Section IX. A. Appendix Accidents

Partial Listing of INL Accidents/Unusual Occurrences (1952-2014)
DOE Daily Operations Briefs (DOB) and Unusual Occurrences (UE)

1952

June 6; EBR-1 pyrophoric sodium coolant leaks from reactor causing **fire**;

1953

April 15; EBR-1 reactor **fuel element melts** down [ANL-5577];

***1954 ***

January; Materials Test Reactor (MTR) **fuel cladding melted** that released beta and gamma activity into the coolant process water in excess of 40,000 dps/ml [disintegrations per second/ milli-liter]. Workers were exposed to "activities as high as five to seven roentgens per hour inside the MTR tank where it is necessary to work in order to change a number of experiments." [Peaceful Uses of Atomic Energy, 8/55]

June; MTR reactor fuel rod plate **melting**;

July 22; BORAX-I reactor was intentionally put into an "**excursion**" which melted the fuel rods. An explosion resulted spreading fuel and contaminated coolant in a 350 ft. radius around the reactor building. The contaminated soil was just covered up with gravel. 720 Ci released in a cloud that was visible for 3 miles downwind before dissipating. The contaminated soil was covered up with gravel. [ERDA-1536 @ C-3] [DOE/ID-12119 @A187]

July; ICPP released 51 uCi (51 x 10^6 pCi) of long-lived fission product accidentally in one discharge 244,000 gal. to the waste injection well. [ERDA @C-3]

***1955 ***

January 10; ICPP emissions resulting in air contamination at INL;

June 18; Navel Reactor S1W was in **excursion** resulting in fuel melting and 310 Ci radioactivity released;

July 27; Accident - worker contaminated with radioactivity.

November 29; ERB-I reactor had an accidental "excursion" which melted 50% of the fuel rods and resulted in contamination of the building from released long-lived fission products. 10 grams of Pu and 52 kilograms of U-235 in fuel.

November 24; Electrician exposed to 450 mR/hr during ICPP RaLa Run No. 1 [PTR-185];

***1956 ***

February 22; Radioactive emissions from release of 46,134 Ci airborne radioactivity from IET nuclear engine test #3;

March 24; Transportation Accident - carload of uranium scrap derailed and scattered;

June ; IET Test #4(B&C) releases 1.9 million Ci;

July 23; Workers exposed to gamma rays at Materials Test Reactor;

August 1956, the ICPP accidentally released 1 Ci of long-lived fission products to the injection well discharging to the aquifer.

November; Electrician exposed to 450 mR/hr in ICPP centrifuge [PTR-185];

December 6; ICPP RaLa Run No.3 Shipping pot released air-borne activity into PM area

December ; IET Test #6 releases 8,953 Ci;

***1957 ***

March; Materials Test Reactor fuel element damaged during an excursion.

March 20; Fuel Element Burn Tests (A)(B) involved Reactor fuel rods being burned in open air pits releases 78.3 Ci;

September; IET test #8 releases 2,152 Ci;

***1958 ***

February 10; ICPP Workers exposed to C0-60 & I-131 during RaLa run accident releasing high levels radiation into building for 5 minutes and releasing one million pico curies of iodine-131;

February; IET test #10 releases 1.65 million Ci;

March 11-27; BORAX-IV was intentionally put into excursion - a meltdown, resulting in long-lived fission products leaking from the fuel and high radiation and building contamination. Cesium-138 was dominating release and a dose at 500 feet was 12 mR/hr.

March; Accidental release of 1 Curie of I-(131) to atmosphere at ICPP during waste transfer.

April; IET test # 11 releases 4,635 Ci;

May; IET test # 12 releases 29,070 Ci;

May 28; RaLa run at ICPP releases 49.5 curies iodine-131. Thirteen RaLa runs occurred in 1958.

June; OMRE reactor accident - coolant released to atmosphere.

July; Fission Products Field Release Tests (FPFRT) through September (9 tests) involved open air melting of reactor fuel to observe radiation dispersion. 1,334.36 Ci released;

July; Between July and August, ICPP released particulate fallout to the north-east. Maximum dose from a single particle was 25 mrads inhalation and 17 mrads ingestion using Ce-141 as the most hazardous isotope. Part of the release source was solvent process building near the ICPP stack that was venting directly to the atmosphere, however the major source could not be determined.

August; ICPP blower failure caused 10 uCi (10,000,000 pCi) long-lived fission product release to air.

September; ICPP Solvent Burner failure released .25 Ci of long-lived particulate fission product to atmosphere;

October 29; ICPP filter failure released 1,200 Ci long-lived fission particles to atmosphere from fuel element cutting facility resulting in contaminating 200 Acres around ICPP;

November 18; IET test #13 released 9,730 Ci green fission product contaminating 1500 acres south of IET. Ground contamination four hours after release was two micro curies per square foot (two million pico curies) at a distance of 2.5 miles. Primary activity was iodine-131.

November; ICPP pump leak spilled 1000 R/hr waste water (100 curies long-lived fission product) on floor of process building that was later moped up and dumped at RWMC;

December; ICPP waste collection tank released 1 Ci radioactive noble gas and Iodine to the atmosphere caused by a leaking flange;

December 9; ICPP liquid waste release (ten times allowable amount) of 29 Ci including 7 Ci Strontium-90;

***1959 ***

March 3; ICPP Accident - fission release to waste tank vault;

April; ICPP spill in fuel process building of 100 Ci;

May; IET test # 14 released 13,456 Ci;

June; IET test # 15A released 1,954.98 Ci;

June; IET test # 15B released 1,223.36 Ci;

July 9; ICPP released 105 mCi (.105 Ci) of plutonium to the atmosphere. The release was the result of burning plutonium contaminated waste solvent.

September; ICPP accidental leak in NaK heat exchanger;

October; ICPP high-level waste tank service line leaked;

October; Materials Test Reactor released of long-lived fission product gasses;

October; IET test # 16 released 294.42 Ci;

October 10; ICPP accidental release of SR-91 and Ba-139 to atmosphere;

October 16; Criticality accident at ICPP vessel WH-100 released 4E+19 fissions of U-235 (350,000 Curies) 21 workers exposed - some at 50 R/Hr [IDO-10035];

November 30; Engineering Test Reactor rupture of coolant impale tube in reactor;

November; IET test #17 released 6,402 Ci;

***1960 ***

February; IET test # 18 released 14,757 Ci;
February 9; Worker exposed while falling on "hot" equipment while cleaning at ICPP;
February 15; ICPP criticality Incident, [Ginkel];
February; IET test # 19 released 11,381 Ci;
June; IET test # 20 released 10,249 Ci;
August; IET test # 21 (FEET #1) released 3,752 Ci;
August; IET test # 22 (LIME) released 10,522.2 Ci;
October; IET test # 23 (FEET#2) released 2,890 Ci;
October; IET test # 24 (LIME-II) released 7,725.9 Ci;
November 16; OMRE solvent burning experiment .03 Ci;
November; IET test # 25 released 10,171.26 Ci;
December; Materials Test Reactor fuel assembly failure, apex-714;

1961

January; Materials Test Reactor fuel assembly failures;
January 3; SL-1 reactor explosion with fatalities Spec.5.C. John A. Byrnes, Spec.4.C. Richard L. McKinney ; Spec.1.C. Richard C. Legg, released 1,128 Ci January 3 -April; Workers exposed at INL during SL-1 cleanup;
January 7; 50 worker exposures to Si-110 at ETR reactor;
January 25; ICPP criticality accident in vessel H-110 released 5,200 Ci to environment 20 workers exposed [IDO-10036];
February; IET test # 26 released 10,090.66 Ci;
March 27; MTR spectrometer fire;
September 27; OMRE reactor coolant impurities loop fire;
December 12; Engineering Test Reactor fuel element meltdown due to coolant blockage;

***1962 ***

May 10; Fuel element flow blockage in the engineering test reactor [IDO-16780]
March; ML-1 reactor pressure vessel leak;
March; ICPP uncontrolled high-level waste leak in two tanks into vaults;
Jun-Aug; Overexposure of decontamination workers in SL-1 recovery;
August; EBR-II reactor corrosion in coolant seal plug;
August 24; Truck trailer accident load contamination I-129;
September; Worker exposure to 500 R/hr ICPP "E" Cell decontamination [IDO-14599]
November 5; SPERT-I test No. 1 intentional reactor meltdown caused 240,000 Ci released including 500 Ci Iodine.
November 13; MTR reactor fuel meltdown caused by coolant flow blockage. Accident required evacuation.
November 19; Worker exposed to Ir-192 during radiography;
November 25; MTR reactor debris in coolant;

***1963 ***

May 27; Controlled Environmental Radioiodine Test (CERT) May through December 1977 included 29 releases of 32 Ci of Iodine-131.
April-May; ERB-2 reactor coolant pump failure;
August 3; Container of radioactive material dropped and leaks at INL terminal;
October 19; Fuel failure-Borax -V reactor [Forum-Memo];
November; ICPP Accident resulting in plutonium contamination.
November 10; SPERT-I test No. 2 intentional reactor fuel melt down releasing 530 Ci.

***1964 ***

April 1; SNAPTRAN-3 test destruction of SNAPTRAN 2/10A-3 reactor in an open water tank. Radioactive cloud traveled 21 miles, released 24,000 Ci;
April 14; SPERT-I reactor destruct test No. 3 released 1900 Ci.;

May 10; ICPP tank released 5 Ci long-lived fission waste released to ground from leaking line coupling. Three acres inside and ten acres outside the ICPP fence were contaminated.
May 10; Accident causes spread of radioactive waste from Radioactive Waste Management Complex;
July 7; Borax-I excursion released 714 Ci;
July 10; ICPP explosion containing plutonium piercing worker's arm;
July 22; Worker exposed straightening "hot" wire;
Oct. 21 through July 21, 1965 released 32.72 during CERT experiments;

***1965 ***

January; EBR-II reactor fuel element failure [ANL-7010];
January; ATR reactor vibration leak in coolant system;
August; ML-1 reactor coolant leak and **shutdown;**
September.9-13; Leak of 10 curies of I-131 from airfreight shipment. 64 people receiving dispositions in thyroids.

1966

January 11; SNAPTRAN-2: SNAP 10A/2 Reactor intentionally destroyed in open air tests at Test Area North. Radiation readings of 2.7 R/hr from a remote detector. Radioactive plume traveled 30 Kilometers (off-site) released 600,000 Ci.;
September 8&9; Uncontrolled fire in RWMC waste in SDA;

Between July 1961 and January 1966, 3,210 whole body counts of workers at TRA, ICPP, SPERT, TAN, and CFA. Forty six of these counts showed activity greater than 0.1 uCi (uCi = micro-curie or 10-6). Six of the more significant exposures are listed in the following table. [PTR-789 @5]

Case	Nuclides observed	Activity (uCi)	Remarks
A	I-131	0.20	Medical Experiment (count taken at termination)
B	Zr-95 Nb-95	0.10	Contamination on external surface of body
C	Hg-197	0.29	8.75 mrem to kidney, 7.3 mrem to gastrointestinal tract
D	Co-60	0.10	Radioactive contamination on external surfaces of body
E	Mn-54	0.15	Radioactive contamination on external surfaces of body
F	Co-60	1.50	93 mrem to lungs, 94 mrem to gastrointestinal tract, 3 mrem to whole body

1967

February 20; Engineering Test Reactor fuel element melt down due to clogged coolant lines caused by duck tape left over reactor coolant lines. 7.398 g of fuel was lost
November 30; Relative Diffusion Tests (RDT) between November and October 1969 released 10.04 Ci. of radio-Iodine-131.

***1968 ***

February; EBR-II reactor sodium coolant release which immediately ignited the 80 gal radioactive Sodium-24. The sodium coolant is pyrophoric when it comes in contact with air. Boiler plant building and control room contaminated with 4 mCi (4×10^{-3}Ci) Na-24. [ERDA-1536@C-5
May 3; Experimental Cloud Exposure Study (EXCES) between May and April 1970 released 987.6 Ci of radioactive Xe-133 and Na-24.

