

PROBLEMS AT THE SUSQUEHANNA NUCLEAR POWER PLANT

Contact: Eric Epstein (717)-233-7897

- February 16, 1979 - A Nuclear Regulatory Commission (NRC) inspection noted a non-compliance: Pennsylvania Power and Light (PPL) failed to control structural steel arc strikes. (NRC inspection 50-387/79-03)

- March 1, 1979 - An NRC inspection reported a non-compliance: The Susquehanna Plant failed to meet ASME III code requirements for a pipe weld joint alignment. (NRC inspections 50-387/79-04 and 50-388/79-03.)

- March 3, 1979 - The NRC cited PPL again for a non-compliance involving a failure to remove arc strikes per established procedures. (See February 16, 1979 for a related event.) (NRC inspections 50-387/79-01 and 50/388/79-01.)

- April 6, 1979 - During an NRC inspection, a non-compliance was identified relating to PPL's failure to properly prepare an electrical cable termination prior to installation. (NRC inspections 50-387/79-11 and 50-388/79-07.)

- April 19, 1979 - The NRC noted two non-compliances items: PPL failed to specify supplementary essential variables in welding procedure specs and the utility failed to assure piping cleanliness before closure. (NRC inspections 50-387/79-14 and 50-388/79-08.)

- May 5, 1979 - The NRC observed a non-compliance item: PPL failed to follow documented procedures for control of nonconfirming items. (NRC inspections 50-387/79-10 and 50-388/79-06.)

- June 8, 1979 - The NRC identified two non-compliance items: PPL failed to inspect purging for tack welds and also failed to provide documented instruction to control storage and maintenance of the reactor pressure vessel. (NRC inspections 50-387/79-15 and 50-388/79-09.)

July 11, 1979 - The NRC identified a safety related issue: PPL failed to provide a prescribed weld profile transition on safety related piping. (NRC Inspection 50-387/79-19.)

- September 11, 1979 - PPL failed to control their drawings. (NRC inspections 50-387/79-21 and 50-388/79-12.)

- September 14, 1979 - PPL failed to comply with applicable codes when burning and welding structural steel. (See February 16 and March 3, 1979, for related events.)

- September 21, 1979 - PPL failed to control erosion-sedimentation. (NRC inspections 50-387/79-25 and 50-388/79-13.)

- October 10, 1979 - PPL failed to apply design control measures relating to field models in order to demonstrate that inservice inspection requirements could be met. (NRC inspection 50-387/79-30.)

- November 15, 1979 - PPL failed to follow instrument procedures' instructions. (NRC inspections 50-387/79-32 and 50-388/79-17.)

- December 26, 1979 - The NRC noted that PPL incorrectly identified a safety-related conduit. (NRC inspection 50-387/79-35.)

- January 9, 1980 - The following non-compliance item was identified by the NRC: PPL failed to review their tech specs and provide documented instruction to control completion of related water quenching of a weld. (NRC inspections 50-387/79-31 and 50-388/79-16.)

- January 11, 1980 - The NRC recorded the following non-compliance issues: PPL failed to provide adequate design review resulting in non-conforming installation, and the licensee also failed to follow procedure for tagging non-conforming items. (See August 18, 1980 and June 30, 1981, for related issues.) (NRC inspections 50-387/79-36 and 50-388/79-19.)

- January 30, 1980 - The NRC observed non-compliances related to uncontrolled documents and inappropriate documents. (NRC inspections 50-387/79-41 and 50-388/79-22.)

- March 3, 1980 - PPL failed to provide "independence" to employees performing Quality Assurance functions. (NRC inspection 50-387/79--20.)

- April 9, 1980 - The NRC noted that PPL failed to follow approved procedures during preventive maintenance and establish a proper test program for hydrostatic testing. (NRC inspections 50-387/80-01 and 50-388/80-01.)

- April 20, 1980 - PPL failed to identify a nonconforming plant condition. (NRC inspections 50-387/80-05 and 50-388/80-03.)

- May 28, 1980 - PPL failed to document a chemical analysis of weld filler material. (NRC inspections 50-387/80-04 and 50-388/80-02.)

- June 2, 1980 - The NRC observed a failure by PPL to follow approved procedure during ultrasonic examination of piping welds. (NRC inspection 50-387/80-09.)

- June 16, 1980 - Two non-compliance items associated with PPL's failure to establish controls for Quality Control were identified. Additionally, PPL failed to establish controls for field fabrication of incorrect parts. (NRC inspections 50-387/80-06 and 50-388/80-04.)

- July 8, 1980 - A non-compliance item in PPL's program for the nondestructive examination of personnel certification was identified. (NRC inspections 50-387/80-12 and 50-388/80-08.)

