

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/86002

Docket No. 50-440

License No. CPPR-148

Licensee: Cleveland Electric Illuminating Company
Post Office Box 5000
Cleveland, OH 44101

Facility Name: Perry Nuclear Power Plant, Unit 1

Inspection At: Perry Site, Perry, OH

Inspection Conducted: January 6-10 and 13-17, 1986

Inspectors: J. McCormick-Barger

C. Scheibelhut

Approved By: R. C. Knop, Chief
Reactor Projects
Section 1C

R.C. Knop
2/4/86

Date

Inspection Summary

Inspection on January 6-10 and 13-17, 1986 (Report No. 50-440/86002(DRP))

Areas Inspected: Unannounced safety inspection of Perry Plant Integrated Operating Instructions to assure they adequately controlled safety-related operations within the applicable regulatory requirements; review of selected surveillance instruction, required by Technical Specifications, to assure that formal requirements have been established for conducting the selected surveillance test; review of licensee actions on previous inspection findings. The inspection involved a total of 104 inspector-hours onsite by two inspectors including no inspector-hours during offshifts.

Results: No violations of regulatory requirements were identified in any area. During the review of Integrated Operating Instructions (IOI's) the inspectors noted many errors and omissions of Technical Specification references and reverences to supporting operating instructions. The applicant has undertaken a 100% re-review of the IOI's to assure that the information provided in the IOI's correctly reflect the latest Technical Specifications and supporting operating instructions.

DETAILS

1. Persons Contacted

Cleveland Electric Illuminating Company

*M. Lyster, Manager, Perry Plant Operations Department (PPOD)
*C. Shuster, Manager, Nuclear Quality Assurance Department
*F. Stead, Engineering Manager
***J. Waldron, Technical Department Manager
**R. Tadych, General Supervising Engineer, PPOD
***S. Kensicki, Technical Superintendent
**B. Walrath, General Supervising Engineer, OQS
***B. Liddell, Operation Engineer
**B. Ferrell, Licensing Engineer
*T. Heatherly, Compliance Engineer
*P. Russ, Compliance Engineer
*W. Colvin, Operation Engineer
***J. Hansen, Surveillance Coordinator
***M. Gmyrek, Senior Operations Coordinator
***J. Ellis, Operations Engineer
***R. Simmons, Unit Supervisor
*D. Nemeth, Supervising Operator
***L. Brosch, Supervising Operator

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**J. McCormick-Barger, Project Inspector, Perry
*C. Scheibelhut, Argonne (NRC Consultant)
*J. Grobe, Senior Resident Inspector, Perry
*K. Connaughton, Resident Inspector, Perry

*Denotes those persons attending both January 10 and 17, 1986, exit meetings.

**Denotes those persons attending only the January 10, 1986, exit meeting.

***Denotes those persons attending only the January 17, 1986, exit meeting.

Other licensee personnel were routinely contacted during the course of the inspection.

2. Licensee Action on a Previously Identified Item (92701)

(Closed) Open Inspection Item (440/85046-04(DRP)): "No high pressure test requirements post license issuance for the drywell." During the preoperational Structural Integrity Test (SIT) of the reactor drywell, there were numerous failures of the boot seals around each Safety-Relief Valve Discharge Line (SRVDL) where the piping penetrates the drywell wall. The failures were determined to be caused by material and design deficiencies. Following a re-design and installation of new boots, the SIT was successfully completed at 30 psid. The assumed purpose of the

boots is to prevent bypass leakage into containment during a loss of coolant accident blowdown. The plant technical specifications require testing the drywell bypass leakage rate at least every 18 months at a differential pressure of 2.5 psi. Since this is only 11% of the maximum calculated accident drywell differential pressure (22.1 psid), the inspector was concerned because the boot material may be susceptible to degradation during the 40 year life of the plant and a 2.5 psid bypass leakage test may not be adequate to ensure operability of the drywell. The concern was forwarded to the NRC Office of Nuclear Reactor Regulation (NRR) for resolution.

In a memorandum dated December 31, 1985, R. M. Bernero, Director, Division of BWR Licensing, NRR, to C. E. Norelius, Director, Division of Reactor Projects, RIII, NRR resolved the concern by concluding that the present technical specification testing requirements for bypass leakage are adequate to assure drywell integrity. This conclusion was based on the following:

The purpose of the boot seals is to alleviate the concern that additional unaccounted for hydrodynamic loads may be produced by steam condensation that could occur at the exit of the SRVDL sleeve annulus during a LOCA. The seals also permit the performance of the drywell SIT.

