1 of the Kozloduy nuclear power plant, during an outage in May 1998, a spill of chemical cleaning fluid resulted in the contamination of the water tank used for three emergency core cooling and confinement spray systems. Plant management decided – contrary to safety requirements – to drain the emergency water tank. This left the emergency core cooling system and spray system without a water supply for 24 hours, contrary to license requirements. This event was rated Level 2 on the 7-point International Nuclear Event Scale due to a serious reduction in defence-in-depth and the adverse safety culture of the plant executives and personnel. This event occurred at a reactor that does not have a containment.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1998, May 12

CIVAUX-1 REACTOR, FRANCE

The Civaux-1 pressurised water reactor was shut down for five days, when, during startup tests, a 25 cm diameter pipe of the main residual heat removal system cracked open and a large leak (30,000 litres per hour) occurred in the primary cooling circuit. The reactor core needs to be cooled permanently, even when it is shut down, in order to evacuate the significant amount of residual heat of the fuel. It took nine hours to isolate the leak and reach a stable situation. An 18 cm long crack on a weld was identified and 300 m3 of primary coolant had leaked into the reactor building. The unit had been operating for only six months at 50% power level maximum prior to the event. The operator, EDF, suggested rating this event at Level 1 on the INES scale ('anomaly'), but the safety authorities decided on Level 2 ('incident').

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html; WISE News Communique 495 7/8/98

1998, June 6

UNTERWESER, GERMANY

Problems occurred in a steam turbine at the Unterweser nuclear power plant. The incident was classed as Level 2 on the 7-point International Nuclear Event Scale due to the unavailability of a safety-related mechanism and because of a lack in the administrative regulations and in the check of the system status.

BBC Monitoring European 19/10/99; Federal Office for Radiation Protection, Germany, Compulsorily notifiable events in systems for splitting of nuclear fuels in the Federal Republic of Germany,

Annual Report, 1998

1998, June 11

BELLEVILLE-2 REACTOR, FRANCE

The containment spray system was activated when it was not supposed to, and sent borated water into the core. The activation was accompanied by an automatic order for containment isolation that stopped cooling to and operation of the main coolant pumps, thus lowering temperature and pressure of the cooling system. At the same time a control rod remained blocked at the top of the core. The design of the control rod mechanism was changed.

Nucleonics Week, 24/6/1998; WISE News Communique 495 7/8/1998

1998, July 16

SELLAFIELD, U.K.

Following an accident in the Magnox Encapsulation Plant (MEP) on July 16, British Nuclear Fuels (BNFL), Sellafield's operating utility, stopped all reprocessing operations. At 5.30am, a release of radioactivity was detected from a bin containing Magnox swarf. Swarf is the 'peeled' outer casing of Magnox fuel rods from the UK's oldest generation of commercial reactors. They are encapsulated in cement in drums at the MEP. Classified as low-level waste, the drums are currently stored on site at Sellafield. Following the radioactive leak, believed to have been caused by the over-pressuring of a swarf bin, 13 workers had to be evacuated. An unknown quantity of radioactivity escaped into the atmosphere via the building's ventilation system.

Cumbrians Opposed to a Radioactive Environment CORE Briefing 12/98; WISE News Communique 495 7/8/1998

1998, December 27

HUNTERSTON, SCOTLAND

Severe storm conditions severed the Hunterston B station's links to the grid twice within 11 hours, causing a Level 2 incident on the 7-point International Nuclear Event Scale. After the second grid loss, problems with the back-up electrical supply meant that forced cooling could not be re-established at the unit-2 advanced gas-cooled reactor. Both reactors had been in a safe shut-down condition for about 11 hours after the first grid loss but the Reactor Safety Sequence Equipment (RSSE) had not been rearmed by the time the second grid loss occurred. Resetting of the RSSE is normally associated with preparing reactor start-up, so testing of the system had not been completed. With the second loss of grid power, the restoration of cooling was dependent on operator action without any automatic sequence support. While the diesel generators allocated to unit 1 were successfully started and forced circulation established, problems were encountered with reconfiguring the diesels on unit 2. This was due to a plant fault compounded by further difficulties in completing tasks normally done by the RSSE.

'U.K.'s NII says utility needs to address lessons of station blackout', Inside N.R.C. 26/4/1999; Hermes - UK Government Press Releases 6/4/1999

1999

IKITELLI, TURKEY

Loss of a highly radioactive cobalt-60 source. Rated Level 3 ('serious incident') on the 7-point International Nuclear Event Scale.

www.iaea.org/Publications/Factsheets/English/ines.pdf

1999

YANANGO, PERU

Incident with radiography source resulting in severe radiation burns. Rated Level 3 ('serious incident') on the 7-point International Nuclear Event Scale.

www.iaea.org/Publications/Factsheets/English/ines.pdf

1999, February

SYDNEY, AUSTRALIA

Three incidents at the Lucas Heights nuclear reactor in Sydney's south were downplayed, with the Federal Government saying none posed a health risk. One incident occurred while a spent fuel element was being transferred from storage to an examination area. The other two happened during radiopharmaceutical production when gases were released at higher than routine levels.

Daily Telegraph (Australia), 25/03/1999, p.9

1999, March 11

TRICASTIN-1, FRANCE

Following a series of organisational and human errors, a technician has penetrated into a protected, highly radioactive area of the reactor (red zone) and has received a dose of about 340 mSv. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1999, March 26

MADRAS, KALPAKKAM, INDIA

A team of nuclear engineers were testing a special device designed to inspect the reactor's coolant tubes, which had been routinely plagued by cracks and vibration problems. On that day, Channel K-05 had been defuelled to enable the inspection. But as an extension tube was being fitted, the plug slipped away and six tonnes of heavy water leaked out. This exposed 50 workers to doses of radiation.

Rethinaraj, T S Gopi, 'In the comfort of secrecy', Bulletin of Atomic Scientists, Nov/Dec 1999, v55, no6, pp 52-57

1999, April 11

SELLAFIELD, U.K.

A routine survey at the plant found a spillage of particulate contamination in an area near the master slave manipulator port. There were no significant doses to personnel and no indication that the contamination had escaped from the controlled area. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

HERMES - UK Government Press Releases 9/7/1999; Health and Safety Executive - statement of nuclear incidents at nuclear installations; Reuters 9/7/1999

1999, June 10

TRICASTIN, THEN ALL 58 EDF UNITS, FRANCE

Polyamide cages, non-qualified for accidental situations, instead of metal cages have been built onto ball bearings of coolant safety injection pumps. First identified at the Tricastin site, the problem turned out to be spread over all of EDF's nuclear power plants. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

1999, June 14

TOMSK, RUSSIA

Two workers were exposed to high doses of radiation at the Siberian Chemical Combine reactor no. 4 in Tomsk. The workers were meant to load a fuel element inside the reactor core, but miscalculated and opened the lid of a channel with fuel inside, resulting in radioactive gases escaping. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

WISE News Communique 515 13/8/1999

1999, July 12

TSURUGA REACTOR, JAPAN

A coolant water leakage occurred at the second unit of the Tsuruga nuclear power plant. Primary coolant water leaked (50 tonnes), due to a crack in a pipe used to remove impurities from the coolant water. Radiation levels 11,500 times the limit were measured inside the reactor building. The crack was a result of metal fatigue.

WISE News Communique 515 13/8/1999

1999, July 15

WASHINGTON, USA

President Clinton announces that contract workers at U.S. nuclear weapons facilities, exposed to toxic and radioactive substances during the previous 50 years, can seek federal compensation for related illnesses.

http://www.lutins.org/nukes.html

1999, July 20

LINGEN (NORTH), GERMANY

At the Lingen (North) nuclear reprocessing plant, 2 kgs of radioactive material fell from a 170 kg container with a badly sealed cover, resulting in elevated radiation levels in the room.

Europe Energy, 29/10/1999

1999, August

USA

Safety has been compromised at nuclear reactors throughout the US, with more than 90 percent of the country's reactors run in violation of government safety regulations over the last three years. The study by Public Citizen found that between October 1996 and May 1999, 102 of the country's 111 reactors were operated outside the safety parameters established in their licenses.

'US: regulations violated in 90% of N-reactors', Press Release CMEP, 10/8/1999; WISE News Communique 516 27/8/99 www10.antenna.nl/wise/516/5072.html

1999, August 8

KENTUCKY, USA

The Washington Post reported that thousands of workers were unwittingly exposed to plutonium and other highly radioactive metals over a 23-year period beginning in the

mid-1950s at the Paducah Gaseous Diffusion Plant in Kentucky. In addition, a nearby field was contaminated with radioactive material from the plant including uranium and technetium. The finding corroborates charges made in a lawsuit filed in June by workers at the plant that wastes had routinely been dumped illegally outside the premises.

http://www.lutins.org/nukes.html

1999, September 30

TOKAIMURA, JAPAN

This accident occurred as poorly-trained workers prepared uranium fuel for an experimental fast breeder reactor in a tank at JCO's Fuel Fabrication Plant. The tank was not designed to dissolve this type of solution and was not configured to prevent a run-away atomic chain reaction (a criticality accident).

When a critical mass of enriched uranium was poured into the tank, unexpected and uncontrolled criticality began and continued intermittently for 20 hours. Local residents were evacuated and others within a 10 km radius were advised to stay indoors.

The incident was rated Level 4 ('Accident with local consequences') on the 7-point International Nuclear Event Scale. Two workers died and another was hospitalised for three months. A total of 667 JCO workers, emergency workers and nearby residents received smaller radiation doses.

Ibaraki Prefecture announced that direct damages from this accident have reached a total of 15.3 billion yen (US$125 million) for 7,000 cases. Direct damages include, for example, compensation for the forced closure of businesses, and suspension of agricultural activities and fisheries. In addition there are indirect costs such as the effect of the accident on real estate prices.

Countless subsequent accidents, incidents and scandals would have been averted had the lessons of the Tokaimura accident been properly learnt and acted upon. In 2002 and again in 2007, details of several hundreds safety breaches and data falsification incidents were revealed, stretching back to the 1980s. Yet the underlying problems had not been addressed by the time of the March 2011 Fukushima disaster. Those recurring problems include cost-cutting and time-saving at the expense of safety; data falsification and concealment of accidents (including the concealment of a criticality accident); inadequate regulation; and the failure to learn from previous accidents including criticality accidents very similar to the 1999 Tokaimura accident.

http://cnic.jp/english/topics/safety/JCO/index.html

WISE www.antenna.nl/wise/uranium//eftokc.html

www.johnstonsarchive.net/nuclear/radevents/1999JAP1.html

http://en.wikipedia.org/wiki/Tokaimura_nuclear_accident

International Atomic Energy Agency: 'Report on the preliminary fact finding mission following the accident at the nuclear fuel processing facility in Tokaimura, Japan', 1999 www-pub.iaea.org/MTCD/publications/PDF/TOAC_web.pdf

www.mun.ca/biology/scarr/4241_Tokaimura_Accident.html

Monahan S., et al., 2000, 'A review of criticality accidents', LANL, www.orau.org/ptp/Library/accidents/la-13638.pdf

1999, October 4

WOLSUNG REACTOR, KYONGSANG PROVINCE, KOREA

Radioactive water leaked at a nuclear power plant in Wolsung on the south-east coast. The 45 litres of heavy water, which leaked from a valve on the reactor's moderator, were recovered just hours after the accident. Twenty-two workers at the plant were exposed to low levels of radiation.

The Korea Times 20/10/1999; CNN, 5/10/99, cnn.com/ASIANOW/east/9910/05/korea.nuclear.01/index.html

1999, October 9

EASTERN FRANCE

On October 9 a truck loaded with 900 smoke detectors, containing americium-241 and flammable materials, caught fire on a highway in eastern France. Total radioactivity of the smoke detectors was 4 MBq. About 40 people (police, firemen, and highway service personnel) were identified as potentially contaminated. The truck was not marked with the standard radioactivity sign.

'France wants ban on radioactive smoke detectors after truck fire', Nucleonics Week, 28/10/1999

www.antenna.nl/wise/521/5116.html

1999, December 1

CHERNOBYL, UKRAINE

The newly re-opened third reactor at Chernobyl has been shut down because of a malfunction in its emergency cooling system, a plant spokesman said. 'A leak was detected Wednesday night in the pipes transporting radioactive water and used to cool down the third reactor.' He added that no increase in radioactivity was recorded. Reactor number three, which is the only one in operation at the plant, was reopened on November 26 after five months of work.

'Chernobyl nuclear reactor closed after radioactive leak', The Age, 3/12/1999

1999, December 27

BLAYAIS, FRANCE

The Blayais nuclear power plant site was flooded after heavy storms resulting in certain key safety equipments of the plant being under over 100,000 m3 of water, for example safety injection pumps and the containment spray systems of units 1 and 2. The electrical system was also affected. Power supply was interrupted. Flying objects and debris rendered any intervention dangerous. All four units on the site were shut down. For the first time,

the 2000s

the national level of the internal emergency plan (PUI) was triggered. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2000, January 29

USA

A preliminary study by the White House and Department of Energy cites higher-than-normal incidences of cancer among 600,000 workers at 14 nuclear weapons plants.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000

2000, February

BANGKOK, THAILAND

A scrap dealer stole a case containing three metal tubes from a warehouse and sold them to a metal recycling yard in an industrial area of Bangkok. However the tubes contained cobalt-60. The yard workers began cutting up the tubes and fell ill. Radiation sickness was first diagnosed on February 17. Officials were notified the next day and Environment Department workers, wearing only white gloves, linen face masks and no other protective clothing, searched the yard. One official admitted that the country wasn't prepared for a radiation emergency: 'We don't have a single piece of rescue equipment or protective clothing.'

Further, once the tubes' ownership was identified, it was clear that the company had not reported the theft or that it was storing cobalt-60 in its warehouse. The cobalt-60 was imported for use in cancer treatment. The company was supposed to recover cobalt-60 and other sealed source radiation waste and return it from the country of origin. This rarely happened due to cost factors. The Science Minister has ordered three inquiries − to find a new storage site, re-examine the Act governing radioactive waste and a report into the office's structure and management.

Weekend Australian 26-27/2/2000, p 13

2000, February 15

INDIAN POINT, NEW YORK

The Indian Point nuclear power plant's reactor 2 in Buchanan, New York, vents a small amount of radioactive steam when a steam generator tube fails. No detectable radioactivity was observed offsite. Con Edison is censured by the Nuclear Regulatory Commission for not following the procedures for timely notification of government agencies. Subsequently, Con Edison is required by the NRC to replace all four steam generators.

www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/2000/in00009.html

2000, March 16

LOS ALAMOS, NEW MEXICO, USA

Eight workers at the Processing and Handling Facility at Los Alamos National Laboratory were exposed to plutonium-238. A worker was performing a maintenance evaluation of a glovebox when air monitors indicated the presence of radioactive material.

'Accident at Los Alamos Exposes Workers to plutonium', Environment News Service, 20/3/2000

2000, April 5

CENTRAL ASIA

Nearly a tonne of radioactive material hidden in 10 lead boxes is recovered from a truckload of scrap metal bound for Pakistan via Iran on a trip that began in Kazakhstan. The seized material is emitting about 1,200 milliroentgen per hour.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000

2000, April 26

CHERNOBYL

UN Secretary-General Kofi Annan, in a new UN report on the continuing effects of the Chernobyl nuclear disaster in 1986, states that 'Chernobyl is a word we would all like to erase from our memory. More than seven million of our fellow human beings do not have the luxury of forgetting. They are still suffering, everyday, as a result of what happened. Not until 2016, at the earliest, will be known the full number of those likely to develop serious medical conditions.'

The Ukraine Minister of Health Olha Bobyleva said that consumption of radioactive food produced in the northern and central Ukraine regions of Kiev, Chernihiv, Zhytomyr, Cherkassy and Rivne pose continuous public health dangers.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000

2000, May

LOS ALAMOS, USA

Wildfires enter the Los Alamos National Laboratory (LANL) compound, a 110 sq km U.S. nuclear weapons facility in New Mexico. The fire was deliberately set by forest rangers to clear dry brush in the Bandalier National Forest surrounding the lab. An LANL spokesperson said most of the three tonnes of plutonium on the lab grounds were stored in stainless steel cans in fireproof concrete bunkers and that the fire came within thirty yards of that storage facility.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000

2000, June 28

CAIRO, EGYPT

An army unit removed a 6 cm long radioactive cobalt rod from the home of a farmer's family. The family found the rod in sand they were going to use for construction and kept it for a year in their home. Two people died and five were seriously ill from radiation poisoning. The source of the rod was not known.

Environment News Service, 28/6/2000

2000, July

FARLEY, USA

During an 'Operational Safeguards Response Evaluation' – a war-game-type exercise to evaluate whether nuclear power plant security forces could effectively defend against an adversary team – the security force at Farley could not prevent the mock adversary team from simulating the destruction of entire target sets in two out of four exercises (and therefore simulating a core meltdown); and simulating the destruction of 'significant plant equipment' in a third exercise.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2000, August 7

USA

The National Academy of Sciences released a report entitled 'Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites', commissioned by the Department of Energy. The report states that most of the sites where the U.S. federal government built nuclear bombs will never be cleaned up enough to allow public access to the land. The report also notes that the plan for guarding sites that are permanently contaminated is inadequate. It further states that the government can try to declare certain areas permanently off-limits, but it does not have the technology, money and management techniques to prevent the contamination from spreading.

www.nap.edu/catalog.php?record_id=9949

2000, August 12

BARENTS SEA

The Russian submarine Kursk sinks in the Barents Sea after an apparent internal torpedo accident, killing 118. Russia eventually recovers the submarine's nuclear reactor and states that the submarine had carried no nuclear weapons. Greenpeace states there are now 10 nuclear reactors and over 50 nuclear warheads on the floors of the world's oceans. The remains of the Kursk were recovered in 2001.

2000, August 18

LOVIISA PLANT, FINLAND

Ten cubic metres of radioactive water leaked into the steam generator room at Finland's Loviisa plant, the second leak in two days during annual maintenance at unit 1. A day earlier, 20 cubic metres of radioactive water leaked into the lower part of Loviisa-1's reactor building while a pump was being tested during annual maintenance. Plant management said there was no injury to personnel and no outside release.