June 14; Contamination from the failure of a first-stage burner while burning enriched fuel elements RDT test;

***1969 ***

August; Tan Support Facility 10,000 gal high-level waste tank overflowed, contaminated soil had radiation readings of 5 Rad/hr at one foot;

August; Experimental Cloud Exposure Study (EXCES) test released 600 Ci;

September; ICPP accidental release 19 Ci long-lived fission product to injection well;

October; ANL-W released 413 mCi of zirconium-niobium-95, cesium-137, cerium-144, cobalt -60, antimony-124 were dumped in a ditch at the ANL-W in uncontrolled incident;

December; ICPP uncontrolled release 1.5 uCi (1.5×10^6 pCi) in excess of the discharge limits of Sr-90 were dumped to the ICPP injection well

***1970 ***

April 7; Experimental Cloud Study (EXCES) tests released 352.6 Ci through May 25;

June 1; Uncontrolled fire in RWMC SDA waste;

July; Test Reactor Area tank failure released .578 Ci;

***1971 ***

January; ICPP ruthenium released 1 Ci;

February; TSF tank overflowed, 293 gal, .88 Ci long-lived fission waste product released;

March 3; Long-distance Diffusion Tests (LDDT) released between March and September 1000 Ci Kr-85, & 12.3 Ci Iodine-131;

May 5; Accident- contamination which caused evacuation of the ETR reactor building;

May 18; During attempt to remove the highly radioactive KAPL J-10 In-Pile tube from ETR core using the NR-2 transfer cask to ETR canal, the In-Pile tube fell out of the cask striking the shielding block on the top of the reactor. Twelve workers were exposed to over 25 rad/hr. Radiation Juno instruments could only read a maximum of 25 rad/hr. All 26 workers at the Test Reactor Area were evacuated to the main gate. [J-10]

September; Tan Support Facility liquid waste evaporator incident release 266 uCi cesium- 137 (266 million pCi),.0142 uCi Sr-90 (14,000 pCi), .0142 uCi Yttrium-90 (14,000 pCi);

***1972 ***

January; ICPP released 1 Ci. of radioactive Ruthenium-106 from the main stack;

May; ICPP accidental release 1 Ci Ruthenium-106 to environment;

May; Waste Calcine Facility accidental release 10 Ci long-lived fission waste product;

***1974 ***

April; ICPP waste line to high-level waste tank broke releasing 1,000 Ci of Cs-137, Cs-134, Sr-90, and Eu-154 to the soil.

October; ICPP tank line leak released 3,000 Ci Eu-154 with an additional 3,000 Ci contaminated soil left in ground;

***1975 ***

September; ICPP high-level waste line rupture was "discovered" releasing an estimated 14,000 gal of liquid waste containing 30,000 Ci. No accurate amount of release has been established indicating considerably more could have leaked out. To date, it has never been cleaned up.

***1976 ***

January 16; ICPP diversion valve leak, 12 gal. containing 500 mCi (.5 Ci) Sr-90, 500 mCi (.5 Ci) Ce-137, 130 mCi (.13 Ci) Ce-144;

September; ICPP waste line leak, 20,000 gal.60 mCi (.06 Ci) released;

October; ICPP's Waste Calcine Facility cyclone failure contaminated building with 230 mCi (.23 Ci) Sr-90, 40 mCi (.04 Ci) Ru-106, 230 mCi (.23 Ci) Cs-137. Contamination covered up not cleaned up.

***1977 ***

November 1; Accident - radioactive waste truck high-centering on railroad tracks;

***1978 ***

October 17; ICPP criticality accident occurred in first cycle uranium extraction system in CPP-601 building, lasting 20 minutes releasing a radioactive plume (including Iodine) which traveled beyond the boundary to the SW. 6,200 Ci release resulted in one month plant closure and evacuation;

***1981 ***

July 20; Accident - workers exposed to radioactive particles;

***1983 ***

November 17; cancer victim seeking $11 million from INL blast;

***1984 ***

March 12; Report on ducks carrying INL radiation off site;

October; CPP-603 spent fuel storage (IFSF) radiation Shield Door Rails fail. The cause is determined to be from movement of door and/or seismic events. [ID-WINC-ICPP-1990-9020]

***1985 ***

February 15; Accident - worker exposure;

July 9; LOFT Reactor core intentional melt down resulting in fission products leaking into reactor building released 8,800 Ci plus .09 Ci of Iodine, this was the last of eight test series between 1979 to 1985; [A-58]

***1986 ***

December 10; Accident - 2 workers contaminated at INL;

***1987 ***

March 1; Accident - welders exposed to radiation ;

***1988 ***

October 30; Radioactive Ruthenium gas release at ICPP stack Released .17 Ci; Explosion at ICPP resulting in one fatality.

1989

Feb. 27; ICPP employee bypasses radiation monitors and takes contamination home after work shift.

1990

May 9; ICPP-603 IFSF shield door rails inadequate to sustain seismic event. The door hinges had failed in 1984 and the plug had been removed. In 1990 unsuccessful attempts were made to replace the plug in preparation of Ft. St. Vrain fuel.

Nov. 16; Contamination at 4,000 ppm beta-gamma spread outside a controlled area at ICPP-603

1991

Jan.29; NWCF stack monitor found out of calibration

Feb.11; ICPP fuel dissolver exploded, spraying three workers with highly enriched uranium and heated nitric acid; a forth worker was also exposed when he came to their aid. The facility remains closed because of explosion damage and high levels of contamination. Office of Nuclear Safety concluded that the initial contractor investigation & the corrective actions taken by the DOE/ID were inadequate. [Ryan @ 53]

May 2; Failure of EBR-II Fuel can carrier at cpp-603 allowed four cans of fuel to drop out of the can carrier and on top of the criticality control fixture which separates the two tiers of fuel in each storage pot. Faulty welding at ANL-W of the can was the fault.

May 20; Advanced Test Reactor fuel element fell from handling tool to water storage canal floor.

May 29; EBR-II reactor **shutdown** due to neutron detectors were not operative.

June 4; ATR reactor **scrammed** due to under voltage to coolant pump.

June 10; Idaho State files RCRA air/water quality violations and fines totaling $127,793.

June 11; Specific Manufacturing Capacity facility fire in exhaust filter caused by loss of coolant to deburring operations.

June 20; EBR-II **shutdown** due to no filtering and radiation monitoring on common stack violations.

June 21; Radiation contamination in material prepared for off-site shipment labeled "non-radioactive asbestos".

June 25; Operator's left hand is contaminated up to 100 mR beta gamma and 3,000 counts per minute beta gamma on his right hand at the NWCF while cleaning liquid sample cell

July 2; TRA Hot Cell worker contaminated with radium-192.

July 4; Denitrator Off-gas drain malfunction results in highly alpha contamination (Zone-III)

July 8; ICPP worker drained uranium concentrate into unauthorized container.
ICPP liquid radioactive leak into glove box violation.

July 9; Unplanned **shutdown** of the Fuel Storage Basin ICPP-603

July 11; WERF radioactive waste incinerator lost negative pressure in ash room caused by vent damper failure.

July 17; Argonne-W Hot Fuel Examination facility violates OSR for no annual electrical inspection on cooling blowers to fuel storage pits.

July 19; WERF incinerator **shutdown** due to pressure cell disconnected which detects differential between rooms.

July 25; NWCF activated rapid **shutdown** system due to off-gas compressor shutdown during power dip

July 29; Central Facility Area Laundry OSR diocty-1-phthalate violation.

Aug.6; Personal contamination to 500 cpm at ICPP-627 Radiological Materials Area

Aug.6; NWCF **shutdown** due to plugged filters however it took nearly three hours before operators shut down and no spare filter banks were available during that time.

Aug.9; Incineration violation when waste containing greater than 25 mrem/hr limit was incinerated.

Aug.13; ATR reactor **scrammed** due to loss of power to coolant pump.

Aug.13; Unplanned **shutdown** of the Fuel Storage Basin at CPP-603 after extensive corrosion of fuel hanger yokes were found.

Aug.; Unexplained personnel exposure at Test Reactor Area Hot Cell of up to 560 mRem and radiation beams up to 700 mRem/hr [Blush Report DOE Office of Nuclear Safety 4/2/93]

Sept.11; WERF incinerator emissions pre-filters and HEPA filters failure - filters were found completely breached.

Sept.13; NWCF failure of off-gas atmospheric protection system (APS) HEPA filters. The HEPA filters, F-OGF-100/101/102 failed a special requested DOP test after nine months of service. When the filters were changed out it was discovered the filter media had deteriorated. Two of the filters had the filter media missing or partially missing. The third filter's media was intact, but was discolored. Depending on when the filters failed, the APS could have operated for the entire nine months without HEPA filters. [ID-WINC-ICPP-1991-1058]

Oct.14; ATR reactor scrammed due to low coolant pressure caused by malfunctioning temperature control valve.

Oct.16; ATR reactor **scrammed** again due to low coolant pressure caused by another malfunctioning temperature control valve.

Oct.18; ICPP evacuated due to gamma radiation during Fort St. Vrain fuel handling. Fuel handling operation suspended. Radiation detection monitor shielded with lead to quiet alarm. Spent fuel radiation levels being investigated. A few days later an alarm went off in the Irradiated Fuels Storage Facility as a result of these emissions levels. DOE's response was to disconnect the alarm. [Ryan @ 54]

Oct.24; Radioactive Waste Management Complex safety envelope violations at SWEEP plant.

Nov.5; WERF incinerator **shut down** due to unapproved modifications to emissions HEPA filter; and non-approved drums used for shipment and disposal; and exceeding weight limits in incinerator.

Nov.7; ICPP steam generator dust explosion (Jan. 23)

Nov.27; ICPP high-level waste tank leak detection system failed...due in part to sensors and high radiation levels in the valve box greater than 21,500 cpm which repeatedly set off alarms.

Nov.28; ICPP evacuated after radiation alarms sound. [Times News (h)]

Dec. 3; Personal contamination at 1,000 cpm at ICPP-666 while unloading NRF fuel.

Dec.6; Contamination spread in an ICPP-666 Radioactive Materials Area while unloading NRF fuel canister contaminating two workers.

Dec. 22; ICPP-604 Process off-gas System HEPA filter monitors inoperable.

1992

Jan.6; Inspection found 9 alarms disconnected at the ICPP

Jan. 15; WINCO employee takes Cesium-137 contaminated section of pipe off site in his briefcase;

Jan.16; Advanced Test Reactor spilled 350 gallons of sulfuric acid into the "cold" waste pond;

Jan.19; ICPP Process Off-gas System blowers failed for two days while NWCF and other operations continued to operate

Jan.24 NWCF exceeded State limits on nitrogen oxide on five different occasions between 6/89 to 1/92

Feb.1; Fire in CPP-1605 which contains offices and equipment for engineering services

Feb.5; Personnel skin contamination to 100 cpm at the Remote Analytical Lab

Feb. 19; Radioactive contamination found outside controlled areas at Test Reactor Hot Cell Building - radiation readings ranged 1,500 to 28,000 DPM

Feb.1 Fire in CPP-1605

Mar. 4; Significant corrosion found in spent fuel storage racks at ICPP-603. Racks are supposed to prevent fuel rods from getting too close together - thus starting an uncontrolled reaction. DOE report acknowledges uncertainty regarding the facility condition following a major seismic event and the risks associated with such an event

Mar. 6; Container of Plutonium-239 found on the ground outside the ICPP-630 building;

Mar. 18; Radiation beam in the Test Reactor Area Hot Cell was left uncovered. Radiation levels of 20 rem/hr inside the cell and 2 rem/hr outside the cell wall were detected. 18,000 Ci. of Cobalt-60 were charged to the beam. Report calls the incident as a near miss in the sense that prompt fatalities could have resulted from the manner in which the facility was being operated. [Also see Ryan@52]

Mar.16; CPP-603 Middle basin spent fuel bucket yoke failed causing fuel to fall to pool floor

Mar.24; Personnel contamination to 1,000 cpm at the ICPP Flurorinel Dissolution Process Facility

Apr. 1; Unauthorized removal of criticality alarm system warblers at the ICPP.

Apr. 2; Employees forced to stay inside of ICPP due to unplanned radiation release from main stack containing 3 mrem/hr beta-gamma. [ID-WINC-ICPP-1992-0035] Contaminants spread beyond the ICPP boundary fence. Five to six acres had to be decontaminated. Ryan cities flakes the size of quarters falling on 40 acres around ICPP, and DOE sent notice of this incident to Idaho and the Fort Hall Reservation with a cover page erroneously stating; "This is a Drill". [Ryan @ 53][also see DOB 4/3/92], stating flakes 2 inches in diameter released] The released radionuclide composition was Cs-137, Sb-125, and Ru-106.

Apr. 7; Radionuclide release via excessed contaminated file cabinet. 10,000 cpm alpha (Radium-226)

Apr. 12; Advanced Test Reactor was scrammed when a diesel generator supply power failed;

April; High power scram at TREAT reactor caused by incorrectly calculating critical rod position by operator trainee [Blush Report]

May.2; Failure of an EBR-II fuel can carrier at ICPP-603 that caused the fuel to drop out of the can

May 11; Radioactive contamination found on roadway at Test Area North with readings of 700 mR/hr and a welding rod reading 70,000 dpm.

May 18; Unscheduled power outage at Advanced Test Reactor resulted from a malfunctioning rod becoming disconnected requiring the reactor to be **scrammed.**

May 22; CPP-603 lost commercial and standby power generator due to ICPP operator errors

May 26; Unscheduled power outage at ICPP resulted when operator attempting to shut off an alarm in Irradiated fissile Materials Storage and turned off the whole power supply that could not readily be turned on.

May 27; An error found in the irradiation of dosimeters for use in the DOE Laboratory Accreditation Program. Dosimeters for the past three years have been irradiated to higher levels than anticipated and incorrectly read as a result of the errors.

May 28; Idaho State inspection may result in notice of RCRA violations.

