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RECIP.NAME RECIPIENT AFFILIATION
VOLLMER,R.H. Division of Engineering

SUBJECT: Requests issuance of SER approving reactor coolant pump fire protection sys.Submits proposed accident scenario per 801022 telcon & ACRS 801010 meeting & addl info to document safe shutdown potential in postulated accident.

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November 26, 1980

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Serial No.: NO-80-1752

Mr. Richard H. Vollmer, Director
Division of Engineering
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
FIRE PROTECTION FOR REACTOR COOLANT PUMP BAYS

Dear Mr. Vollmer:

Based on your discussions with Mr. P. W. Howe at the October 10, 1980 ACRS session and your followup telephone discussion with him on October 22, 1980, it is our understanding that your Staff would be agreeable to allowing an automatically initiated fixed fire suppression system for reactor coolant pump (RCP) lube oil fire protection at H. B. Robinson Unit 2 where it can be shown that the results of such a fire, including the effects of the heated gases rising from the fire, would not prevent the safe shutdown of the reactor. As was discussed, the proposed accident scenario would be:

(1) In the event of a seismic occurrence of sufficient magnitude to cause the reactor coolant pump lube oil system to rupture, and

(2) the leaking lube oil soaked into the reactor coolant pipe and pump lagging to the point at which temperatures reached the flash point for lube oil (approximately 425°F), and

(3) if the resultant smoldering lagging did not energize the installed fire detection devices in a timely manner, and

(4) if the same seismic event also incapacitated the installed fixed suppression system in the reactor coolant pump bays, and

(5) if the reactor coolant pump lube oil level alarm, reactor coolant pump bearing temperature alarms, reactor coolant pump vibration alarms and reactor coolant pump flow indication in the control room did not alert the control room operators to take immediate action to investigate the problem as called for by existing operating procedures, and

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(6) if the smoldering lagging in the reactor coolant pump bays were not extinguished by the backup fire brigade, then

(7) any resultant fire damage to safety related cabling, instrumentation or equipment would not prevent the safe shutdown of the reactor.

If this demonstration could be made, it is our understanding that an automatically actuated, fixed suppression system would be acceptable fire protection for the reactor coolant pump bays and a lube oil collection system would not be required.

In order to document sufficient information that the above postulated events would not prevent safe shutdown of H. B. Robinson Unit No. 2, the following additional information is provided:

1. Lack of Safety Related Equipment

At H. B. Robinson, Unit No. 2, the only safety-related equipment in the RCP bays is the cabling for that reactor coolant loop instrumentation. The loss of this instrumentation would not threaten the ability to safely shut down the reactor, since operation of a reactor coolant loop is not required for safe shutdown. Attached to this letter is a list of the safety related cabling within the RCP bay.

2. Plume Rise Impact

The RCP bays are covered with removable concrete access blocks. Since these blocks must be removable to provide maintenance access to the RCP bays, there is no equipment installed above the RCP bays. These blocks, however, will cause the plume rise to be diverted through the steam generator area. The only safety-related equipment within this area is the steam flow instrumentation sensing lines. The steam flow instrumentation is not needed for safe shutdown of the reactor. In addition, this equipment will not be adversely impacted by a RCP lube oil fire since:

a. with the sensing lines together, density changes in one leg will be balanced by density changes in the other leg,

b. very conservative calculations show that even if the sensing lines were in the hottest part of the flame, over nine (9) hours would be required before a change in fluid state would take place within the sensing line at the transmitter located outside the concrete shield wall.

3. Time Delay For Auto-ignition

A lube oil fire would not occur instantaneously with a rupture of the RCP lube oil system. With the exception of two valve bonnets on the 2" RCP bypass line, all associated reactor coolant piping is protected by lagging. Lagging or shield protection for these valves will be installed at the next appropriate outage. At HBR Unit 2, it would take a period of time for the oil to soak into the reactor coolant pipe and pump lagging to a depth where the temperature would exceed the flash point of lube oil (approximately 425°F). The reactor coolant is at a temperature of approximately 500°F, which is the only source of lube oil ignition in the RCP bays. It would be unreasonable to assume this would occur before an operator would be aware of this situation from other control room indications (RCP bearing high temperature, RCS low flow indication, RCP high vibration, and low lube oil level alarms).

4. Redundant Early Warning

Adequate redundant warning exists of a pending lube oil fire in the HBR Unit 2 RCP bays. Upon receipt of a low lube oil level alarm or a RCP bearing high temperature alarm, the control room operator dispatches an auxiliary operator to determine the cause. These alarms and indications in the control room would occur independent of installed fire detection alarms in the RCP bays.

5. Fire Brigade Backup

Should the installed, automatically actuated, fixed suppression system fail to actuate for any reason, and manual initiation was also incapacitated, the reactor would be shut down and the backup fire brigade would fight any resultant fire.

6. Current Status

The existing fixed suppression system is installed in each HBR RCP bay, based upon: (1) the NRC's Staff requirement for automatic actuation, and (2) the draft Appendix R which was noticed in the Federal Register on May 29, 1980. Installation of the fixed suppression system commenced on August 11, 1980 and required over 600 man-rems of exposure for installation, which was completed in October, 1980.

7. Value/Impact Analysis of Further Backfits

Any additional requirement to backfit a lube oil collection system to the existing HBR RCP bays would require additional man-rem of exposure during installation; would require further man-rem exposure for removal of the lube oil collection system

prior to each repair or inspection of the reactor coolant pumps; and, based on the above safety analysis, would have a doubtful incremental safety benefit with regard to a value/impact assessment (Ref: NRC Guidelines for Conducting Value/Impact Analyses, p. i, iii, and 5 January 1978).

In summary, it is requested that, based on the information provided in this letter, an approved NRC Safety Evaluation Report be issued for the existing H. B. Robinson Unit 2 RCP fire protection system, such that the provisions of the proposed Appendix R would not apply to H. B. Robinson Unit 2 in this regard.

Should you have any questions regarding this issue, please contact Mr. P. W. Howe at (919) 836-6816.

Yours very truly,

E. E. Utley
Executive Vice President
Power Supply and
Engineering & Construction

DLB/jc (5298)
Attachment

cc: Mr. J. D. Neighbors
Mr. H. R. Denton
Mr. R. B. Minogue