'Finland's Loviisa plant records second water leak', Nuclear News Flashes, www.platts.com

2000, October 21

USA

The U.S. Department of Energy (DoE) reported that the amount of plutonium and other man-made radioactive elements released into the soil or buried in unsafe containers during the first four decades of nuclear weapons production is 10 times larger than it had estimated. Since 1987, the DoE has stated that more than 97 percent of radioactive waste was locked up in 'retrievable' storage and would be deposited into a deep burial repository. They also claimed that only three percent was poured into the dirt or buried. Using a standard measure of radioactivity, DoE officials now say there is 10 times the amount of those wastes in the soil, leaving underground water supplies extremely vulnerable.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000

2000, November 27

CHERNOBYL

Power line failures force the last operating reactor at Chernobyl to be shut down. The reactor was due to be shut down permanently on 15 December and Energy Sector officials state that there would be no point in turning it back on before that date.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000

2000, December

FRANCE

According to the Radiological Protection Institute of Ireland, watches sold in France at the Carrefour store chain under the brand name 'Trophy' were found to be contaminated with cobalt-60. Tests carried out by French officials on over 3,000 watches found that almost 50% of them had radioactive adjustment hinges. An investigation has been initiated at the point of manufacture in Hong Kong by the Chinese government to ascertain the contamination source.

www.rpii.ie

2001, March 1

MURUROA ATTOL, PACIFIC

The New Zealand Herald reports that the French Atomic Energy Commission (CEA) admits that the rock of Mururoa Atoll is threatened with collapse because of sustained nuclear testing. Between 1966 and 1996, France exploded 178 nuclear bombs on Mururoa and Fangataufa Atolls. Of these, 137 were below ground explosions and 41 were atmospheric.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, March 18

MAANSHAN, TAIWAN

The pressurised water reactor was affected by a total loss of external and internal power supply after a tropical storm. Salt deposit on insulators caused instability of the high voltage grid. A short circuit in a power switch of the emergency power line occurred and caused a cable fire. A breaker and switchgear were destroyed by the fire and the diesel generators could not be started up manually because of heavy smoke. It took about two hours to restore power supply.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2001, April 2

DAMPIERRE-4, FRANCE

Following human and organisational errors, the correct core loading scheme was not implemented. The situation could have led to a criticality risk. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2001, April 17

NORWAY

The Norwegian Radiation Protection Authority (NRPA) reveals that radioactive waste from a nuclear research plant in Norway has been wrongly fed into a town's sewage system for nine years. As a result, some of the radioactive waste has ended up as farm fertiliser. The NRPA states that waste water was incorrectly linked in 1991 to a sewage system in Halden when it should have been pumped directly into the sea. The mistake was not rectified until 1999.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, May

RUSSIA

Three radioisotope power sources (Radioisotope Thermoelectric Generators, RTGs) were stolen from lighthouses of Russia's Defence Ministry on an island in the White Sea, in the area of the Kandalaksha nature reserve in the Murmansk region. Two looters received severe doses of radiation. The 'hot' RTGs were recovered.

www.bellona.no/en/international/russia/navy/northern_fleet/incidents/37598.html

2001, May

FUKUI, JAPAN

Local officials revealed that a nuclear reactor at the Nuclear Cycle Development Institute in Fukui (300 kms north-west of Tokyo) has leaked radioactive tritium since January. The facility has been in operation since 1979 and is used to develop new fuel and research plutonium usage. A Fukui prefectural government official stated that 'A small leak [of] tritium is natural. But this leak was slightly over the normal amount.' The reason for the leak is unknown. Operation at the facility has been temporarily halted to conduct inspections.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, May 12

U.K. AND AUSTRALIA

The UK Ministry of Defense admits that it deliberately exposed British, Australian and New Zealand servicemen to radiation in tests during the 1950s and 1960s. A spokesperson for the Ministry denies that the soldiers were used as guinea pigs, stating that each man gave his consent to participate. According to the Ministry of Defense, officers were ordered to walk, run and crawl through contaminated nuclear test sites at Monte Bello Island and Maralinga to determine what types of clothing would give best protection against radioactive contamination.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, May 28

MARALINGA, AUSTRALIA

Although previously thought to be used for the first time during the Gulf War, the Australian government confirms that more than eight tonnes of depleted uranium was blasted into the air during nuclear tests at Maralinga in the 1950's. The government is preparing a study of those who may have been affected, including soldiers and Aboriginal and civilian populations in the area at the time of testing. The findings of the study will determine eligibility for

compensation under military or safety stipulations. An Australian Royal Commission first discovered the use of depleted uranium in atomic tests at Maralinga but the government failed to take any action at the time.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, June 22

RUSSIA

The Russian Foreign Ministry reports an explosion on 21 June caused four deaths and three injuries. The explosion occurred in the calcium reprocessing area of the Tchepetski factory in Glazov, Russia. The factory specialises in manufacturing zirconium alloys and enriched uranium.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

http://www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2000%20%20

2001, July

CHAPELCROSS, ANNAN, SCOTLAND

During routine defuelling activities on Reactor 3, a basket containing 24 irradiated Magnox fuel elements fell about one metre within the discharge machine onto the door at the top of the fuel discharge well. Remote TV camera inspections revealed that twelve of the elements had fallen about 25 m down the discharge well into a water filled transport flask at the bottom.

http://en.wikipedia.org/wiki/Chapelcross_nuclear_power_station

2001, July 11

ROCKY FLATS, USA

Edward McCallum, the former Chief Security Officer at the Rocky Flats nuclear weapons plant, testified to a U.S. federal judge that the plant had serious security problems five years ago and the government barred investigators from looking into complaints for a month. McCallum, now an anti-terrorism official in the Defense Department, said that plant workers who complained about security problems faced retaliation from the federal government if they exposed security risks.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, August 12

PHILIPPSBURG, GERMANY

A deviation from the specified boron concentration − a neutron absorber needed to slow down or stop the nuclear reaction − in several flooding storage tanks during the restart of the plant was reported to the authorities. In addition, the liquid level had not reached the required value fixed in the operational instructions for the start-up and was only implemented with a delay. The emergency core cooling system will only work effectively if it is operated according to the design basis conditions. Subsequent investigations revealed that significant deviations from start-up requirements and violations from related instructions seemed to be common, probably for several years, and took place in other German nuclear plants.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2001, August 23

VERMONT YANKEE, USA

The 23 August 2001 'Operational Safeguards Response Evaluation' (OSRE) – a war-game-type exercise to evaluate whether nuclear power plant security forces could effectively defend against an adversary team – at Vermont Yankee nuclear power plant was the last one conducted by the Nuclear Regulatory Commission before the program was terminated after the 11 September 2001 attacks. Of the 11 OSREs preceding the 11 September 2001 attacks, this was the worst, the only one assigned a 'yellow' finding by NRC, indicating the failure had 'substantial safety significance' and resulted from a 'broad programmatic problem.' However, because the inspection report was not filed before the NRC revamped its policy on release of security information after 11 September 2001, specific details about what warranted such a harsh finding never became publicly available.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2001, August 27

U.K.

The U.K. Ministry of Defence (MoD) admits for the first time some details of seven politically sensitive accidents involving British nuclear weapons. However, the MoD admits that it is only releasing partial information. According to the MoD, a full description of these incidents cannot be released to protect the 'operational security' of the weapons. The MoD insists that the accidents did not endanger public safety since none of the weapons were damaged or leaked radioactive material.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, September 17

VIENNA, AUSTRIA

In the aftermath of the September 11 attacks in the U.S., delegates from 132 nations attending an annual International Atomic Energy Agency (IAEA) conference in Vienna, Austria call for tightened security. They also note the need to make sure nuclear materials are kept out of the hands of terrorists. Most nuclear power plants were built during the 1960s and 1970s and were designed to withstand only accidental impacts from smaller aircraft widely used at the time. A US official states that a direct hit of a nuclear plant by a modern-day jumbo jet travelling at high speed 'could result in a Chernobyl situation.' According to the IAEA, if an airliner hit a nuclear power plant, the reactor would not explode, but the strike could destroy the plant's cooling systems and potentially generate a steam explosion that would release radioactivity into the atmosphere.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, September 21

SELLAFIELD, U.K.

Both nuclear fuel reprocessing plants at Sellafield in Cumbria are shut down due to high-level nuclear waste reaching unacceptable levels. The UK Nuclear Installations Inspectorate, a government regulator, has been critical of British Nuclear Fuels Limited for failure to deal with heat-producing waste, the most dangerous material stored at the plant. Despite attempts to reduce the amount of liquid waste, the plant has broken down repeatedly and been out of operation for most of this year.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, October 4

USA

David Lappa, a former nuclear engineer at Lawrence Livermore National Laboratory (LLNL), who was harassed for refusing to cover up nuclear safety violations, settles his whistleblower lawsuit against the lab for $250,000. Lappa worked at LLNL for 20 years and continued to raise safety concerns to his managers and federal authorities about serious and repeated violations of plutonium safe-handling requirements at the facilities. Lappa claimed that he was forced to resign after harassment became intolerable.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, November 7

HAMAOKA, JAPAN

On 7 November 2001, a valve in Unit 1 ruptured during a periodical manual start-up test. Since this is considered a part of the emergency core cooling system, the failure into question the reliability of the emergency safety system.

On 9 November 2001 there was a coolant leak accident in Unit 1.

In 2002, an independent inspection found that 16 unique signs of cracks in steam pipes were known by the utility (Chubu Electric Power Company) but were not reported to authorities.

On 24 May 2002, there was a water leak in Unit 2 resulting in the irradiation of 16 workers.

On 21 February 2004, there was a fire in a room above turbine room in Unit 2.

In August 2004, it emerged that the utility had fabricated data regarding Unit 4.

On 4 November 2005, there was a pipe leak incident in Unit 1.

On 16 November 2005, there was an outside pipe leak due to corrosion in Unit 3.

On 16 November 2005, foreign matter was found in the spent fuel pool in Unit 1.

In June 2006, damage to turbine blades was detected in Unit 5.

On 15 June 2006, Unit 5 was shut down due to excessive turbine vibrations − a number of turbine vanes had completely broken off.

In March 2007 the utility admitted to 14 cases of unfair business practices.

On 11 August 2009, Units 4 and 5 (the only ones operating) automatically shut down due to an earthquake.

On 6 May 2011, in the wake of the Fukushima disaster, Prime Minister Naoto Kan ordered Units 4 and 5 to be shut down and Unit 3 not to be restarted.

On 15 May 2011, 400 tons of seawater were found to have leaked into the Unit 5 turbine steam condenser.

On 20 May 2011, damaged pipes were located in the Unit 5 condenser and the operator estimated that about five tons of seawater may have entered the reactor itself.

cnic.jp/english/newsletter/pdffiles/nit88.pdf

http://en.wikipedia.org/wiki/Hamaoka_Nuclear_Power_Plant

WISE/NIRS Nuclear Monitor #569

2001, October 24

RUSSIA

Charles Curtis, former Deputy Energy Secretary in the Clinton administration and President of the Nuclear Threat Initiative states that missing Russian suitcase bombs are still a concern. He states, 'We believe we have a full accounting of all of Russia's strategic weapons, but when it comes to tactical weapons − the suitcase variety − we do not know, and I'm not sure they do, either.' In May 1997, then Russian Security Council Secretary Aleksandr Lebed revealed to US Congressmen visiting Moscow that Russia once had between 80 and 100 suitcase-size, one kiloton atomic demolition weapons. He said that the KGB ordered the weapons to be built in the 1970s, and he also told the Congressmen that the weapons were missing. The Russian government at first denied the existence of such weapons, later saying that if the weapons were built, they were accounted for.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, December 12

ROMANIA

The Romanian National Commission for the Control of Nuclear Activities (CNCAN) reported that nine workers were exposed to serious levels of radiation while dismantling a smelting plant in western Romania last June. The men have been hospitalised since June, but the incident was kept secret while police conducted an investigation. CNCAN Director Anton Coroianu stated, 'They wore no protective clothes. They got a huge dose of radiation from cobalt-60, which could have killed them at once.' Cobalt-60 is a man-made radioactive isotope which serves many medical and industrial uses. An 1,100-square-foot area around the furnaces has been sealed off to everyone except authorised personnel, including investigators, who must wear protective clothing before entering the site.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, December 14

BRUNSBÜTTEL, GERMANY

A hydrogen explosion caused a high degree of damage to the spray system piping of the boiling water reactor. Some parts of the 5.6 mm diameter pipes were ruptured. An approximately 2.7 m long piping section had burst and was completely destroyed. Some sections of the piping were missing. Prior to this event the possibility of severe explosions caused by radiolysis gas during normal operation was nearly excluded.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2002, January 5

TBLISI, GEORGIA

Experts from International Atomic Energy Agency (IAEA) arrived in Tbilisi, Georgia to visit a site where three lumberjacks found two containers of highly radioactive strontium-90 near the village of Dzhvare in December 2001. The radioactive containers are believed to have been used in signal beacons during the construction of a nearby hydroelectric plant 30 years ago. The IAEA will assemble a special task force to remove the containers. The lumberjacks who found the containers have been hospitalised.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, January 15

CONNECTICUT, USA

Inspectors from the US Nuclear Regulatory Commission announce that two radioactive fuel rods that have been missing for 20 years from the Millstone Nuclear Complex located in Waterford, Connecticut, were likely mistaken for other radioactive waste and disposed of. The investigation regarding the missing fuel rods began in December 2000 after Northeast Utilities (NU), the owner of plant until last year, conducted an inventory of the plant's spent nuclear fuel. Neither NU or the plant's current owners, Dominion Inc., could determine conclusively where the rods were.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, January 18

DIMONA, ISRAEL

Israel's commercial television station, Channel 2, broadcasts a special report exposing the dangers of the Dimona nuclear weapons production reactor. The report is the first time Israeli mass media has presented first-hand testimonies of former reactor workers to the public. The testimonies reveal the dangers posed by the nuclear weapons factory to workers as well as to the environment.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, January 21

FLAMANVILLE-2, FRANCE

The installation of inappropriate condensers due to an inappropriate procedure led to the simultaneous loss of several control-command boards and systems while the unit was operating as well as to the destruction of two safety significant pumps during the shut down sequence. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2002, February 27

FRANCE

France's Independent Commission on Research and Information on Radioactivity (CRIIRAD) files a civil suit against President Jacques Chirac's government on the grounds that the government covered up risks to public health after the 1986 Chernobyl disaster. According to the CRIIRAD, the French government was aware that the radioactive fallout from the explosion at the Chernobyl nuclear power plant posed risks to public health, but deliberately failed to warn the public.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, March

DAVIS-BESSE, OHIO, USA

Workers at the Davis-Besse nuclear plant in Ohio were replacing a cracked Control Rod Drive Mechanism nozzle when they discovered a pineapple-sized hole that had completely eaten through the 15 cm steel outer shell of the reactor vessel head. This only left a 5 mm stainless steel liner to hold back 87,000 gallons (330,000 litres) of water at a pressure of 2000 psi (14 MPa). Later investigation of the stainless steel liner found the beginnings of a crack. A government study estimated that the hole would have widened to the point where the liner ruptured in another 2−11 months of operation. Because Davis-Besse ran 18 months between refueling outages, had the damage been missed during the 2002 outage, it seems likely that a loss of coolant accident would have occurred. Had the 5mm stainless steel liner ruptured, a hole with a diameter of approximately 250 mm would have created a medium-sized loss of coolant accident. While Davis-Besse was equipped with emergency systems to mitigate such an accident, these backup systems were also found to be impaired (the worst problem involved the containment sump used during the second phase of accident mitigation).

The damage occurred over a period of nearly six years due to a cracked nozzle leaking borated water onto the reactor head. The Nuclear Regulatory Commission calculated the severe core damage risk from this event to be 0.6% per reactor-year and rated it Level 3 ('serious incident') on the 7-point International Nuclear Event Scale. On April 22, 2005 the NRC proposed a $5.4 million fine against FirstEnergy, the plant owner. System engineer Andrew Siemaszko was also banned from working in the industry for five years due to his falsification of reactor vessel cleaning logs in May 2000.

The incident was a result of inappropriate design of the reactor head penetration sealing, a prolonged institutional failure to conduct proper surveillance, combined with a lack of management procedures mandating further investigation of the root cause, such as determining the reasons for the discovery of carbon steel corrosion products trapped in the main containment air sampler filters

www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/vessel-head-degradation-files/pr-02-036.pdf

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2002, March 5

MISSISSIPPI, USA

During an extended power test uprate designed to extend the power of ageing boiling water reactors (BWR), the Quad City nuclear power plant unit 2 began vibrating. On March 29 the plant was manually shut down due to high vibrations causing leaks in the main turbine control system. Unit 2 had a restart on April 2, but vibrations broke a main steam pipe drain line. The line was repaired and the restart resumed, but by June 7 the main steam lines were showing unexplained aberrations. On June 18 it became obvious that the power uprate was causing damage, so the power was reduced but the damage had been done. Once again the plant was taken offline for repairs on July 11. The problem was traced to a hole in the steam dryer. It was repaired and restarted on July 21, 2002. The steam dryer failed yet again on May 28, 2003 with a 6 mm by 2.7m crack. This failure rate has not deterred the NRC from continuing the power uprate program and offering these extended uprates to other ageing BWRs.

2002, March 7

HANFORD, USA

The Bush administration agrees to restore $300 million in the 2003 budget that was cut from a Department of Energy (DoE) program to clean-up waste at the most contaminated nuclear site in the US. Under a new agreement, the Hanford nuclear production site in Washington State will undergo an accelerated clean-up. Hanford is a 1450 sq km site where plutonium was made for more than 40 years for the nation's nuclear arsenal. The new target date for clean-up, originally set for 2070, is now 2025. The administration also agrees to spend an additional $150 million next year, bringing Hanford's total 2003 budget to some $2 billion. The new agreement between the DoE, Washington State and federal regulators calls for speeding up retrieval of more than 53 million gallons of highly radioactive waste stored in 177 underground tanks near the Columbia River. The tanks have leaked more than one million gallons into the soil and groundwater. The agreement will also accelerate clean-up of basins where lethal, corroding spent nuclear fuel rods are stored and speed up the processing of scrap plutonium.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 5

OHIO, USA

The U.S. Nuclear Regulatory Commission releases a report stating that an acid leak that ate through a steel cap over a reactor at the Davis-Besse nuclear plant in Ohio should have been spotted as long as four years ago. The problem was not discovered until the plant was shut down for refuelling in February 2002. According to the NRC, it is the most extensive corrosion ever found on top of a U.S. nuclear reactor. The damage will keep the plant shut until at least June. The NRC ordered operators of all 69 pressurised water reactors in the U.S. to submit information on the structural integrity of their plant's reactor heads.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 7

ALABAMA, USA

The Tennessee Valley Authority issued a report stating that an electrician's mistake caused an accident on 26 March at the Browns Ferry nuclear power plant that seriously burned four workers. The TVA and state emergency management officials state that there was no danger of a release of radioactivity from the plant.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 9

FUGEN, JAPAN

The Fugen 165,000 MW nuclear reactor in western Japan was shut down due to a leakage of radioactive steam.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 10

ROSTOV, RUSSIA

Russia's newest nuclear reactor at the Rostov Nuclear Power Plant in the southern part of the country shut down automatically after a malfunction occurred in a steam valve. It was the reactor's second shutdown since it went online in 2001. It is the only new nuclear reactor that has been opened in Russia since the 1986 explosion at Chernobyl.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, June 16

U.K.

The UK Office of Civil Nuclear Security (OCNS) released a report which states that standard security checks have not been carried out at several nuclear power facilities in the U.K. because of staff shortages. According to OCNS, some inspections were suspended after staff were diverted from routine work in the aftermath of the September 11 terrorist attacks in the U.S. The report also said that OCNS has lost experienced security staff to the private sector and the organisation is finding it difficult to recruit replacements.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, June 18

USA

The 9th U.S. Circuit Court of Appeals revives two lawsuits filed by thousands who claimed they were sickened by radiation releases from the Hanford nuclear weapons complex. It orders a federal trial court in Washington State to reconsider the claims that were dismissed, in part, in 1998.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, July 4

JAPAN/U.K.

British Nuclear Fuels ships carrying 255 kgs (560 pounds) of rejected mixed oxide (MOX) fuel left Japanese ports to be returned to the fuel's maker in Great Britain. Japan's Kansai Electric Power Co. imported the fuel in 1999 for its experimental nuclear power program, but Japan later rejected the fuel when BNFL revealed that workers had falsified quality-control data. The shipments of plutonium MOX fuel, high-level nuclear waste and spent fuel between Europe and Japan sparked international concern from governments and organisations fearing leaks and accidents or terrorist attacks, and because of the proliferation risks associated with plutonium separation and transport.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, July 15

BELARUS

Throughout mid-July, dozens of wildfires burning in parts of Belarus that were most affected by the Chernobyl nuclear accident raise radiation levels in the area.

www.nuclearfiles.org/menu/timeline/2000/2002.htm

2002, August 29

17 TEPCO REACTORS, JAPAN

The Tokyo Electric Power Company (TEPCO) operates 17 boiling water reactors. On 29 August, the Japanese Nuclear Industrial Safety Agency (NISA) shocked the nation with the public revelation of a massive data falsification scandal at TEPCO. At that point 29 cases of 'malpractice' had been identified, including the falsification of the operator's self-imposed inspection records at its nuclear power plants over many years. In the follow-up, all of the 17 TEPCO units had to be shut down for inspection and repair. It was reported later that these practices had gone on for as long as 25 years and the total number of events is put at nearly 200 so far. However, revelations of cover-ups and malpractice have extended to all major nuclear operators in Japan and continue today. In April 2007, for example, Hokuriku Electric admitted to a criticality incident at its Shika-1 boiling water reactor. The event had been covered up for almost eight years.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2003

PAKS, HUNGARY

Design deficiencies of a chemical system built to clean 30 partially irradiated fuel assemblies caused insufficient cooling of all assemblies, which were heavily damaged. A subsequent IAEA investigation identified eight separate design errors. The system was developed, manufactured and delivered by AREVA NP. During the accident, radioactive releases were about four times the noble gases and almost 200 times the iodine-131 and aerosols released by all 58 French pressurised water reactors during the whole of 2003. The event was reclassified as Level 3 ('serious incident') on the International Nuclear Event Scale after an initial Level 2 rating.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2003, January 20

KOZLODUY, BULGARIA

Loss of Coolant Accident − Kozloduy unit 3 reactor protection system was automatically actuated by a low pressure in the primary system signaling a primary coolant leak. All safety injections and confinement spray pumps started as designed. The leaking part of the primary system was isolated and the leak was compensated. Soon after this the primary system pressure and the pressuriser level were restored. During the event the safety injection and confinement spray pumps were in operation for about 60 mins. The direct cause of the pipe leak was mechanical damage due to a long time vibration and friction of a pipe to a part of the structural components. Deficiencies of the surveillance program for pipes in the confinement also contributed. The damaged pipe was not included in the non-destructive testing program and surprisingly the visible mechanical damage was not discovered by visual inspections. The event was rated at Level 1 ('anomaly') on the 7-point International Nuclear Event Scale in spite of the fact that according to INES guidelines the starting assessment for events with real leakage from primary system is to be considered a Level 2 event.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2003, February

OAK RIDGE TENNESSEE Y-12 FACILITY, USA

During the final testing phase of a new saltless uranium processing method, the test experienced a small explosion followed by a fire. The explosion occurred in an unvented vessel containing unreacted calcium, water and depleted uranium. The reaction amongst these articles generated enough steam to burst the container. The explosion breached the glove box where it was stored. Air filtered into the damaged glove box igniting some loose uranium powder (uranium is pyrophoric) starting a fire that slightly contaminated three employees. A year later BWTX, a partnership of BXW Technologies and Bechtel National, was fined $82,500 for the accident.

nucnews.net/nucnews/2004nn/0406nn/040612nn.htm#010) [83]

2003, March 12

LENINGRAD NAVAL BASE, RUSSIA

Military personnel at the Leningrad Naval Base discovered a vandalised lighthouse near Kurgolovo. The Radioisotope Thermoelectric Generator (RTG) had been looted for scrap metal by thieves. The 'hot' strontium capsule melted the ice and sank to the sea floor. Although the ice covering the spot where the radioactive heat source sank was a metre thick, the gamma radiation exposure dose rate directly above the sunken unit reached over 300 mSv/h.