June 17; Radiation detected streaming from collimator port at Test Reactor Area Hot Cell # 1. Radiation readings of 700 mR/hr even with shielding. Additional shielding was not sufficient to stop the radiation. A similar incident happened on 3/18/92 Office of Nuclear Safety reviewed historical radiological survey records and discovered a surveillance report in August 1991 which revealed several unexplained employee exposures to dangerous levels of radiation. The Office of Nuclear Safety stated that the DOE/ID did not follow up on this surveillance report and line management failed to respond to the concerns until after the March 1992 incident. [Also see Ryan]

June 25; Personnel contamination to 3,000 cpm beta-gamma at the ICPP NWCF

July 1; NWCF HEPA filter failure due to rapid pressure rise and defective or failed filter material. This incident occurred while spare filter bank was undergoing filter change out and was not available for use. Three hours elapsed before the decision was made to **shut down** the Calciner

July 7; ICPP-603 BORAX-V fuel bucketed yoke failed causing fuel to fall to pool floor

July 18; ICPP NWCF unplanned **shutdown** due to clogged HEPA filters

July 25; NWCF activation of the rapid **shutdown** system due to compressor failure

Aug.2; Power failure at ICPP and 70 mph wind storm causes significant building damage;

Aug.7; Advanced Test Reactor **scrammed** due to loss of coolant and loss of backup diesel generator; restart delayed by malfunctioning control rod.

Aug.11; ICPP shipping cask had loose bolts on trunnion hold-down blocks

Aug.11; Personal Skin contamination in ICPP-640 Electrolytic Dissolution Area

Aug.12; Advanced Test Reactor remains **shut down** pending resolution of control rod problem.

Aug.19; Personal skin contamination at the ICPP New Waste Calcining Facility

Aug.21; Release of radioactivity from ICPP main stack - 25,000 counts per minute (cpm)

Aug.25; Unauthorized disconnection of alarms in ICPP-637

Aug.28; Personal contamination of 1,200 cpm at ICPP-666 Fuel Storage Area

Sept.1; Loss of stand-by power to evacuation sirens at the ICPP Remote Analytical Lab

Sept.12; Personnel contaminated to 20,000 dpm at the ICPP New Waste Calciner

Sept.17; Power outage at ICPP-604 Waste Treatment and loss of instrumentation and ventilation - these facilities operate the ICPP off-gas emission systems

Sept.18; Loss of contingencies against criticality accidents at ICPP-603 caused by side by side placement of highly reactive fuels;

Sept.21; Personnel contamination to 10,000 dpm in the ICPP-604 sample corridor

Sept.22; ICPP NWCF radiation detection instruments found out of tolerance

Sept.23; Three personnel contaminated to 1,500 cpm at NWCF

Sept.27; Sixteen radiation monitors found out of compliance at ICPP and instead of replacing the monitors managers chose to rescind the compliance order

Sept.22; Criticality infraction at ICPP Fuel Storage Basin (CPP-603) were 25 highly reactive fuel elements were stored adjacent to each other. Carbon steel fuel hanger failed allowing fuel to drop to bottom of basin. Violation of double contingency rule.

Sept.29; ANL-W female worker contaminated and left site to shop in Idaho Falls. Contamination not detected until return to the site.

Oct.13; Two workers in full bubble suits were decontaminating a tank floor, the air compressor supplying air to their suits stopped. 250 gal reserve tank provided air for exit.

Oct.20; Worker receives second degree burns while purging a nitric acid (13 Molar) line with compressed air.

Oct.21; Loss of control of radioactive material, building contamination to 50,000 dpm at ICPP-603

Oct.26; Improper fuel storage configuration at ICPP CPP-603. Two instances of expended fuel component configuration. violating criticality separation

Oct.29; Violation of ESA for radioisotope processing at INL. Preparations of isotope processing failed to properly align air sampling equipment to the hot cell - while irradiated targets were in the cell, but before processing began. Operators failed check list for valve alignment and provisions of Experimental Safety Analysis (ESA).

Nov.23; Improper fuel storage at ICPP building 603. Continuing investigation from 10/26 revealed north and middle basins have another improper fuel storage configuration and more corroded carbine steel support hangers. Ryan cites 25 highly radioactive fuel elements were stored adjacent to each other, and in the same area, corrosion caused a carbon steel hanger to fail which resulted in a bucket containing spent fuel to drop to the floor creating a potential criticality. [Ryan @ 54]

Nov.8; ERB-II reactor scrammed due to power perturbation caused by loss of the feed water pump and the secondary sodium loop. Scramming also caused loss of power to the ANL-W site.

Nov.15; Personnel contamination to 400 cpm at the ICPP NWCF

Nov.19; Personnel contamination to 10,000 cpm at the ICPP NWCF

Nov.28; ICPP evacuated because of radionuclide particulate releases at CPP-603

Dec.1; ICPP High-level waste tanks WM-101 and 102 vault sump level instrument probes (leak detection) were discovered to be connected to the transmitter in reverse

Dec.27; Kerosene fire in the Calciner Cell of the New Waste Calcining Facility. During cold operations of the NWCF kerosene fuel which had leaked from a Calciner fuel nozzle ignited resulting in a small fire in the Calciner vessel cell floor which burned for about 35 minutes. Nozzle connection was installed improperly (threads reversed).

1993

Jan.4; Advanced Test Reactor **scrammed.** During a lC-W loop experiment, a scram occurred due to loss of flow signal because of an operator error. The operator did not properly follow the procedure and a reset button was depressed which caused the loop pumps to turn off and the reactor scrammed.

Jan.4; Criticality Alarm System Warblers found Inoperable in CPP-651 and 603.

Jan.6; Unsafe entry into ICPP WL-101/102 Tank vaults by health physics technicians without proper protection.

Jan 9; New Waste Calciner forced to **shut down** due to plugged final off-gas filter plugging

Jan.25 Personal contamination by spray of 13 molar nitric acid at ICPP-601. Operator was not wearing the PPE specified by the HWP

Jan.28; New Waste Calciner again forced to **shut down** due to defective off-gas filters

Feb.2; State issues notice of violations based on May 18-22 1992 inspection. Notice cites, among other, things, a lack of training, and labeling and administrative deficiencies under the state hazardous waste management act.

Feb.26; ICPP-603 underwater fuel storage review found an additional five fuel canister failures.

Mar.4; ICPP-603 fuel canister yoke hook failed

Mar.9; NWCF worker contaminated to 12,000 Disintegrations per minute (dpm) and other areas of the mezzanine where the worker was were found to be contaminated to 100,000 dpm

Mar.13; Worker contamination to 800 dpm at CPP-604 tank farm

April 15; Contamination released from containers sent to ICPP from Pantex via commercial carrier

May 17; Personnel Skin contamination at Argonne-west. The contamination occurred at Fuel Cycle Facility Radioactive Liquid Waste System. Contaminated liquid (tritium and possibly strontium and cesium was sprayed on two individuals standing outside the radiation barrier when flexible tubing became disconnected from an adapter. The two individuals were no wearing protective clothing since they were outside the radiation control area. Individuals were decontaminated.

Sept. 8; A damaged C cell battery was found in the ATR reactor vessel outside of the core region and removed; a thorough inspection of the vessel revealed no other debris and the vessel was closed up.

Sept. 13; Crushed parts of a flashlight were found inside the ATR reactor vessel, but outside the core region and no debris was found on the fuel. Detailed inspections were conducted including the use of an underwater camera video system, but other missing flashlight parts were not found. Reactor operation was delayed for more than two days and in-vessel inspections will be performed following each nuclear re-qualification testing event.

Sept. 24; Approximately one and a half sticks of unexploded dynamite were uncovered during the excavation of an existing underground storage tank at INL Research Center. The site was immediately cleared and an explosive expert was called to the scene where it was determined that no other explosives existed. The dynamite, which appeared to be residue from initial construction was removed and safely detonated.

Oct 12; Approximately 1,540 gallons of diesel fuel leaked from the Central Facilities Area Tank Farm through an open drain valve on a fuel tank.

Dec 12; Two construction workers at the ICPP Tank Farm received whole body radiation doses of 770 mrem and 507 mrem and skin doses of 4,469 mrem and 2,040 mrem while completing work on a valve box.

"During calendar year 1993 at INL, there were 5,145 individuals monitored by whole body counting and 3,116 individuals monitored with urine/fecal analyses. Record summary data does not permit differentiation of how many who have whole body counts may have also had urine/fecal analyses. Of these individuals monitored, six had positive doses for plutonium and one had a positive dose for uranium. The 6 positive plutonium doses ranges from 14 mRem to 53 mRem committed effective dose equivalent. One uranium dosed was 11 mRem committed effective dose equivalent." [DOE Facts @ 2-87]

1994

Jan.21; A leak of unknown volume breached secondary containment at ICPP-604. [Boise Weekly]

April 4; During refueling of the Advanced Test Reactor, 19 workers received internal radiation exposure caused by underwater control rod cutting operations in preparations for disposal. Workers using a remote control saw were cutting through a control rod of hafnium and aluminum and either the saw arced or hit the hafnium which got into bubbles of hydrogen and rose to the surface of the pool. The highest dose was 2 mRem. Hafnium has a half life of 45 days. The facility was evacuated. OCAW union said exposure was 1.3 REM and internal uptake of 96 microcurie of hafnium-181.

April 15; A chlorine leak at ANL-W occurred when 40 pounds of chlorine gas leaked while changing out a tank at a water treatment facility. Of the 40 people exposed, one person was hospitalized for respiratory distress; and seventeen others were treated for respiratory distress. The 900 site personnel were evacuated for two hours. The leak continued for over 41 minutes until an ANL-W Haz-mat team closed the valve. [OE-95-21][DOE/EH-0527]

April 24; Test Reactor Area engineer violated safety procedures by not surveying his clothing before leaving the site. His cloths and shoes were contaminated with Cobalt-60 and Cesium-137 which he took home. The workers home then had to be checked and decontaminated.

1995

March 22; Unauthorized valve modification to Emergency Firewater Injection System is not corrected prior to reactor startup. [OE-95-13]

March 22; Concrete floor core drilling project at the Advanced Test Reactor dropped a 14 pound plug to the floor below were no safety barriers had been erected to prevent access and possible injury. [OE-95-13]

April 13; Decontamination manifold in the New Waste Calcine Facility and an air purge line had become internally contaminated with process fluid. The contact radiation level on the manifold was 3 R/hr. Personnel evacuated the immediate area.

April 13; Contaminated equipment used in an attempt to unplug a resin discharge line in the Test Reactor Area Warm Waste Treatment Facility (WWTF) was placed in the system engineer's office and in the uncontrolled tool crib.

June 30; An operator at the Test Reactor Area was exposed to acid fumes after 1,000 pounds (66 gal) of concentrated sulfuric acid was released while he was purging a tanker truck and fill line used to fill a site acid storage tank. Approximately 25 feet by 50 feet of ground was contaminated. The operator required medical treatment.

July 3; Several pipefitters working at the Advanced Test Reactor were exposed to 50,000 counts per minute by over a dozen isotopes because their anti-contamination (anti-c) clothing provided inadequate protection in the work environment. In another event, a DOE Environmental Health Representative was contaminated while conducting an inspection of the check valve work that was the subject of previous pipefitter contamination. In both cases the Pro-Tech 2000 anti-c clothing did not prevent the migration of graphite particles through the material or protect individuals during bending, kneeling, extreme temperatures, or presence of contaminated liquids.

July 6; A construction worker at the New Waste Calcine Facility was exposed to 383 millirem when he mistakenly worked in a different area with a higher dose rate and failed to hear an alarming dosimeter.

July 12; A construction worker received 383 millirem exposure when instructed to lay blotter paper over a high contamination area at the ICPP

Aug. 19; Misplacement of spent reactor fuel in ICPP-666 storage pool during re-racking operations caused radiation releases amounting to 200 mRem.

Aug. 24; The Advanced Test Reactor Emergency Fire Water Injection System would be rendered inoperable during a design basis earthquake. The purpose of the injection system is to pump water into the reactor core to prevent irradiated fuel elements from being uncovered in the event of a loss-of-coolant accident or a complete loss of coolant flow during an earthquake.

Sept. 25; At the ICPP Tank Farm, a construction worker was contaminated by work tools when he helped to install radiation monitors on a valve box. The tools had 3 rem/hr beta/gamma contamination. They took a whole body count of the worker which revealed 4.6 nanocuries of internal contamination.

Dec 14; INL Mercury Retort Plant was shut-down and evacuated when propane tank truck attempted to refill a 10,000 gallon propane tank through the wrong port. Forty pounds of propane were released inside and outside the plant.

1996

Feb 8; Argonne-West Sodium Component maintenance Shop was evacuated when a highly reactive sodium potassium (NaK) when a transfer line overheated. Workers were attempting to treat 40 year old Experimental Breeder Reactor - I NaK coolant. NaK will burn if exposed to water or air.