- August 13, 1980 - In the Unit-2 primary containment, the NRC found "loose debris" in the construction joint of a concrete placement. (NRC inspections 50-387/80-17 and 50-388/80-11.)

- August 18, 1980 - PPL failed to follow approved procedures for reporting nonconforming items. (See January 11, 1980 and June 30, 1981, for related issues.) (NRC inspection 50-387/80-14.)

- August 19, 1980 - The NRC noted that PPL failed to supply cable tray softeners. (NRC inspections 50-387/80-19 and 50-388/80-13.)

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- September 8, 1980 - PPL failed to incorporate recirculation system flow testing into preoperational testing. (NRC inspection 50-387/80-16.)

- September 12, 1980 - PPL failed to control weld filter material. (See May 28, 1980, for a related incident.) (NRC inspections 50-387/80-21 and 50-388/80-14.)

- October 16, 1980 - PPL used a field procedure which did not contain quantitative or qualitative acceptance criteria. (NRC inspections 50-387/80-25 and 50-388/80-16.)

- January 21, 1981 - PPL was chastized for failing to have properly approved test procedure changes. (NRC inspection 50-387/80-32.)

- January 26, 1981 - PPL failed to follow Quality Control instructions for inspection cable terminations prior to taping connections. (NRC inspections 50-387/81-01 and 50-388/81-01.)

- April 13, 1981 - PPL failed to complete design testing before placing a crane system in operation. (NRC inspection 50-387/81-04.)

- May 25, 1981 - The NRC noted shortcomings in auditor certification, inservice inspection design accessibility and a Quality Assurance procedure. (NRC inspections 50-387/81-08 and 50-388/81-04.)

- June 30, 1981 - Among the non-compliance items reported by the NRC: Placement of an electrical ground between a tray and a conduit and failure to tag nonconforming items. (See August, 18 and January 11, 1980 for related issues.) (NRC inspection (50-387/81-12 and 50-388/81-06.)

- July 14, 1981 - The NRC noted that PPL operators were using an "unapproved" and "unsigned" document in the control room. (NRC inspection 50/387/81-10.)

- August 31, 1981 - An electrical component was installed without proper certification. (NRC inspections 50-387/81-14 and 50-388/81-07.)

- October 22, 1981 - PPL's NSSS data sheet specified "insufficiently accurate" turbine trip switches. (NRC inspection 50-387/81-19.)

- November 25-27, 1981 - PPL failed to follow written procedures during a maintenance test. (NRC inspection 50-387/81-25.)

- January 7, 1982 - Unit-1 failed to maintain control over modification of electrical equipment. (NRC inspection 50-387/81-26 and 50-388/81-13.)

- March 3, 1982 - The NRC reported that PPL improperly incorporated test requirements in their preoperational tests and exercised inadequate control of environmental conditions activities "affecting quality." (NRC inspection 50-387/82-04.)

- April 8, 1982 - PPL failed to witness a test involving the Reactor Coolant System, and the utility also failed to follow preoperational test procedures. (NRC inspection 50-387/82-08.)

- April 23, 1982 - PPL failed to incorporate all test requirements in a preoperational test failure. Problems relating to surveillance testing and housekeeping were also identified. (NRC inspection 50-387/82-10.)

- May 27, 1982 - PPL failed to obtain proper authorization prior to work on a safety-related system and failed to conduct comprehensive audits of preoperational testing. (NRC inspection 50-387/82-09.)

- September 10, 1982 - PPL failed to provide a second verification on safety-system check lists. (NRC inspections 50-387/82-33 and 50-388/82-10.)

- October 4, 1982 - The following non-compliance items were recorded: PPL failed to provide "adequate training," failed to distribute current and approved design documents and failed to provide suitable design for a small bore pipe anchors. (See January 6, March 14 and April 4, 1984; last entry for 1987; February 18, 1985; and December 13, 1989 for related issues.) (NRC inspection 50-387/82-31.)

- October 14, 1982 - PPL failed to follow written procedures for control of "safety or quality-related" computer software. (NRC inspection 50-387/82-39.)

- November 2, 1982 - PPL failed to issue a field change request for modification of pipe clamp flanges for pipe supports and failed to transmit design information to field. As a result, PPL installed malfunctioning pipe snubbers. (NRC inspection 50-387/82-34.)

- November 3, 1982 - The NRC identified a security violation and observed that requirements for operable fire protection equipment were not met. (NRC inspections 50-387/82-32 and 50-388/82-05.)

- November 4, 1982 - PPL failed to properly interpret radiographs. (NRC inspection 50-387/82-36.)

- December 6, 1982 - The NRC reported that PPL was using an "unqualified material" in the emergency diesel generator lube oil system. (NRC inspections 50-335/82-36 and 50-389/82-55.)