A similar case happened in the Leningrad region in 1999. An identical lighthouse was found completely destroyed, and its radioactive power element discarded at a bus station in the city of Kingisepp, 50 kms away from the crime scene. Three people, who the police established were the perpetrators of the 1999 episode, died from radiation poisoning.

www.bellona.no/bellona.org/english_import_area/international/russia/navy/northern_fleet/incidents/37598

2003, March 23

RANGER, NORTHERN TERRITORY, AUSTRALIA

At least 28 workers fall ill after process water pipes were accidentally connected to drinking and shower water at the Ranger Uranium Mine in Kakadu National Park. Workers were exposed to 400 times the 'legal' concentrations of uranium in the water, and suffer headaches, nausea, vomiting and skin irritations. The mine is closed for a number of weeks. The Northern Territory Minister for Mines and Energy refers the process water contamination incident to the Department of Justice for prosecution, and Rio Tinto is later fined $150,000. A report finds that 159 workers were potentially exposed to contaminated water.

www.theage.com.au/news/Business/ERA-fined-150000-over-contamination/2005/06/01/1117568249370.html

2003, April 26

CHERNOBYL, UKRAINE

Days before the 17th anniversary of the disaster at Chernobyl, a Ukrainian intelligence agency declassifies several documents that show design flaws, shoddy workmanship, and major violations of safety rules at the plant and exposing 29 accidents at the plant between

1977 and 1981. Russia responded by claiming that post-Soviet Ukraine has not properly maintained the concrete canopy covering the faulty reactor, leaving holes through which radiation could leak.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2003

2003, October

AUSTRALIA

A report by a federal Senate References and Legislation Committee found 'a pattern of under-performance and noncompliance' in the uranium mining industry. It identified many gaps in knowledge and found an absence of reliable data on which to measure the extent of contamination from the uranium mining industry, and it concluded that changes were necessary 'in order to protect the environment and its inhabitants from serious or irreversible damage'. The committee concluded 'that short-term considerations have been given greater weight than the potential for permanent damage to the environment'.

Senate References and Legislation Committee, 'Regulating the Ranger, Jabiluka, Beverley and Honeymoon uranium mines', www.aph.gov.au/senate/committee/ecita_ctte/completed_inquiries/2002-04/uranium/report/index.htm

2003, October 21

NEVADA, USA

The Nuclear Waste Technical Review Board (NWTRB) issues another warning to the US Department of Energy (DoE) cautioning officials that the Yucca Mountain project does not meet its strict quality assurance standards. The NWTRB expresses concerns over the effectiveness of the casks designated to indefinitely hold high-level nuclear waste. Specialists cite the waste package design as susceptible to corrosion and, consequently, prone to leaking waste into the aquifer that serves as the only source of drinking water for the people of Amargosa Valley.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2003

2003, December 28

SELLAFIELD, U.K.

19.1 kgs of plutonium is unaccounted for at the Sellafield nuclear plant in Cumbria, England. A spokesman for British Nuclear Fuels, the company that manages the Sellafield plant, says the figures of plutonium that were 'unaccounted for' are normal as 'it is impossible to measure absolutely exactly that amount of material going into the plant and the amount coming out because of the huge amount of material that is put through it each year.' However, Dr. Frank Barnaby, a nuclear consultant and a former director of the Stockholm International Research Institute states, 'In reprocessing, a small amount of material is bound to be lost in the process, but 19 kgs is a very significant amount of plutonium.' (In 2005 it was discovered that a leak in the THORP reprocessing plant at Sellafield was responsible for the loss of 83,000 litres of radioactive liquor containing 160 kgs of plutonium.)

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2003

2004, January 24

FESSENHEIM-1, FRANCE

Following the erroneous operation of an auxiliary circuit valve, ion exchange resins have been introduced into the primary cooling circuit. Their presence could have threatened the integrity of the primary pump joints as well as the proper functioning of the control rods. Both elements are essential to control and shut down the reactor. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2004, March 22

FRANCE − ALL 58 EDF REACTORS

An insulation default at an electrical switchboard, experienced on unit 2 of the Penly nuclear power plant, was triggered by a steam leak close to electrical equipment that was to be qualified to resist accidental conditions. The non-conformity of the cabling has been subsequently identified on all of the French nuclear power plants and led to large-scale verification and remediation operations. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2004, March 25

DEMOCRATIC REPUBLIC OF CONGO

The Democratic Republic of Congo (DRC) calls upon the international community to help control access to the Shinkolobwe mine. According to industry experts, uranium is being illegally quarried and exported without control. DRC Mining Minister Diomi Ndongala says officials from North Korea and African countries have expressed an interest in DRC uranium in recent years. The Shinkolobwe mine produced uranium for the US nuclear weapons dropped on Hiroshima and Nagasaki in Japan during World War II.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, May 14

TENNESSEE, USA

Strontium-90, considered one of the most hazardous nuclear wastes by the US Environmental Protection Agency, is spilled across about three kms of Highway 95 in Roane County, Tennessee at 11:00 am . More than five hours after the spill occurs, authorities finally close the road. Department of Energy (DoE) spokesman Steve Wyatt announces there is no danger to the public. Highway 95 remains closed until 16 May 2004, after specialists clean and re-pave sections of the road. The clean-up bill will exceed $1 million.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, June 15

USA

Assistant Secretary of Environmental Management, Jessie Roberson, resigns her post at the Department of Energy (DoE). Roberson was head of the DoE Accelerated Cleanup Program that was created in order to reduce the cost and accelerate the environmental cleanup process at US nuclear weapon sites. The DoE program has adhered to minimal environmental standards and has proposed minimising clean-up efforts in order to cut costs. Roberson is the third Senate-confirmed DoE official to resign in the last 80 days. Undersecretary Robert Card and Assistant Secretary Beverly Cook precede Roberson's resignation. All three officials were involved in environmental clean-up programs at DoE nuclear weapon sites.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, July 27

HANFORD, USA

According to a Federal audit, efforts to clean contaminated groundwater around the Hanford Nuclear Reservation in Washington State has been 'largely ineffective.' So far, the U.S. Department of Energy (DoE) has spent $85 million in an attempt to clean the groundwater, including $8 million a year on its pump-and-treat system, which pulls groundwater out of the ground, runs it through filters, and puts it back. However, the system doesn't work and, according to the audit, the DoE knows it doesn't work and yet it is doing little to find alternative methods. The report recommends that the DoE shut down current treatments, establish concrete goals and try new technologies so that polluted water stops draining into the Columbia River .

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, August 31

NEW MEXICO, USA

The New Mexico Environment Department penalised the US Department of Energy (DoE) $2.4 million for violating hazardous waste management regulations. They discovered that numerous shipments of mixed waste destined for the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico had not undergone safety inspections and testing. Officials base the $2.4 million fine on 107 drums of radioactive waste shipped between March and July 2004 that were overlooked by DoE personnel. All of the $2.4 million fine will go to the State of New Mexico Hazardous Waste Emergency Fund to pay for environmental clean-ups.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, September

RUSSIA

The effects of the 1986 Chernobyl disaster are still being felt. The incidence of thyroid cancer among people who grew up in the highly radioactive environment is 45 times greater compared to those people living in the lowest-dose group. A research team of American and Russian researchers, led by Scott Davis, Ph.D. at the Fred Hutchinson Cancer Research Center, have established this dose-response relationship between the radiation dose from Chernobyl and thyroid cancer.

www.sciencedaily.com/releases/2004/09/040902085844.htm

2004, September 10

RUSSIA

Zemlya Bunge, Novosiberian islands, Yakutia − two Radioisotope Thermoelectric Generators (RTGs) were being flown from the 'New Siberia' island lighthouse. They were suspended by cables below a helicopter so they could be taken to the Russian polar station at Bunge. The helicopter flew into heavy weather and the crew was forced to drop the two RTGs from a height of 50 metres onto the tundra at Zemlya Bunge island. According to nuclear regulators, the impact compromised the RTGs' external radiation shielding. At a height of 10 metres above the impact site, the intensity of gamma radiation was measured at 4 mSv per hour.

www.bellona.no/bellona.org/english_import_area/international/russia/navy/northern_fleet/incidents/37598

2004, September 21

USA

The state of Washington's Department of Ecology issues a $270,000 fine to the US Department of Energy (DoE) for inappropriately shipping nuclear waste from South Carolina to the Hanford complex in Washington. State officials argue that 83 storage drums containing radioactive waste were accidentally shipped from South Carolina. Additionally, the waste was accompanied by documentation that was mostly incomplete, inaccurate, or missing. The DoE has 30 days to appeal the fine.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, December 20

CZECH REPUBLIC

At the Temelin nuclear power plant in the Czech Republic, more than 5,000 gallons of radioactive water leak from the reactor. Czech officials deny that the spill poses any environmental risk or that it endangers workers' health.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, December 26

KALPAKKAM, INDIA / INDIAN OCEAN EARTHQUAKE AND TSUNAMI

The Indian Ocean tsunami on (resulting from a very large undersea earthquake off the coast of Indonesia) caused flooding at the Kalpakkam nuclear site in India. Water from the tsunami caused $3.5 million in damage at the site, and caused water level in the operating unit to rise, resulting in tripping of the reactor.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005-06

KOZLODUY, BULGARIA

Design, fabrication and delivery by Atomstroyexport, Russia to Kozloduy unit 5, Bulgaria, of a set of control rod drive mechanisms, not properly tested after implementing design changes. New control rod drive mechanisms were installed in Kozloduy unit 5 (WWER, 953 MW) in July 2005 during the annual outage. The unit restarted in the beginning of September 2005 and was operated at full power. However, on 1 March 2006 after a main coolant pump trip triggered the shut down of the reactor, it appeared that three control rods remained in the upper end position. The follow-up tests identified that 22 of a total of 61 control rods could not be moved with control rod drive mechanisms. The total number of control rods unable to scram (to drop due to gravity only) remains unknown. Presumably their number was between 22 and 55. Thus, for eight months the reactor was operated at full power with an insufficient number of operable control rods. Control rod drive mechanisms of this faulty design were also delivered and installed to Tianwan unit 1 (China) and Kalinin 3 (Russia).

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005

USA

Overexposure of a radiographer exceeding the annual limit for radiation workers. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

www.iaea.org/Publications/Factsheets/English/ines.pdf

2005

MIHAMA, JAPAN

A pipe failed due to erosion/corrosion leading to release of non-radioactive steam in the reactor number 3 building. Five workers died and six were injured. It was later revealed that the pipe wall thickness of the failed pipe had not been checked since the plant went into operation in 1976.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, January 8

USA / PACIFIC OCEAN

The U.S. nuclear-powered and nuclear-armed submarine U.S.S. San Francisco struck an uncharted undersea mountain near Guam while sailing submerged at high speed. The bow of the submarine was severely damaged. No radioactive material was released in the accident.

navysite.de/ssn/ssn711.htm

2005, January 24

MICHIGAN, USA

A leak of 18,000 to 27,000 gallons of coolant from the Fermi II nuclear power plant. The Nuclear Regulatory Commission cannot confirm whether or not the leaked water is radioactive.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, February 11

BOSTON, USA

Officials at the Nuclear Regulatory Commission announce that a Halliburton Co. shipment of radioactive material went missing in October 2004, but the company didn't alert government authorities until 8 February 2005. The material was found intact on 9 February in Boston after an intense search by federal authorities.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, February 12

WASHINGTON, USA

About 300 gallons of nitric acid leaked from a Richland, Washington low-level radioactive waste treatment plant. The liquid is slightly radioactive. The accident was reported when a yellowish-orange cloud was seen emanating from a storage shed operated by Pacific EcoSolutions, located on the southern edge of the Department of Energy's Hanford Site. Emergency responder crews and hazardous materials teams contain the spill and dispose of the leaked radioactive waste. Battelle Boulevard in north Richland is closed during the accident. Brant Baynes, Richland's Fire Chief, says local residents were lucky winds were calm because the nitric acid fumes could have posed a threat to public health.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, February 23

SOMALIA / INDIAN OCEAN TSUNAMI

The United Nations Environment Program (UNEP) releases the report, 'After the Tsunami: Rapid Environmental Assessment'. It provides a preliminary ground-level look at the December 2004 Asian tsunami's impact on various sectors of the region's environment. The report states that the tsunami has scattered Somalia's illegally dumped nuclear wastes across the country. When the tsunami hit on 26 December 2004, contamination and radioactivity was stirred up causing numerous health and environmental problems. The tsunami's power broke barrels and waste containers. Groundwater as well as fishing communities have been contaminated. Unusual health problems are arising, such as acute respiratory infections, heavy coughing and bleeding from the mouth, abdominal haemorrhages, unusual skin conditions, and sudden death after inhaling toxic materials.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, March 1

KOZLODUY-5, BULGARIA

In the process of power reduction at the Russian-designed pressurised water reactor (WWER), the operators identified that three control rod assemblies remained in the upper end position. The follow-up tests of the remaining control rod assemblies identified that 22 out of 61 could not be moved with the driving mechanisms. The exact number of control rod assemblies unable to scram (to drop due to the gravity only) remains unknown but it is thought to be between 22 and 55. The WWER-1000 scram system is designed to put the reactor in safe shutdown if one control rod assembly is jammed in the upper position. The operator had originally rated the incident a Level 0 'deviation' on the 7-point International Nuclear Event Scale but safety authorities eventually rated it a Level 2 'incident'.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, March 16

USA

US Department of Energy (DOE) Secretary Samuel Bodman announces that 'certain employees of the U.S. Geological Survey at the Department of the Interior working on the Yucca Mountain project may have falsified documentation of their work.' At question are studies of how water would infiltrate the storage areas.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, March 26

DOUNREAY, SCOTLAND

The Scottish Environment Protection Agency (SEPA) has been monitoring the sporadic discovery of radioactive spent fuel fragment contamination on public beaches in the area of the Dounreay nuclear facility. The Dounreay site is in the process of decommissioning its facilities, which contain three power reactors along with a fuel manufacturing and fuel reprocessing plant. The problem was first detected in 1984 and was seen as an isolated incident at the time, but a second particle was found in 1997 at Sandside. This prompted the formation of the Dounreay Particles Advisory Group (DPAG) to investigate the full extent of the problem.

Upon further review, likely reasons were identified. In December 2000 a particle was found buried in the soil near Dounreay castle adding an unforeseen piece to the puzzle. Early findings pointed to a transport chain based on improper drain routes allowing radioactive effluents access to 'non-active' drains running to the sea. The finding of a particle well outside the influence of the sea opens the possibility of air, humans or animals as the transport mechanism.

SEPA has required UKAEA to routinely monitor Sandside

Bay, the Dounreay Foreshore, Crosskirk, Brims Ness, Scrabster and Thurso Beaches. This program recently turned up another fuel fragment on Dunnet beach in March 2005.

SEPA now requires the UKAEA to monitor the degree of particle contamination on the seabed in an effort to understand the extent of the off-shore contamination.

2005, April 7

GRAVELINES-3, FRANCE

During the year 2006 the operator has noticed the presence of provisional pieces of equipment on both of the reactor protection control command lines. These pieces were applied during the previous reactor outage and had been left there by mistake. Under accidental conditions certain automatic sequences would not have taken place in a normal way. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, April 19

SELLAFIELD, U.K.

The hazards associated with nuclear reprocessing were highlighted in April 2005 with the revelation of an accident at the THORP reprocessing plant at Sellafield. A broken pipe led to the leaking into a containment structure of 83,000 litres of a highly radioactive liquor containing dissolved spent nuclear fuel. The leakage went undetected for at least eight months.

The accident was classified as Level 3 ('serious incident') on the 7-point International Nuclear Event Scale and British Nuclear Group Sellafield Limited was fined 500,000 pounds plus costs after pleading guilty to three serious, prolonged breaches of its licence conditions.

What is significant about the leakage is not the small environmental and health risk it posed but the fact that the liquid spill contained 160 kgs of plutonium − enough to build 15-20 nuclear weapons − yet the loss went undetected for at least eight months.

The UK Health and Safety Executive concluded: 'An underlying cause was the culture within the plant that condoned the ignoring of alarms, the non-compliance with some key operating instructions, and safety-related equipment which was not kept in effective working order for some time, so this became the norm. In addition, there appeared to be an absence of a questioning attitude, for example, even where the evidence from the accountancy data was indicating something untoward, the possibility of a leak did not appear to be considered as a credible explanation until the evidence of a leak was incontrovertible.'

There have been numerous other serious accidents and incidents at the Sellafield site (previously called Windscale) including the 1957 fire, a data falsification scandal and a serious sabotage incident in the late 1990s. Moreover the site has been a major source of radioactive emissions to the environment and has been the subject of formal complaints and opposition from European Governments.

UK Health and Safety Executive report: www.hse.gov.uk/nuclear/thorpreport.pdf

news.bbc.co.uk/2/hi/uk_news/england/cumbria/4559771.stm

news.bbc.co.uk/2/hi/uk_news/england/cumbria/4589321.stm

2005, May 16

CATTENOM-2, FRANCE

The sub-standard of the secondary coolant pump power supply cabling led to a fire in the electricity funnel. As a consequence one of the two safety circuits had to be disconnected. The operator EDF triggered its local (Level 1) internal emergency plan. The technical emergency center was activated. Details of the event have never been published. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, May 19 and August 26

UKRAINE

Two erosion/corrosion-related pipe failures occurred at the South Ukraine nuclear power plant. On 19 May 2005, a high-pressure heater line ruptured at Unit 2; and on 26 August 2005, a condensate pipe ruptured at the same plant. The lack of surveillance of this piping appears difficult to justify considering the previous operating experience with secondary pipe failures, which included many reported failures including a feedwater line break at the Surry Unit 2 plant in December 1986 that resulted in four deaths and two serious injuries.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, June 29

FORSMARK, SWEDEN

Radioactive water leaked into the Baltic Sea from the waste store at Forsmark nuclear power plant. The content of radioactive caesium-137 was 10 times the normal value. The Federal Institution of Radioactive Safety believed that the leakage came from one of the waste barrels that had corroded.

en.wikipedia.org/wiki/List_of_civilian_nuclear_accidents

2005, September 30

NOGENT-1, FRANCE

Material failures and human error during the restart of the reactor led to hot water and steam penetrating the four rooms containing the control command boards of the reactor protection system. Under normal conditions these rooms are independent from each other and should never be put in danger simultaneously. In the case of an accident, this incident could have made it difficult for the operator to bring back the reactor into safe state. EDF activated its internal emergency plan and the nuclear safety authority ASN activated its national emergency organisation for a few hours. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M., et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, December

SHEARON HARRIS, NORTH CAROLINA, USA

In December 2005, the nuclear power watchdog groups NC WARN and Union of Concerned Scientists disclosed a number of security allegations that had been brought to their attention by security personnel at the Shearon Harris nuclear plant in New Hill, North Carolina. In response to the NC WARN-UCS letter, the Nuclear Regulatory Commission sent an inspection team to the site to investigate the allegations. None of these issues had previously been noticed by NRC inspectors. The allegations included broken security doors leading to vital areas that management refused to fix despite repeated complaints from security officers; widespread cheating on the security certification exams administered to security officers by the state of North Carolina; and the issuance of merchandise 'gift cards' in lieu of overtime payments in order to keep excessive overtime hours off the books. All three of these allegations were substantiated, although the NRC claimed the last one was due to a misunderstanding. The NRC claimed that these events were of 'very low safety significance', providing a window into the NRC's questionable perception of the dangers posed by such chronic and severe security violations.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, December 21

CHINON-B (FOUR UNITS), FRANCE

An ill-conceived surveillance of the tertiary cooling water intake canal led to its significant silting up. The collapse of the sand hill could have led to the heat sink loss of all four reactors. Synthetic material used to selectively remove dissolved contaminants such as heavy metals or radionuclides from water by replacing or exchanging them with other constituents. As dated by IRSN, the safety authorities technical support organization. According to a database transmitted by ASN have dated the incident on 30 December 2005 and notes it as declared by EDF on 4 January 2006; Marc Stoltz, database transmitted by e-mail to the project coordinator, personal communication, 23 February 2007. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006

FLEURUS, BELGIUM

Severe health effects for a worker at a commercial irradiation facility as a result of high doses of radiation. Rated Level 4 ('accident with local consequences') on the 7-point International Nuclear Event Scale.

www.iaea.org/Publications/Factsheets/English/ines.pdf

2006

OLKILUOTO-3, FINLAND

Significant lack of safety culture and repeated delays in the construction of Olkiluoto-3, Finland. Construction of Olkiluoto-3 (PWR, 1600 MW) is being undertaken by AREVA NP under a turnkey contract. Finnish safety authorities STUK released a report in 2006 which stated: 'The so-called safety culture training to all those participating in the plant delivery, as stipulated in IAEA regulations and in discussions between STUK and [energy utility] TVO, has in practice not been provided in most cases. One expert of TVO's quality organisation stated in the interview that, as far as he knew, this training had not been provided in any organisation. It has not been defined what the content of the training should be and who should be responsible for its provision.'

