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Dalwyn R. Davidson
VICE PRESIDENT
SYSTEM ENGINEERING AND CONSTRUCTION

March 25, 1982

Mr. A. Schwencer
Chief, Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Response to Request for
Additional Information -
Instrument and Control Branch

Dear Mr. Schwencer:

This letter and its attachment is submitted to provide draft responses to the concerns identified in your letter dated March 2, 1982 in regard to Instrument and Control.

It is our intention to incorporate these responses in a subsequent amendment to our Final Safety Analysis Report.

Very Truly Yours,

Dalwyn R. Davidson

Dalwyn R. Davidson
Vice President
System Engineering and Construction

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421.72 During our review of the testing procedures for the pilot solenoid valves which control compressed air to the automatic depressurization system (ADS) relief valves, it became apparent that the present Perry design does not provide a method to indicate the actual position of the solenoid during this test. In the GESSAR-238 NSSS preliminary design safety evaluation report (Docket No. STN 50-550) dated March 1977, the NRC staff identified this as a potential problem and took the position that the General Electric Company would be required to make provisions to improve the testability of the ADS solenoid valves during reactor operation. Therefore, the staff requires that the applicant revise the design of the circuitry used to activate the solenoids to permit verification of solenoid operation during tests.

Response

CEI commits to comply with Technical Specification requirements regarding testing of ADS.

Technical Specifications require:

At least once per 18 months for the ADS by:

1. Performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence, but excluding actual valve actuation.

2. Manually opening each ADS valve (when the reactor steam dome pressure is greater than or equal to 100 psig) and observing (the expected change in the indicated valve postion) (that either:

   a) The control valve or bypass valve postion responds accordingly, or

   b) There is a corresponding change in the measured steam flow.)

421.73 During our review, it has become apparent that the logic for manual initiation for several Engineered Safety Feature (ESF) systems is interlocked with permissive logic from various sensors. In some cases it appears that the permissive logic is dependent upon the same sensors as those used for automatic initiation of the system. The staff questions whether this design meets the intent of IEEE 279, Section 4.17. The staff requires the applicant to revise the design to provide the capability to manually initiate each safety system independent of any permissive logic dependent upon sensors or circuitry used for automatic initiation or submit justification for interlocks for each ESF system in which the applicant proposes to retain the interlocks.

Response

A review of all ESF systems was conducted to identify those areas where manual initiation of a system is interlocked with permissive logic from various sensors. This review identified the following systems in which this condition exists.

1. ECCS System

   a. HPCS - The HPCS cannot be manually initiated with a high vessel water level signal present.

   b. LPCS/LPCI - The injection valve on the discharge of the LPCS/LPCI pumps will not open manually if a pressure in excess of 450 psi exists in the system between the injection valve and the testable check valve.

c. ADS - System level manual actuation of the ADS valve cannot occur unless a low pressure ECCS pump is running.

Although the individual subsystems mentioned above do not appear to meet IEEE 279 section 4.17 criteria, the ECCS system (at the system level) does meet the criteria. For example, if HPCS fails due to the loss of the high level trip, the operator can use the ADS along with LPCI/LPCS to provide water to the core.

2. RHR System

a. Containment Spray Cooling Mode - Several interlocks exist in this mode.

(i) A containment high pressure signal must exist prior to manual initiation of containment spray. Loop A receives a signal from a containment high pressure sensor different from the one which Loop B receives.

(ii) Upon receipt of a LOCA signal, a 10 minute timer precludes the manual initiation of the containment spray cooling mode until after the timer runs out.

(iii) Manual initiation of Loop B of the containment spray cooling mode requires the operator to hold down the manual switch for 90 seconds before loop B will initiate.

The above interlocks are necessary to prevent inadvertent initiation of the containment spray cooling mode. The consequences of inadvertent initiation are considered to be significant enough to justify the interlocks.

Rapid depressurization of the containment spray cooling mode could cause excessive negative pressures on the containment shell. This is

prevented by the interlocks mentioned in i and iii above.

The most important post LOCA mode for RHR is LPCI because it is necessary to keep the core flooded. The 10 minute timer helps to prevent operator action which could divert LPCI flow away from the core.

b. Suppression Pool Cooling Mode - Manual initiation of the suppression pool cooling mode is also governed by a 10 minute post-LOCA timer. The purpose of this interlock is the same as described above for item ii of the containment spray cooling mode.

3. Control Room Emergency Recirculation - Manual and automatic initiation of this system is interlocked with the arming or actuation of the charcoal filter deluge switch. This prevents operating fans and dampers when a high temperature condition in the filter requires deluge.

4. Diesel Generator Building Ventilation - System operation is interlocked to prevent operation when CO_2 flooding is activated to fight a fire in the diesel generator building.

5. Annulus Exhaust Gas Treatment - Manual and automatic initation of this system is interlocked with arming or actuation of the charcoal filter deluge switch. This prevents operating fans and dampers when a high temperature condition in the filter requires deluge.

6. Suppression Pool Makeup System - The only interlock on maunaul system initiation is the required presence of a LOCA signal to avoid inadvertant or accidental actuation of the system prior to its requirement.

7. Containment Vacuum Relief System - The only interlock provided is to override both manual and automatic isolation closure if a containment vacuum condition exists.