- Even if all of the 19 SRVDL boot seals were to fail following the onset of a LOCA, the predicted leakage is bounded by the bypass leakage capability of the drywell design.
- It is possible during selected short term accident conditions that the drywell differential pressure could be more than 5 psid. The periodic low pressure bypass test is at a pressure differential of 2.5 psi. However, the acceptance criteria for the low pressure test is 10% of the allowable bypass leakage. This required margin is more than enough to compensate for the potential bypass leakage increases due to the increased differential pressure.
- The safety grade automatic containment sprays incorporated in the Perry plant will quench the steam that bypasses the suppression pool should it occur.
- The applicant has been required to add the boot seals to the Perry Equipment Qualification program on a basis consistent with similar passive non-metallic materials in the program. This ensures the long term integrity of the boot seals because they will be replaced on a regular basis consistent with their predicted service life.

3. Review of Integrated Operating Instructions (424508)

A review was conducted of Perry Plant Integrated Operating Instructions (IOI's) to assure that they were prepared in accordance with appropriate administrative procedures and are technically adequate to accomplish their intended purpose. The review included assuring that prerequisites and plant conditions were verified or established to be commensurate with the IOI being reviewed, that limitations and actions were specified as needed to perform the intended operation within

prescribed Technical Specifications and other applicable requirements, and that the instructions appear to be complete and adequate. The purpose of the review was for the inspector to evaluate the scope and depth of the instruction and does not constitute a step-by-step review or approval of the instruction.

The following IOI's were reviewed:

- a) IOI-1, "Cold Startup," Revision 1, dated September 14, 1985.

The inspectors review of this instruction revealed 21 instances where Technical Specifications were incorrectly referenced or omitted in the instruction. The inspector believes these errors are due to the constant revising of the Technical Specifications during the recent developmental stages of the document, which will end just prior to low power licensing issuance. The review also revealed 3 cases where Technical Specification system parameters were specified incorrectly in the IOI. These include:

1. Section 8.12 of Attachment 1 to IOI-1 "Cold Startup System Status Checklist" states that the Suppression Pool water level indication is within normal limits, 18'0" and 18'6". Technical Specification Section 3.6.3.1 specifies limits of 18'0" and 18'6".
2. Section 8.12 of Attachment 1 to IOI-1 also specifies that the average Suppression Pool temperature is less than 95°F. Technical Specification section 3.5.3 specifies the temperature limit to be 90°F.
3. Section 8.13 of Attachment 1 to IOI-1 specifies that the upper containment pool level is to be at a temperature less than or equal to 127°F. Technical Specification Section 3.6.3.4 specifies the limit to be 100°F.

In addition, 19 instances were identified in the IOI where references to other operating instructions, such as System Operation Instructions (SOI's) and Valve Lineup Instructions (VLI's), were either omitted, incorrectly referenced or did not exist due to being administratively cancelled.

Technically the instruction appeared to be adequate, in that the instruction appeared to be complete and inclusive (with the exception of the missing reference to a shutdown margin surveillance described in paragraph 4 of this report).

- b) IOI-5, "Maintaining Hot Standby or Hot Shutdown," Revision 1, dated July 24, 1985.

The inspectors review of this instruction revealed the following concerns:

1. Section 3.0, "Prerequisites" did not provide a step in which the General Supervisor Operations, or his designated alternate, to give permission to the operator to maintain a specified condition

of reactor pressure and if in hot standby, a range of permissible reactor power levels that is to be maintained in the given mode.

2. Step 4.1.1.2 of the instruction for maintaining hot standby with the reactor critical, directs the operator to adjust control rod position to vary reactor power. No reference was given to a System Operating Instruction (SOI) for performing these changes.
- c) IOI-7, "Cooldown Following a Reactor Scram - Main Condenser Available," Revision 1, dated August 26, 1985.