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006, February 16

ROCKY FLATS, USA

A federal jury ruled that two Department of Energy contractors allowed plutonium from the Rocky Flats weapons plant to contaminate nearby land. The jury decided Dow Chemical and the former Rockwell International damaged land around the now-defunct plant through negligence that exposed thousands of property owners to plutonium and increased their risk of health problems. Jurors awarded the plaintiffs US$553.9 million in damages. The government already is facing an estimated $58 million in legal fees for the contractors. State and federal laws likely will limit any verdict payout to US$352 million, attorneys said, but taxpayers may have to foot the bill because the two companies' contracts called for the federal government to indemnify them. The plant

made plutonium triggers for nuclear warheads until it was closed in 1989. The lawsuit was filed in 1990 on behalf of 13,000 people.

About 25,000 people worked in the construction or operation of the plant from 1949 to 1990. Department of Labor figures released in May 2007 showed that 5,221 claims had been filed from Colorado, and 2,615 of them had been paid. The total paid to Colorado claimants was $130,660,717

http://seattletimes.nwsource.com/html/nationworld/2002808447_rockyflats16.html

www.havredailynews.com/cms/news/story-148175.html

2006, March 1

KOZLODUY, BULGARIA

New control rod drive mechanisms were installed in Kozloduy unit 5 in July 2005 during the annual outage. The unit restarted in beginning of September and was operated on full power. However on 1 March 2006 after a main coolant pump trip it appeared that 22 of total 61 control rods could not be moved with control rod driving mechanisms. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale. The root cause for this incident was design changes of driving mechanisms, which were not properly authorised and tested. Thus, during eight months the reactor was operated at full power with an insufficient number of operable control rods. The Kozloduy incident included elements of faulty detailed design and institutional failure to conduct type approval quality assurance controls.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006, March 16

BRAIDWOOD, USA

The State of Illinois sued Exelon Corporation for repeated leaks of tritium into water discharged around its Braidwood Nuclear Generating Station. The spills poisoned underground water and, after a legal challenge, the company agreed to pay US$11.5 million for a new water supply for the neighbouring village. Will County State's Attorney General, James Glasgow, said Exelon and its subsidiaries 'clearly placed their profit margin first with a callous disregard for the health, safety and welfare of the local residents.'

en.wikipedia.org/wiki/List_of_civilian_nuclear_accidents

2006, March 22

OKI, JAPAN

A fire broke out at Kansai Electric Power Co's (KEPCO) plant at Oki. A spokesman said a waste disposal facility at No. 3 and No. 4 nuclear power generation units at the plant had caught fire. KEPCO's Ikuo Muramatsu said the thick smoke was making it hard for firefighters to approach the building, according to the Associated Press news agency. Employees were evacuated. Two were taken to hospital. No unusual radiation exposures were reported.

Reuters

2006, June 2

TEMELIN, CZECH REPUBLIC

Design, fabrication and supply by Westinghouse to the Temelin nuclear power plant, Czech Republic, of fuel assemblies that were bending and twisting, causing problems with control rod insertion. By the middle of third fuel cycle of Temelin unit 1 (WWER, 931 MW) there were 11 control rods (neutron absorbers) that could not be entirely inserted and at the end of the fuel cycle their number had increased to 30. In the beginning of the fourth fuel cycle (October 2005 – June 2006) there were two control rods that could not be inserted properly and at the end of the cycle their number had increased to 51. The results of the last drop test of control rods performed on 2 June 2006 demonstrated a step change in further deterioration of fuel assemblies − two neutron absorbers came to a halt above the bottom of the reactor core and the unit was shutdown about four months before the planned outage. Despite improvements to the design, in September 2006 Temelin unit 1 started the next fuel cycle, presenting again seven control rods unable to reach full insertion. Similar problems are experienced in Temelin unit 2.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2007, July

SELLAFIELD, UK

The operators of Sellafield are to be prosecuted after two contractors received 'higher than anticipated' doses of radiation (17 and 4 mSv). The workers were refurbishing a floor at the site's plutonium finishing and storage plant in July 2007 when they were exposed to airborne contamination. Sellafield Ltd was accused of failing to discharge its duty under UK Section 3 (1) of the Health and Safety Act. Sellafield Ltd. was later fined 75,00 pounds plus costs.

http://news.bbc.co.uk/2/hi/uk_news/england/cumbria/8063372.stm

www.telegraph.co.uk/news/uknews/6729077/Sellafield-fined-75000-for-exposing-worker-to-radiation.html

2007, July 16

NIIGATA, JAPAN

A 6.8-magnitude quake hit the Kashiwazaki-Kariwa light-water nuclear plant, the world's largest nuclear power complex. Four reactors shut down automatically while three were already shut down for inspection. Radiation releases included small leaks of radioactive liquids from Unit 6 reactor building, a spent fuel pool and other sources; 12 MBq of iodine and 402 MBq of particulate radioactivity released from an exhaust pipe; and the release of small quantities of radionuclides from 400 drums of low-level nuclear waste which were knocked over, 40 losing their lids. Fire broke out in a transformer building.

www.independent.co.uk/news/world/asia/nuclear-leak-after-earthquake-in-japan-457525.html

http://en.wikipedia.org/wiki/Kashiwazaki-Kariwa_Nuclear_Power_Plant

http://cnic.jp/english/newsletter/nit119/nit119articles/kkearthquake.html

2006, July 25

FORSMARK, SWEDEN

A short circuit in an outdoor switching station caused the emergency shutdown (scram) of unit 1 and led to a number of subsequent failures at the plant. Due to a design error, the disconnection of the plant from the grid and the switch to house load operation − where the power plant uses its own power to operate essential auxiliaries − did not function as planned. An inappropriate converter adjustment led to the failure of the attempt to connect safety related equipment to the emergency power supply. The start up of two of the four emergency diesel generators was aborted, which led to a partial blackout, even in the main control room. For a period of time, the exact state of the plant and the consequences of potential actions to perform were unclear. The shift team decided nevertheless to try to reconnect the plant to the grid, which was performed successfully.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006, August

SOUTH TEXAS, USA

Whistleblower complaints − brought to light in August 2006 by the Union of Concerned Scientists − at the South Texas Project nuclear plant near Bay City, Texas, resulted in a special security inspection by the Nuclear Regulatory Commission. These included an allegation that during a force-on-force security drill being observed by both the NRC and the Federal Bureau of Investigation, the mock adversary team was instructed by management to intentionally lose the exercise. The NRC substantiated the concern of the employee who reported it.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2007, August 4

VALENCIA, SPAIN

A blaze which started at 11:45am local time at the Cofrentes nuclear power plant in eastern Spain resulted in a shut-down of the facility. The Nuclear Security Council said the fire was put out one hour later.

www.jovenesverdes.org/joomla/index.php?option=com_content&task=view&id=426&Itemid=1

2007, August 22

VERMONT YANKEE, USA

In 2007 the fourth cell of the west cooling tower collapsed, spilling some of the non-radioactive, cooling water. The Nuclear Regulatory Commission stated that the remaining cooling tower had enough capacity to allow the plant to operate at full output, however, until September 16, 2007 the reactor was kept at 50% power.

en.wikipedia.org/wiki/Vermont_Yankee_Nuclear_Power_Plant

2007, October 9

ROME, ITALY

A nuclear waste trafficking scandal has been unveiled by the authorities in Italy. The 'Ndrangheta mafia', a powerful mafia clan, has been accused of monitoring illegal shipments of radioactive waste from miscellaneous countries to Somalia, as well as seeking the 'clandestine production' of other nuclear material. This alleged waste-dumping tarnished the image of the state energy research agency Enea. It is alleged the manager paid the clan to get rid of 600 drums of toxic and radioactive waste from Italy, Switzerland, France, Germany, and the US.

www.guardian.co.uk/world/2007/oct/09/italy.nuclearpower

2007, November 2

ASCO VILLAGE, TARRAGONA, SPAIN

The 1,000 megawatt Endesa-owned Asco plant experienced a leak in November 2007 during refuelling, which was only detected in March 2008. According to the Nuclear Safety Council, regulators were eventually notified on April 4. Even though it did not cause any personal or environmental damage, the Spanish government fined Endesa 15.4 million euros for failing to report the incident properly and downplaying the amount of contamination released.

www.world-nuclear-news.org/newsarticle.aspx?id=25202

www.reuters.com/article/idUSL2873981320080428

www.neurope.eu/articles/89404.php

www.reuters.com/article/idUSLB59038420090511

www.reuters.com/article/idUSL115448520080611?rpc=401

2008

JAPANESE PORTS / US SUBMARINES

The U.S. government filed its final report on the submarine USS Houston's radioactive leak, saying it had no adverse effect on human health or the environment. The incident came to light on August 1 when the United States notified Japan that the Los Angeles-class fast-attack sub may have leaked radioactive water during port calls at Nagasaki, Kanagawa and Okinawa prefectures. According to the US Embassy, the radioactive releases were negligible − less than one microcurie − and were due to water seeping out of a shut valve.

http://search.japantimes.co.jp/mail/nn20080830a5.html

2008

JAPAN

Tadashi Kiyuna died of malignant lymphoma in March 2005 at the age of 53 after being exposed to radiation through his work at nuclear power plants throughout Japan and at the Rokkasho Reprocessing Plant. An expert committee established by the Ministry of Health, Labour and Welfare concluded that there is a causal relationship between malignant lymphoma and worker radiation exposure. On 27 October 2008, after receiving the expert committee's report, the Yodogawa Labor Standard Supervision Office in Osaka informed Kiyuna's widow that it had accepted his family's application for workers' compensation. In so doing it overturned its September 2006 decision. On hearing the news, Kiyuna's wife Sueko said: 'This result is due to the support of people throughout the whole of Japan. Time has stood still for me since the death of my husband, but it has begun to move again. I feel my strength returning through my whole body. If there are any other people like my husband suffering from cancer due to their exposure to radiation while working at nuclear plants, I would like to support them.'

http://cnic.jp/english/newsletter/nit127/nit127articles/kiyunanagao.html

2008, April 19

SANTA FE, MEXICO

The Navajo Nation is situated on a geological formation rich in radioactive ores. It has experienced widespread mining and milling of uranium for military and energy purposes since the 1940s. This has created a legacy of over 500 abandoned uranium mines, four inactive uranium milling sites, a former dump site, contaminated groundwater, and environmental and public health concerns.

But increasing prices of uranium, rising from $7 per pound to $68 per pound during the past seven years, have triggered a steep rise in the number of exploratory land permits requested by mining companies in New Mexico. Despite a Navajo Nation ban on uranium mining on Navajo land imposed on April 19, 2005, the Nuclear Regulatory Commission (NRC) approved the license to Hydro Resources Inc. for an in-situ leach uranium mine in May 2006. For the first time in history, the commission will be challenged in federal appeals court by the New Mexico Environmental Law Centre, which filed a lawsuit in 2007 against the NRC to overturn the license.

www.ens-newswire.com/ens/apr2008/2008-04-19-02.asp

2008, September 24

RUSSIA

Russian State Channel One program Health has warned that the 1986 Chernobyl accident is still wreaking havoc. A study on the Tula, Bryansk, Kaluga and Orlov regions showed that thyroid cancers were 20 to 70 times above normal levels.

www.bellona.org/news/news_2008/chernobyl_thyroid

2008, December,

OLKILUOTO, FINLAND

Concerns that the new EPR (European Pressurised Water Reactor) is susceptible to an airplane strike. On 16 May 16 2006, the spokesperson of the anti-nuclear organisation Sortir du Nucleaire was arrested for 14 hours by the French secret service for possession of a classified defence document. According to this document, EPR reactors would not resist a terrorist attack, such as those carried out in the U.S. on September 11, 2001.

In 2008, the EPR construction in Finland was questioned after numerous design errors were pointed out. Multiple non-conformities included incorrectly positioned reinforcements, inadequate control and cooling systems and hazardous waste storage.

www.newscientist.com/article/dn9191-europes-new-nuclear-%09reactors-will-not-be-911proof.html

www.greenpeace.org.uk/blog/nuclear/finland's-under-construction-ol3-reactor-'without-proper-design-meets-basic-principles-nuclear-safety'-20090514-0

www.terranauta.it/a1050/nucleare/pericolo_nucleare_fermate_quel_%09reattore.html

news.bbc.co.uk/2/hi/europe/8138869.stm

www.independent.co.uk/environment/green-living/safety-threat-to-planned-nuclear-power-stations-1682293.html

2008, December 5

CHALK RIVER, ONTARIO, CANADA

Reports filed with the Canadian Nuclear Safety Commission by Atomic Energy of Canada say a radioactive spill happened on December 5 and radioactive tritium was released into the air. Officials said neither workers nor area residents were exposed to significant danger, and 211 gallons of contaminated water was captured and is being stored in special drums. The reactor was shut down briefly. A news release at the time of the brief shutdown said only 'unanticipated technical challenges' had occurred at the facility west of Ottawa.

www.upi.com/Top_News/2009/01/27/December-nuclear-spill-reported-in-Canada/UPI-99571233060610/?rel=95821242742150

2009

KAKADU NATIONAL PARK, N.T., AUSTRALIA

The Commonwealth Supervising Scientist confirmed that the Ranger Uranium Mine is leaking around 100,000 litres of uranium-contaminated water into the groundwater every day. The contaminant was found to be leaking from the tailings pond into rock fissures beneath the World Heritage listed Kakadu National Park. The water may contain up to 5,000 times the background level of uranium. Local communities registered concerns that the contaminated water could run in to local drinking water supplies.

www.theage.com.au/national/polluted-water-leaking-into-kakadu-from-uranium-mine-20090312-8whw.html

www.abc.net.au/news/stories/2010/05/28/2911960.htm

2009, March 5

KASHIWAZAKI-KARIWA, USA

Pump Room fire at Kashiwazaki-Kariwa nuclear power plant owned by TEPCO. One worker suffered minor burn injuries. The Nuclear and Industrial Safety Agency implemented an inspection and issued a severe reprimand to TEPCO.

http://vaec.gov.vn/en/TabId/684/ArticleId/2564/PreTabId/624/Default.aspx

2009, March 24

FRANCE

The French government plans to offer compensation to nuclear test victims by setting up a US$13.6 million fund which will be distributed by a panel of independent doctors. For decades, the government had rejected any links between nuclear tests in the Pacific and statistics which report illnesses, including cancers and heart diseases, affecting people in the test areas. But another reason for compensation is to avoid long costly trials.

French atom bomb testing began in Algeria in 1960, then moved in 1966 to French Polynesia. The tiny atoll was the test site for Program O for 30 years. This sparked violent protests, which reached a climax in 1985 when the French secret service sank Greenpeace's ship Rainbow Warrior in a New Zealand port.

www.youtube.com/watch?v=p2wvPP5zWQM

2009, April 9

UKRAINE

Three men, including a regional lawmaker, have been arrested by the Ukrainian Security Service (SBU) for allegedly trying to sell 37 kgs of plutonium-239 to an undercover agent. However, tests showed that it was actually a metallic chemical called americium, a common and less radioactive material that can only be used in making terrorist weapons, or so-called dirty bombs. Although Ukraine renounced nuclear weapons after the Soviet collapse, concerns remain over the existence of unsecured radioactive material being smuggled, illegally handled and eventually sold to the highest bidder on the black market.

www.rferl.org/content/Ukraine_Arrests_Three_Attempting_To_Sell_Radioactive_Material/1609074.html

www.huffingtonpost.com/2009/04/14/ukraine-arrests-lawmaker-_n_186925.html

www.nytimes.com/2009/04/15/world/europe/15ukraine.html

2009, May 4

PAKS, HUNGARY

In a mishap during maintenance work, a device that measured neutron flow fell into the Block 4 reactor at the nuclear power plant in Paks. The winch cable broke that was to have hauled it out of the reactor interior. There were no injuries to workers. Hungarian nuclear energy officials rated the accident at Level 2 on the 7-point International Nuclear Event Scale. Previous incidents include a radioactive gas release in 2003 from damaged fuel rods (Level 3 'serious incident'), and Level 1 incidents ('anomalies') in 2006 and July 2008.

www.topnews.in/mishap-hungarian-nuclear-reactor-2162163

2009, May 5

VALENCIA, SPAIN

Malfunctioning electronics created problems at the Spanish nuclear power plant, Confrentes. Experts concluded that the incident was most likely caused by a system failure and that the plant could be back online the following day. Although the Nuclear Safety Council stated that this event did not harm workers, the public or the environment, the plant has already suffered many power downs. There were more than three in the first three months of 2009. Its license expires in 2011.

www.lasprovincias.es/valencia/20090506/valenciana/fallo-sensor-temperatura-obliga-20090506.html

2009, May 9

BELGIUM

A report released by the ONDRAF, the National Authority of Radioactive Waste, raised awareness about insufficient radioactive waste management funds in Belgium. According to the report, US$233 million would be necessary to cover the shortfall.

www.rtbf.be/info/belgique/nucleaire/nucleaire-le-rapport-de-londraf-09pointe-du-doigt-le-manque-de-provision-106241

2009, May 11

MADRID, SPAIN

The 1,000 MW nuclear plant, Asco I, has been fined nearly US$21 million by the Spanish government for six charges of breaching safety rules over a radioactive leak in November 2007. The breach occurred when radioactive water splashed a ventilation system during refuelling. The fine is the highest ever made against a nuclear power plant in Spain.

www.reuters.com/article/rbssUtilitiesElectric/idUSLB59038420090511

2009, May 11

SELLAFIELD, U.K.