- December 10, 1982 - During RCIC system testing, PPL did not keep a record of average suppression chamber water temperatures. (See March 8 and June 28, 1984 and August 14, 1985 for related issues.) (50-387/82-40 and 50-388/82-12.)

- In 1982, Susquehanna had 39 "human" errors; 13 "design/manufacturing" errors; 28 "equipment failures;" 1 "significant mishap" and 80 total "mishaps." Berwick-1 also lost emergency diesel generator power in this year (Public Citizen, 1983.)

- February 22, 1983 - Several non-compliances were identified relating to radiological controls: PPL failed to determine low level dose for 24-H iodine and particulate samples and the licensee also failed to keep a log for gamma spectrometry system. In addition, PPL failed to approve contractor procedures prior to implementation. (See August 8 and December 19, 1983, for related issues.) (NRC inspection 50-387/83-02.)

- March 14, 1983 - The standby gas treatment system was improperly tagged out leading to its inoperability. (NRC inspections 50-387/83-03 and 50-388/83-01.)

- March 23, 1983 - PPL failed to establish a separate log to record safeguard event reports. (NRC inspection 50-387/83-04.)

- May 13, 1983 - The NRC found that numerous fuses had one terminal disconnected on the temporary, modification control panels. (NRC inspections 50-387/83-11 and 50-388/83-04.)

- June 13, 1983 - PPL was caught using an unapproved handbook for acceptance of pipe supports. The NRC also noted that intermittent breaches of secondary containment field changes were not implemented. (NRC inspections 50-387/83-12 and 50-388/83-06.)

- June 25, 1983 - Susquehanna was shut down due to electrical problems, and on July 26, maintenance found two leads reversed in a control circuit cabinet, preventing the opening of a safety-related valve. (Nuclear Regulatory Commission).

- July 12, 1983 - PPL was operating Susquehanna with a mode switch in run position, while the high-reactor, vessel water level trip to main turbine was bypassed. (NRC inspection 50-387/83-14.)

- July 14, 1983 - PPL failed to remove from access authorization list four employees who were no longer employed at the site. (NRC inspection 50-387/83-16.)

- August 18, 1983 - PPL failed to maintain an updated safety-related drawing file. (50-387/83-29, 50-388/83-01 and 50-388/83-11.)

- August 26, 1983 - PPL failed to "adhere to radiation protection procedures" as required by their tech specs. (See February 22 and December 19, 1983, for related issues.) (NRC inspection 50-387/83-18.)

- September 2, 1983 - Several non-compliance items were identified by the NRC: PPL failed to conduct 15 surveillance tests due to inadequate procedures, the utility failed to test when equipment was operable and several procedures were reported to be "missing." (NRC Inspection 50-387/83-20.)

- November 18, 1983 - At Unit-1, the FSAR was not updated prior to completion of construction. Also, as required, a 31-day surveillance was not performed on a valve. (NRC inspections 50-387/83-23, 50-388/83-21 and 50-388/83-23.)

- November 21, 1983 - PPL failed to maintain two independent off-site power sources. Also, both trains of the main condenser off-gas treatment system was inoperable. Both issues were non-compliance items. (NRC Inspection 50-387/83-24.)

- December 19, 1983 - The NRC issued a violation for PPL's failure to take weekly iodine samples of the reactor building. (See February 22 and August 26, 1983, for related issues.) (NRC Inspection 50-387/83-17.)

- December 29, 1983 - PPL failed to maintain average reactor coolant temperatures. (NRC inspections 50-387/83-25, 50-388/83-24 and 50-388/83-24.)

- January 5, 1984 - PPL failed to follow procedures for liquid, radwaste monitor calibration. (NRC inspections 50-387/83-27 and 50-388/83-26.)

- January 6, 1984 - The NRC recorded violation regarding PPL's failure to provide training to personnel to control temporary setpoint changes and to assess effectiveness of Quality Assurance audits. (See October 4, 1982; March 14 and April 4, 1984; February 18, 1985; last entry for 1987; and, December 13, 1989 for related issues.) (NRC inspections 50-387/83-30 and 50-388/83-25.)

- January 25, 1984 - The NRC noted the following violation: PPL failed to follow Quality Assurance/Quality Control interface procedures in nonconformance reporting areas. (NRC inspections 50-387/83-31 and 50-388/83-31.)

- February 24, 1984 - The NRC issued a violation for PPL's failure to promptly identify and correct "conditions adverse to quality." The NRC identified the following "deviation:" PPL failed to meet FSAR commitments for the automatic depressurization system. (NRC inspections 50-387/83-29, 50-388/83-22 and 50-388/83-32.)

