



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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up to AES

MEMORANDUM FOR: Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

James L. Milhoan, Regional Administrator
Region IV

FROM: Edward L. Jordan, Director
Office for Analysis and Evaluation
of Operational Data

SUBJECT: SOUTH TEXAS DIAGNOSTIC EVALUATION PROPOSED FOLLOWUP ACTIONS

Enclosed for your review and concurrence are proposed staff actions resulting from the South Texas Project evaluation.

Your expeditious review of this document is requested. Comments regarding these staff actions are requested by June 25, 1993. If there are any questions regarding either document, please contact Ron Lloyd at (301) 492-4149.

Edward L. Jordan, Director
Office for Analysis and Evaluation
of Operational Data

Enclosure:
STP Evaluation Staff Actions

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Enclosure:
STP Evaluation Staff Actions

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*See previous page for concurrence

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STAFF ACTIONS: SOUTH TEXAS PROJECT

1. ISSUE: A number of staffing issues were raised as a result of the diagnostic evaluation at STP. The scope of responsibilities and administrative burdens of the operating staff was excessive given the conditions that were prevalent at STP during the DET evaluation, the design of the facility, and operator workarounds. The team concluded that operator staffing, which exceeded TS minimum requirements, was significantly strained to accomplish a scenario involving shutdown from outside the control room. The scenario used during preoperational testing, that demonstrated the capability to shutdown from outside the control room with TS minimum staffing, did not include additional operational tasks associated with the fire brigade and emergency preparedness.

- ACTION:
- (a) Assess conditions at STP and the administrative burdens overloading the operating staff. Issue direction as appropriate.
 - (b) Assess the assignment of multiple responsibilities to operating staff to mitigate resource-intensive accidents such as shutdown from outside the control room. Incorporate any safety and generic findings into the ongoing NRC study of shift staffing at nuclear power plants.

RESPONSIBLE OFFICE: NRR, with Region IV assistance

2. ISSUE: The ability of the essential chilled water system to perform its safety function, during a design basis accident under low heat load conditions was never demonstrated, either through testing of the system, or by engineering analysis. Technical specification or post maintenance required testing also did not ensure that the essential chilled water system would be operable during accident conditions. The system had a total design cooling capacity of 450 tons per train, which exceeds the requirements for the highest expected heat load, and greatly exceeds the expected heat load for cold weather conditions. The licensee has experienced surging and vibration of chillers, particularly when throttling ECW flow because of cool weather conditions. If an accident occurred during cold weather and all chillers operated as designed, in response to an engineered safety feature actuation, the chillers would be significantly under-loaded, potentially causing surging and failure. Failure of the chillers would result in loss of essential chilled water system cooling of safety-related equipment. The piping design configuration did not allow the system to be tested with heat loads representative of those anticipated during accident conditions. The licensee indicated that the existing analysis did not adequately address the issue of

chiller operation during a design basis accident under low heat load conditions, and agreed to perform an engineering analysis by September 1993.

- ACTION:
- (a) Assess the licensee's engineering analysis regarding chiller operation under low heat load accident conditions. Issue direction as appropriate.
 - (b) Assess the need and scope of baseline testing of the essential chilled water system that would more closely simulate design basis accident heat load conditions and validate operability. Issue direction as appropriate.
 - (c) Assess the need and scope of periodic testing of the essential chilled water system to ensure that it can perform its safety function. Issue direction as appropriate.

RESPONSIBLE OFFICE: NRR, with Region IV assistance

3. ISSUE: A limited review of the fire protection area identified many fire protection deficiencies at STP associated with: shrinkage of penetration seals, the fire protection computer alarm system and operator training on the system, a large backlog of service requests on fire protection systems, control of transient combustibles in the plant, and fire brigade leader qualification. STP management did not oversee and direct the efforts to resolve the above deficiencies in a timely manner.

ACTION: Assess the need to perform a fire protection followup inspection at STP.

RESPONSIBLE OFFICE: Region IV, with NRR assistance

4. ISSUE: To protect HVAC ducts from collapsing during a tornado, outside ventilation intake dampers are designed to close automatically within .25 seconds, given a differential pressure of 3 psi. Collapse of the HVAC ducts would prevent cooling of safety-related or important to safety components and systems. Thirty dampers at STP were never tested once installed to verify that they would operate as designed. An STP preventive maintenance action was scheduled on a ten year frequency, but had never been performed. STP agreed to motion test the dampers to verify operability.