The managers of Sellafield reprocessing plant, Nuclear Management Partners, have admitted that radioactive waste was leaking for 14 months without detection and that two containers of highly radioactive material were lost. The leaking pipe had been left unnoticed 'because managerial controls over the line were insufficient and there was inadequate inspection' according to the conclusions of a board of inquiry. The 'steady drip' was detected on 23 January, the day Prime Minister Gordon Brown visited the site to announce possible locations for new nuclear power stations. The leak was initially classified as a Level 1 accident ('anomaly') on the International Nuclear Event Scale but was later upgraded to Level 2.

http://news.bbc.co.uk/2/hi/uk_news/england/cumbria/8050008.stm

www.guardian.co.uk/business/2009/may/17/safety-scares-at-sellafield

www.whitehavennews.co.uk/news/sellafield_braces_for_fall_out_over_undetected_pipe_leak_1_557205

2009, May 13

TRICASTIN, FRANCE

An accident occurred in a reactor building where two tonnes of mechanic components fell from a height of 15 metres. Only material damages were reported and no workers were injured. Safety checks have been urged by the Nuclear Safety Authority due to numerous malfunctions that have occurred since the beginning of the year, including repeated leaks of uranium and problems with discharging machines.

www.lemonde.fr

2009, May 14

CHALK RIVER, CANADA

A small leak of heavy water was detected within the National Research Universal reactor (NRU) at Chalk River. Atomic Energy of Canada Ltd. shut down the reactor after discovering the leak, and could not provide a timeline for its reopening. Reports state that the repairs may involve removing the fuel rods in the reactor and draining the vessel that holds the heavy water, which could keep the facility off-line for at least a year. The incident has raised questions about the future of the 50-year-old facility. Its also likely to compound the worldwide shortage of medical isotopes used in the diagnosis and treatment of cancer and other illnesses, as the plant owner said it will be unable to meet the increasing demand for medical isotope.

www.reuters.com/article/idUSN2121590320090521

blogs.physicstoday.org/newspicks/2009/07/medical-isotope-shortage-reach.html

www.bloomberg.com/apps/news?pid=20601082&sid=aG.uHSnCrupE&refer=canada

2009, May 14

SOUTHERN MARYLAND, USA

A statewide SWAT team exercise at a firing range on the secured grounds of a nuclear power plant in Southern Maryland was halted on May 14 after stray bullets shattered glass and struck a command centre near the plant's reactors. At least five bullets escaped the firing range and travelled more than 800 m before striking buildings and a vehicle near the reactors. One struck the plant's 'outage control centre', another hit an employee's car and three struck an office facility. Employees were working in both buildings at the time. Firing ranges are common on the sprawling grounds of the nation's nuclear facilities.

www.washingtonpost.com/wp-dyn/content/article/2009/05/27/AR2009052703405.html

2009, May 15

ANGRA II, BRAZIL

A leak at Brazil's Angra II nuclear power plant in Rio de Janeiro state affected six employees, state-owned Eletronuclear said. The leak on May 15 was a 'Level 1' event on the International Nuclear Event Scale. Tests showed the workers were exposed to 'very low' levels of radiation. The accident occurred during a routine procedure to scrape a contaminated part, with several filings entering the air conditioning system, which had not been disconnected due to an error.

http://www.laht.com/article.asp?ArticleId=335911&CategoryId=14090

2009, May 15

PALUEL, FRANCE

An incident at the Paluel plant was due to a deficiency in a cooling reactor. The International Nuclear Event Scale Level 1 incident ('anomaly') was the result of the incorrect assembly of a component part of the pump circuit, dating back to 2001. The circuit is essential in the event of very serious incidents.

www.sortirdunucleaire.org/actualites/presse/affiche.php?aff=6068

2009, May 17

JAPAN

An armed vessel with a load of recycled nuclear fuel from France arrived amid heavy security at a Japanese port. The Pacific Heron delivered a load of mixed-oxide or MOX fuel, a blend of plutonium and reprocessed uranium. Environmental group Greenpeace has called the cargo, which left France in March via a secret route, 'the largest shipment of plutonium in history,' saying the 1.8 tonnes would be enough to make 225 nuclear weapons. Japan experiences about 20 percent of the world's most powerful quakes, and anti-nuclear activists say relying on atomic power in a tectonically unstable country is a catastrophic accident waiting to happen.

AFP:
www.google.com/hostednews/afp/article/ALeqM5itSPU0AsAiKCe-QzYLY8w6xwJhZw

2009, May 21

CAMPANIA, ITALY/ HAMBURG, GERMANY

German authorities have banned the processing of Italian hospital wastes after they found they contained levels of radioactivity 80 times higher than normal. Hamburg said it will not continue to reprocess any more waste coming from Italy unless it receives written guarantees from the Italian authorities that all rubbish has been checked thoroughly before being sent to Germany.

current.com/items/89006852_germany-hamburg-bans-waste-from-italy-due-to-high-levels-of-radioactivity.htm

2009, May 21

CERNAVOD, ROMANIA

Romania's only nuclear power plant, at Cernavod on the Danube River, was shut down after a water pipe cracked on the Unit 1 reactor. Authorities said the cracked pipe posed no radiation risks and that the reactor would be back in operation the following week.

www.upi.com/Top_News/2009/05/31/Romania-repairs-nuclear-plant-water-pipe/UPI-37601243781309/

2009, May 25

CHAMBÈRY, FRANCE

The Citizen Inspection Authority, set up by Greenpeace and French organisation Sortir du Nucleaire, has revealed that 28 tonnes of radioactive waste recently crossed the Savoie region using ordinary railway transport. According to the group, this is the 11th convoy of this type that has been discovered since 2007. Local groups want to increase the pressure on authorities to keep the public better informed about where and when these crossings are taking place.

bellaciao.org/fr/spip.php?article86388

chichechambery.free.fr/spip/spip.php?article385

2009, June 2,

USA

The US government mistakenly made public a 266-page report, marked 'highly confidential', that gives detailed information about hundreds of civilian nuclear sites and includes nuclear reactors and confidential sites at weapon laboratories.

http://www.nytimes.com/2009/06/03/us/03nuke.html

2009, July 9

TRICASTIN, FRANCE

Liquid containing uranium leaked into two nearby rivers at the Tricastin nuclear site, about 40 kms from the city of Avignon. France's nuclear safety agency banned the consumption of well water in three nearby towns. It also halted the watering of crops from the two rivers, the Gaffiere and the Lauzon, as well as all water-related activities such as swimming and fishing. Plant managers said the spill was only slightly radioactive and happened while a tank was being washed.

www.nysun.com/foreign/france-uranium-leak-leads-to-water-bans/81453

2009, July 15

DRESDEN, USA

A liquid substance containing six times the allowed level of tritium was discovered leaking from a turbine building at the Dresden nuclear power plant. The plant's owner, Exelon, owns 10 nuclear power plants in the U.S. Records show that executives took steps to hide three radioactive tritium spills at its Braidwood Plant in Will County between 1996 and 2006.

articles.lancasteronline.com/local/4/239699

www.ens-newswire.com/ens/mar2006/2006-03-21-02.asp

www.chicagobreakingnews.com/2009/06/exelon-radioactive-leak-contained-not-in-water-supply.html

2009, September 27

UK NUCLEAR SUBMARINES

Figures released by the UK Ministry of Defence (MoD) detail the number of fires on UK nuclear submarines since 1987:

- 213 small-scale fires, that are categorised as a localised fire such as a minor electrical fault creating smoke dealt with quickly and effectively using minimal onboard resources.
- 20 medium-scale fires that were generally categorised as a localised fire such as a failure of mechanical equipment creating smoke and flame requiring use of significant onboard resources.
- Three fires occurred while the submarines involved were in naval bases, requiring both ship and external resources.

Nearly half of the medium- and large-scale fires occurred on submarines which could have been carrying nuclear weapons. The three most serious fires were as follows:

- 17 February 1992 / HMS Renown / Clyde
- 30 April 1992 / HMS Turbulent / Devonport
- 24 October 2003 / HMS Trafalgar / Devonport

Data on pre-1987 fires was not held centrally by the MoD.

www.robedwards.com/2009/09/exposed-22-serious-fires-on-nuclear-submarines.html

www.publications.parliament.uk/pa/cm200809/cmhansrd/cm090916/corrtext/90916c0001.htm

In the aftermath of the September 11 attacks in the U.S., delegates from 132 nations attending an annual International Atomic Energy Agency (IAEA) conference in Vienna, Austria call for tightened security. They also note the need to make sure nuclear materials are kept out of the hands of terrorists. Most nuclear power plants were built during the 1960s and 1970s and were designed to withstand only accidental impacts from smaller aircraft widely used at the time. A US official states that a direct hit of a nuclear plant by a modern-day jumbo jet travelling at high speed 'could result in a Chernobyl situation.' According to the IAEA, if an airliner hit a nuclear power plant, the reactor would not explode, but the strike could destroy the plant's cooling systems and potentially generate a steam explosion that would release radioactivity into the atmosphere.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, September 21

SELLAFIELD, U.K.

Both nuclear fuel reprocessing plants at Sellafield in Cumbria are shut down due to high-level nuclear waste reaching unacceptable levels. The UK Nuclear Installations Inspectorate, a government regulator, has been critical of British Nuclear Fuels Limited for failure to deal with heat-producing waste, the most dangerous material stored at the plant. Despite attempts to reduce the amount of liquid waste, the plant has broken down repeatedly and been out of operation for most of this year.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, October 4

USA

David Lappa, a former nuclear engineer at Lawrence Livermore National Laboratory (LLNL), who was harassed for refusing to cover up nuclear safety violations, settles his whistleblower lawsuit against the lab for $250,000. Lappa worked at LLNL for 20 years and continued to raise safety concerns to his managers and federal authorities about serious and repeated violations of plutonium safe-handling requirements at the facilities. Lappa claimed that he was forced to resign after harassment became intolerable.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, November 7

HAMAOKA, JAPAN

On 7 November 2001, a valve in Unit 1 ruptured during a periodical manual start-up test. Since this is considered a part of the emergency core cooling system, the failure into question the reliability of the emergency safety system.

On 9 November 2001 there was a coolant leak accident in Unit 1.

In 2002, an independent inspection found that 16 unique signs of cracks in steam pipes were known by the utility (Chubu Electric Power Company) but were not reported to authorities.

On 24 May 2002, there was a water leak in Unit 2 resulting in the irradiation of 16 workers.

On 21 February 2004, there was a fire in a room above turbine room in Unit 2.

In August 2004, it emerged that the utility had fabricated data regarding Unit 4.

On 4 November 2005, there was a pipe leak incident in Unit 1.

On 16 November 2005, there was an outside pipe leak due to corrosion in Unit 3.

On 16 November 2005, foreign matter was found in the spent fuel pool in Unit 1.

In June 2006, damage to turbine blades was detected in Unit 5.

On 15 June 2006, Unit 5 was shut down due to excessive turbine vibrations − a number of turbine vanes had completely broken off.

In March 2007 the utility admitted to 14 cases of unfair business practices.

On 11 August 2009, Units 4 and 5 (the only ones operating) automatically shut down due to an earthquake.

On 6 May 2011, in the wake of the Fukushima disaster, Prime Minister Naoto Kan ordered Units 4 and 5 to be shut down and Unit 3 not to be restarted.

On 15 May 2011, 400 tons of seawater were found to have leaked into the Unit 5 turbine steam condenser.

On 20 May 2011, damaged pipes were located in the Unit 5 condenser and the operator estimated that about five tons of seawater may have entered the reactor itself.

cnic.jp/english/newsletter/pdffiles/nit88.pdf

http://en.wikipedia.org/wiki/Hamaoka_Nuclear_Power_Plant

WISE/NIRS Nuclear Monitor #569

2001, October 24

RUSSIA

Charles Curtis, former Deputy Energy Secretary in the Clinton administration and President of the Nuclear Threat Initiative states that missing Russian suitcase bombs are still a concern. He states, 'We believe we have a full accounting of all of Russia's strategic weapons, but when it comes to tactical weapons − the suitcase variety − we do not know, and I'm not sure they do, either.' In May 1997, then Russian Security Council Secretary Aleksandr Lebed revealed to US Congressmen visiting Moscow that Russia once had between 80 and 100 suitcase-size, one kiloton atomic demolition weapons. He said that the KGB ordered the weapons to be built in the 1970s, and he also told the Congressmen that the weapons were missing. The Russian government at first denied the existence of such weapons, later saying that if the weapons were built, they were accounted for.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, December 12

ROMANIA

The Romanian National Commission for the Control of Nuclear Activities (CNCAN) reported that nine workers were exposed to serious levels of radiation while dismantling a smelting plant in western Romania last June. The men have been hospitalised since June, but the incident was kept secret while police conducted an investigation. CNCAN Director Anton Coroianu stated, 'They wore no protective clothes. They got a huge dose of radiation from cobalt-60, which could have killed them at once.' Cobalt-60 is a man-made radioactive isotope which serves many medical and industrial uses. An 1,100-square-foot area around the furnaces has been sealed off to everyone except authorised personnel, including investigators, who must wear protective clothing before entering the site.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2001

2001, December 14

BRUNSBÜTTEL, GERMANY

A hydrogen explosion caused a high degree of damage to the spray system piping of the boiling water reactor. Some parts of the 5.6 mm diameter pipes were ruptured. An approximately 2.7 m long piping section had burst and was completely destroyed. Some sections of the piping were missing. Prior to this event the possibility of severe explosions caused by radiolysis gas during normal operation was nearly excluded.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2002, January 5

TBLISI, GEORGIA

Experts from International Atomic Energy Agency (IAEA) arrived in Tbilisi, Georgia to visit a site where three lumberjacks found two containers of highly radioactive strontium-90 near the village of Dzhvare in December 2001. The radioactive containers are believed to have been used in signal beacons during the construction of a nearby hydroelectric plant 30 years ago. The IAEA will assemble a special task force to remove the containers. The lumberjacks who found the containers have been hospitalised.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, January 15

CONNECTICUT, USA

Inspectors from the US Nuclear Regulatory Commission announce that two radioactive fuel rods that have been missing for 20 years from the Millstone Nuclear Complex located in Waterford, Connecticut, were likely mistaken for other radioactive waste and disposed of. The investigation regarding the missing fuel rods began in December 2000 after Northeast Utilities (NU), the owner of plant until last year, conducted an inventory of the plant's spent nuclear fuel. Neither NU or the plant's current owners, Dominion Inc., could determine conclusively where the rods were.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, January 18

DIMONA, ISRAEL

Israel's commercial television station, Channel 2, broadcasts a special report exposing the dangers of the Dimona nuclear weapons production reactor. The report is the first time Israeli mass media has presented first-hand testimonies of former reactor workers to the public. The testimonies reveal the dangers posed by the nuclear weapons factory to workers as well as to the environment.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, January 21

FLAMANVILLE-2, FRANCE

The installation of inappropriate condensers due to an inappropriate procedure led to the simultaneous loss of several control-command boards and systems while the unit was operating as well as to the destruction of two safety significant pumps during the shut down sequence. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2002, February 27

FRANCE

France's Independent Commission on Research and Information on Radioactivity (CRIIRAD) files a civil suit against President Jacques Chirac's government on the grounds that the government covered up risks to public health after the 1986 Chernobyl disaster. According to the CRIIRAD, the French government was aware that the radioactive fallout from the explosion at the Chernobyl nuclear power plant posed risks to public health, but deliberately failed to warn the public.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, March

DAVIS-BESSE, OHIO, USA

Workers at the Davis-Besse nuclear plant in Ohio were replacing a cracked Control Rod Drive Mechanism nozzle when they discovered a pineapple-sized hole that had completely eaten through the 15 cm steel outer shell of the reactor vessel head. This only left a 5 mm stainless steel liner to hold back 87,000 gallons (330,000 litres) of water at a pressure of 2000 psi (14 MPa). Later investigation of the stainless steel liner found the beginnings of a crack. A government study estimated that the hole would have widened to the point where the liner ruptured in another 2−11 months of operation. Because Davis-Besse ran 18 months between refueling outages, had the damage been missed during the 2002 outage, it seems likely that a loss of coolant accident would have occurred. Had the 5mm stainless steel liner ruptured, a hole with a diameter of approximately 250 mm would have created a medium-sized loss of coolant accident. While Davis-Besse was equipped with emergency systems to mitigate such an accident, these backup systems were also found to be impaired (the worst problem involved the containment sump used during the second phase of accident mitigation).

The damage occurred over a period of nearly six years due to a cracked nozzle leaking borated water onto the reactor head. The Nuclear Regulatory Commission calculated the severe core damage risk from this event to be 0.6% per reactor-year and rated it Level 3 ('serious incident') on the 7-point International Nuclear Event Scale. On April 22, 2005 the NRC proposed a $5.4 million fine against FirstEnergy, the plant owner. System engineer Andrew Siemaszko was also banned from working in the industry for five years due to his falsification of reactor vessel cleaning logs in May 2000.

The incident was a result of inappropriate design of the reactor head penetration sealing, a prolonged institutional failure to conduct proper surveillance, combined with a lack of management procedures mandating further investigation of the root cause, such as determining the reasons for the discovery of carbon steel corrosion products trapped in the main containment air sampler filters

www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/vessel-head-degradation-files/pr-02-036.pdf

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2002, March 5

MISSISSIPPI, USA

During an extended power test uprate designed to extend the power of ageing boiling water reactors (BWR), the Quad City nuclear power plant unit 2 began vibrating. On March 29 the plant was manually shut down due to high vibrations causing leaks in the main turbine control system. Unit 2 had a restart on April 2, but vibrations broke a main steam pipe drain line. The line was repaired and the restart resumed, but by June 7 the main steam lines were showing unexplained aberrations. On June 18 it became obvious that the power uprate was causing damage, so the power was reduced but the damage had been done. Once again the plant was taken offline for repairs on July 11. The problem was traced to a hole in the steam dryer. It was repaired and restarted on July 21, 2002. The steam dryer failed yet again on May 28, 2003 with a 6 mm by 2.7m crack. This failure rate has not deterred the NRC from continuing the power uprate program and offering these extended uprates to other ageing BWRs.

2002, March 7

HANFORD, USA

The Bush administration agrees to restore $300 million in the 2003 budget that was cut from a Department of Energy (DoE) program to clean-up waste at the most contaminated nuclear site in the US. Under a new agreement, the Hanford nuclear production site in Washington State will undergo an accelerated clean-up. Hanford is a 1450 sq km site where plutonium was made for more than 40 years for the nation's nuclear arsenal. The new target date for clean-up, originally set for 2070, is now 2025. The administration also agrees to spend an additional $150 million next year, bringing Hanford's total 2003 budget to some $2 billion. The new agreement between the DoE, Washington State and federal regulators calls for speeding up retrieval of more than 53 million gallons of highly radioactive waste stored in 177 underground tanks near the Columbia River. The tanks have leaked more than one million gallons into the soil and groundwater. The agreement will also accelerate clean-up of basins where lethal, corroding spent nuclear fuel rods are stored and speed up the processing of scrap plutonium.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 5

OHIO, USA

The U.S. Nuclear Regulatory Commission releases a report stating that an acid leak that ate through a steel cap over a reactor at the Davis-Besse nuclear plant in Ohio should have been spotted as long as four years ago. The problem was not discovered until the plant was shut down for refuelling in February 2002. According to the NRC, it is the most extensive corrosion ever found on top of a U.S. nuclear reactor. The damage will keep the plant shut until at least June. The NRC ordered operators of all 69 pressurised water reactors in the U.S. to submit information on the structural integrity of their plant's reactor heads.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 7

ALABAMA, USA

The Tennessee Valley Authority issued a report stating that an electrician's mistake caused an accident on 26 March at the Browns Ferry nuclear power plant that seriously burned four workers. The TVA and state emergency management officials state that there was no danger of a release of radioactivity from the plant.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 9

FUGEN, JAPAN

The Fugen 165,000 MW nuclear reactor in western Japan was shut down due to a leakage of radioactive steam.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, April 10

ROSTOV, RUSSIA

Russia's newest nuclear reactor at the Rostov Nuclear Power Plant in the southern part of the country shut down automatically after a malfunction occurred in a steam valve. It was the reactor's second shutdown since it went online in 2001. It is the only new nuclear reactor that has been opened in Russia since the 1986 explosion at Chernobyl.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, June 16

U.K.

The UK Office of Civil Nuclear Security (OCNS) released a report which states that standard security checks have not been carried out at several nuclear power facilities in the U.K. because of staff shortages. According to OCNS, some inspections were suspended after staff were diverted from routine work in the aftermath of the September 11 terrorist attacks in the U.S. The report also said that OCNS has lost experienced security staff to the private sector and the organisation is finding it difficult to recruit replacements.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, June 18

USA

The 9th U.S. Circuit Court of Appeals revives two lawsuits filed by thousands who claimed they were sickened by radiation releases from the Hanford nuclear weapons complex. It orders a federal trial court in Washington State to reconsider the claims that were dismissed, in part, in 1998.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, July 4

JAPAN/U.K.