- February 27, 1984 - The NRC identified the following violations: Inadequate preparation of the welds for ultrasonic inspection and a small bore piping flex leg was not installed per engineering design calculation. (NRC inspection 50-387/84-05.)

- March 7, 1984 - PPL failed to follow a Quality Control procedure for radiochemistry to determine instrument operating voltage. (NRC inspections 50-387/84-05 and 50-388/84-06.)

- March 8, 1984 - The NRC inspected system lineup problems that resulted in the HPCI system and the RCIC system's inoperability. (See December 10, 1982 and June 28, 1984 and August 14, 1985 for related issues.) (NRC inspection 50-387/84-11.)

- March 14, 1984 - The NRC reported a violation relating to PPL's failure to follow documentation procedures regarding health physics personnel training. (See October 4, 1982; January 6 and April 4, 1984; February 18, 1985; last entry for 1987; and, December 13, 1989 for related issues.) (50-387/84-01.)

- April 4, 1984 - Another violation was recorded relating to worker training. PPL failed to follow radwaste training and training qualification and certification of personnel procedures. (See October 4, 1982; January 6 and March 15, 1984, February 18, 1985, last entry for 1987; and, December 13, 1989 for related issues.) (50-387/84-09.)

April 16, 1984 - A violation was issued for PPL's failure to take a dose rate instrument into a high radiation area and the Licensee also operated logs that lacked quantitative data. (NRC inspections 50-387/84-07 and 50-388/84-08.)

- April 20, 1984 - The NRC inspected an event involving the inoperability of a source range monitor "while loading fuel in core quadrant "A." (NRC Inspection 50-388/84-19.)

- May 14, 1984 - Local, leak-rate test valves in Unit-1 were closed instead of closed and locked as required. PPL was issued a violation due to this incident. (NRC Inspections 50-387/84-14 and 50-388/84-16.)

- June 19, 1984 - The NRC and PPL met to discuss a power level transient which apparently exceeded the 5% licensed limit. (Meeting report 50-388/84-25.)

- June 28, 1984 - The RCIC flow controller on Unit-2 was not returned to automatic following surveillance and the secondary containment integrity on Unit-1 was not maintained for two days. Violations was issued by the NRC. (See December 10, 1982 and March 8, 1984 and August 14, 1985 for related issues.) (NRC Inspection reports 50-387/84-18 and 50-388/84-22.)

- July 23, 1984 - Among the non-compliances observed by the NRC: Two chemistry grab samples missed a fire detection, instrumentation surveillance not performed with tech spec limit. (NRC inspections 50-387/84-22 and 50-388/84-28.)

- August 21, 1984 - PPL failed to complete required emergency training. (NRC Inspection 50-387/84-27.)

- August 23, 1984 - Bracing was not provided to prevent shift of loading under normal transportation conditions. A violation was issued. (NRC inspections 50-387/84-31 and 50-388/84-37.)

- September 17, 1984 - Violations were issued due to inadequate corrective action for plant operator manipulation of DC auxiliary relay and bus-control, knife switches. (NRC Inspection 50-388/84-34.)

- October, 1984 - Four control rods failed to insert and nine others hesitated before scramming. Testing which should brought the problem to light was 15 months overdue. (See November 15, 1985 for a related event.) (Public Citizen, May 3, 1986.)

- November 15, 1984 - A deficiency was noted when two of four control rods failed to scram during rod scram testing and were in control array that exceeded insertion time. (See October, 1984 for a related event.) (NRC inspections 50-387/84-35 and 50-388/84-44.)

- November 16, 1984 - A violation was issued for PPL's inadequate surveillance procedures for end-of-cycle recirculation pump trip instrumentation. (NRC inspection 50-388/84-42.)

- November 28, 1984 - A violation was issued by the NRC relating to security issues. (NRC inspections 50-387/84-34 and 50-388/84-41.)

- In 1984, Susquehanna had 49 (the seventh highest in the nation) accidents or Licensee Event Reports in the nation. Also, an event that took place at Susquehanna-2 in July, resulted in the plant losing all of its AC power, including its back-up emergency diesel generators resulting in the deterioration of crucial instrumentation.

In the 1984 Nuclear Power Safety Report (Public Citizen) Susquehanna had the second highest number of mishaps in the industry and was tied for fifth for the number of "significant" incidents at a reactor.

- February 18, 1985 - The NRC issued violations for inadequate control of combustible gas cylinders and for four, fire brigade members who had not completed initial fire brigade training. (See October 4, 1982; January 6, March 14 and April 4, 1984; last entry for 1987; and, and December 13, 1989 for related issues.) (NRC inspections 50-387/84-38 and 50-388/84-47.)

- February 25, 1985 - PPL received a violation for failing to analyze post-fuel loading initial program test results per administrative procedure requirements. (NRC inspection 50-388/85-02.)