Feb 20; Construction worker died in a fall off a stack of radioactive waste containers at the Radioactive Waste Management Complex.

Feb 22; Safety Analysis of the Advanced Test Reactor found breaks in the coolant piping and fuel damage to be “anticipated” events but that allowable exposure limits for workers would not likely be exceeded and that off-site exposures would also not likely be exceeded.

Mar 20; Criticality safety limits were exceeded when Uranium-235 spent fuel plates were found to be stored in twice the allowable limits of moderator. Moderators increase the hazard of accidental criticality of relatively low masses of fissionable material. The aging plastic moderator caused it to adhere to some of the fuel plates, which slowly oxidizing because the plate ends were cut off prior to shipment to INL.

Mar 21; Idaho Department of Health and Welfare send DOE/ID notice of 61 violations of State Hazardous Waste Management Act and levee penalties totaling $317,300,000.

Mar 28; A 25 year old crane at the Naval Reactor Facility failed, and dropped an 8,500 pound load of reactor refueling equipment. The 8 foot drop significantly damaged the equipment.

May 28; Pipe fitter was burned by sulfuric acid dripping from ceiling after a pipe failed while flushing bulk chemical storage tank at the Advanced Test Reactor. 25-30 ml of acid were ejected. The worker was only protected for a potential frontal spray not an overhead spray.

July 11; A site alert was declared when a range fire northeast of the ICPP perimeter fence. The fire occurred inside a controlled contamination area. Previous survey records show arsenic and cesium contamination that would become airborne as a result of the fire.

July 18; Uranium bearing storage bottles found improperly stored in ICPP violating criticality standards.

July 22; Five construction workers were contaminated during demolition of the ICPP Waste Calcine Facility. Whole body counts showed 500 mrem internal exposure to Cs-137, Sr-90, Pu-238, and Pu-239. The five workers were not wearing respirators yet were working in the immediate area where another group of workers were cutting and removing piping that contained contamination. LMITCO fined $25,000 by DOE for violations of nuclear safety regulations under the Price Anderson Amendments Act. [Star 3/11/97]

Nov. 25; ANL-W EBR-II ventilation monitors found to be inoperable for at least seven months during which time over 28 spent fuel assemblies had been processed

Nov 30; During a dismantling operation of a reactor spent fuel subassembly two fuel pins were dropped. One of the fuel pins fell below the machine and could not be retrieved with standard handling equipment.

Dec 3; ANL-W maintenance workers found that the emergency power diesel generator had been disconnected from the system for over a month.

Dec 25; Advanced Test Reactor while under full power scrammed by experimental loop 'watchdog' timer scram system. The experimental loop primary and secondary DPU operating systems failed triggering the **shutdown.**

1997

Jan 6; Mixed waste shipped from INL's Waste Reduction Operations to Envirocare disposal site was mislabeled and caused worker contamination with lead-227. Envirocare was shut down.

Jan 13; Two INL workers were contaminated during a HEPA filter change out when the second of two filters became disengaged from the lifting device and dropped 12 feet to the cell floor. The Radiological Control Technician (RTC) received 779 mrem and the Operator received 535 penetrating exposures from Cs-137. The RTC's shoe was contaminated with 6,000 dpm Cs-137. [DOB 1/16/97]

Feb.8; Nuclear Metals incorrectly shipped classified depleted uranium in boxes labeled as empty to INL SMC facility which violated Department of Transportation regulations.

Feb.13; A 6M drum of plutonium was shipped by air to Los Alamos without legal authorization and notification to the US Department of Transportation. All shipments were suspended pending an investigation.

Feb.17; Argonne-West Hot Fuel Examination Facility technician received an internal plutonium 239 dose of 143 mrem in addition to external exposure of 1600 dpm on his arm.

Feb.24; A Test Reactor Area Hot Cell operator was exposed to 3.15 rem on his right hand while moving an irradiated sample from a hot cell into a lead cask. Delays in the processing of extremity dosimetry created the potential for exceeding extremity dose limits.

Feb.24; Advanced Test Reactor accident resulted in 410 pounds of Freon when a scaffold fell on and broke a chiller unit line. Operators attempting to use self-contained breathing apparatus found five to be unusable. Freon, according to NIOSH is immediately dangerous to life or health in concentrations as low as 2 ppm.

Feb.27; DOE imposed $25,000 civil penalty on Lockheed Martin Idaho Technologies under the Price Anderson Act for multiple failures to maintain radiation exposures as low as reasonably achievable.

Mar.1; A Test Reactor Area Technician received a whole body neutron exposure of 1865 millirem the month of April and the source of the exposure could not be determined.

Mar.13; Two cesium-137 sources containing 27.5 mCi and 12 mCi with a potential dose rate of 111 mrem/hr were lost and a search was unable to determine their location.

March 20; State fines DOE $970,000 for missing RWMC Pit-9 cleanup milestone.

April 27; Advanced Test Reactor spent fuel element fell off handling device during transfer from reactor to storage pool

May 12; During a trial burn at the WERF incinerator, the chlorine emissions exceeded the administrative limit. Operators ignored monitoring instruments and proceeded with operations.

June 5; Worker exposed to 40,000 dpm of Gd-153, Eu-152, and Co-60 during decontamination of Hot Cell Facility despite wearing a double set of Personnel Protective Equipment. [6/9/97 DOB]

Aug 25; Five workers were exposed to nitrogen oxides while conducting a remote video inspection of underground ICPP Calciner valve box. NIOSH safety limits of 5 ppm were exceeded but the immediately dangerous to life limit of 20 ppm were not exceeded.

Aug 25; State of Idaho Division of Environmental Quality sent DOE/ID a Notice of Non-Compliance for 135 violations of Hazardous Waste Management Act and set penalties at $892,725.

Sept 8; Workers discover that liquid storage tanks (v-1,v-2, v-3, v-9, v-13, and v-14) at Special Nuclear Material Storage Facility contained fissile material in concentrations equal to 45% required for a critical mass. The tanks in question were not controlled as a Criticality Control Area.

Sept 17; Six workers at Test Reactor Area Hot Cell Facility were contaminated with europium resulting in evacuation. Facility contamination measured 260,000 dpm where the workers were located. Two of the six workers received uptakes of 10 to 30 mrem OVER 50 years committed effective dose equivalent and a maximum organ dose of 57 mrem committed dose equivalent to bone surfaces. Radiological surveys determined contamination escaped the Hot Cell. LMITCO claims the six worker exposures were at the 100 mrem level. [Star 9/23/97] This resulted in notices of violation under the Price-Anderson Amendments Act and LMITCO fines of $125,000.

Sept 19; DOE Office of Enforcement and Investigation issued Notice of Violation under the Price-Anderson Act to Lockheed Martin Idaho Technologies and INL Operations Office for six Severity Level III safety violations.

Oct 6; A lead shipment from INL contained contamination on the bed of the truck as high as 10,000 cpm. The trailer is owned by Tri-State Motor Transport.

Oct.7; Workers shirt contaminated during work in the basement buffer area in the manipulator repair glove box room.

Oct 25; Advanced Test Reactor operators discover five holes in gas-tight reactor confinement boundary (during operations) that subcontractors had left unfilled. This breached the reactor gas-tight confinement boundary. A similar event occurred on December 16, 1996 at the same location.

Nov 20; An unprotected Test Reactor Area worker was sprayed with 50 milliliters of sulfuric acid foam while disconnecting an air hose to an air sparge line.

Dec 3; An Argonne-West emergency power switch prevented the transfer of diesel generator power when outside power outage fails to reactor coolant and other process systems. The switch was left off a month earlier (November 9) during diesel maintenance. During that time there was no effective emergency backup power system.

Dec 8; ICPP New Waste Calcine facility maintenance fitter was contaminated after he removed his acid suit in a high contamination area. A radiological control technician measured 8,000 dpm beta/gamma on the fitter's knees, 3,200 dpm beta/gamma on his stomach, and 39,000 dpm beta/gamma on his modesty clothing. The fitter had removed his acid suit during the job because of heat stress caused by inadequate breaks and excessive hours.

Dec 18; RWMC waste storage building WMF-634 radiation survey required by the state revealed seven Sandia transuranic waste boxes with surface americium-241 contamination levels at 2,500 disintegrations per minute (dpm) per 100 square centimeters. All personnel were evacuated from the building. Undated winter 1997-98; Managers reported fire caused when an engine overheated and caused a fire because the cooling water drain was plugged with ice which prevented circulation of cooling water through the engine coolant heat exchanger.

1998

Jan 6; Fire resulted from an overheated diesel powered water pump when the discharge line froze.

Jan 8; ICPP reactor fuel handlers dropped a container of uranium bearing material

Jan 12; The Advanced Test Reactor at the Test Reactor Area had an uncontrolled **shutdown** after a secondary coolant line system piping leaked.

Feb.3; Workers respirator air line failed due to the plunger being reversed in the quick disconnect line which could have been serious if the worker was in a contaminated are at the time of discovery.

Feb 26; Five lithium containers were found to be improperly stored in a nitrogen charged glove-box instead of the required argon charged glove-box. Lithium reacts with nitrogen and can result in a highly exothermic reactions when exposed to water or oxygen.

March 1; A liquid waste evaporator that was processing uranium oxide spilled 50 gallons of the waste on to the building floor when it lost steam used to heat the evaporator. No safety control systems were installed to shut the process down in the event of a malfunction.

March 11; WERF **chlorine emissions limit exceeded during incinerator operations** of 33 boxes of MLLW indicated HCL concentrations rose rapidly.

March 13; ANL-W Fuels Manufacturing Facility glove-box **fire** broke out when a technician was consolidating cans of passivated uranium hydride (uranium corrosion) in an air atmosphere glove-box and opened one can (1.7 kg) resulting in a spark that caused a fire in both cans. Despite putting Met-L-X designed to extinguish metal fires on the blaze, it took ten minutes before it was brought under control.

March 17; Test Reactor Area operator inadequately secured one end of a hose that went to a drain pit sump resulting in a spill of waste containing halogenated and non-halogenated solvents and hydrofluoric acid. Some of the 16 gallon spill went into the soil around the pad.

March 18; Worker found contamination on his right shoe during the decontamination of a seal rube bag-out ring at the manipulator maintenance.

March 19; Test Area North employee received an unexpected radiological exposure to neutron from an improperly stored americium-beryllium source which was stored on the top shelf in a room below the employee's office for six years. Investigators believe other workers were also exposed.

March 19; Test Reactor Area TRA-605 waste water spill to environment while transferring spent filter resin to Resin Disposal Cask.

April 1; Test Reactor Area (TRA-777C) underground waste storage tank leak detection system non-functional and leaks possible and undetected.

April 3; Test Reactor Area underground waste storage tanks leak detection alarm was found to malfunctioning. Due to noncompliance with inventory control requirements, investigators were uncertain if a release had occurred.

April 8; Specific Manufacturing Capacity Facility at Test Area North found that they had been shipping contaminated resins off-site since March of 1997 resulting in loss of control of nuclear materials.

May 5; ATR operator inserted an experiment capsule into the wrong capsule irradiation position, and was lost. Because it was in the wrong position it was not discharged from the reactor and was over irradiated. [OES-98-19]

June 9; Test Reactor Area raw water tank found to contain PCB's.

June 30; Three reactor operators exposed at Advanced Test Reactor with trimethylamine above the short-term (15 minutes) exposure limit while recharging anion exchange resin in a demineralized tank. The operators were exposed for less than 30 seconds and may have resulted in personnel injury.

July 21; Advanced Test Reactor Critical Facility emergency **shut down** when an unplanned power excersion resulted from control cylinder withdrawal failed to operate.

July 28; **One Test Reactor Area worker (Kerry Austin) killed and 14 other workers sustained life threatening injuries** when trapped in building 648 during preparation for electrical system preventive maintenance, a high-pressure CO2 fire suppression system unexpectedly activated when workers opened the last of several electrical circuit breakers. Workers did not have means to safely escape and were deprived of clear exit pathways, emergency breathing apparatus. No alarms sounded or evacuation warning alarms.

Aug.9; INTEC plant wide emergency communications and alarm system failed and the backup power system and battery backup also failed.

Aug.19; Eleven workers received external exposure at Fuel Conditioning Facility during a seal tube repair when a release of radioactive contamination to the operations corridor occurred. Of the eleven, four workers received an uptake, (determined by whole body count) with the highest reading being 23 nanocuries of cesium-137.

Oct.7; Fire Alarms found inoperable at INTEC.

Oct.15; Two workers at Waste Experimental Waste Reduction Facility (WERF) incinerator were exposed to 2.68 times the permissible OSHA levels for cadmium dust of 5 micrograms per m3, during cleaning the incinerator off-gas heat exchanger.

