

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- R. A. Watson, Vice President, Harris Nuclear Project
- *C. S. Hinnant, Plant General Manager
- C. R. Gibson, Director, Programs and Procedures
- *D. L. Tibbitts, Director, Regulatory Compliance
- C. S. Bohanan, Director, Special Programs
- R. B. Van Metre, Manager, Technical Support
- *T. C. Morton, Manager, Maintenance
- *J. M. Collins, Manager, Operations
- *J. R. Sipp, Manager, Environmental and Radiation Monitoring
- D. A. Braund, Supervisor, Security
- T. F. Lentz, Systems Engineering
- W. R. Wilson, Reactor/Performance Engineering
- *L. J. Woods, Testing and Maintenance Support
- W. H. Batts, Supervisor, Mechanical Maintenance
- J. H. Smith, Supervisor, Operations Support
- C. S. Olexik, Supervisor, Shift Operations
- G. L. Forehand, Director, QA/QC
- E. E. Willett, Manager, Outages and Modifications

Other licensee employees contacted included technicians, operators, mechanics, security force members, engineering personnel and office personnel.

*Attended exit interview.

Acronyms and initialisms used throughout this report are listed in paragraph 12.

2. Operational Safety Verification (71707)

The inspectors observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the report period. Also, the operability of selected emergency systems was verified, tagout records were reviewed and proper return to service of affected components was verified. Tours of the plant were conducted to observe plant equipment conditions; including fluid leaks, excessive vibrations, and general housekeeping efforts. The inspectors verified compliance with selected LCO and results of selected surveillance tests. The verifications were accomplished by direct observation of monitoring instrumentation, valve positions, switch positions, accessible pipe snubbers, and review of completed logs, records, and chemistry results. The licensee's compliance with LCO action statements was reviewed as events occurred.

The inspectors routinely attended meetings with certain licensee management and observed various shift turnovers. These meetings and shift turnovers provided a daily status of plant operations, maintenance, and testing activities in progress, as well as discussions of significant problems. The inspectors reviewed the shift foreman's log, control room operator's log, clearance center tag out logs, system status logs, chemistry and health physics logs, and control status board. The inspectors noted that the operators appeared to be alert and aware of changing plant conditions.

The following events and conditions were reviewed:

a. Pressurizer Power Operated Relief Valve - Spurious Opening

On October 20, 1988, at 8:03 a.m., pressurizer pressure transmitters 444 and 445 indicated erratic low and high readings. The high readings actuated power operated relief valve 444B and approximately 28 gallons of reactor coolant were discharged into the pressurizer relief tank. The valve reclosed following the instrument perturbations and no further actuations were experienced. The initial root cause was attributed to a radio transmission in the area of the pressure transmitter inside of containment. Discussions with personnel indicated that no previous problems had been experienced in this area with radio transmissions. It was also noted, that the security radio bands experienced chatter at the same time as the erratic instrument behavior. The licensee declared an unusual event and made the appropriate notifications in a timely manner. The licensee is continuing the investigation of this event and the findings will be reviewed by the inspectors.

b. Loss of "A" Train Electrical Power

On September 21, 1988, at 1:00 p.m. with the unit in mode 5, a complete loss of power occurred on the "A" train electrical distribution system. A dispatcher supervised relay crew was performing switchyard testing and inadvertently lifted the wrong lead in the fault circuitry which caused offsite supply breakers to trip and lock out. The "A" diesel generator was inoperable due to maintenance and the "A" RHR pump, which was running at the time, tripped. The "B" RHR pump was started at 1:07 p.m. and shutdown cooling flow was established at 1:12 p.m. The recovery of shutdown cooling and the "A" train electrical distribution was witnessed by the inspector and appeared to be excellent. The licensee was questioned about the operability of "A" RHR pump without its emergency power source being available, in that the "A" diesel generator was inoperable. The inspectors performed a detailed review of the shutdown RHR and electrical distribution Technical Specifications and reviewed the licensee's previous Technical Specification changes. The inspectors have concluded, as the

licensee had previously done, that the plant was in full compliance with the applicable Technical Specifications prior to the loss of electrical power event.

c. Reactor Coolant System Unidentified Leakage.