British Nuclear Fuels ships carrying 255 kgs (560 pounds) of rejected mixed oxide (MOX) fuel left Japanese ports to be returned to the fuel's maker in Great Britain. Japan's Kansai Electric Power Co. imported the fuel in 1999 for its experimental nuclear power program, but Japan later rejected the fuel when BNFL revealed that workers had falsified quality-control data. The shipments of plutonium MOX fuel, high-level nuclear waste and spent fuel between Europe and Japan sparked international concern from governments and organisations fearing leaks and accidents or terrorist attacks, and because of the proliferation risks associated with plutonium separation and transport.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2002

2002, July 15

BELARUS

Throughout mid-July, dozens of wildfires burning in parts of Belarus that were most affected by the Chernobyl nuclear accident raise radiation levels in the area.

www.nuclearfiles.org/menu/timeline/2000/2002.htm

2002, August 29

17 TEPCO REACTORS, JAPAN

The Tokyo Electric Power Company (TEPCO) operates 17 boiling water reactors. On 29 August, the Japanese Nuclear Industrial Safety Agency (NISA) shocked the nation with the public revelation of a massive data falsification scandal at TEPCO. At that point 29 cases of 'malpractice' had been identified, including the falsification of the operator's self-imposed inspection records at its nuclear power plants over many years. In the follow-up, all of the 17 TEPCO units had to be shut down for inspection and repair. It was reported later that these practices had gone on for as long as 25 years and the total number of events is put at nearly 200 so far. However, revelations of cover-ups and malpractice have extended to all major nuclear operators in Japan and continue today. In April 2007, for example, Hokuriku Electric admitted to a criticality incident at its Shika-1 boiling water reactor. The event had been covered up for almost eight years.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2003

PAKS, HUNGARY

Design deficiencies of a chemical system built to clean 30 partially irradiated fuel assemblies caused insufficient cooling of all assemblies, which were heavily damaged. A subsequent IAEA investigation identified eight separate design errors. The system was developed, manufactured and delivered by AREVA NP. During the accident, radioactive releases were about four times the noble gases and almost 200 times the iodine-131 and aerosols released by all 58 French pressurised water reactors during the whole of 2003. The event was reclassified as Level 3 ('serious incident') on the International Nuclear Event Scale after an initial Level 2 rating.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2003, January 20

KOZLODUY, BULGARIA

Loss of Coolant Accident − Kozloduy unit 3 reactor protection system was automatically actuated by a low pressure in the primary system signaling a primary coolant leak. All safety injections and confinement spray pumps started as designed. The leaking part of the primary system was isolated and the leak was compensated. Soon after this the primary system pressure and the pressuriser level were restored. During the event the safety injection and confinement spray pumps were in operation for about 60 mins. The direct cause of the pipe leak was mechanical damage due to a long time vibration and friction of a pipe to a part of the structural components. Deficiencies of the surveillance program for pipes in the confinement also contributed. The damaged pipe was not included in the non-destructive testing program and surprisingly the visible mechanical damage was not discovered by visual inspections. The event was rated at Level 1 ('anomaly') on the 7-point International Nuclear Event Scale in spite of the fact that according to INES guidelines the starting assessment for events with real leakage from primary system is to be considered a Level 2 event.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2003, February

OAK RIDGE TENNESSEE Y-12 FACILITY, USA

During the final testing phase of a new saltless uranium processing method, the test experienced a small explosion followed by a fire. The explosion occurred in an unvented vessel containing unreacted calcium, water and depleted uranium. The reaction amongst these articles generated enough steam to burst the container. The explosion breached the glove box where it was stored. Air filtered into the damaged glove box igniting some loose uranium powder (uranium is pyrophoric) starting a fire that slightly contaminated three employees. A year later BWTX, a partnership of BXW Technologies and Bechtel National, was fined $82,500 for the accident.

nucnews.net/nucnews/2004nn/0406nn/040612nn.htm#010) [83]

2003, March 12

LENINGRAD NAVAL BASE, RUSSIA

Military personnel at the Leningrad Naval Base discovered a vandalised lighthouse near Kurgolovo. The Radioisotope Thermoelectric Generator (RTG) had been looted for scrap metal by thieves. The 'hot' strontium capsule melted the ice and sank to the sea floor. Although the ice covering the spot where the radioactive heat source sank was a metre thick, the gamma radiation exposure dose rate directly above the sunken unit reached over 300 mSv/h.

A similar case happened in the Leningrad region in 1999. An identical lighthouse was found completely destroyed, and its radioactive power element discarded at a bus station in the city of Kingisepp, 50 kms away from the crime scene. Three people, who the police established were the perpetrators of the 1999 episode, died from radiation poisoning.

www.bellona.no/bellona.org/english_import_area/international/russia/navy/northern_fleet/incidents/37598

2003, March 23

RANGER, NORTHERN TERRITORY, AUSTRALIA

At least 28 workers fall ill after process water pipes were accidentally connected to drinking and shower water at the Ranger Uranium Mine in Kakadu National Park. Workers were exposed to 400 times the 'legal' concentrations of uranium in the water, and suffer headaches, nausea, vomiting and skin irritations. The mine is closed for a number of weeks. The Northern Territory Minister for Mines and Energy refers the process water contamination incident to the Department of Justice for prosecution, and Rio Tinto is later fined $150,000. A report finds that 159 workers were potentially exposed to contaminated water.

www.theage.com.au/news/Business/ERA-fined-150000-over-contamination/2005/06/01/1117568249370.html

2003, April 26

CHERNOBYL, UKRAINE

Days before the 17th anniversary of the disaster at Chernobyl, a Ukrainian intelligence agency declassifies several documents that show design flaws, shoddy workmanship, and major violations of safety rules at the plant and exposing 29 accidents at the plant between

1977 and 1981. Russia responded by claiming that post-Soviet Ukraine has not properly maintained the concrete canopy covering the faulty reactor, leaving holes through which radiation could leak.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2003

2003, October

AUSTRALIA

A report by a federal Senate References and Legislation Committee found 'a pattern of under-performance and noncompliance' in the uranium mining industry. It identified many gaps in knowledge and found an absence of reliable data on which to measure the extent of contamination from the uranium mining industry, and it concluded that changes were necessary 'in order to protect the environment and its inhabitants from serious or irreversible damage'. The committee concluded 'that short-term considerations have been given greater weight than the potential for permanent damage to the environment'.

Senate References and Legislation Committee, 'Regulating the Ranger, Jabiluka, Beverley and Honeymoon uranium mines', www.aph.gov.au/senate/committee/ecita_ctte/completed_inquiries/2002-04/uranium/report/index.htm

2003, October 21

NEVADA, USA

The Nuclear Waste Technical Review Board (NWTRB) issues another warning to the US Department of Energy (DoE) cautioning officials that the Yucca Mountain project does not meet its strict quality assurance standards. The NWTRB expresses concerns over the effectiveness of the casks designated to indefinitely hold high-level nuclear waste. Specialists cite the waste package design as susceptible to corrosion and, consequently, prone to leaking waste into the aquifer that serves as the only source of drinking water for the people of Amargosa Valley.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2003

2003, December 28

SELLAFIELD, U.K.

19.1 kgs of plutonium is unaccounted for at the Sellafield nuclear plant in Cumbria, England. A spokesman for British Nuclear Fuels, the company that manages the Sellafield plant, says the figures of plutonium that were 'unaccounted for' are normal as 'it is impossible to measure absolutely exactly that amount of material going into the plant and the amount coming out because of the huge amount of material that is put through it each year.' However, Dr. Frank Barnaby, a nuclear consultant and a former director of the Stockholm International Research Institute states, 'In reprocessing, a small amount of material is bound to be lost in the process, but 19 kgs is a very significant amount of plutonium.' (In 2005 it was discovered that a leak in the THORP reprocessing plant at Sellafield was responsible for the loss of 83,000 litres of radioactive liquor containing 160 kgs of plutonium.)

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2003

2004, January 24

FESSENHEIM-1, FRANCE

Following the erroneous operation of an auxiliary circuit valve, ion exchange resins have been introduced into the primary cooling circuit. Their presence could have threatened the integrity of the primary pump joints as well as the proper functioning of the control rods. Both elements are essential to control and shut down the reactor. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2004, March 22

FRANCE − ALL 58 EDF REACTORS

An insulation default at an electrical switchboard, experienced on unit 2 of the Penly nuclear power plant, was triggered by a steam leak close to electrical equipment that was to be qualified to resist accidental conditions. The non-conformity of the cabling has been subsequently identified on all of the French nuclear power plants and led to large-scale verification and remediation operations. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2004, March 25

DEMOCRATIC REPUBLIC OF CONGO

The Democratic Republic of Congo (DRC) calls upon the international community to help control access to the Shinkolobwe mine. According to industry experts, uranium is being illegally quarried and exported without control. DRC Mining Minister Diomi Ndongala says officials from North Korea and African countries have expressed an interest in DRC uranium in recent years. The Shinkolobwe mine produced uranium for the US nuclear weapons dropped on Hiroshima and Nagasaki in Japan during World War II.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, May 14

TENNESSEE, USA

Strontium-90, considered one of the most hazardous nuclear wastes by the US Environmental Protection Agency, is spilled across about three kms of Highway 95 in Roane County, Tennessee at 11:00 am . More than five hours after the spill occurs, authorities finally close the road. Department of Energy (DoE) spokesman Steve Wyatt announces there is no danger to the public. Highway 95 remains closed until 16 May 2004, after specialists clean and re-pave sections of the road. The clean-up bill will exceed $1 million.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, June 15

USA

Assistant Secretary of Environmental Management, Jessie Roberson, resigns her post at the Department of Energy (DoE). Roberson was head of the DoE Accelerated Cleanup Program that was created in order to reduce the cost and accelerate the environmental cleanup process at US nuclear weapon sites. The DoE program has adhered to minimal environmental standards and has proposed minimising clean-up efforts in order to cut costs. Roberson is the third Senate-confirmed DoE official to resign in the last 80 days. Undersecretary Robert Card and Assistant Secretary Beverly Cook precede Roberson's resignation. All three officials were involved in environmental clean-up programs at DoE nuclear weapon sites.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, July 27

HANFORD, USA

According to a Federal audit, efforts to clean contaminated groundwater around the Hanford Nuclear Reservation in Washington State has been 'largely ineffective.' So far, the U.S. Department of Energy (DoE) has spent $85 million in an attempt to clean the groundwater, including $8 million a year on its pump-and-treat system, which pulls groundwater out of the ground, runs it through filters, and puts it back. However, the system doesn't work and, according to the audit, the DoE knows it doesn't work and yet it is doing little to find alternative methods. The report recommends that the DoE shut down current treatments, establish concrete goals and try new technologies so that polluted water stops draining into the Columbia River .

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, August 31

NEW MEXICO, USA

The New Mexico Environment Department penalised the US Department of Energy (DoE) $2.4 million for violating hazardous waste management regulations. They discovered that numerous shipments of mixed waste destined for the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico had not undergone safety inspections and testing. Officials base the $2.4 million fine on 107 drums of radioactive waste shipped between March and July 2004 that were overlooked by DoE personnel. All of the $2.4 million fine will go to the State of New Mexico Hazardous Waste Emergency Fund to pay for environmental clean-ups.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, September

RUSSIA

The effects of the 1986 Chernobyl disaster are still being felt. The incidence of thyroid cancer among people who grew up in the highly radioactive environment is 45 times greater compared to those people living in the lowest-dose group. A research team of American and Russian researchers, led by Scott Davis, Ph.D. at the Fred Hutchinson Cancer Research Center, have established this dose-response relationship between the radiation dose from Chernobyl and thyroid cancer.

www.sciencedaily.com/releases/2004/09/040902085844.htm

2004, September 10

RUSSIA

Zemlya Bunge, Novosiberian islands, Yakutia − two Radioisotope Thermoelectric Generators (RTGs) were being flown from the 'New Siberia' island lighthouse. They were suspended by cables below a helicopter so they could be taken to the Russian polar station at Bunge. The helicopter flew into heavy weather and the crew was forced to drop the two RTGs from a height of 50 metres onto the tundra at Zemlya Bunge island. According to nuclear regulators, the impact compromised the RTGs' external radiation shielding. At a height of 10 metres above the impact site, the intensity of gamma radiation was measured at 4 mSv per hour.

www.bellona.no/bellona.org/english_import_area/international/russia/navy/northern_fleet/incidents/37598

2004, September 21

USA

The state of Washington's Department of Ecology issues a $270,000 fine to the US Department of Energy (DoE) for inappropriately shipping nuclear waste from South Carolina to the Hanford complex in Washington. State officials argue that 83 storage drums containing radioactive waste were accidentally shipped from South Carolina. Additionally, the waste was accompanied by documentation that was mostly incomplete, inaccurate, or missing. The DoE has 30 days to appeal the fine.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, December 20

CZECH REPUBLIC

At the Temelin nuclear power plant in the Czech Republic, more than 5,000 gallons of radioactive water leak from the reactor. Czech officials deny that the spill poses any environmental risk or that it endangers workers' health.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2004

2004, December 26

KALPAKKAM, INDIA / INDIAN OCEAN EARTHQUAKE AND TSUNAMI

The Indian Ocean tsunami on (resulting from a very large undersea earthquake off the coast of Indonesia) caused flooding at the Kalpakkam nuclear site in India. Water from the tsunami caused $3.5 million in damage at the site, and caused water level in the operating unit to rise, resulting in tripping of the reactor.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005-06

KOZLODUY, BULGARIA

Design, fabrication and delivery by Atomstroyexport, Russia to Kozloduy unit 5, Bulgaria, of a set of control rod drive mechanisms, not properly tested after implementing design changes. New control rod drive mechanisms were installed in Kozloduy unit 5 (WWER, 953 MW) in July 2005 during the annual outage. The unit restarted in the beginning of September 2005 and was operated at full power. However, on 1 March 2006 after a main coolant pump trip triggered the shut down of the reactor, it appeared that three control rods remained in the upper end position. The follow-up tests identified that 22 of a total of 61 control rods could not be moved with control rod drive mechanisms. The total number of control rods unable to scram (to drop due to gravity only) remains unknown. Presumably their number was between 22 and 55. Thus, for eight months the reactor was operated at full power with an insufficient number of operable control rods. Control rod drive mechanisms of this faulty design were also delivered and installed to Tianwan unit 1 (China) and Kalinin 3 (Russia).

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005

USA

Overexposure of a radiographer exceeding the annual limit for radiation workers. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale.

www.iaea.org/Publications/Factsheets/English/ines.pdf

2005

MIHAMA, JAPAN

A pipe failed due to erosion/corrosion leading to release of non-radioactive steam in the reactor number 3 building. Five workers died and six were injured. It was later revealed that the pipe wall thickness of the failed pipe had not been checked since the plant went into operation in 1976.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, January 8

USA / PACIFIC OCEAN

The U.S. nuclear-powered and nuclear-armed submarine U.S.S. San Francisco struck an uncharted undersea mountain near Guam while sailing submerged at high speed. The bow of the submarine was severely damaged. No radioactive material was released in the accident.

navysite.de/ssn/ssn711.htm

2005, January 24

MICHIGAN, USA

A leak of 18,000 to 27,000 gallons of coolant from the Fermi II nuclear power plant. The Nuclear Regulatory Commission cannot confirm whether or not the leaked water is radioactive.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, February 11

BOSTON, USA

Officials at the Nuclear Regulatory Commission announce that a Halliburton Co. shipment of radioactive material went missing in October 2004, but the company didn't alert government authorities until 8 February 2005. The material was found intact on 9 February in Boston after an intense search by federal authorities.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, February 12

WASHINGTON, USA

About 300 gallons of nitric acid leaked from a Richland, Washington low-level radioactive waste treatment plant. The liquid is slightly radioactive. The accident was reported when a yellowish-orange cloud was seen emanating from a storage shed operated by Pacific EcoSolutions, located on the southern edge of the Department of Energy's Hanford Site. Emergency responder crews and hazardous materials teams contain the spill and dispose of the leaked radioactive waste. Battelle Boulevard in north Richland is closed during the accident. Brant Baynes, Richland's Fire Chief, says local residents were lucky winds were calm because the nitric acid fumes could have posed a threat to public health.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, February 23

SOMALIA / INDIAN OCEAN TSUNAMI

The United Nations Environment Program (UNEP) releases the report, 'After the Tsunami: Rapid Environmental Assessment'. It provides a preliminary ground-level look at the December 2004 Asian tsunami's impact on various sectors of the region's environment. The report states that the tsunami has scattered Somalia's illegally dumped nuclear wastes across the country. When the tsunami hit on 26 December 2004, contamination and radioactivity was stirred up causing numerous health and environmental problems. The tsunami's power broke barrels and waste containers. Groundwater as well as fishing communities have been contaminated. Unusual health problems are arising, such as acute respiratory infections, heavy coughing and bleeding from the mouth, abdominal haemorrhages, unusual skin conditions, and sudden death after inhaling toxic materials.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, March 1

KOZLODUY-5, BULGARIA

In the process of power reduction at the Russian-designed pressurised water reactor (WWER), the operators identified that three control rod assemblies remained in the upper end position. The follow-up tests of the remaining control rod assemblies identified that 22 out of 61 could not be moved with the driving mechanisms. The exact number of control rod assemblies unable to scram (to drop due to the gravity only) remains unknown but it is thought to be between 22 and 55. The WWER-1000 scram system is designed to put the reactor in safe shutdown if one control rod assembly is jammed in the upper position. The operator had originally rated the incident a Level 0 'deviation' on the 7-point International Nuclear Event Scale but safety authorities eventually rated it a Level 2 'incident'.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, March 16

USA

US Department of Energy (DOE) Secretary Samuel Bodman announces that 'certain employees of the U.S. Geological Survey at the Department of the Interior working on the Yucca Mountain project may have falsified documentation of their work.' At question are studies of how water would infiltrate the storage areas.

www.nuclearfiles.org/menu/timeline/timeline_page.php?year=2005

2005, March 26

DOUNREAY, SCOTLAND

The Scottish Environment Protection Agency (SEPA) has been monitoring the sporadic discovery of radioactive spent fuel fragment contamination on public beaches in the area of the Dounreay nuclear facility. The Dounreay site is in the process of decommissioning its facilities, which contain three power reactors along with a fuel manufacturing and fuel reprocessing plant. The problem was first detected in 1984 and was seen as an isolated incident at the time, but a second particle was found in 1997 at Sandside. This prompted the formation of the Dounreay Particles Advisory Group (DPAG) to investigate the full extent of the problem.

Upon further review, likely reasons were identified. In December 2000 a particle was found buried in the soil near Dounreay castle adding an unforeseen piece to the puzzle. Early findings pointed to a transport chain based on improper drain routes allowing radioactive effluents access to 'non-active' drains running to the sea. The finding of a particle well outside the influence of the sea opens the possibility of air, humans or animals as the transport mechanism.

SEPA has required UKAEA to routinely monitor Sandside

Bay, the Dounreay Foreshore, Crosskirk, Brims Ness, Scrabster and Thurso Beaches. This program recently turned up another fuel fragment on Dunnet beach in March 2005.

SEPA now requires the UKAEA to monitor the degree of particle contamination on the seabed in an effort to understand the extent of the off-shore contamination.

2005, April 7

GRAVELINES-3, FRANCE

During the year 2006 the operator has noticed the presence of provisional pieces of equipment on both of the reactor protection control command lines. These pieces were applied during the previous reactor outage and had been left there by mistake. Under accidental conditions certain automatic sequences would not have taken place in a normal way. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, April 19

SELLAFIELD, U.K.

The hazards associated with nuclear reprocessing were highlighted in April 2005 with the revelation of an accident at the THORP reprocessing plant at Sellafield. A broken pipe led to the leaking into a containment structure of 83,000 litres of a highly radioactive liquor containing dissolved spent nuclear fuel. The leakage went undetected for at least eight months.

The accident was classified as Level 3 ('serious incident') on the 7-point International Nuclear Event Scale and British Nuclear Group Sellafield Limited was fined 500,000 pounds plus costs after pleading guilty to three serious, prolonged breaches of its licence conditions.

What is significant about the leakage is not the small environmental and health risk it posed but the fact that the liquid spill contained 160 kgs of plutonium − enough to build 15-20 nuclear weapons − yet the loss went undetected for at least eight months.

The UK Health and Safety Executive concluded: 'An underlying cause was the culture within the plant that condoned the ignoring of alarms, the non-compliance with some key operating instructions, and safety-related equipment which was not kept in effective working order for some time, so this became the norm. In addition, there appeared to be an absence of a questioning attitude, for example, even where the evidence from the accountancy data was indicating something untoward, the possibility of a leak did not appear to be considered as a credible explanation until the evidence of a leak was incontrovertible.'

There have been numerous other serious accidents and incidents at the Sellafield site (previously called Windscale) including the 1957 fire, a data falsification scandal and a serious sabotage incident in the late 1990s. Moreover the site has been a major source of radioactive emissions to the environment and has been the subject of formal complaints and opposition from European Governments.