Oct.26; Fuel Storage Area found to not meet seismic code requirements because of a misapplied computer code for soil structure interaction used in seismic analysis.[98-43]

Sept.; DOE Office of Oversight Progress Report September 1998 found that "Workplace safety at INL has deteriorated since 1994" and that "corrective actions plan found that deficiencies were not resolved and that lessons learned from previous accidents were not being effectively applied. In environmental management and controls, data indicate weak regulatory compliance and inadequate, short-term, quick-fix solutions. Long term solutions are only in the conceptual stages, with no defined strategies, plans of action, or milestones." "Specifically, one-fifth of all INL occurrences in 1997 were related to radiation protection (personnel contamination) and environmental management occurrences have increased by one-third from 1994 through 1997."

Sept.1; INTEC radiation laboratory analysts received internal plutonium-239 exposure from inhalation that measured 0.1 mrem from unprotected work on plutonium-contaminated graphite molds. [Operational Experience Summary 98-47]

Sept.21; DOE fines LMITCO $55,000 for violation Price Anderson Act resulting from Advanced Test Reactor Critical Facility disabling of the seismic scram subsystem discovered in October 1997.

Sept. ; DOE Oversight Analysis Group issues Office of Oversight Progress Report covering INL's non-compliance with environmental regulations, poor implementation of worker safety and health programs and privatization issues. The report cited, "workplace safety performance has deteriorated," "recurring problems in work control and facility authorization basis, noncompliance with environmental regulations, and cost overruns associated with the Pit-9 project," "INL has not established an effective process to pro-actively track and prioritize corrective actions. Further, ES&H functions and activities are not always integrated into programs or work planning." "Worker competence and safety performance are also impacted by the reduction enforce at INL since the beginning of integrated management. The reductions have affected the experience level of workers and reduced morale. Since 1994, INL has experienced to workplace fatalities, a serious electrical shock, and many unplanned exposures and near misses involving workplace hazards." "Significant weaknesses are also noted in INL's environmental management program as shown by the site's having received four Notices of Violation from the State of Idaho for environmental non compliance since 1994, as well as 4 of the 26 DOE Enforcement Actions issued by DOE through

June 1998." "In recent years, weakness in work planning and controls have resulted in two Type A accidents as well as many near misses involving workplace hazards. The identified programmatic deficiencies include insufficient worker training, lack of hazard identification and control, and inadequate supervision of work."

Sept. 28; On 9/27/98 the Region VI (Idaho) Radiological Assistance team was deployed to Idaho Falls to investigate two cooler-type containers bearing cesium transport index 5 labels. The containers were discovered in a residential home's garage. The team determined that the containers held sealed radioactive sources, on cesium-137 and one amercium-241." [DOE Daily Filed Management Report, September 28, 1998]

Nov.4; Waste Experimental Waste Reduction Facility (WERF) incinerator worker seriously injured when thrown against an air receiver and into a concrete wall from the concussion following a catastrophic air compressor **explosion**. Compressor parts, debris, and oil were propelled into the south end of the compressor room, and immediately filling it with atomized lubricating oil and smoke.

Nov.25; RWMC fire alarm notification to other facilities was found to be "non-functioning" for over three weeks.[Operational Experience Summary 98-48

Dec. 14; Advanced Test Reactor forced into unscheduled **shutdown**.

Dec.17; Two workers at Argonne-West 752 analytical Laboratory and two workers at Fuel Conditioning Facility received carbon monoxide exposure when a fork lift truck was left running next to the intake for two breathing air compressors. The four workers showed signs of CO exposure and were transferred to INL Dispensary.

Dec.22; Six workers contaminated at the New Waste Calcine Facility incinerator during waste transfer operations. Additionally, two pickup trucks, some road surfaces, and hallway carpets in another INTEC were contaminated when workers left the NWCF.

Undated; INTEC (ICPP) Fuel Element Cutting Facility (CPP-603) HEPA filter failure resulted in outside ground contamination of 131,302 square feet. [Waste Area Group 3, RI/FS page 2-129]

1999

Jan.3; Fire at Argonne-West Sodium Process Facility resulted when a sodium leak (four ounce) in the reaction vessel sodium injection lines. The process was **shut down** and the facility evacuated.

Jan.6; At Test Reactor Area, an Iridium-192 pellet was unknowingly removed from a cell charging port at the TRA Hot Cell Facility and resulted a radiation filed of approximately 800 rem/hr on contact. Three workers were exposed to 2 rem/hr and one worker received 14 rem/hr exposure.

Jan 7; INTEC NWCF and CPP-665 & 679 fire detection system found inoperable due to degradation, down for two weeks for being corrected. Operator attempted to cover up by destroying printout. [ID-LITCO-Landlord Occurrence Reports 9901]

Jan. 11; New Waste Calciner Facility **fire** erupted while bringing the NWCF into operation, a flexible, braided stainless steel oxygen hose for the calciner vessel #4 fuel nozzle failed. This failure resulted in a spray of kerosene mist, which ignited in the cell.

Jan. 11; Butte County High School student was contaminated during tour of Advanced Test Reactor Canal Area. Cobalt-60 contamination measuring 23,500 disintegrations per minute (dps) was found on the students shoes.

Jan.15; New Waste Calciner Facility incinerator **fire** in the oxygen/kerosene fuel loop was caused by missing seals. It is believed that absence of these seals allowed oxygen and kerosene to leak, mix and catch fire at calciner operating temperatures.

Jan.19; INTEC a maintenance electrician at CPP-601 and 640 received contamination (12,000 cpm) beta-gamma, the gamma scan showed Cs-137 at 6,000 dpm. [ID-LITCO-Landlord Occurrence Reports 1998-0002]

Feb.3; ICPP, Two of four air compressors crucial to radiological material transport between systems failed.

Feb. 4; Waste Experimental Reduction Facility (WERF) incinerator worker exposed to contamination when he entered a mixed-waste incinerator chamber to remove hardened hearth ash from an ash hopper. A stand down order was issued

Feb.12; INTEC standby power generator starting float mechanism disconnected preventing startup. [ID-LITCO-Landlord Occurrence Reports]

Feb. 17; INTEC nitric acid leak contaminated employee's head and arm. [ID-LITCO-Landlord Occurrence Reports]

Feb. 17; Advanced Test Reactor operators found that a flux trap target capsule holder assembly had been rotated 90 degrees from its intended position since 1994. Miss orientation of the targets could have caused a variation of the neutron flux peaking within the flux trap resulting in operating the advanced test reactor outside its safety authorization basis.

Feb. 19; INTEC high-level waste transfer error from VES-WH-101 Tank Farm containing 1976 gallons went to VES-WL-133 and 1325 gallons went to VES-WM-100 for a total of 3,301 gallons. [ID-LITCO-Landlord Occurrence Reports]

Feb. 23; Test Area North radiological control technician worker was contaminated with 2,000 dpm cesium-137 when he walked through water that had become contaminated when it leaked from the roof onto the facility duct-work.. Fan room floor contamination measured 23,900 dpm gamma.

March 8; INTEC diesel driven fire water pump batteries exploded during test startup. [DOE Operational Experience Summary 99-12]

March 9; INTEC Fuel Storage Area operators failed to store a fuel assembly in the storage port that was specified on a fuel receipt record which could have resulted in a criticality but luckily was stored with compatible fuel assemblies.

March 10; INTEC power failure at CPP-603 and CPP-1758. [ID-LITCO Landlord Occurrence Reports.]

March 16; INTEC NWCF individual (with Science Applications) was exposed doing NWCF off gas sampling. [ID-LITCO-Landlord Occurrence Reports]

March 21; Waste Experimental Reduction Facility (WERF) incinerator operator was radiologically exposed to europium and the waste sizing room was also contaminated. The cause of the accident was inaccurate isotopic data from the site waste-tracking database. Contamination levels were greater than one-million dpm beta-gamma and 17,500 dpm alpha.

March 22; Advanced Test Reactor crane dropped a 400 pound irradiated inpile tube assembly being lifted from the reactor core and narrowly missed hitting a worker. The uncontrolled fall damaged the storage well and docking plate.

April 1; INTEC NWCF individuals received exposure to methylene chloride and toluene during off-gas sampling over two months. The exposure data indicated values that exceed twice the value of the limits established for a 40 hour workweek of methylene chloride of 105 ppm; toluene at 166 ppm. Samples at the base on INTEC main stack exceeded OSHA limit of 25 ppm. [ID-LITCO-Landlord Occurrence Reports 1999-006]

April 7; INTEC NWCF high radiation area (exceeded 1 rem/hr) found unattended when it should have been in a secured locked box. [ID-LITCO-Landlord Occurrence Reports]

May 5; INTEC bacterial contamination found in potable water supply. [ID-LITCO-Landlord Occurrence Reports]

June 13; INTEC emergency alarm and personnel emergency paging system was found non-functional when managers attempted activate the facility incident response team to respond to a personnel injury. The system has a history of intermittent failures.

June 21; ANL-W West Fuel Conditioning Facility special nuclear materials security handling requirements were violated causing a general **shut down** of the facility.

June 30; ANL-W employee performing an oil vapor test on a breathing air system was burned by concentrated sulfuric acid expelled from a drager [sic] tube. The employee received burns to the right side of the neck, the right forearm, and the little finger of the left hand.

July 12; INTEC (ICPP) fire in a power beaker resulted in loss of power, communication, and ventilation system failure. The New Waste Calcine Facility (high-level waste incinerator) at INTEC was evacuated when backup generators, and battery backups failed. Three radiologically contaminated areas within facility radiological buffer areas were found and the cause was due to ventilation failure. Fuel Receiving and Storage Facility and Irradiated Fuel Storage Facility at

INTEC were also evacuated because backup generator power failed to be automatically routed into the system. A similar power failure occurred at ANL-W in 1997.

July 15; INTEC NWCF shift supervisor certification expired two months earlier in violation of operating rules. [ID-LITCO-Landlord Occurrence Reports]

July 20; RWMC Pit-9 waste characterization program shut-down due to sonic drilling into the pit could cause the mixture of potassium and sodium nitrates and organic chemicals in the waste to explode or ignite.[Star 7/22/99 pg 4]

July 27; ANL-W rigger injured in construction accident

August 23; INTEC, three of four air compressors fails and the fourth was unable to maintain plant air demand. [ID-LITCO-Landlord Occurrence Reports]

August 24; INTEC New Waste Calcine Facility operators failed to refuel a diesel powered portable air compressor causing it to **shut down** and resulting in a loss of plant air. The facility manager ordered an evacuation because the air compressor shutdown reduced the plant air supply and caused the ventilation system intake dampers to close. Failure to maintain the minimum air supply resulted in a facility evacuation and could have resulted in additional facility evacuations or the spread of contamination. Investigators determined that the portable air compressor was being used as a backup supply because three of the four permanently installed air compressors were out of service.

August 25; Operator suffered heat stroke while working in high-temperature area. Worker was wearing three sets of personal protection equipment and a full face mask respirator. He worked one hour when the maximum safe limit is 15 minutes. Management fails to provide refrigerated air lines for workers because of expense

Sept.15; INTEC air quality check on portable breathing air compressor expired but still in use. [ID-LITCO-Landlord Occurrence Reports]

Sept. 17; Specific Manufacturing Capability Facility operator incorrectly opened the main flush valve to the evaporator process resulting in a spill of 20 gallons of uranium process liquid on the floor of the plant.

Sept. 20; INTEC radiation worker contaminate on his arms at INTEC Tank Farm 20,000 dpm/ 50 mrem whole body that went through protective clothing. [ID-LITCO-Landlord Occurrence Reports 1999-0011]

Sept.23; Hydrogen gas and a spark produced a quick fire at the Advanced Test Reactor destroying the HEPA filters

Oct.24; INTEC Calciner air compressor shutdown because it ran out of fuel. “This resulted in a shortage of plant air impacting operating facilities when pressure dropped below the limits required to sustain operations.” NWCF was evacuated. [1999-0011 Final Report]

Nov. 6; A leaky valve in the primary coolant system caused an unscheduled **shut down** of the Advanced Test Reactor (ATR. The ATR lost 55 hours of operation. An internal report concluded that a lack of preventive maintenance contributed to the problem. This forced shut down “cost $392,000 because preventive maintenance was not performed. A nearly identical failure occurred in 1996. [DOE/IG 3/01]

2000

Jan. 24; An over-pressurization condition in a furnace caused an explosion that led to an exhaust stack falling to the floor. Although no one was injured, this was the second failure of this furnace. A report on the incident cited improper maintenance as the problem. Incident reports identified other furnace problems, all related to inadequate maintenance. DOE/IG audit states “We further noted that, as of April 2000, the backlog of preventive maintenance was approximately 311,000 hours.” [DOE/IG 3/01]

March 17; Test Area North Hot Shop Special Equipment Service Room had two radiation penetration areas without shielding. The Hot Shop also had “several additional straight through radiation penetrations.” [Operational Experience Summary 98-47]

August 5; The Test Reactor Area potable water supply was contaminated after the area’s chlorination system failed. A report linked the problem to maintenance that was neglected. Auditors found that $362,700 (just for IFSF operation) was transferred out of the maintenance budget and into current operating budget. [DOE/IG 3/01]

2002

Nov. 20; Four workers at ATR received radioactive contamination on Nov. 20, when a shipping cask loaded with Cobalt-60 failed to depressurize properly after a routine cask pressure check. The incident occurred at the Advanced Test Reactor. The four workers – a heavy equipment operator, and engineer, a mechanic and a pipe fitter – were wearing the proper protective clothing and were quickly decontaminated. Three of the four tested positive for nasal contamination and were further tested for internal contamination. None of the three was found to be internal contaminated. [DOE/ID Press Release November 25, 2002]

2003

August 14; AMWTP at RWMC fire during venting of a 55 gallon waste drum containing a sludge mixture of plutonium contaminated solvents mixed with concrete. The drum was part of a retrieval of buried mixed waste at the INL RWMC burial ground. About 20 drums were found to be "bulging from built-up pressure, such as hydrogen gas.[Times-News August 14, 2003] [also see the Albuquerque Journal (8/14/03) that states "the drum contained radioactive sludge from the Rocky Flats nuclear weapons plant in Colorado. In the 1970s, drums from Rocky Flats were sent to Idaho for long-term storage until a permanent waste dump could be built. In this case, however, flames leapt from the drum as soon as it was vented."