- March 27, 1985 - PPL failed to adhere to radiation protection procedures for all operations involving personnel radiation exposure. (NRC inspections 50-387/85-07 and 50-388/85-07.)

- April 10, 1985 - The NRC recorded a deviation and violation for a failure to maintain and functionally test fire barriers and for failing to perform duct failure analysis. (NRC inspection 50-387/85-06 and 50-388/85-06.)

- May, 1985, the PUC allowed only a 9% rate increase of \$121 million, rather than the 23% or \$330 million PPL requested for costs associated with Susquehanna Unit-2. PUC Chairperson Linda Talliafero told PPL: "You took the risk. You lost."

- May 16, 1985 - A violation and deviation were reported on a late surveillance identified on emergency SVC water system and a lack of indication identified in FSAR and the regulatory guide. An enforcement conference was scheduled for July 8, 1985. (NRC inspections 50-387/85-16 and 50-388/85-15.)

- May 30, 1985 - Fire dampers in the standby gas treatment system was not included in applicable surveillance procedures. A violation was issued. (NRC inspections 50-387/85-12 and 50-388/85-12.)

- July 23, 1985 - The NRC reviewed an "allegation" concerning drywell average air temperatures and found "discrepancies" in associated procedures. (NRC inspections 50-387/85-18 and 50-388/85-16.)

- August 14, 1985 - The NRC found the manual containment isolation valve for the RCIC was closed but not locked. A violation was issued. (See December 10, 1982 and March 8 and June 28, 1984 for related issues.) (NRC inspections 50-387/85-21 and 50-388/85-17.)

- October 10, 1985 - PPL was issued a violation for failing to test entire HPCI channel. (NRC inspections 50-387/85-28 and 50-388/85-23.)

- November 1, 1985 - The NRC convened an enforcement conference to discuss PPL's ability to safely shutdown Susquehanna in the event of a fire.

- February 19, 1986 - PPL was issued a violation for failing to test creosote isolation dampers. (NRC inspections 50-387/85-36 and 50-388/85-32.)

- March 27, 1986 - The RHR pump operated without without cooling water due to valve misalignment and installation of expired squib valve in standby liquid control system. A violation was issued. (NRC inspections 50-387/86-02 and 50-388/86-01.)

- April 30, 1986 - PPL failed to include longitudinal seam welds in inservice inspection program and also failed to respond to audit findings. A violation was issued by the NRC. (NRC inspection 50-387/86-05.)

- May 2, 1986 - Violations were issued when PPL improperly controlled maintenance work in reactor building recirculation plenum and when two, scram, discharge volume level transmitters were found to be inoperable. (NRC inspections 50-387/86-06 and 50-388/86-04.)

- May 24, 1986 - With both reactors at full power, all four emergency cooling water pumps were declared inoperable. Both reactors had to be shut down. (Public Citizen, September 8, 1987.)

- August 13, 1988 - One deviation and three unresolved items were reported in the NRC's emergency response appraisal. (NRC reports 50-387/86-10 and 50-388/86-10.)

- September 24, 1986 - Tech specs limiting the condition for operation transversing incore probes were not met. A violation was issued. (NRC inspections 50-387/86-14 and 50-388/86-14.)

- October 22, 1986 - The NRC issued violations when PPL used unqualified terminal blocks in limit torque motor valve operators and failed to follow procedures for sealing conduit entry into components. (NRC inspections 50-387/86-21 and 50-388/86-22.)

- In 1986, the Susquehanna Nuclear Generating Station had the eighth highest number of "scrams" at Unit-1. January 30, 1987 - The following "deficiencies" were recorded by the NRC: PPL failed to demonstrate qualification of valcor, high temperature wire rockbestos cables and raychem cable splices. (See August 16, 1988 for a related development.) (NRC inspections 50-387/86-25 and 50-388/86-28.)

- February 9, 1987 - Due to the inoperability of the station battery supplying common loads, the NRC issued a violation. (NRC Inspections 50-387/86-27 and 50-388/86-30.)

- August 8, 1987 - PPL removed a shift supervisor (the person in charge of the plant) because he repeatedly fell asleep while on duty. (Public Citizen, October 19, 1988.)

- September 4, 1987 - The NRC identified several violations. Major areas inspected included plant operations, radiation protection, physical security, plant events, surveillance and maintenance and previous inspection findings. (NRC Inspections 50-387/87-12 and 50-388/87-12.)

- September 23, 1987 - A significant event was reported when a steam line plug blew into the reactor vessel.

- November 16, 1987 - One violation was recorded during this inspection. (NRC Inspections 50-387/87-16 and 50-388/87-16.)