On October 6, 1988, at 2:30 p.m. with the unit in mode 4, unidentified reactor coolant system leakage was found to be 2.4 GPM. The licensee was unable to locate the source of the RCS leakage within 4 hours as per Technical Specifications. Accordingly, as required by the site emergency plan, an unusual event was declared. Letdown flow was isolated and the unidentified leakage was reduced to .39 GPM; thereby allowing termination of the unusual event. Plant personnel found the "A" mixed bed demineralizer drain valve, FCS-74, cracked open 1 1/2 turns. This valve had been previously checked closed using the remote handwheel. Letdown was re-established and the RCS leak rate for unidentified leakage remained within the Technical Specification limits of 1 GPM.

d. Feedwater Valve 1FW-307

Main feedwater valve 1FW-307 is a 3 inch air operated valve and serves as the isolation valve for the bypass line around the main feedwater isolation valve. This valve is also a containment isolation valve and is closed by a main feedwater isolation signal. It is opened between 15% and 20% power in order to warm up the main feedwater line prior to opening the main feedwater isolation valve, and is required to be open for approximately 1 hour to prevent thermal shocking of the steam generator internals.

The valve was found to have an excessive stroke time which exceeded the surveillance test requirement of 10 seconds. The failure of the valve to meet the ASME Section XI stroking requirements made the valve inoperable and consequently was required to be closed per TS 3.6.3. The licensee determined that the stroking problem was due to a deficiency with the valve internals, which could only be repaired with the plant in mode 5. Unable to perform the necessary feedwater warming and remain in compliance with the TS 3.6.3 Action Statement, the licensee formally requested the NRC to grant enforcement discretion until 1FW-307 could be repaired. Enforcement discretion was granted on October 14, 1988.

No violations or deviations were identified.

3. Monthly Surveillance Observation (71709)

The inspectors witnessed the licensee conducting maintenance surveillance test activities on safety-related systems and components to verify that the licensee performed the activities in accordance with licensee requirements. These observations included witnessing selected portions of each surveillance, review of the surveillance procedure to ensure that

administrative controls were in force, determining that approval was obtained prior to conducting the surveillance test, and verifying that the individuals conducting the test were qualified in accordance with plant approved procedures. Other observations included ascertaining that test instrumentation used was calibrated, data collected was within the specified requirements of Technical Specifications, any identified discrepancies were properly noted, and the systems were correctly returned to service. Portions of the following test activities were observed or reviewed by the inspectors:

OST-1015	Emergency Service Water Operability
OST-1026	Reactor Coolant System Leakage
OST-1080	Auxiliary Feedwater Full Flow
OST-1081	Containment Visual Inspection
OST-1106	Chemical Volume Control System/Safety Injection System Operability
OST-1108	Residual Heat Removal System Operability
OST-1216	Component Cooling Water Quarterly Test (Vibration Test Only)
OST-1315	Emergency Service Water Valves In Service Inspection
OST-1803	Containment Sump Visual Inspection

No violations or deviations were identified.

4. Monthly Maintenance Observation (62703)

Station maintenance activities of safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes and standards, and were in conformance with Technical Specifications. Items considered during the review included: verification that limiting conditions for operations were met while components or systems were removed from service; approvals were obtained prior to initiating the work; approved procedures were used; completed work was inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials were properly certified; and radiological and fire prevention controls were implemented. Work requests were also reviewed to determine the status of outstanding jobs to assure that priority was assigned to safety-related equipment maintenance which may affect system performance.



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Portions of the following activities were observed or reviewed:

1 MS-72; The main steam supply to the turbine driven AFW pump was found to have excessive leakage. The plant re-entered mode 5 and the valve was rebuilt.