2004

July 26; INTEC vapor leak that first started June 24 involving a gas cylinder that contains anhydrous (containing no water) hydrofluoric gas. Employees were instructed to remain indoors. This is an active work area were old cylinders are being recovered from an existing burial pit. The 40-year-old cylinders are being retrieved and stored.[DOE News Release 7/26/04]

2005

Nov. 8; RWMC propane leak caused the **evacuation** of 650 employees in the vicinity of RWMC and the AMWTP. Initial reports indicated the propane was leaking from an overfill line on a 1,000-gallon propane tank. Further reports indicated the leak is coming from a failed line or valve leading to a pair of 1,000 gallon propane tanks connected in series as part of the a heating system at the RWMC's Accelerated Retrieval Project Facility. [DOE/ID News Release 11/8/05] Other reports indicate that propane leaks occurred twice during the summer of 2005.

DOE order O 232.1A Effective Date 8/012/97 closed public access to DOE's Occurrence Reporting and Processing of Operations Information.

2006

June 22: During a Safety Analysis Report (SAR) review, Advanced Test Reactor personnel identified a Potentially Inadequate Safety Analysis (PISA) condition regarding Primary Coolant System (PCS) overpressure protection in relation to a complete loss of heat sink (LOHS). Upon a LOHS condition, the PCS water will heat up, expand, and cause a pressure increase. Additional flow from the gland seal water (GSW) pump was not considered in the analysis. However, combining the GSW flow of 68 gallons per minute (gpm) with the LOHS transient flow (maximum of 622 gpm) would result in a total flow of 690 gpm. This would exceed the capacity of the SAR minimum required relief valve flow. The currently installed PCS relief valves have a combined certified relief capacity of 700 gpm, which would provide adequate protection for this transient. Appropriate notifications were made and an Unreviewed Safety Question evaluation was initiated. There were no restrictions or interim controls associated with this PISA conditions. (NE-ID--BEA-ATR-2006-0007)

June 22: During a Safety Analysis Report review, Advanced Test Reactor personnel identified a Potentially Inadequate Safety Analysis condition regarding an extreme over-speed of the diesel-powered standby pressurizing pump. The analysis assumed that only the pressurizing pump would be affected by the diesel over-speed, and did not take into account the flow increase from the diesel-powered gland seal water pump. Appropriate notifications were made and an Unreviewed Safety Question evaluation was initiated. (NE-ID--BEA-ATR-2006-0008)

May 22: During routine plant observations, it was noted that an unused Advanced Test Reactor (ATR) fuel element storage position was moving laterally approximately 1/2 inch. Movement was most likely induced by the flow from the canal recycle system. At the time, no other storage positions were noted to be moving and this condition was treated as a material deficiency. An extent of conditions review was performed and two additional storage positions were found to move greater than the design dimensional tolerance (1/32 inch). Initial assessment indicates that due to the large amount of conservatism built into the criticality safety evaluation for the fuel storage grid, this small amount of lateral movement poses no threat to criticality safety and no interim controls are required. ATR management has removed the three storage locations from service until a new detailed criticality analysis of the grid is completed. (NE-ID--BEA-ATR-2006-0005)

June 7: The Design Basis Reconstitution (DBR) team discovered a minor calculation error in the high pressure set point of the Advanced Test Reactor plant protection system. When primary coolant system pressure increased to a pre-determined value, the ATR core and several pumps are shutdown automatically. Due to the inaccuracy, the automatic shutdown may have been slightly delayed. The miscalculation was of such small magnitude, it was determined that no additional controls or limits were required for the continued operation of the ATR. The DBR is an effort to search for and correct errors and inconsistencies in the design of the ATR. Similar DBRs have been conducted on numerous commercial nuclear reactors. (NE-ID--BEA-ATR-2006-0006)

June 26: During post-maintenance testing at the Advanced Test Reactor Critical (normal shutdown/ outage period), the #3 safety rod failed to drop into the reactor core, as required. A spare actuator controller was installed in the #3 position and the test repeated. The #3 safety rod again failed to drop into the reactor core, indicating performance degradation associated with the actuator controllers and their circuitry. Plant and Nuclear Safety Engineering commenced an evaluation of the problem for indication of a possible original design deficiency and a reasonability determination of the existence of a potential inadequacy in the safety analysis (PISA). There was no safety impact since the discovery was during facility shut down. Currently, there are no programmatic impacts. There is potential for future impacts, if further evaluation reveals the need for component redesign. (NE-ID--BEA-ATR-2006-0009)

July 26: A review of the powdered uranium inventory stored at the Nuclear Materials Inspection and Storage Facility (NMIS) was conducted to determine if it was within the safety basis to repackage and permanently remove the material from the facility. The quantity of material in some of the individual packages was large enough to raise a question about whether the current safety documentation was sufficient, resulting in an unreviewed safety question finding. Interim controls were established for the movement of uranium powders from these approved storage areas. (NE-ID--BEA-ATR-2006-0010)

Aug 2: Operations personnel were routing tubing through the Advanced Test Reactor Loop 2B transmitter cabinet when the tubing came in contact with a conduit. The radiological controls technician noted a spark coming from the end of the conduit upon contact. Work was immediately stopped, management was notified and boundaries were established to restrict access to the area. The source of the spark was determined and power to the energized wiring was tagged out. The wiring was placed in an electrically safe configuration by insulating the exposed ends of the wiring and then power was restored. (NE-ID--BEA-ATR-2006-0011)

Aug. 7: Battelle Energy Alliance has a zero defect policy for administration of the lockout/tag out (LO/TO) process. Recently two events fell short of the zero defect expectation and caused the contractor to stop work and a critique and safety stand downs were conducted. Subcontractors were then trained on the LO/TO requirements and the contractor's expectations. In neither case was work performed without hazard mitigations in place. (NE-ID--BEA-ATR-2006-0012)

Aug. 21: During non-routine maintenance on several Advanced Test Reactor switchgear and motor control centers, the systems control panel was placed under Lockout/Tag-out (LO/TO). During a control panel recheck an energized power source was found. Work was immediately stopped. A critique was held and the cause was identified prior to work restarting. (NE-ID--BEA-ATR-2006-0013)

Aug. 22: Neutron Radiography Reactor operations were being performed when an automatic reactor **shutdown** occurred. No observable failure was identified. The reactor was restarted by reactor operations personnel following verification that the high voltage power supply spurious alarm was clear and operational checks of the reactor protective circuits were completed satisfactorily. Reactor operations personnel did not notify management immediately and did not obtain permission for continued operation. As a result, the reactor has been **shut down** and cannot be restarted without line management authority. A critique is being performed. (NE-ID--BEA-NRAD-2006-0001)

Aug. 23: It was discovered that the Advanced Test Reactor's Safety Analysis Report did not fully analyze the bounding of accidents for reflector aging. A Potentially Inadequate Safety Analysis was identified after this discovery. Compensatory measures were taken, appropriate notifications were made, and an Unreviewed Safety Question Determination was initiated. (NE-ID--BEA-ATR-2006-0014)

Aug. 28: Part of the ongoing Advanced Test Reactor Design Basis Reconstitution Program includes review of the Safety Analysis Report (SAR) and supporting calculations. This review has resulted in a Potential Inadequacy in the Safety Analysis in Section 15.6, "Decrease in Primary Coolant Inventory." One of the supporting calculations had several deficiencies. The calculations will be corrected and changes made. Interim controls have been established to assure secondary coolant system activity remains within the controlled limits. (NE-ID--BEA-ATR-2006-0015)

Oct. 2: During a standard review, it was determined that a more detailed analysis was needed for a maximum potential accident scenario at the Advanced Test Reactor spent fuel storage canal. No compensatory measures were required because requirements are already in place to prevent the movement of loads over irradiated fuel in the canal. Appropriate management notifications were made, and a more detailed safety review was initiated. (NE-ID--BEA-ATR-2006-0023)

Oct. 2: A condition was identified at the Advanced Test Reactor regarding inconsistencies in a maximum hypothetical accident analysis associated with radiological consequence analysis. Appropriate interim measures were taken, management notifications were made, and a more detailed safety review was initiated. (NE-ID--BEA-ATR-2006-0024)

2007

July 31: While working on the Advanced Test Reactor Critical, operators noted that an instrument light for an amplifier was indicating erratically. The instrument was declared out of service, the failed amplifier was replaced, and required post-maintenance testing completed. (NE-ID-BEA-ATR-2007-0016).

Aug. 9: During a maintenance outage of the Advanced Test Reactor, a discrepancy was identified in the safety documentation of the reactor. A review of the concern is under way while the reactor is in maintenance shut down, and no interim controls are required. (NE-ID-BEA-ATR-2007-0017).

Sept. 19: Electricians working at the Advanced Test Reactor discovered electrical energy in an area that was supposed to be de-energized to allow for maintenance. Work was stopped and an investigation undertaken to determine the source of the energy. (NE-ID-BEA-ATR-2007-0018).

Oct. 3: Equipment required for the safe operation of the Advanced Test Reactor (ATR) is identified using a rigorous analysis process and documented in the ATR Safety Analysis Report (SAR). Operation, maintenance, and modification of the ATR are accomplished only after careful review of the SAR for impacts to this safety analysis. When the SAR was upgraded in the late 1990s, a discrete list of this safety-related equipment was developed. Contrary to DOE administrative requirements, there is currently no procedure for maintaining this safety-related equipment list. This is not a safety issue because the list is not used for safety-related decision making – the source analysis documents are. (NE-ID- BEA-ATR-2007-0019)

Oct. 4: During a review of historical ATR documents, it was discovered that a fuel storage requirement had been inappropriately removed from operating procedures. Past operating procedures required that fuel used in the reactor not be placed within 12 inches of the wall of the fuel storage canal during the first 17 days of its storage. The heating of structural materials caused by their absorption of radiation may adversely affect the structural performance of those materials. The 12 inches of separation allows the canal water to shield the walls from the more intense radiation emitted by the fuel during the first 17 days of storage. This requirement was based on extremely conservative assumptions regarding ATR operations which yielded far higher wall radiation exposures than actual operations do. The requirement has been reincorporated into facility procedures. (NE-ID-BEA-ATR-2007-0020)

Oct. 18: A total power outage occurred at INL when a phase conductor on a power pole fell to the ground and tripped the breakers at both ends of the power line. The power pole and cross arm were burned, but the conductor was not damaged. The power pole was repaired and the line was re-energized. (NE-ID-BEA-CFA-2007-0007).

Oct. 24: During startup of the Advanced Test Reactor Critical, the reactor operator reported that instrumentation was showing abnormal readings. He stopped the start-up procedure and ordered the **reactor shut** down pending review**.** (NE-ID-BEA-ATR-2007-0021).

Oct. 29: At the Advanced Test Reactor, "dampers" are used to prevent the release of radioactive material from the facility in the event of an incident. Several years ago, backup dampers were upgraded to provide the same kind of protection as primary dampers. While both the backup and primary dampers would close in the event of a release at ATR, current safety documentation only requires that one or the other is in service during reactor operations. This is inconsistent with a higher-level safety requirement, and is under review. (NE-ID-BEA-ATR-2007-0023).

Oct. 29: As part of an ongoing evaluation process to ensure that safety documentation at the Advanced Test Reactor is consistent, three issues were identified. These deal with how much pressure the reactor confinement system can withstand; an improper evaluation of the heating, ventilation and air conditioning system performance during a radiation release; and improper evaluation of the effect of negative air pressure on the confinement system. Both the ATR contractor and DOE have evaluated these issues and found there is no impact to the safe operation of ATR. An evaluation of the issues and how to correct them is ongoing. (NE-ID-BEA-ATR-2007-0022).

Nov. 5: Proper procedures were not followed when workers could not get a large sliding door to open at the Advanced Test Reactor building. A worker complained of shoulder pain resulting from manual efforts to force open the stuck door, was examined and released back to work with restrictions. An investigation into the failure to follow proper procedures is underway and corrective actions will be put in place. (NE-ID-BEA-ATR-2007-0024).