UK Health and Safety Executive report: www.hse.gov.uk/nuclear/thorpreport.pdf

news.bbc.co.uk/2/hi/uk_news/england/cumbria/4559771.stm

news.bbc.co.uk/2/hi/uk_news/england/cumbria/4589321.stm

2005, May 16

CATTENOM-2, FRANCE

The sub-standard of the secondary coolant pump power supply cabling led to a fire in the electricity funnel. As a consequence one of the two safety circuits had to be disconnected. The operator EDF triggered its local (Level 1) internal emergency plan. The technical emergency center was activated. Details of the event have never been published. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, May 19 and August 26

UKRAINE

Two erosion/corrosion-related pipe failures occurred at the South Ukraine nuclear power plant. On 19 May 2005, a high-pressure heater line ruptured at Unit 2; and on 26 August 2005, a condensate pipe ruptured at the same plant. The lack of surveillance of this piping appears difficult to justify considering the previous operating experience with secondary pipe failures, which included many reported failures including a feedwater line break at the Surry Unit 2 plant in December 1986 that resulted in four deaths and two serious injuries.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, June 29

FORSMARK, SWEDEN

Radioactive water leaked into the Baltic Sea from the waste store at Forsmark nuclear power plant. The content of radioactive caesium-137 was 10 times the normal value. The Federal Institution of Radioactive Safety believed that the leakage came from one of the waste barrels that had corroded.

en.wikipedia.org/wiki/List_of_civilian_nuclear_accidents

2005, September 30

NOGENT-1, FRANCE

Material failures and human error during the restart of the reactor led to hot water and steam penetrating the four rooms containing the control command boards of the reactor protection system. Under normal conditions these rooms are independent from each other and should never be put in danger simultaneously. In the case of an accident, this incident could have made it difficult for the operator to bring back the reactor into safe state. EDF activated its internal emergency plan and the nuclear safety authority ASN activated its national emergency organisation for a few hours. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M., et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, December

SHEARON HARRIS, NORTH CAROLINA, USA

In December 2005, the nuclear power watchdog groups NC WARN and Union of Concerned Scientists disclosed a number of security allegations that had been brought to their attention by security personnel at the Shearon Harris nuclear plant in New Hill, North Carolina. In response to the NC WARN-UCS letter, the Nuclear Regulatory Commission sent an inspection team to the site to investigate the allegations. None of these issues had previously been noticed by NRC inspectors. The allegations included broken security doors leading to vital areas that management refused to fix despite repeated complaints from security officers; widespread cheating on the security certification exams administered to security officers by the state of North Carolina; and the issuance of merchandise 'gift cards' in lieu of overtime payments in order to keep excessive overtime hours off the books. All three of these allegations were substantiated, although the NRC claimed the last one was due to a misunderstanding. The NRC claimed that these events were of 'very low safety significance', providing a window into the NRC's questionable perception of the dangers posed by such chronic and severe security violations.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2005, December 21

CHINON-B (FOUR UNITS), FRANCE

An ill-conceived surveillance of the tertiary cooling water intake canal led to its significant silting up. The collapse of the sand hill could have led to the heat sink loss of all four reactors. Synthetic material used to selectively remove dissolved contaminants such as heavy metals or radionuclides from water by replacing or exchanging them with other constituents. As dated by IRSN, the safety authorities technical support organization. According to a database transmitted by ASN have dated the incident on 30 December 2005 and notes it as declared by EDF on 4 January 2006; Marc Stoltz, database transmitted by e-mail to the project coordinator, personal communication, 23 February 2007. Rated Level 1 ('anomaly') on the 7-point International Nuclear Event Scale.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006

FLEURUS, BELGIUM

Severe health effects for a worker at a commercial irradiation facility as a result of high doses of radiation. Rated Level 4 ('accident with local consequences') on the 7-point International Nuclear Event Scale.

www.iaea.org/Publications/Factsheets/English/ines.pdf

2006

OLKILUOTO-3, FINLAND

Significant lack of safety culture and repeated delays in the construction of Olkiluoto-3, Finland. Construction of Olkiluoto-3 (PWR, 1600 MW) is being undertaken by AREVA NP under a turnkey contract. Finnish safety authorities STUK released a report in 2006 which stated: 'The so-called safety culture training to all those participating in the plant delivery, as stipulated in IAEA regulations and in discussions between STUK and [energy utility] TVO, has in practice not been provided in most cases. One expert of TVO's quality organisation stated in the interview that, as far as he knew, this training had not been provided in any organisation. It has not been defined what the content of the training should be and who should be responsible for its provision.'

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006, February 16

ROCKY FLATS, USA

A federal jury ruled that two Department of Energy contractors allowed plutonium from the Rocky Flats weapons plant to contaminate nearby land. The jury decided Dow Chemical and the former Rockwell International damaged land around the now-defunct plant through negligence that exposed thousands of property owners to plutonium and increased their risk of health problems. Jurors awarded the plaintiffs US$553.9 million in damages. The government already is facing an estimated $58 million in legal fees for the contractors. State and federal laws likely will limit any verdict payout to US$352 million, attorneys said, but taxpayers may have to foot the bill because the two companies' contracts called for the federal government to indemnify them. The plant

made plutonium triggers for nuclear warheads until it was closed in 1989. The lawsuit was filed in 1990 on behalf of 13,000 people.

About 25,000 people worked in the construction or operation of the plant from 1949 to 1990. Department of Labor figures released in May 2007 showed that 5,221 claims had been filed from Colorado, and 2,615 of them had been paid. The total paid to Colorado claimants was $130,660,717

http://seattletimes.nwsource.com/html/nationworld/2002808447_rockyflats16.html

www.havredailynews.com/cms/news/story-148175.html

2006, March 1

KOZLODUY, BULGARIA

New control rod drive mechanisms were installed in Kozloduy unit 5 in July 2005 during the annual outage. The unit restarted in beginning of September and was operated on full power. However on 1 March 2006 after a main coolant pump trip it appeared that 22 of total 61 control rods could not be moved with control rod driving mechanisms. Rated Level 2 ('incident') on the 7-point International Nuclear Event Scale. The root cause for this incident was design changes of driving mechanisms, which were not properly authorised and tested. Thus, during eight months the reactor was operated at full power with an insufficient number of operable control rods. The Kozloduy incident included elements of faulty detailed design and institutional failure to conduct type approval quality assurance controls.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006, March 16

BRAIDWOOD, USA

The State of Illinois sued Exelon Corporation for repeated leaks of tritium into water discharged around its Braidwood Nuclear Generating Station. The spills poisoned underground water and, after a legal challenge, the company agreed to pay US$11.5 million for a new water supply for the neighbouring village. Will County State's Attorney General, James Glasgow, said Exelon and its subsidiaries 'clearly placed their profit margin first with a callous disregard for the health, safety and welfare of the local residents.'

en.wikipedia.org/wiki/List_of_civilian_nuclear_accidents

2006, March 22

OKI, JAPAN

A fire broke out at Kansai Electric Power Co's (KEPCO) plant at Oki. A spokesman said a waste disposal facility at No. 3 and No. 4 nuclear power generation units at the plant had caught fire. KEPCO's Ikuo Muramatsu said the thick smoke was making it hard for firefighters to approach the building, according to the Associated Press news agency. Employees were evacuated. Two were taken to hospital. No unusual radiation exposures were reported.

Reuters

2006, June 2

TEMELIN, CZECH REPUBLIC

Design, fabrication and supply by Westinghouse to the Temelin nuclear power plant, Czech Republic, of fuel assemblies that were bending and twisting, causing problems with control rod insertion. By the middle of third fuel cycle of Temelin unit 1 (WWER, 931 MW) there were 11 control rods (neutron absorbers) that could not be entirely inserted and at the end of the fuel cycle their number had increased to 30. In the beginning of the fourth fuel cycle (October 2005 – June 2006) there were two control rods that could not be inserted properly and at the end of the cycle their number had increased to 51. The results of the last drop test of control rods performed on 2 June 2006 demonstrated a step change in further deterioration of fuel assemblies − two neutron absorbers came to a halt above the bottom of the reactor core and the unit was shutdown about four months before the planned outage. Despite improvements to the design, in September 2006 Temelin unit 1 started the next fuel cycle, presenting again seven control rods unable to reach full insertion. Similar problems are experienced in Temelin unit 2.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2007, July

SELLAFIELD, UK

The operators of Sellafield are to be prosecuted after two contractors received 'higher than anticipated' doses of radiation (17 and 4 mSv). The workers were refurbishing a floor at the site's plutonium finishing and storage plant in July 2007 when they were exposed to airborne contamination. Sellafield Ltd was accused of failing to discharge its duty under UK Section 3 (1) of the Health and Safety Act. Sellafield Ltd. was later fined 75,00 pounds plus costs.

http://news.bbc.co.uk/2/hi/uk_news/england/cumbria/8063372.stm

www.telegraph.co.uk/news/uknews/6729077/Sellafield-fined-75000-for-exposing-worker-to-radiation.html

2007, July 16

NIIGATA, JAPAN

A 6.8-magnitude quake hit the Kashiwazaki-Kariwa light-water nuclear plant, the world's largest nuclear power complex. Four reactors shut down automatically while three were already shut down for inspection. Radiation releases included small leaks of radioactive liquids from Unit 6 reactor building, a spent fuel pool and other sources; 12 MBq of iodine and 402 MBq of particulate radioactivity released from an exhaust pipe; and the release of small quantities of radionuclides from 400 drums of low-level nuclear waste which were knocked over, 40 losing their lids. Fire broke out in a transformer building.

www.independent.co.uk/news/world/asia/nuclear-leak-after-earthquake-in-japan-457525.html

http://en.wikipedia.org/wiki/Kashiwazaki-Kariwa_Nuclear_Power_Plant

http://cnic.jp/english/newsletter/nit119/nit119articles/kkearthquake.html

2006, July 25

FORSMARK, SWEDEN

A short circuit in an outdoor switching station caused the emergency shutdown (scram) of unit 1 and led to a number of subsequent failures at the plant. Due to a design error, the disconnection of the plant from the grid and the switch to house load operation − where the power plant uses its own power to operate essential auxiliaries − did not function as planned. An inappropriate converter adjustment led to the failure of the attempt to connect safety related equipment to the emergency power supply. The start up of two of the four emergency diesel generators was aborted, which led to a partial blackout, even in the main control room. For a period of time, the exact state of the plant and the consequences of potential actions to perform were unclear. The shift team decided nevertheless to try to reconnect the plant to the grid, which was performed successfully.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2006, August

SOUTH TEXAS, USA

Whistleblower complaints − brought to light in August 2006 by the Union of Concerned Scientists − at the South Texas Project nuclear plant near Bay City, Texas, resulted in a special security inspection by the Nuclear Regulatory Commission. These included an allegation that during a force-on-force security drill being observed by both the NRC and the Federal Bureau of Investigation, the mock adversary team was instructed by management to intentionally lose the exercise. The NRC substantiated the concern of the employee who reported it.

Schneider, M. et al., 2007, 'Residual Risk', www.greens-efa.eu/residual-risk-3736.html

2007, August 4

VALENCIA, SPAIN

A blaze which started at 11:45am local time at the Cofrentes nuclear power plant in eastern Spain resulted in a shut-down of the facility. The Nuclear Security Council said the fire was put out one hour later.

www.jovenesverdes.org/joomla/index.php?option=com_content&task=view&id=426&Itemid=1

2007, August 22

VERMONT YANKEE, USA

In 2007 the fourth cell of the west cooling tower collapsed, spilling some of the non-radioactive, cooling water. The Nuclear Regulatory Commission stated that the remaining cooling tower had enough capacity to allow the plant to operate at full output, however, until September 16, 2007 the reactor was kept at 50% power.

en.wikipedia.org/wiki/Vermont_Yankee_Nuclear_Power_Plant

2007, October 9

ROME, ITALY

A nuclear waste trafficking scandal has been unveiled by the authorities in Italy. The 'Ndrangheta mafia', a powerful mafia clan, has been accused of monitoring illegal shipments of radioactive waste from miscellaneous countries to Somalia, as well as seeking the 'clandestine production' of other nuclear material. This alleged waste-dumping tarnished the image of the state energy research agency Enea. It is alleged the manager paid the clan to get rid of 600 drums of toxic and radioactive waste from Italy, Switzerland, France, Germany, and the US.

www.guardian.co.uk/world/2007/oct/09/italy.nuclearpower

2007, November 2

ASCO VILLAGE, TARRAGONA, SPAIN

The 1,000 megawatt Endesa-owned Asco plant experienced a leak in November 2007 during refuelling, which was only detected in March 2008. According to the Nuclear Safety Council, regulators were eventually notified on April 4. Even though it did not cause any personal or environmental damage, the Spanish government fined Endesa 15.4 million euros for failing to report the incident properly and downplaying the amount of contamination released.

www.world-nuclear-news.org/newsarticle.aspx?id=25202

www.reuters.com/article/idUSL2873981320080428

www.neurope.eu/articles/89404.php

www.reuters.com/article/idUSLB59038420090511

www.reuters.com/article/idUSL115448520080611?rpc=401

2008

JAPANESE PORTS / US SUBMARINES

The U.S. government filed its final report on the submarine USS Houston's radioactive leak, saying it had no adverse effect on human health or the environment. The incident came to light on August 1 when the United States notified Japan that the Los Angeles-class fast-attack sub may have leaked radioactive water during port calls at Nagasaki, Kanagawa and Okinawa prefectures. According to the US Embassy, the radioactive releases were negligible − less than one microcurie − and were due to water seeping out of a shut valve.

http://search.japantimes.co.jp/mail/nn20080830a5.html

2008

JAPAN

Tadashi Kiyuna died of malignant lymphoma in March 2005 at the age of 53 after being exposed to radiation through his work at nuclear power plants throughout Japan and at the Rokkasho Reprocessing Plant. An expert committee established by the Ministry of Health, Labour and Welfare concluded that there is a causal relationship between malignant lymphoma and worker radiation exposure. On 27 October 2008, after receiving the expert committee's report, the Yodogawa Labor Standard Supervision Office in Osaka informed Kiyuna's widow that it had accepted his family's application for workers' compensation. In so doing it overturned its September 2006 decision. On hearing the news, Kiyuna's wife Sueko said: 'This result is due to the support of people throughout the whole of Japan. Time has stood still for me since the death of my husband, but it has begun to move again. I feel my strength returning through my whole body. If there are any other people like my husband suffering from cancer due to their exposure to radiation while working at nuclear plants, I would like to support them.'

http://cnic.jp/english/newsletter/nit127/nit127articles/kiyunanagao.html

2008, April 19

SANTA FE, MEXICO

The Navajo Nation is situated on a geological formation rich in radioactive ores. It has experienced widespread mining and milling of uranium for military and energy purposes since the 1940s. This has created a legacy of over 500 abandoned uranium mines, four inactive uranium milling sites, a former dump site, contaminated groundwater, and environmental and public health concerns.

But increasing prices of uranium, rising from $7 per pound to $68 per pound during the past seven years, have triggered a steep rise in the number of exploratory land permits requested by mining companies in New Mexico. Despite a Navajo Nation ban on uranium mining on Navajo land imposed on April 19, 2005, the Nuclear Regulatory Commission (NRC) approved the license to Hydro Resources Inc. for an in-situ leach uranium mine in May 2006. For the first time in history, the commission will be challenged in federal appeals court by the New Mexico Environmental Law Centre, which filed a lawsuit in 2007 against the NRC to overturn the license.

www.ens-newswire.com/ens/apr2008/2008-04-19-02.asp

2008, September 24

RUSSIA

Russian State Channel One program Health has warned that the 1986 Chernobyl accident is still wreaking havoc. A study on the Tula, Bryansk, Kaluga and Orlov regions showed that thyroid cancers were 20 to 70 times above normal levels.

www.bellona.org/news/news_2008/chernobyl_thyroid

2008, December,

OLKILUOTO, FINLAND

Concerns that the new EPR (European Pressurised Water Reactor) is susceptible to an airplane strike. On 16 May 16 2006, the spokesperson of the anti-nuclear organisation Sortir du Nucleaire was arrested for 14 hours by the French secret service for possession of a classified defence document. According to this document, EPR reactors would not resist a terrorist attack, such as those carried out in the U.S. on September 11, 2001.

In 2008, the EPR construction in Finland was questioned after numerous design errors were pointed out. Multiple non-conformities included incorrectly positioned reinforcements, inadequate control and cooling systems and hazardous waste storage.

www.newscientist.com/article/dn9191-europes-new-nuclear-%09reactors-will-not-be-911proof.html

www.greenpeace.org.uk/blog/nuclear/finland's-under-construction-ol3-reactor-'without-proper-design-meets-basic-principles-nuclear-safety'-20090514-0

www.terranauta.it/a1050/nucleare/pericolo_nucleare_fermate_quel_%09reattore.html

news.bbc.co.uk/2/hi/europe/8138869.stm

www.independent.co.uk/environment/green-living/safety-threat-to-planned-nuclear-power-stations-1682293.html

2008, December 5

CHALK RIVER, ONTARIO, CANADA

Reports filed with the Canadian Nuclear Safety Commission by Atomic Energy of Canada say a radioactive spill happened on December 5 and radioactive tritium was released into the air. Officials said neither workers nor area residents were exposed to significant danger, and 211 gallons of contaminated water was captured and is being stored in special drums. The reactor was shut down briefly. A news release at the time of the brief shutdown said only 'unanticipated technical challenges' had occurred at the facility west of Ottawa.

www.upi.com/Top_News/2009/01/27/December-nuclear-spill-reported-in-Canada/UPI-99571233060610/?rel=95821242742150

2009

KAKADU NATIONAL PARK, N.T., AUSTRALIA

The Commonwealth Supervising Scientist confirmed that the Ranger Uranium Mine is leaking around 100,000 litres of uranium-contaminated water into the groundwater every day. The contaminant was found to be leaking from the tailings pond into rock fissures beneath the World Heritage listed Kakadu National Park. The water may contain up to 5,000 times the background level of uranium. Local communities registered concerns that the contaminated water could run in to local drinking water supplies.

www.theage.com.au/national/polluted-water-leaking-into-kakadu-from-uranium-mine-20090312-8whw.html

www.abc.net.au/news/stories/2010/05/28/2911960.htm

2009, March 5

KASHIWAZAKI-KARIWA, USA

Pump Room fire at Kashiwazaki-Kariwa nuclear power plant owned by TEPCO. One worker suffered minor burn injuries. The Nuclear and Industrial Safety Agency implemented an inspection and issued a severe reprimand to TEPCO.

http://vaec.gov.vn/en/TabId/684/ArticleId/2564/PreTabId/624/Default.aspx

2009, March 24

FRANCE

The French government plans to offer compensation to nuclear test victims by setting up a US$13.6 million fund which will be distributed by a panel of independent doctors. For decades, the government had rejected any links between nuclear tests in the Pacific and statistics which report illnesses, including cancers and heart diseases, affecting people in the test areas. But another reason for compensation is to avoid long costly trials.

French atom bomb testing began in Algeria in 1960, then moved in 1966 to French Polynesia. The tiny atoll was the test site for Program O for 30 years. This sparked violent protests, which reached a climax in 1985 when the French secret service sank Greenpeace's ship Rainbow Warrior in a New Zealand port.

www.youtube.com/watch?v=p2wvPP5zWQM

2009, April 9

UKRAINE

Three men, including a regional lawmaker, have been arrested by the Ukrainian Security Service (SBU) for allegedly trying to sell 37 kgs of plutonium-239 to an undercover agent. However, tests showed that it was actually a metallic chemical called americium, a common and less radioactive material that can only be used in making terrorist weapons, or so-called dirty bombs. Although Ukraine renounced nuclear weapons after the Soviet collapse, concerns remain over the existence of unsecured radioactive material being smuggled, illegally handled and eventually sold to the highest bidder on the black market.

www.rferl.org/content/Ukraine_Arrests_Three_Attempting_To_Sell_Radioactive_Material/1609074.html

www.huffingtonpost.com/2009/04/14/ukraine-arrests-lawmaker-_n_186925.html

www.nytimes.com/2009/04/15/world/europe/15ukraine.html

2009, May 4

PAKS, HUNGARY

In a mishap during maintenance work, a device that measured neutron flow fell into the Block 4 reactor at the nuclear power plant in Paks. The winch cable broke that was to have hauled it out of the reactor interior. There were no injuries to workers. Hungarian nuclear energy officials rated the accident at Level 2 on the 7-point International Nuclear Event Scale. Previous incidents include a radioactive gas release in 2003 from damaged fuel rods (Level 3 'serious incident'), and Level 1 incidents ('anomalies') in 2006 and July 2008.

www.topnews.in/mishap-hungarian-nuclear-reactor-2162163

2009, May 5

VALENCIA, SPAIN

Malfunctioning electronics created problems at the Spanish nuclear power plant, Confrentes. Experts concluded that the incident was most likely caused by a system failure and that the plant could be back online the following day. Although the Nuclear Safety Council stated that this event did not harm workers, the public or the environment, the plant has already suffered many power downs. There were more than three in the first three months of 2009. Its license expires in 2011.

www.lasprovincias.es/valencia/20090506/valenciana/fallo-sensor-temperatura-obliga-20090506.html

2009, May 9

BELGIUM

A report released by the ONDRAF, the National Authority of Radioactive Waste, raised awareness about insufficient radioactive waste management funds in Belgium. According to the report, US$233 million would be necessary to cover the shortfall.

www.rtbf.be/info/belgique/nucleaire/nucleaire-le-rapport-de-londraf-09pointe-du-doigt-le-manque-de-provision-106241

2009, May 11

MADRID, SPAIN

The 1,000 MW nuclear plant, Asco I, has been fined nearly US$21 million by the Spanish government for six charges of breaching safety rules over a radioactive leak in November 2007. The breach occurred when radioactive water splashed a ventilation system during refuelling. The fine is the highest ever made against a nuclear power plant in Spain.

www.reuters.com/article/rbssUtilitiesElectric/idUSLB59038420090511

2009, May 11

SELLAFIELD, U.K.