- November 25, 1987 - The NRC identified several violations. Major areas inspected were training and qualification, ALARA external and internal exposure controls and radioactive and contaminated materials control. (NRC Inspections 50-387/87-19 and 50-388/87-19.)

- In 1987, at least 40% of the applicants for reactor operations failed their licensing tests at Susquehanna-1. Only 12% of the licensed operators at Susquehanna-1&2 have a bachelor's degree. Only 56% of licensed operators passed their written licensing exams (The industry average is: 86%). (Public Citizen, October 19, 1988). (For other training problems see October 4, 1982; January 6, March 14 and April 4, 1984; February 18, 1985; last entry for 1987; and, December 13, 1989.)

In 1987, Susquehanna-1 was ninth out of 83 reactors in the number of Licensee Event Reports.

- February 24, 1988 - The NRC convened a meeting to discuss, "Licensee beliefs as to causes of weaknesses identified and licensee corrective actions." (NRC Inspections 50-387/87-19 and 50-388/87-19.)

- March 11, 1988 - Several violations were reported during an inspection that included plant operations, physical security, plant events, surveillance and maintenance and licensee posting of radiation areas. (NRC inspections 50-387/88-04 and 50-388/88-03.)

- March 16, 1988 - The NRC discussed with PPL "Inattentiveness of [a] licensed operator." (50-387/88-08 and 50-388/88-08.)

- April 25, 1988 - Several violations were identified during an inspection which included plant operations, physical security, plant events, surveillance scram discharge volume capability and fitness for duty. (NRC inspections 50-387/88-07 and 50-388/88-08.)

- July 7, 1988 - Several violations were noted during this inspection. Major areas inspected included corrective and preventive maintenance, engineering and surveillance programs. (NRC inspection 50-388/88-10.)

- August 15, 1988 - A violation was reported during an inspection of the operability of the main, steam tunnel differential temperature isolation modules. (NRC inspections 50-387/88-15 and 50-388/88-18.)

- August 16, 1988 - The NRC held an enforcement conference to discuss the results of a previous inspection on January 30, 1987.

- September, 1988 - The NRC fined PPL \$50,000 for safety violations at the Susquehanna Nuclear Generating Station.

- November 16, 1988 - A violation and unresolved item were identified. The major area of inspection was Unit-2's unplanned ESF actuations in which the RWCU system isolated when a "large" Unit-1 pump started. (NRC inspections 50-387/88-18 and 50-388/88-21.)

- December 20, 1988 - An unresolved item was identified during an inspection which included plant operations, physical security, plant events and surveillance and maintenance activities. (NRC inspections 50-387/88-19 and 50-388/88-22.)

- February 2, 1989 - Several violations were recorded during an inspection which included plant operations, physical security, plant events and surveillance and maintenance activities. (NRC inspections 50-387/88-20 and 50-388/88-23.)

- March 8, 1989 - "Events noted indicate need for increased management attention to weaknesses." The NRC inspected physical security, plant events and surveillance and maintenance activities. (NRC inspections 50-387/89-01 and 50-388/89-01.)

- March 24, 1989 - The NRC met with PPL's management to discuss "reactor building post-accident temperature profile and environmental qualification of electrical equipment." (NRC inspections 50-387/89-03 and 50-388/89-03.)

- June 1, 1989 - The NRC raised concerns about the "adequacy of [the] carbon dioxide system." (NRC inspections 50-387/89-09 and 50-388/89-09.)

- June 16, 1989 - Several violations were reported during an inspection of radiological controls, organization and staffing personnel qualifications and training corrective action system performance monitoring and audits. (NRC inspections 50-387/89-12 and 50-388/89-12.)

- July 26, 1989 - Several violations were observed by the NRC during an inspection of plant operations, physical security, plant events, surveillance and maintenance and Unit-1, refueling outage activities. (NRC inspections 50-387/89-15 and 50-388/89-13.)

- August 8, 1989 - Violations and deviations were identified during an inspection of the emergency diesel generator fuel supply equipment and related procedures. (NRC inspections 50-387/89-18 and 50-388/89-16.)

- August 28, 1989 - During this inspection period, two recirculation pump trips occurred at Unit-2. (NRC inspections 50-387/89-21 and 50-388/89-19.)

- August 31, 1989 - A contractor performing reactor coolant sampling had an "unplanned exposure." (See September 31 and October 18, 1989 for follow up.)

- September 13, 1989 - Violations were noted during an inspection which reviewed, "Licensee evaluations and corrective actions associated with unplanned exposure to contractor performing reactor coolant sampling activities." (See August 31 and October 18, 1989 for more information.) (NRC inspection 50-388/89-25.)

- September 19, 1989 - A violation was issued during a review of a, "Chronology of events and reasons that led to starting up plant with potentially unacceptable ultrasonic indications in reactor vessel." (NRC inspections 50-387/89-26.)