Nov. 15: During a planned power outage at the Reactor Technology Complex, power was unexpectedly lost to another building in the area. Work in progress, including crane operations and containment work requiring filtered air movers, was impacted. Upon discovery of the unexpected power loss, a decision was made to complete the work in order to restore power quickly to the affected building. A critique was held to determine the cause of the incident and to identify lessons learned. (NE-ID-BEA-ATR-2007-0025).

Dec. 3, 2007: DOE Cites Battelle Energy Alliance, LLC for Price-Anderson Violations

The U.S. Department of Energy (DOE) today notified Battelle Energy Alliance, LLC (BEA) that it will fine the company $123,750 for violations of the Department's nuclear safety requirements. BEA is the DOE Idaho Operations Office prime contractor for the operation of the Neutron Radiography (NRAD) reactor. The Neutron Radiography Reactor is used to non-destructively examine irradiated materials; the imaging technique utilizes thermal neutrons and is used for quality control purposes in industries which require precision machining.

The Preliminary Notice of Violation (PNOV) issued today cited a series of violations that occurred on August 20, 2006 during the restart and subsequent automatic unplanned shutdown of the NRAD reactor. Violations include failures to adhere to technical safety requirements and reactor operating instructions, inadequacies in the reactor operating instructions, failure to correct known problems with a reactor component, and failure to adequately conduct management assessments in reactor operations.

The proposed civil penalty of $123,750 is based on the significance of the violations yet reflects substantial mitigation granted by DOE for BEA's identification of the issues and corrective actions they have taken to prevent recurrence of the identified deficiencies. While the deficiencies in NRAD reactor operations did not compromise reactor safety systems, they did represent a significant departure from what the Department expects in the operation of its reactors. BEA will have 30 days to respond with any objections to the notice.

The Price-Anderson Amendments Act of 1988 authorizes the Energy Department to undertake regulatory actions against contractors for violations of its nuclear safety requirements. The enforcement program encourages departmental contractors to identify and correct nuclear safety deficiencies at an early stage, before they contribute to or result in more serious events.

2008

Feb. 11: A leak was discovered in the non-radioactive system that supplies sealing and cooling water to the shaft seal on the primary coolant pump at the Advanced Test Reactor during recent perations**.** The reactor was **shut down** to allow a switch to a different primary coolant pump with a non-leaking seal system, and the reactor was restarted. (NE-ID-BEA-ATR-2008-0003).

March 4: It was determined there is a discrepancy between a computer model's projections for how quickly safety rods can be inserted at the Advanced Test Reactor, and the response time predicted in current safety documentation. Interim safety controls will be implemented while the issue is further analyzed. (NE-ID-BEA-ATR-2008-0005).

May 6: During start-up of the Advanced Test Reactor, it was determined that a system that indicates power levels in the reactor lobes was not functioning properly, even though it was not required at lower power levels. **Limits were placed on reactor operations** as a precaution until the system is restored. (NE-ID-BEA-ATR-2008-0007).

May 13: The Advanced Test Reactor was inadvertently **shut down** when an operator hit the wrong computer command. Normal reactor shutdown procedures were followed. The test and debug computer displays will be password protected in the future to prevent a similar inadvertent shutdown. (NE-ID-BEA-ATR-2008-0009)

June 5: The Advanced Test Reactor experienced an unplanned **shutdown** due to an electrical malfunction. The reactor went into an unplanned outage to allow for troubleshooting and repair of the problem. (NE-ID-BEA-ATR-2008-0010)

June 26: While inspecting the Advanced Test Reactor during a planned outage, a flow restrictor component was found out of its installed experiment position in the vessel tank. A review of the reactor loading records showed the flow restrictor was installed as part of the vessel closeout process. The closeout process will be revised to include performance of the final visual inventory and inspections after all in-vessel operations are complete and all long-handled tools are removed from the vessel. (NE-ID-BEA-ATR-2008-0013).

July 10: During operation of the Advanced Test Reactor on July 5, operators observed an intermittent reactor vessel low differential pressure alarm. Follow-up investigation revealed electrical interference between the cables of a regulating rod and the differential pressure instrument, causing fluctuations in the differential pressure. Spacers were placed between the cables to limit the interference. Testing was performed and validated that the electrical interference was eliminated. (NE-ID-BEA-ATR-2008-0015).

July 15: A systems engineer determined that an electrical breaker installed in the switchgear cubicle of a pump at the Advanced Test Reactor was not the breaker that was expected to be installed. It was then determined that a required response check of the system was not conducted as prescribed. The pump was placed out of service until the required check could be performed. The pump was not operating at the time the discrepancy was found. (NE-ID-BEA-ATR-2008-0016 and 0017).

July 29: It has been determined that there is an error in the computer code used as part of accident analysis at the Advanced Test Reactor and the Advanced Test Reactor-Critical. After an analysis of the error was conducted, it was determined the error would not significantly change the conclusions of the safety analysis done for the reactors, and no interim restrictions or requirements on reactor operation were necessary. (NE-ID-BEA-ATR-2008-0018).

Aug. 7: Operators noticed unusual noises caused by vibration from a coolant pump at the Advanced Test Reactor. The pump was removed from service and the reactor was **shut down.** A technical evaluation was performed on the remaining coolant pumps and reactor operations resumed. (NE-ID-BEA-ATR-2008-0019).

Aug. 7: While exiting the storage canal area at the Advanced Test Reactor, an employee set off a personnel contamination monitor alarm when contamination was discovered on the operator's shoe. The contamination was removed and analyzed. Detailed surveys were performed in the canal area and additional controls were implemented for entry in that area. (NE-ID-BEA-ATR-2008-0020).

Aug. 11: An alarm went off while a primary coolant pump was being restarted at the Advanced Test Reactor. Operators noted that a stand-by pump was running inadvertently. Both pumps were **shut down** and management notified. (NE-ID—BEA-ATR-2008-0021).

Sept. 22: It was discovered that the engine block heater thermostat on a diesel firewater pump failed at the Advanced Test Reactor Complex. The reactor was in shutdown condition and defueled, and the pump is not required to be operable when the reactor is defueled. The pump was declared inoperable and will be repaired. (NE-ID-BEA-ATR-2008-0027).

Sept. 11: While removing an experiment from the Advanced Test Reactor, it was discovered that configuration of the lift equipment was not in compliance with the drawing in the operating procedure. However, evaluation by the engineering staff determined that the configuration used was an acceptable and safe method for the lift. Management was notified of the non-compliance and an incident critique was held. (NE-ID-BEA-ATR-2008-0024).

Sept. 15: During inspection of a circuit breaker at the Advanced Test Reactor, suspect bolting material was discovered. A non-conformance report was placed into the tracking system for resolution. (NE-ID-BEA-ATR-2008-0025).

Nov. 3: The Advanced Test Reactor was **shut down** and a review undertaken after an investigation identified potential seismic concerns with a cinder block wall in the facility. Compensatory actions were taken to ensure the wall would not damage required utility systems in a seismic event, and the reactor was restarted. (NE-ID-BEA-ATR-2008-0028).

2009

March 10: During startup of the Advanced Test Reactor on March 8, it was determined that a primary coolant check valve was not seating properly. Startup preparations were stopped **[shutdown],** the primary coolant system was depressurized and the reactor was defueled so the check valve could be replaced. (NE-ID-BEA-ATR-2009-0003).

March 19: An operator at the Advanced Test Reactor discovered that an inflatable seal on the canal bulkhead at a fuel storage facility was no longer maintaining required pressure because of an air leak. Spent fuel cask movements in the canal area affected by the failed seal were prohibited until the failed seal is repaired or modifications completed. (NE-ID-BEA-ATR-2009-0004).

March 26: It was determined that an existing safety analysis of the Advanced Test Reactor does not fully address the possibility that emergency cooling pumps at the reactor could be submerged before they are able to fulfill their safety function following a reactor shutdown in a particular accident scenario. No compensatory action was taken because subsequent calculations showed that the emergency cooling pumps would remain operational for the required time. (NE-ID-BEA-ATR-2009-0005).

March 30: During a routine safety walk down of the Advanced Test Reactor, a facility representative discovered a slightly open door on a 480-volt electrical panel. The open door provided a small opening where a person could contact energized wires. The electrical panel with the open door was roped off for further investigation. (NE-ID-BEA-ATR-2009-0006).

June 9: An operator at the Advanced Test Reactor noted power variations in one of the reactor's experimental lobes. After consulting with ATR engineering and verifying the indications were from a failure of the instrumentation system, the ATR shift supervisor declared the instrumentation system inoperable, and initiated **limiting conditions on reactor operations**. The indication problem was corrected and the limiting condition on reactor operations was removed the same day. (NE-ID-BEA-ATR-2009-0013).

June 29: An equipment operator noted the improper assembly of wire rope components on a mobile crane during a daily pre-use inspection at the Advanced Test Reactor Complex. Other suspect/counterfeit wire clamps were also noted. This crane was tagged out of service and further mobile crane inspections discovered suspect/counterfeit components. These cranes were also tagged out of service. (EM-ID-CWI-BIC-2009-0002).

Aug. 24: A review was initiated to look at the Advanced Test Reactor primary coolant system chemistry. In the course of the review, it was noted that the technical safety requirements limits for pH of the ATR primary coolant system water allow a low range (pH 4.7) that could possibly cause damage to the thin boehmite oxidation layer that is on the fuel. Interim controls after the discovery have been put into place that do not allow the pH of the primary coolant system to get below 5.0. A review of chemistry logs has been performed to ensure that none of the fuel in the canal has been exposed to a pH less than 5.0. (NE-ID—BEA-ATR-2009-0020).

Sept. 16: It has been determined that evacuation sirens located at the Advanced Test Reactor Complex are mounted within office buildings that are not designed to withstand significant seismic events. A review of the safety analysis at the facility is underway. (NE-ID—BEA-ATR-2009-0021).

Sept. 30: An automatic **shutdown** of the Advanced Test Reactor occurred when a circuit breaker on a diesel bus tripped open on a ground fault indication. An investigation was initiated into the cause of the ground fault trip. The reactor remained in a safe condition and was restarted following review of the shutdown. (NE-ID—BEA-ATR-2009-0022).

Oct. 12: An automatic **shutdown** of the Advanced Test Reactor occurred as the result of an error by an experiment operator who failed to follow proper procedures**.** The reactor remained in a safe condition; a critique was conducted and corrective actions taken. (NE-ID—BEA-ATR-2009-0023).

Nov. 17: While connecting a battery charger to a battery bank at the TRA-604 Battery Room, an electrician was burned on both hands by an electrical arc. The injured electrician was treated at the Central Facility Area medical dispensary and then driven home. The doctor found first and second degree burns over 5 percent of the electrician's hands. Electrical work was stopped and access to the battery room secured pending a critique of the incident. (NE-ID—BEA-RTC-2009-0002).

Fuel Burnup Record: Idaho National Laboratory scientists have set a new world record for fuel burnup with a reactor fuel for next generation high temperature gas reactors. As part of a nearly three-year experiment, about 19 percent of the fuel's low-enriched uranium has been consumed in the INL's Advanced Test Reactor – more than double the previous record set by German researchers. Better reactor fuels mean more efficient heat and power production and less waste when the fuel is spent.

Nov. 24: Start-up of the Advanced Test Reactor was interrupted by an instrument problem. The problem was diagnosed and corrected and reactor **start-up** resumed. (NE-ID-BEA-ATR-2009-0024).

Dec. 2: The Advanced Test Reactor was **shut down** when a calculation error was discovered in the assurance package for that particular reactor operating cycle. The reactor remained in shutdown until the error was corrected and a re-calculation performed. (NE-ID—BEA-ATR-2009-0025).

2010

Jan. 12: The shift supervisor at the Advanced Test Reactor entered into a **limiting condition shut-down** for operation of the reactor when two instrument systems used to calculate water flow in the reactor were declared out of service. Limiting conditions for operation are a Department of Energy approved method to ensure safety of nuclear facilities while system performance is evaluated. The shift supervisor used other data systems to verify the safety of reactor operations while the systems were repaired and returned to operation. (NE-ID—BEA-ATR-2010-0001).

Nuclear Research: The INL's Advanced Graphite Capsule project will test over 2,000 different samples of graphite in the INL's Advanced Test Reactor over a 10-year period. The tests are part of work to certify the graphite that is used in many parts of advanced nuclear reactor designs.

Feb. 11: An air leak was detected from two pressurized seals on the bulkhead at the head of a nuclear fuel storage canal. Cask handling was prohibited in the canal until the seal was repaired. (NE-ID—BEA-ATR-2010-0003).

March 9: An electrician violated a lock out/tag out when he mistakenly disconnected the electrical system for the wrong pump motor at the Advanced Test Reactor. The motor was not energized at the time, and there were no injuries or damage to equipment. A lock out/tag out was applied and a critique of the incident was scheduled. (NE-ID—BEA-ATR-2010-0004).