Containment Air Cooler; The containment air cooler had experienced leakage on the tube manifold. A brazing process was used to make the necessary repairs.

Valve Live Load Packing; The plant completed approximately 700 live load packings during this outage. Initial results appear to be excellent.

Diesel Generators; Problems were experienced with the Woodward governor. The manufacturer's technical representative was on site to assist in repairs.

During an inspection of the main control board internals, various discrepancies were identified such as loose debris, missing cover plates and loose amphenol connectors. Operations personnel took immediate action in writing deficiencies for the identified items. The loose debris was removed immediately and cover plates were replaced. Maintenance personnel secured loose spare amphenols and verified proper locking for other main control board amphenols.

No violations or deviations were identified.

5. Radiological Protection Program (71709)

Selected activities of the licensee's Radiological Protection Program were reviewed by the inspectors to verify conformance with plant procedures and NRC regulatory requirements. The areas reviewed included: organization and management of the plant's health physics staff; "ALARA" implementation; Radiation Work Permits (RWPs) for compliance to plant procedures; personnel exposure records; observation of work and personnel in radiation areas to verify compliance to radiation protection procedures; and control of radioactive materials.

No violations or deviations were identified.

6. Physical Security Program (71881)

Licensee's compliance to the approved security plan was reviewed by the inspectors. The inspectors verified by observation and interviews with security force members that measures taken to assure the physical protection of the facility met current requirements. Areas inspected included: organization of the security force; establishment and maintenance of gates, doors, and isolation zones; access control; and badging procedures.

No violations or deviations were identified.

7. Licensee Event Reports (92700)

The following Licensee Event Reports (LER) were reviewed for potential generic problems to determine trends, to determine whether information included in the report meets the NRC reporting requirements and to consider whether the corrective action discussed in the report appears appropriate. The licensee action was reviewed to verify that the event has been reviewed and evaluated by the licensee as required by the Technical Specifications; that corrective action was taken by the licensee; and that safety limits, limiting safety settings and LCOs were not exceeded. The inspector examined the incident report, logs and records, and interviewed selected personnel. The following reports are considered closed:

LER 87-25	Reactor Trip
LER 87-26	Auxiliary Feedwater Actuation
LER 87-27	Pressurizer Pressure Channels Inoperable
LER 87-29	Inoperable Piping Snubber on Steam Generator Blow Down Line
LER 87-30	Missed Surveillance Test
LER 87-31	Reactor Trip
LER 87-32	REM-21WL-3541 Radiation Monitor Inoperable
LER 87-33	Emergency Diesel Generator Missed Air Roll
LER 87-35	Reactor Trip
LER 87-36	Emergency Diesel Generator Missed Air Roll
LER 87-38	Reactor Trip
LER 87-39	Intermediate High Range Trip Setpoint Out of Calibration
LER 87-40	Time Interval Exceeded for Calorimetric
LER 87-43	Containment Isolation Valves Omitted from Monthly Position Check
LER 87-44	Missed Surveillance Test for Axial Flux Difference
LER 87-46	Failed Main Feed Recirculation Flow Control Valve
LER 87-47	Auxiliary Feedwater Actuation
LER 87-48	Missed Surveillance Test for Axial Flux Difference
LER 87-49	Auxiliary Feedwater Actuation
LER 87-50	Reactor Shutdown - Unidentified Leakage Greater Than 1 GPM
LER 87-51	Auxiliary Feedwater Actuation
LER 87-54	Reactor Shutdown - Unanalyzed Condition

No violations or deviations were identified.

8. Reactor Trip

On October 14, 1988, at 12:27 p.m., the plant lost the "B" condensate pump and "B" condensate booster pump. The control room operator manually tripped the "B" main feed pump after observing "0" PSIG suction pressure. The operators manually tripped the reactor and main turbine, started the auxiliary feedwater system, and closed the main steam isolation valves. The reactor plant was stabilized using the steam generator power operated

relief valves and auxiliary feedwater. Attempts were made to restart the "A" and "B" condensate pumps with no success. After troubleshooting the control circuitry and performing system inspections, the licensee found that the control board instrument for hotwell level was in error and indicating higher than actual. The hotwell level had actually been low and caused a loss of suction in the condensate pump which caused a low condensate discharge pressure pump trip. Repairs were made and the plant returned to operation.