- October 10, 1989 - One unresolved item remained after an inspection which reviewed the, "... adequacy of licensee actions to resolve items." (NRC inspections 50-387/89-27 and 50-388/89-24.)

- October 18, 1989 - The NRC held an enforcement conference to discuss an "unplanned occupational exposure of contractor employee on August 31, 1989." (See August 31 and September 13, 1989 for more information.) (NRC report 50-388/89-25.)

- October 23, 1989 - Several violation were recorded during an inspection of plant operations, physical security, plant events and surveillance and maintenance. (NRC inspections 50-387/89-24 and 50-388/89-22.)

- November 22, 1989 - Violations were reported during an inspection of radiological controls, ALARA and housekeeping. (NRC inspections 50-387/89-28 and 50-388/89-26.)

- November 24, 1989 - Several violations were observed by the NRC during an inspection of plant operations, physical security, plant events and maintenance and surveillance. (NRC inspections 50-387/89-30 and 50-388/89-27.)

- December 13, 1989 - An enforcement conference issued a violation and discussed, "NRC findings [on] root cause of inadequate program provisions and safety significance of nonproficient operators (For other training problems see October 4, 1982; January 6, March 14, April 4, 1984; February 18, 1985; and, the last entry in 1987.) (NRC reports 50-387/89-90 and 50-388/89-27.)

- December 24, 1989 - Several violation were reported during an inspection of PPL's action on previous NRC inspections. (NRC inspections 50-387/89-33 and 50-388/89-31.)

- January 19, 1990 - The NRC cited PPL for violations during this inspection. This report reviewed, "licensee actions in response to contractor employee allegation" relating to a "noncompliance with penetration, fire seal requirements." (NRC inspections 50-387/89-35 and 50-388/89-34.)

- January 19, 1990 - The NRC and PPL met to discuss "preliminary root cause findings for recent emergency diesel generator crankcase explosions at plant, along with possible corrective actions to prevent recurrence." NRC inspections 50-387/89-37 and 50-388/89-36.)

- February 3, 1990 - Unit-1 lost "shutdown cooling." (See February 23, 1990 for follow up.)

- February 4, 1990 - A low-level event was announced due to an electrical function at Susquehanna-2. The Plant was shut down.

- February 23, 1990 - The NRC reviewed PPL's actions in response to the loss of shutdown cooling at Unit-1 on February 3, 1990. (NRC inspections 50-387/90-05 and 50-388/90-05.)

- May 31, 1990 - Several unresolved items remained after a, "Comparison of EOPs [emergency operating procedures] with BWR [boiling water reactors] owners' group emergency procedure guidelines and plant-specific emergency procedure guidelines." (NRC inspections 50-387/90-80 and 50-388/90-80.)

- June 12, 1990 - One violation was noted after an inspection of operations, radiological controls, maintenance surveillance testing, emergency preparedness, security and engineering-technical support. (NRC inspections 50-387/90-08 and 50-388/90-08.)

- June 13, 1990 - The NRC inspected PPL's, "Compliance with ATWS rule including design implementation verification and surveillance test procedure and results review." A deviation was reported. (NRC inspection reports 50-387/90-11 and 50-388/90-11.)

- September 6, 1991 - Several violations were reported during an inspection of, "Transportation and solid radwaste programs." (NRC inspections 50-387/90-16 and 50-388/90-16.)

- September 13, 1990 - Several violations were recorded during an inspection of the qualification of polyurethane seals. (NRC inspections 50-387/90-17 and 50-388/90-17.)

- September 28, 1990 - One unresolved item was observed during an inspection of operations, radiological controls, maintenance-surveillance testing, emergency preparedness, security and engineering technical support. (NRC inspections 50-387/90-15 and 50-388/90-15.)

- October 11, 1990 - The NRC convened an enforcement conference to discuss, "Environmental qualification deficiencies and nonconformance report system concerns." (NRC inspections 50-387/90-17 and 50-388/90-17.)

- November 7, 1990 - One violation was reported during an inspection of written policies and procedures, program administration, key program processes and onsite testing facility. (NRC inspections 50-387/90-14 and 50-388/90-14.)

- November 8, 1990 - One violation was recorded during an inspection of operations, radiological controls, maintenance-surveillance testing, emergency preparedness, security and engineering-technical support. (NRC inspections 50-387/90-20 and 50-388/90-20.)

- January 22, 1991 - The SALP reported, "Overall control of radiological controls effective buy weaknesses in contractor and contamination controls noted." (NRC inspections 50-387/89-99 and 50-388/89-99.)