April 8: An operator at the Advanced Test Reactor noted that the distribution breaker for the Plant Protective System channel C battery charger had tripped open. An attempt was made to reset the breaker, but it immediately tripped open again. The system is not required to be operable while the reactor is shut down, and it was taken off-line. (NE-ID—BEA-ATR-2010-0006).

April 26: Two subcontractors violated posted radiological control area entry instructions while delivering waste boxes to a storage pad at the Advanced Test Reactor Complex. Because of the low radiological fields present in the area, the two workers did not receive significant exposures. A radiation engineer will complete a radiological exposure questionnaire to document any dose received. (NE-ID—BEA-RTC-2010-0001).

May 5: Several instances of suspect/counterfeit bolts were discovered during a recent outage at the Advanced Test Reactor. Some of the suspect bolts were determined to be non-load bearing and acceptable for use. They will be replaced when future maintenance activities require disassembly of the components. All other suspect bolts were removed pending determination for disposal or destruction. (NE-ID—BEA-ATR-2010-0008).

June 7, 2010 INL.gov website Information Update; "On May 30, 2010, Idaho National Laboratory voluntarily interrupted **[shutdown]** routine testing at the Advanced Test Reactor because operators detected momentary, higher-than-normal radioactivity levels in the reactor's primary coolant and building exhaust systems." "The radioactivity levels detected were too low to trigger any routine reporting criteria, but warranted interruption of testing at the ATR to allow for experiment analysis and removal of the source. No measurable exposure to workers or the public occurred. "One of the ATR's functions as a test reactor is to test how new nuclear fuel designs perform. During this testing, experiments may release minor quantities of radioactivity into the reactor's primary coolant system. INL's continuous monitoring of ATR systems quickly detects such release conditions, should they occur." "ATR staff has now determined that the experiment which released fission products into the reactor coolant is one of several testing new types of low-enriched fuel that could be used in research reactors that currently run on highly-enriched uranium. Testing at the ATR will resume after the experiment causing the increased radioactivity is removed and normal scheduled maintenance work is completed."

June 15: A need for further safety analysis was determined at the Advanced Test Reactor. As part of ongoing review of the safety documentation at the reactor, it was determined the existing analysis does not look at what would happen in the unlikely event that all five experiment loops in the reactor **failed during an earthquake.** The preliminary analysis showed that this accident is already enveloped by other accidents in the unlikely category and it does not have any effect on safe reactor operation (NE-ID—BEA-ATR-2010-0009).

July 8: A laborer, working at the Advanced Test Reactor Complex, cut the index finger and thumb on his left hand while trying to cut a plastic sprinkler pipe. The employee was evaluated by a doctor, who referred the employee to an off-site specialist. A review of the event and critique were performed. (NE-ID—BEA-RTC-2010-0002).

July 14: An engineer at the Advanced Test Reactor reported that the lubricating oil viscosity for a diesel firewater pump was out of specification. The pump was declared out of service, operations were limited according to procedure, and a service request to change the lubricating oil and filter on the firewater pump was submitted and approved. (NE-ID—BEA-ATR-2010-0010).

July 20: An operator injured his elbow while moving a grating at the Advanced Test Reactor canal. The injury occurred in June, but was not fully diagnosed for a few weeks. The operator eventually had outpatient surgery. An accident investigation was initiated and a critique scheduled. (NE-ID—BEA-ATR-2010-0011).

July 22: Management at the Advanced Test Reactor (ATR) noted data anomalies from the Wide Range Neutron Level ion chamber. Specifically, the measured current from the ion chamber was expected to level out at high voltage, but did not. A critique was held and ATR engineering was asked to perform a technical evaluation of the chamber. (NE-ID—BEA-ATR-2010-0012).

July 25; The Advanced Test Reactor was forced into a **limited power mode**.
INL Initial Not. Rpt. FOIA Doc., 26 July 2010, Reduced power 25 July 2010.

July 27: The Advanced Test Reactor was **shut down** following discovery of low oil pressure in one of the two primary coolant pumps. The pump was secured at temperatures well below acceptable levels and there was no equipment damage. (NE-ID—BEA-ATR-2010-0013).

Aug. 9: The safety analysis for the Advanced Test Reactor is continually reviewed. In a recent review, it was determined that a more conservative or safer approach would be to adjust the interim operating controls for the ATR surge tank, which affects the initiation time of the Emergency Firewater Injection System (EFIS). This was due to review of the ATR surge tank volume. The new controls were slightly more stringent. However, the actual EFIS as tested will operate much faster than the safety analysis requires. (NE-ID—BEA-ATR-2010-0015).

Summary of Advanced Test Reactor Shutdowns
1973 Through September 20, 2012 [1]

Year	Shutdown/ Scrams Dates	Power Restricted Dates	Total Shutdowns Power Restrictions	Comments DOE Document Citation
1973	Feb. 2			Foot Note (FN) [2]
1974	Jan. 15			FN [3] + FN 6
	June 5			FN 3 + FN 6
	Sept. 12			FN 3 + FN 6
1977	Feb. 9			FN [4] + FN 6
1991	June 4			FN [5]
	Oct. 16			FN 5
	Aug. 13			FN 5
1992	May 18			FN 5
	Aug. 7			FN 5
	Aug 12			FN 5
1993	Jan. 4			FN 5
1996	Dec. 25			FN 5
1998	Jan. 21			FN 5
	July 21			FN 5
	Dec. 14			FN 5
1999	Nov. 6			FN 5
2000-	Jan. 2			DOE/IG 3/01
	Jan. 11			NE-ID-BBWI-ATR-2000-0003+
2001	Feb. 1			-0004 +-0020 +
2002	Sept. 27			Internal Office Memo 11/18/02
	Feb. 6			NE-ID-BBWI-ATR-2002-0008 + FN 6
2003	Nov. 1			NE-ID-BBWI-ATR-2003-0012
2004	Aug. 21			NE-ID-BBWI-ATR-2004-0007
2006	July 10			NE-ID-BEA-ATR-2005-0004
	Aug. 22			NE-ID-BEA-ATR-2006-0019
2007	October 24			NE-ID-BEA-ATR-2007-0013
				NE-ID-BEA-ATR-2007-0014 + FN 6
				NE-ID-BEA-ATR-2007-0021

[1] DOE Occurrence Reports database (https://orpspublic.hhs.doe.gov/orps/)
[2] Incident Report, Aerojet Nuclear Co., ANC-73-11, ATR, 2/2/73; "A scram was received …for run startup. **A second scram** received at 0906 hours, Feb. 2, 1973."
[3] Incident Reports, Aerojet Nuclear Co., ANC-73-11, 2/2/73; ANC-74-5 (ATR-74-1) 1/15/74. Aerojet Nuclear Co,, Unusual Occurrence Reports (UCR), ANC-74-60 (ATR-74-27), 6/5/74. UCR, Aerojet Nuclear Co., ANC-74-64, (ATR-74-31), 9/10/74.
[4] Unusual Occurrence Reports (UCR), EG&G-77-26 (ATR-77-19), 3/9/77.
[5] DOE Freedom of Information documents provided to EDI.

2008	Feb. 11 May 13 June 5 Aug 7 Aug. 11 Nov. 3	May 6		NE-ID-BEA-ATR-2008-0003 NE-ID-BEA-ATR-2008-0007 NE-ID-BEA-ATR-2008-0009 NE-ID-BEA-ATR-2008-0010 NE-ID-BEA-ATR-2008-0019 NE-ID-BEA-ATR-2008-0021 NE-ID-BEA-ATR-2008-0028
2009	Mar. 10 Mar 26 May 31 June 9 Sept. 30 Oct. 8 Oct. 12 Oct. 14 Nov. 6 Dec. 2	Mar. 17 Nov. 22		NE-ID-ATR-2009-0003 NE-ID-BEA-ATR-2009-0003+FN 6 FN 7 + ATR-CR-5-31-09 NE-ID-BEA-ATR-2009-0013 FN 7 + NE-BEA-ATR-2009-0022 FN 7 + 6+ NE-ID-ATR-2009-0023 NE-ID—BEA-ATR-2009-0023 FN [6] FN [7] FN [8] NE-ID-BEA-ATR-2009-0024 NE-ID-BEA-ATR-2009-0025 NE-ID-BEA-ATR-2009-0025
2010	 Feb. 14 May 27-30 June 7 July 23 July 26 Oct.12 Oct. 26 Nov. 17	Jan. 12 July 13 July 25		NE-ID- BEA-ATR-2010-0001 FN 7+ FN [9] (Channel A vent failure) FN 7+FN [10] (Increase Rad. PCS/Stack) FN 7 (quad IV flow inst. Failure) + INL Initial Not. Rpt. 14/7/10 FN 7 (M-6 PC pump lub. Failure) + NE-ID-BEA-ATR-2010-0013 FN [11] + FN 7 FN [12] (low coolant flow) FN [13]+ NE-ID-BEA-ATR-2010-0019 FN [14] + FN 6 + INR 26 Oct. 2010 FN [15] INL 11/17/10

[6] INL Initial Notification Report. FOIA Doc.# 9, 13 October 2009, Shutdown 10/12/09. Critique Rpt. ATR-CR-10-13-2009

[7] INL Initial Notification Report. FOIA Doc, 15 October 2009, Scram, 14 October 2009.

[8] INL Initial Notification Report. FOIA Doc.#10, Shutdown, 6 November 2009.

[9] INL Initial Notification Report (INR). FOIA Doc.#14, 15 February 2010, Shutdown 2/14/2010. DOE/ATR Unplanned Shutdowns Slow Setbacks Reductions in Power FY-09-2010 (FOIA)

[10] INL Initial Not. Rpt. FOIA Doc.D-3-#15, 30 May 2010, Shutdown 5/27/10. DOE/ATR Unplanned Shutdowns Slow Setbacks Reductions in Power FY-09-2010 (FOIA). ATR stack effluent 105 Ci/day.

[11] INL Initial Not. Rpt. FOIA Doc., 26 July 2010, Reduced power 25 July 2010.

[12] INL Initial Not. Rpt. FOIA Doc., October 2010

[13] INL Initial Not. Rpt. FOIA Doc. E-1 13 October 2010, Scram 12 October 2010.

[14] INL Initial Not. Rpt. FOIA Doc. #18 , 26 Oct 2010

[15] INL Initial Not. Rpt. FOIA Doc. 17 November 2010, Shutdown 17 November 2010.

2012	Mar. 22 Mar. 27	Mar. 6-26 May 9 June 5		NE-ID-BEA-ATR-2012-0007 + 0008 +0010+0014 NE-ID-BEA-ATR-2012-0013 NE-ID-BEA-ATR-2010-0015 NE-ID-BEA-ATR-2012-0017 (fire water pump failure) NE-ID-BEA-ATR-2012-0021 (fire water pump failure)
2013	April 15	Dec. 12		NE-ID--BEA-ATR-2013-0012 NE-ID--BEA-ATR-2013-0042
2014 *	Jan. 16 [1]	Jan. 3		NE-ID--BEA-ATR-2014-0001 NE-ID--BEA-ATR-2014-0004
Totals 1973 to 2014	Total 55*	Total 9	Total 64	

Additional References:

a. Advanced Test Reactor Outage Risk Assessment, July 9, 1998, INEEL/Con-97-0463; Conf-980616

b. INL Reactor Outage, 2/5/08, DOP-7-7.2.7, Rev.24.

c. References (i.e., NE-ID--BEA-ATR-2014-0001) refer to Occurrence Reports in its data base of Office of Health, Safety and Security (HSS) in the Department of Energy's (DOE) central organization responsible for health, safety, environment, and security.

d. Advanced Test Reactor Outage Risk Assessment, July 9, 1998, INEEL/Con-97-0463; Conf-980616

e. INL Reactor Outage, 2/5/08, DOP-7-7.2.7, Rev.24.

f. Advanced Test Reactor Critical Facility is an identical reactor beside the ATR used for trial runs and using the same safety systems as the ATR, and had 3 shut downs in 2013 (Jan. 15, 17and 23). The Advanced Test Reactor Critical is not included here even though they are co-located with the ATR; operate under the same contractor (Battelle Energy Alliance/management structure and share safety systems). It is reasonable to assume that safety system failures at ATRC reflects on the ATR.

***Dates from 1973 through September 20, 2012 (ATR startup date was ~ 1960 so seven early years are not included plus six years since 2012). Due to 14 years not included and limited access to information on the Advanced Test Reactor plus what information that is available is widely dispersed, EDI cannot conclude that the above table even closely or completely represents all of the reactor shut-downs nor all the power limiting events. Neither DOE nor the Navy likes to admit reactor shut-downs because it represents poor management and aging equipment - thus the information restrictions.**

Also see; Unacceptable Risk at the Idaho National Laboratory Advanced Test Reactor, The Case for Closure Volume I, By David McCoy, J.D. and Chuck Broscious, Updated January2013. http://www.environmental-defense-institute.org/publications/ATR.Risk.Rpt.Rev.6-03.wPics.pdf