Additional problems were encountered during the loss of condensate pump event:

- ° The main feed pump motor failed to trip on loss of the running condensate or condensate booster pump motors as required. It was found that the logic trip relay had failed and was unable to trip the main feed pump motor.
- ° Excessive and repeated water hammers occurred in the secondary plant condensate and feedwater piping. It appears that the condensate and feedwater systems were partially drained after the condensate pump trip and before the main feed pump was tripped. The water hammers appeared to be generated at the 2B feedwater heater and lasted for a period of approximately 20 minutes with a frequency of about once every 8 to 10 seconds. Technical support and site engineering inspected piping supports during and after the event and there was no apparent damage to the plant.

No violations or deviations were identified.

9. Part 21, Report No. 145 - From IMO Delaval, Inc.

On April 29, 1988, IMO Delaval, Inc. reported to NRC and the affected licensees of a potential problem with certain engine control devices in the air start, lube oil, jacket water systems, and crankcase systems. The component manufacturer's Quality Assurance program did not test the product. The components, as listed below, are identified by IMO part number and description.

KR-001-000	Air Start Valve
KR-004-001	Air Start Valve
KR-004-002	Air Start Valve
F-573-156	Low Pressure Lube Oil Trip
F-573-330	High Temperature Jacket Water Trip
F-573-359	High Pressure Crankcase Trip

Another problem was identified on May 12, 1988, with Part No. F-573-156, Low Pressure Lube Oil Trip. The diaphragm can be held solid against the pressure head, creating a smaller surface area, and requiring a higher pressure to activate the valve. Corrective action was to add an additional 1-1/8 inch diameter with .030 inch deep counterbore in the pressure head.

The licensee has initiated corrective action as follows:

- ° The low pressure lube oil trip, high pressure jacket water trip, and high pressure crankcase trip devices were returned to IMO-Delaval for remachining, inspection, and testing.
- ° Work Request 88-AKNT1 was written to disassemble the air start valves in stock and verify operability and leakage rates.

This item is closed.

10. Allegation Investigation

Allegation 88-A-0068 was received by the NRC and concerned Environmental Qualification (EQ) considerations in that the plant was operated for some time without Raychem heat shrink on two triax cable connections. Cables No. 10062R and No. 10062Q are located in the containment building inside a junction box in the seal table room.

Resolution:

After a review of a Harris Nuclear Plant significant operational occurrence report and discussions with responsible management personnel, the inspectors determined that the cables listed above are connected to the Intermediate Range Nuclear Instrument Detectors. These detectors are not required for post accident conditions and, therefore, do not have to meet EQ requirements. The Raychem heat shrink was placed on the connections by the licensee in order to prevent moisture intrusion into the amphenol and possibly rendering the detector inoperable. The cables listed above are not required to be maintained per EQ requirements.

This item is closed.

11. Exit Interview

The inspection scope and findings were summarized during management interviews throughout the report period and on October 20, 1988, with the plant manager and selected members of his staff. The inspection findings were discussed in detail. The licensee acknowledged the inspection findings and did not identify as proprietary any material reviewed by the inspectors during this inspection.

12. List of Acronyms and Initialisms

AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
EQ	Environmental Qualification
FW	Feedwater

GPM	Gallons Per Minute
LER	Licensee Event Report
LCO	Limiting Conditions for Operation
No.	Number
NRC	Nuclear Regulatory Commission
OST	Operation Surveillance Test
PSIG	Pounds per Square-Inch Gauge
RCS	Reactor Coolant System
REM	Radiation Monitor
RHR	Residual Heat Removal
RWP	Radiation Work Permit
TS	Technical Specification
WL	Liquid Waste