- ACTION:
- (a) Evaluate the licensee's surveillance test procedures and results. Issue direction as appropriate.
 - (b) Assess the extent and frequency of damper motion testing in the industry. Evaluate the need to establish technical specification damper motion

testing requirements, and subsequent motion testing of ventilation dampers affecting safety-related equipment. Issue direction as appropriate.

- (c) Assess the need and scope of periodic testing of the dampers to ensure that they can perform their safety function. Issue direction as appropriate.

RESPONSIBLE OFFICE: NRR, with Region IV assistance

5. ISSUE: The findings of the team indicate that the licensee was deficient in several areas of operations, maintenance and testing, and engineering support. The NRC's inspection program did not fully identify many of the concerns, and in some instances, provided limited insights into performance, such as the Maintenance Team Inspection, and recent engineering and operations assessments.

ACTION: In light of the team findings, evaluate the adequacy of existing inspection modules and implementation, particularly in the maintenance, engineering, and self assessment areas.

RESPONSIBLE OFFICE: NRR, with Region IV assistance

6. ISSUE: STP has a unique design feature called "the rapid refueling system." This system was designed with a "one-lift concept" in which the missile shield, reactor vessel head, upper core-support structure, and rod cluster control assemblies would be removed as a single unit. One feature of this design was to withdraw all of the rod cluster control assemblies into the head and upper internals package where they would be held for the duration of the refueling process. This feature was called "rod lockout" and was usually performed with the plant in mode 5. However, the licensee has documentation from Westinghouse (dated June 17, 1992) that indicated that the safety analysis for the boron dilution event did not address the condition with the control rods fully out in mode 5. Additionally, there were no TS requirements governing mode restrictions for this operation.

- ACTION:
- (a) Assess the adequacy of the safety analysis associated with the rapid refueling method at STP with the control rods "locked out." Issue direction as appropriate.
- (b) Evaluate the adequacy of the STP TS during rapid refueling activities. Issue direction as appropriate.

RESPONSIBLE OFFICE: NRR

7. ISSUE: At STP nine standby diesel generator (SDG) high pressure fuel injection pump hold down stud failures occurred from 1987 through 1993. Each time a failure occurred, the SDG

was declared inoperable. Subsequent licensee operability reviews determined that failure of the fuel injector hold down studs would render the associated cylinder inoperable, but would not render the SDG inoperable. The licensee received correspondence from Cooper-Bessemer indicating that as many as 2 cylinders could be out of service and the SDG would still be operable. However there was no analysis available for team review.

The licensee attributed the failures to various root causes such as, faulty material, use of improper installation tools and improper lubrication of the hold down studs prior to torquing. Preliminary indications from the licensee also indicated that other utilities with Cooper-Bessemer SDGs have experienced fuel injector hold down stud failures. However, to date no formal industry notification has been issued by the licensee or the vendor.

- ACTION:
- (a) Evaluate the licensee's SDG operability analysis for various scenarios involving multiple inoperable cylinders during accident conditions. Issue guidance as appropriate.
 - (b) Evaluate the need to provide additional regulatory correspondence regarding the multiple fuel injector hold down stud failures. Issue guidance as appropriate.

RESPONSIBLE OFFICE: NRR, with Region IV and AEOD assistance

8. ISSUE: The standard TS guidance regarding overtime appears to have been developed based on a normal 8-hour shift. The licensee was on site-wide 12-hour shifts. As a result, any need to hold an operator over resulted in exceeding the TS overtime guidance by working more than 24 hours in a 48 hour period. This situation had occurred relatively frequently, largely because of minimally staffed shift crews.

ACTION: Evaluate the applicability of TS overtime requirements for plants on 12-hour shifts. Issue direction as appropriate.

RESPONSIBLE OFFICE: NRR

9. ISSUE: In the transmittal letter forwarding the diagnostic evaluation report, HL&P was requested to review the report and respond within 60 days describing actions they intend to take to address root causes of identified weaknesses.

ACTION: Review and evaluate the licensee's response to the diagnostic evaluation report for completeness. Prepare an appropriate reply for EDO signature.

RESPONSIBLE OFFICE: Region IV, with assistance from NRR and AEOD