The inspectors review of this instruction revealed the following concerns:

 1. Section 1.0, "Scope", did not indicate that the instruction may be entered from IOI-5, "Maintaining Hot Standby or Hot Shutdown," which appears to be possible.
 2. In Section 4.1, "Reactor Cooldown" step 7, 8, and 9, pertain to securing the feedwater heater system, which is necessary because the source of heating steam is the turbine that has been shutdown. These steps are performed in parallel with the cooldown and must be completed before the instructions may be exited. However, step 6 in the procedure is a general step that terminates the cooldown when the desired value of reactor pressure is reached. It appears step 6 should come after steps 7, 8, and 9, to avoid operator confusion or omission of securing of the feedwater-heater system.
 3. Step 4.1.7.a requires the opening of eight main steam line drains in various locations. These drains are two-inch lines that discharge into the main condenser. Under conditions where reactor decay heat is minimal, this may provide a path for dumping so much steam to the condenser that the maximum cooldown rate could be exceeded.
 4. Step 4.1.23 uses the feedwater system for maintaining reactor level. However, if the RCIC system was in use because the feedwater system was unavailable, no alternate method of maintaining reactor water level was given (ie., RHR System).
 5. Step 4.1.19 requires the use of the RHR head spray (in the vessel dome) to prevent a vessel-to-flange temperature differential from exceeding 70°F. However, no provisions or precautions were given if the head spray is not available, such as reducing cooldown rate.
- d) IOI-13, "Cooldown Following Reactor Shutdown by Boron Injection," Revision 0, dated November 22, 1985.

The inspectors review of this instruction revealed the following concerns:

1. Section 2.0, "Precautions and Limitations," number six requires that temperature limitations be observed before starting up an idle recirculation loop. However, there is no statement that prohibits startup of any recirculation loop until all control rods are fully inserted.
2. Section 4.2, "Reactor Cooldown - Main Condenser Available," was found to have similar problems as identified in IOI-7 in that there were no provisions for maintaining reactor water level following a reactor shutdown without feedwater, and the use of the head spray to control the vessel-to-flange temperature differential.
3. Step 4.2.5 states that reactor pressure is "decreased until the desired value is reached." The scope of this instruction indicates that cold shutdown and maintenance is the goal of the instruction. Since cold shutdown is by definition, 0 psid, Step 4.2.5 could cause some confusion since it appears to indicate that reactor pressure may be a variable.
4. This instruction does not instruct the operators to only exit to a special cleanup instruction, which would appear to be necessary since Boron was supposedly injected into the reactor.

Summary

The review revealed that the IOI's were generally found to be technically adequate. However, numerous errors were found concerning references to SOI's and Technical Specifications. Errors were also found in the scope statements in that they did not always encompass all the possible actions in the instruction, and define the procedures by which the instruction may be entered or exited. Resolution of the concerns identified in this section will be tracked as an open item (440/86002-01(DRP)).

4. QA Program (Surveillance Testing and Calibration Control) (35745B)

During the Integrated Operating Instruction (IOI) review, described in paragraph 3 of this report, the inspector performed a partial review of the licensee's program for control of surveillance testing required by Technical Specifications to assure that testing required during plant startups is included in either the licensee's "Repetitive Task" program or have a completion step in the appropriate IOI or Off Normal Instruction (ONI) etc.

Technical Specification Section 4.1.1.a requires that a shutdown margin test is to be performed prior to or during the first startup after each refueling. A review of IOI-1 "Cold Startup," Revision 1, dated August 14, 1985, and IOI-9, "Refueling Unit 1", Revision 0, dated December 27, 1985, did not reveal a step that specifically required that the shutdown margin surveillance be performed. When brought to the licensee's attention,

they were unable to provide a written program which included the surveillance test in question. Subsequently, the licensee performed a review of all non-routine surveillances specified in the Technical Specifications to assure that they are included in their operating procedures (IOI's, ONI's, etc.), as required by Perry Plant Operations Manual PAP-1105 "Surveillance Test Control," Revision 2, dated October 22, 1985, section 6.2.3.1.

The results of the licensee's review indicated that the inspectors finding was isolated, in that no other non-routine surveillance requirement was found to not have been addressed in their pre-existing operation program.

The licensee prepared temporary changes to both IOI-1 and IOI-9 to include a step to perform the shutdown margin surveillance test when required.

Since the missing administrative control for the shutdown margin surveillance test was an isolated case, and the actual test would have been performed initially in a special startup instruction, the inspector has no further concern with this matter.

5. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. The open item disclosed during the inspection is discussed in Paragraph 3.

6. Exit Interview

The inspectors met with licensee representatives denoted in Paragraph 1 on January 10th and 17th, 1985. The inspectors summarized the scope and findings of the inspection report. The licensee did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.