- January 27, 1991 - Several violations were noted during an inspection of, "Maintenance program and implementation of program personnel interviews and observation of maintenance work being performed." (NRC inspections 50-387/90-81 and 50-388/90-81.)

- March 19, 1991 - One violation was observed during an inspection of operations, radiological controls, maintenance-surveillance testing, emergency preparedness, security and engineering-technical support. (NRC inspections 50-387/90-26 and 50-388/90-26.)

- Spring 1991 - PPL filed the final environmental report on a \$23 million, 12,000 square foot radioactive waste holding facility. The building is constructed of steel and has movable interior concrete walls. It is designed to receive a total of 60,000 cubic feet of cement-solidified and dry trash bins per year from the Susquehanna nuclear power plants, it has a four-year, 240,000 cubic foot capacity. This facility has transformed the Susquehanna plant into a nuclear waste facility.

- May 30, 1991 - While Unit was at 100% power, "the primary power supply to the "A" Reactor Protection System (RPS) power distribution panel was lost when its Electrical Protection Assembly (EPA) breakers tripped" (Licensee Event Report 50-388.)

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- October 4, 1991 - Kemp Houck, editor of "Atoms & Waste," reviewed Susquehanna's 1990 "Radiological Environmental Program." Houck concluded: "The plant has been showing up some very strange environmental data, and they [PPL] keep blaming the anomalies on lab malfunctions." PPL's report concluded: "In 1990, REMP detected the naturally occurring radionuclides beryllium-7, potassium-40, radium-226 and thorium-232 in the environment...The 1990 REMP also reported the following eight man-made radionuclides in the environment: tritium, manganese-54, cobalt-60, zinc-65, strontium-89, iodine-131, and cesium 137" (Susquehanna Steam Electric Station Units 1 & 2, "Radiological Monitoring Program: 1990 Annual Report," April 1991.)

- January 19, 1992 - An explosion injured two workers. One man was burned and contaminated with dust particles. According to PPL: "The accident occurred in the basement of the plant's turbine building during work on an out-of-service recombiner -- equipment that combines hydrogen and oxygen to make water. A review team has found that a leak in a valve on the system allowed the hydrogen gas to build up in the pipe where the employee was working with a grinding wheel. New work procedures have been put into place to more clearly label hazards, and to institute safeguards aimed at preventing such incidents in the future" (PPL's "Shareowners' Newsletter," February 3, 1992.)

- March 7, 1992 - The NRC issued two violations for an accident on January 19, 1992. "The NRC reported that the company did not adequately investigate an incident that may have been a precursor to an accident. In the second case, the NRC found fault with parts of the company's record keeping practices" (Patriot, A5, March 7, 1992.)

- June 6, 1992 - Unit-1 was shut down due to the damage of a large pump and "some associated valves" (Patriot, June 8, 1992.)

- December 31, 1992 - Two PP&L engineers charged that Susquehanna's highly radioactive spent fuel pools are unsafe and that if emergency cooling systems fail, a meltdown of spent fuel elements could occur. They told the NRC they reported their concerns to PP&L in March, 1992, and the company dismissed the matter and then tried to fire the engineers. The engineers, Donald Prevatte and David Lochbaum, are consultants for several companies. PP&L's spent fuel pool design is utilized by 1/3 of the nation's 109 nuclear power plants.

- May 26, 1993 - PP&L "determined that the 'C' EDG level indicating instrument had drifted in a nonconservative direction." (LER, 93-003.)

- July 1, 1993 - An INPO inspection "pointed out some areas for improvement at the plant, and we're taking appropriate action." (Shareowners' Newsletter, July 1, 1993.)

- July 12, 1993 - While Unit -1 was operating at 100% power, a reactor scram occurred when the Main Turbine tripped. (LER, 93-008.)

- July 12 to August 1, 1993 - Mechanical problems forced Unit-1 out of service for seven weeks. "The unit shut down automatically July 12 when vibrations caused two large turbine blades to break loose, damaging the turbine and other non-nuclear components of the unit." (PPL, Shareowners' Newsletter, October 1, 1993.)

- September 10, 1993 - Power at Unit-2 was reduced to 40% for "control rod sequence" and "reactor recirc motor generator set brush change outs."

- September 24, 1993 - A power reduction was initiated at Unit-1 due to the inoperability of RHR instrumentation; power was held at 26%.

- October 1, 1993 - During an NRC presentation, David Lochbaum and Donald Prevatte postulated that failure in spent fuel pool cooling could possibly lead to safety-related equipment failure and a full core meltdown.

- October 28, 1993 - At Unit-1, "PP&L suspended [fuel] loading after experiencing three fuel-loading problems in a 36 hour period" ("Patriot," February 2, 1994.)

Unit-1 was due to be back on line by November but not return to service until January 22, 1994; four days after a record demand for electric.