The managers of Sellafield reprocessing plant, Nuclear Management Partners, have admitted that radioactive waste was leaking for 14 months without detection and that two containers of highly radioactive material were lost. The leaking pipe had been left unnoticed 'because managerial controls over the line were insufficient and there was inadequate inspection' according to the conclusions of a board of inquiry. The 'steady drip' was detected on 23 January, the day Prime Minister Gordon Brown visited the site to announce possible locations for new nuclear power stations. The leak was initially classified as a Level 1 accident ('anomaly') on the International Nuclear Event Scale but was later upgraded to Level 2.

http://news.bbc.co.uk/2/hi/uk_news/england/cumbria/8050008.stm

www.guardian.co.uk/business/2009/may/17/safety-scares-at-sellafield

www.whitehavennews.co.uk/news/sellafield_braces_for_fall_out_over_undetected_pipe_leak_1_557205

2009, May 13

TRICASTIN, FRANCE

An accident occurred in a reactor building where two tonnes of mechanic components fell from a height of 15 metres. Only material damages were reported and no workers were injured. Safety checks have been urged by the Nuclear Safety Authority due to numerous malfunctions that have occurred since the beginning of the year, including repeated leaks of uranium and problems with discharging machines.

www.lemonde.fr

2009, May 14

CHALK RIVER, CANADA

A small leak of heavy water was detected within the National Research Universal reactor (NRU) at Chalk River. Atomic Energy of Canada Ltd. shut down the reactor after discovering the leak, and could not provide a timeline for its reopening. Reports state that the repairs may involve removing the fuel rods in the reactor and draining the vessel that holds the heavy water, which could keep the facility off-line for at least a year. The incident has raised questions about the future of the 50-year-old facility. Its also likely to compound the worldwide shortage of medical isotopes used in the diagnosis and treatment of cancer and other illnesses, as the plant owner said it will be unable to meet the increasing demand for medical isotope.

www.reuters.com/article/idUSN2121590320090521

blogs.physicstoday.org/newspicks/2009/07/medical-isotope-shortage-reach.html

www.bloomberg.com/apps/news?pid=20601082&sid=aG.uHSnCrupE&refer=canada

2009, May 14

SOUTHERN MARYLAND, USA

A statewide SWAT team exercise at a firing range on the secured grounds of a nuclear power plant in Southern Maryland was halted on May 14 after stray bullets shattered glass and struck a command centre near the plant's reactors. At least five bullets escaped the firing range and travelled more than 800 m before striking buildings and a vehicle near the reactors. One struck the plant's 'outage control centre', another hit an employee's car and three struck an office facility. Employees were working in both buildings at the time. Firing ranges are common on the sprawling grounds of the nation's nuclear facilities.

www.washingtonpost.com/wp-dyn/content/article/2009/05/27/AR2009052703405.html

2009, May 15

ANGRA II, BRAZIL

A leak at Brazil's Angra II nuclear power plant in Rio de Janeiro state affected six employees, state-owned Eletronuclear said. The leak on May 15 was a 'Level 1' event on the International Nuclear Event Scale. Tests showed the workers were exposed to 'very low' levels of radiation. The accident occurred during a routine procedure to scrape a contaminated part, with several filings entering the air conditioning system, which had not been disconnected due to an error.

http://www.laht.com/article.asp?ArticleId=335911&CategoryId=14090

2009, May 15

PALUEL, FRANCE

An incident at the Paluel plant was due to a deficiency in a cooling reactor. The International Nuclear Event Scale Level 1 incident ('anomaly') was the result of the incorrect assembly of a component part of the pump circuit, dating back to 2001. The circuit is essential in the event of very serious incidents.

www.sortirdunucleaire.org/actualites/presse/affiche.php?aff=6068

2009, May 17

JAPAN

An armed vessel with a load of recycled nuclear fuel from France arrived amid heavy security at a Japanese port. The Pacific Heron delivered a load of mixed-oxide or MOX fuel, a blend of plutonium and reprocessed uranium. Environmental group Greenpeace has called the cargo, which left France in March via a secret route, 'the largest shipment of plutonium in history,' saying the 1.8 tonnes would be enough to make 225 nuclear weapons. Japan experiences about 20 percent of the world's most powerful quakes, and anti-nuclear activists say relying on atomic power in a tectonically unstable country is a catastrophic accident waiting to happen.

AFP:
www.google.com/hostednews/afp/article/ALeqM5itSPU0AsAiKCe-QzYLY8w6xwJhZw

2009, May 21

CAMPANIA, ITALY/ HAMBURG, GERMANY

German authorities have banned the processing of Italian hospital wastes after they found they contained levels of radioactivity 80 times higher than normal. Hamburg said it will not continue to reprocess any more waste coming from Italy unless it receives written guarantees from the Italian authorities that all rubbish has been checked thoroughly before being sent to Germany.

current.com/items/89006852_germany-hamburg-bans-waste-from-italy-due-to-high-levels-of-radioactivity.htm

2009, May 21

CERNAVOD, ROMANIA

Romania's only nuclear power plant, at Cernavod on the Danube River, was shut down after a water pipe cracked on the Unit 1 reactor. Authorities said the cracked pipe posed no radiation risks and that the reactor would be back in operation the following week.

www.upi.com/Top_News/2009/05/31/Romania-repairs-nuclear-plant-water-pipe/UPI-37601243781309/

2009, May 25

CHAMBÈRY, FRANCE

The Citizen Inspection Authority, set up by Greenpeace and French organisation Sortir du Nucleaire, has revealed that 28 tonnes of radioactive waste recently crossed the Savoie region using ordinary railway transport. According to the group, this is the 11th convoy of this type that has been discovered since 2007. Local groups want to increase the pressure on authorities to keep the public better informed about where and when these crossings are taking place.

bellaciao.org/fr/spip.php?article86388

chichechambery.free.fr/spip/spip.php?article385

2009, June 2,

USA

The US government mistakenly made public a 266-page report, marked 'highly confidential', that gives detailed information about hundreds of civilian nuclear sites and includes nuclear reactors and confidential sites at weapon laboratories.

http://www.nytimes.com/2009/06/03/us/03nuke.html

2009, July 9

TRICASTIN, FRANCE

Liquid containing uranium leaked into two nearby rivers at the Tricastin nuclear site, about 40 kms from the city of Avignon. France's nuclear safety agency banned the consumption of well water in three nearby towns. It also halted the watering of crops from the two rivers, the Gaffiere and the Lauzon, as well as all water-related activities such as swimming and fishing. Plant managers said the spill was only slightly radioactive and happened while a tank was being washed.

www.nysun.com/foreign/france-uranium-leak-leads-to-water-bans/81453

2009, July 15

DRESDEN, USA

A liquid substance containing six times the allowed level of tritium was discovered leaking from a turbine building at the Dresden nuclear power plant. The plant's owner, Exelon, owns 10 nuclear power plants in the U.S. Records show that executives took steps to hide three radioactive tritium spills at its Braidwood Plant in Will County between 1996 and 2006.

articles.lancasteronline.com/local/4/239699

www.ens-newswire.com/ens/mar2006/2006-03-21-02.asp

www.chicagobreakingnews.com/2009/06/exelon-radioactive-leak-contained-not-in-water-supply.html

2009, September 27

UK NUCLEAR SUBMARINES

Figures released by the UK Ministry of Defence (MoD) detail the number of fires on UK nuclear submarines since 1987:

- 213 small-scale fires, that are categorised as a localised fire such as a minor electrical fault creating smoke dealt with quickly and effectively using minimal onboard resources.
- 20 medium-scale fires that were generally categorised as a localised fire such as a failure of mechanical equipment creating smoke and flame requiring use of significant onboard resources.
- Three fires occurred while the submarines involved were in naval bases, requiring both ship and external resources.

Nearly half of the medium- and large-scale fires occurred on submarines which could have been carrying nuclear weapons. The three most serious fires were as follows:

- 17 February 1992 / HMS Renown / Clyde
- 30 April 1992 / HMS Turbulent / Devonport
- 24 October 2003 / HMS Trafalgar / Devonport

Data on pre-1987 fires was not held centrally by the MoD.

www.robedwards.com/2009/09/exposed-22-serious-fires-on-nuclear-submarines.html

www.publications.parliament.uk/pa/cm200809/cmhansrd/cm090916/corrtext/90916c0001.htm

the 2010s

2010

PEACH BOTTOM, USA

Workers slowed down control rod testing to evade regulations that would have required a plant shutdown. Nuclear Regulatory Commission inspectors were aware of the problem but failed to address it adequately.

www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/nrc-and-nuclear-power-2010.html

2010

INDIAN POINT, USA

Inspectors documented that the liner of the refueling cavity of the Indian Point power reactor had been leaking since 1993. Nuclear Regulatory Commission management chose to ignore the problem.

www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/nrc-and-nuclear-power-2010.html

2010

VERMONT YANKEE, USA

The Nuclear Regulatory Commission ignored regulations requiring that all releases of radioactively contaminated air be via controlled and monitored pathways − regulations that had been grounds for shutting down a Baton Rouge plant two years previously.

www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/nrc-and-nuclear-power-2010.html

2010, January 22,

NORTH RHINE WESTPHALIA, GERMANY.

A man was hospitalised after being exposed to radioactive material at a uranium enrichment plant. Uranium had leaked into the designated 'safe room' where the man was at the time.

www.dw-world.de/dw/article/0,,5157327,00.html

2010, March 11

ILLINOIS, USA

Exelon Corp. agreed to pay more than US$1.1 million to settle lawsuits connected to releases of radioactive tritium from three of its nuclear power plants, including Braidwood in Will County. Before brokering the legal settlement, Exelon agreed to pay US$11.5 million toward a new water supply for Godley, a village near the Braidwood plant. The payment settles suits filed by Illinois Attorney General Lisa Madigan and three local state's attorneys. Also settled was a third lawsuit pertaining to tritium leaks beginning in 2001 at the Dresden nuclear plant in Grundy County.

Exelon has been criticised for failing to notify authorities and neighbours about the leaks promptly. After the Braidwood contamination was revealed in 2006, the company was cited by the Nuclear Regulatory Commission for failure to respond properly to 22 leaks that started in 1996.

Tritium has leaked from at least 48 of 65 commercial nuclear power sites, according to U.S. Nuclear Regulatory Commission records reviewed as part of a year-long examination of safety issues at ageing nuclear power plants by Associated Press.

www.msnbc.msn.com/id/43475479/ns/us_news-environment/t/radioactive-tritium-leaks-found-us-nuke-sites

www.chicagotribune.com/business/ct-biz-0312-exelon-leak-settlement-20100312,0,5583245.story

www.illinoisattorneygeneral.gov/pressroom/2010_03/20100311.html

http://articles.chicagotribune.com/2010-03-12/business/ct-biz-0312-exelon-leak-settlement-20100312_1_exelon-nuclear-tritium-leaks

2010, June

NEW JERSEY, USA.

The state of New Jersey ordered the company responsible for a 2009 leak of tritium at Oyster Creek to clean up the spill. Exelon, operators of the Nuclear Generating Station, admitted water contaminated with the nuclear reactor by product spilled into the creek. The station is also responsible for contaminating the Cohansen aquifer below the plant - a significant drinking water source for local residents.

www.nj.com/news/index.ssf/2010/09/oyster_creek_nuclear_plant_to.html

eponline.com/articles/2010/06/08/new-jersey-orders-exelon-to-check-oyster-creek-tritium-leak.aspx

2010, September

KYRGYZSTAN

Kyrgystan's president Rosa Otunbayeva appealed to the international community for help managing the country's uranium tailing sites. Kyrgystan claims they lack the resources to maintain environmental protection standards because of soaring international debts. Kyrgyzstan inherited 23 uranium tailing ponds from Soviet-era mining operations, and these sites are recognised as high-risk because of their vicinity to major water sources and susceptibility to landslide.

worldwidescience.org/topicpages/k/kyrgyzstan.html

2010, September 26

AOMORI PREFECTURE, JAPAN

Japan Nuclear Fuel Ltd delayed the start of full-scale commercial operation of its Rokkasho nuclear reprocessing plant until 2012. The plant is now 15 years behind schedule, having been originally slated to begin production in 1997. According to the CNIC:

'Testing of the vitrification furnaces has been a vicious circle in which one problem has led to another. Due to its lack of technical ability, JNFL has only been able to respond to problems in a haphazard fashion. To deal with the sedimentation of platinum group elements at the bottom of the vitrification furnace it inserted a stirring rod, but the stirring rod bent and in the ensuing confusion a brick was dislodged from the ceiling of the furnace. As attempts were being made to overcome the problem, about 150 liters of highly radioactive liquid waste leaked and evaporated within the cell.'

cnic.jp/english/newsletter/nit138/nit138articles/rokkasho.html

www.asahi.com/english/TKY201010110178.html

2010, October

NISKAYUNA, NY

A clean-up at the Knolls Atomic Power Laboratory leaked radioactive water into the Mohawk River during a clean-up of the 1950s nuclear weapons research site. The water, which caesium-137, strontium-90, uranium and plutonium, flowed into the river after heavy rainfall damaged an operating pump and drain. The Department of Environment and Conservation cited Knolls for a violation of the Clean Water Act.

www.timesunion.com/local/article/Radioactive-leak-from-Knolls-cleanup-site-803666.php

2011, March 11

FUKUSHIMA, JAPAN

A powerful tsunami generated by a magnitude 9.0 earthquake caused extensive damage to the Fukushima Daiichi nuclear power plant. Grid power was lost due to earthquake damage. Back-up generators were deployed but they soon failed due to the impact of the tsunami. Batteries provided power for some hours but plant operator TEPCO then had no method of powering the reactor cooling system.

The situation spiralled out of control leading to nuclear fuel melting and damage in reactor cores and spent fuel stores (located in the reactor buildings), multiple fires and, later, hydrogen explosions. Four of the six reactors were seriously damaged.

The disaster was rated Level 7 ('Major Accident') on the 7-point International Nuclear Events Scale. Only Chernobyl and Fukushima have been rated Level 7.

Over 100,000 people were evacuated; as at January 2012 most had not been able to return, and some areas will remain uninhabitable for decades. Profound misery has resulted from the Fukushima disaster including poor physical and mental health, numerous suicides, financial losses, stigmatisation of evacuees, and so on. Total economic costs from the disaster will amount to hundreds of billions of dollars.

The long-term death toll from radiation exposure cannot be reliably estimated at this stage (January 2012); it will certainly amount to some hundreds of deaths, possibly over 1,000.

The Japanese government established an Investigation Committee in June 2011. The Committee's interim report, released six months later, is a damning indictment of the Japanese government, nuclear regulatory agencies, and TEPCO. The report states that tsunami risks were 'grossly underestimated' and the response to the disaster was characterised by 'poor communication and delays in releasing data on dangerous radiation leaks at the facility'.

The Fukushima disaster has put the spotlight yet again on the failures of Japan's nuclear power industry: widespread safety breaches, widespread data falsification, inadequate regulation, inadequate worker training, inadequate disaster risk mitigation, and inadequate emergency planning.

2011, September

DOUNREAY, SCOTLAND

Radioactive contamination that leaked for more than two decades from Dounreay will never be completely cleaned up, a Scottish government agency has admitted. The Scottish Environment Protection Agency has decided to give up on its aim of returning the seabed near the plant to a 'pristine condition'. Tens of thousands of radioactive fuel fragments escaped from the Dounreay plant between 1963 and 1984, polluting local beaches, the coastline and the seabed. Fishing has been banned within a two-kilometre radius of the plant since 1997. Since 2008, over 2,300 radioactive particles have been recovered from the seabed, with 351 removed by a remotely operated underwater vehicle this summer. Since 1983, over 480 particles have also been found on three local beaches and the Dounreay foreshore.

The particles are milled shards from the reprocessing of irradiated uranium and plutonium fuel from two long-defunct reactors. They are thought to have drained into the sea with discharges from cooling ponds. In 2007, Dounreay, which is now being decommissioned, pleaded guilty at Wick sheriff court to a 'failure to prevent fragments of irradiated nuclear fuel being discharged into the environment'. The plant's operator at the time, the UK Atomic Energy Authority, was fined 140,000 pounds.

www.guardian.co.uk/environment/2011/sep/21/scottish-nuclear-leak-clean-up

2011, November

SWITZERLAND / RUSSIA

Swiss nuclear utility Axpo has said it will stop receiving shipments of uranium from Russia's controversial Mayak Chemical Combine on the grounds that the company has not been granted access to examine the Mayak area's environment first hand. The move represents a growing trend of European mistrust toward the Mayak Chemical combine – located in the Ural Mountain in the Chelyabinsk Region – over issues of radioactive contamination and environmental unsuitability surrounding the site. In December of 2010 Germany refused to repatriate Soviet-origin highly enriched uranium from a formerly East German research reactor to the Mayak, defying a US-Russian nonproliferation agreement, on the basis that Mayak was too environmentally unsafe to hold or reprocess the spent fuel.

www.bellona.org/articles/articles_2011/axpo_mayak

2011, December

MAYAK, RUSSIA

Russia's infamous reprocessing plant Mayak never stopped illegal dumping of radioactive waste into nearby river, poisoning residents, newly disclosed court finding says. The ecological group Ecodefense! has obtained and distributed in the media an official court ruling that confirms what the top Russian nuclear authority Rosatom has vigorously denied for years: The Ural-based nuclear waste reprocessing facility Mayak never ceased to dump radioactive reprocessing byproducts into the nearby river Techa, a source of household water supply for thousands of area homes.

Decades of spilling radioactive poison into the nearby Techa River Cascade and Lake Karachai have earned the site the moniker of being the most radioactively contaminated place on earth. The court ruling states that between 2001 and 2004, around 30−40 million cubic metres of radioactive waste ended in the river Techa, which 'caused radioactive contamination of the environment with the isotope strontium-90.' The area is home to between 4,000 and 5,000 residents.

www.bellona.org/articles/articles_2011/illegal_dumping_continues

2012, January 30

EXELON BYRON, USA

Unit 2 at Exelon's Byron nuclear plant was automatically shut down after an offsite power loss. Backup diesel generators supplied power to one of two reactors. Employees at the plant reported seeing smoke coming from a transformer on site after the outage. To aid in cooling, steam was released containing 'expected levels' of radioactive tritium. The Nuclear Regulatory Commission declared the incident an 'unusual event,' the lowest of four levels of emergency.

In an unrelated issue in April 2011, the NRC said it was conducting special inspections of backup water pumps at the Byron and Braidwood generating stations after the agency's inspectors raised concerns about whether the pumps would be able to cool the reactors if the normal system wasn't working. The plants' operator, Exelon Corp., initially said the pumps would work but later concluded they wouldn't.

www.chicagotribune.com/business/breaking/chi-officials-investigating-illinois-reactor-shutdown-20120131,0,5948192.story

www.chicagotribune.com/business/breaking/chi-offsite-power-loss-closes-unit-2-at-exelons-byron-plant-20120130,0,7041106.story

TO BE CONTINUED.

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www.letthefactsspeak.org

THE GREENS

LET THE FACTS SPEAK

AN INDICTMENT OF THE NUCLEAR INDUSTRY