**Omaha Public Power District**

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March 13, 1980

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert W. Reid, Chief
Operating Reactors Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: Docket No. 50-285

Gentlemen:

The Omaha Public Power District received a letter from the Commission, dated March 10, 1980, requesting additional actions or information concerning implementation of Category A Lessons Learned requirements at Fort Calhoun Station Unit No. 1. The Commission's concerns are addressed in the enclosure forwarded herewith.

Sincerely,

W. C. Jones
Division Manager
Production Operations

WCJ/KJM/BJH/TLP:jmm

Enclosure

cc: NRC Regional Office
LeBoeuf, Lamb, Leiby & MacRae

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Enclosure 1

RESPONSE TO REQUEST FOR ADDITIONAL ACTION/DISCUSSION
LESSONS LEARNED - CATEGORY A

Request 2.1.1

Implement procedures for manual reconnection of pressurizer heaters prior to restart of Cycle 6.

Action/Discussion

Procedures for reconnection of the pressurizer heaters have been completed and added to the appropriate emergency procedures.

Request 2.1.3.a

(1) Document your commitment to power all valve position indicators from one vital bus at least until equipment qualification is complete.

(2) Equipment must be operational prior to restart for Cycle 6.

(3) Modify emergency procedures to reference new valve position indicators.

Action/Discussion

(1) Prior to restart for Cycle 6, all valve position indicators for power operated relief and safety valves will be powered from one vital bus. Power feed to one-half the indicators will be changed during the 1981 refueling outage.

(2) All position indicator equipment will be fully operational prior to startup, Cycle 6.

(3) The acoustic indication of the status of the power operated relief valve will be added to the symptoms section of the appropriate emergency procedures prior to startup.

Request 2.1.3.b

(1) Provide plans and schedule for upgrading sub-cooling meter temperature inputs.

(2) Discuss capability to monitor sub-cooling margin with the plant computer (core exit thermocouple inputs).

(3) Modify emergency procedures to reference new sub-cooling monitors.

(4) Equipment must be operational prior to restart of Cycle 6.

Action/Discussion

(1) The temperature inputs to the subcooling margin meters will be upgraded to the 300 to 700°F range during the 1981 refueling outage.

(2) The subcooled margin can be monitored with the plant computer using the core exit thermocouples. It is proposed the saturation temperature be calculated using the RCS pressure as an input. This temperature will be compared to the average of eight core exit thermocouple temperatures and the degree of subcooling displayed to the operator.

(3) The subcooling margin meter and alarm indications will be included in the appropriate operating instructions and emergency procedures prior to startup.

(4) All equipment will be fully operational prior to restart of Cycle 6.

Request 2.1.4

(1) Revise your December 31, 1979, submittal to clearly identify essential and non-essential systems.

(2) Provide the bases for your classification of essential systems.

Action/Discussion

Response to this request is provided in Attachment A.

Request 2.1.6.a

Final system leak rates measured during the leak reduction program must be obtained prior to Cycle 6 power operation and reported shortly thereafter.

Action/Discussion

Final system leak rate measurements will be obtained prior to Cycle 6 restart and the results will be reported within two (2) weeks following restart.

Request 2.1.7.b

Your safety grade auxiliary feed flow transmitters and steam generator level transmitters must be installed prior to startup.

Action/Discussion

All safety grade auxiliary feedwater flow transmitters and steam generator level transmitters will be installed prior to Cycle 6 restart, providing the one level transmitter that was returned to the vendor is received in time for Cycle 6 restart. The transmitter is due to be shipped March 13, 1980.

Request 2.1.8.c

Incorporate the procedures for determining airborne radioiodine concentrations in occupied areas following an accident. Procedures should reflect need to move sampler between Technical Support Center and Control Room.

Action/Discussion

Operating Instruction OI-PAP-9, Procedure for Post Accident Monitoring of Radioiodine in Occupied Areas, has been completed. Instructions for instrumentation operation and personnel actions in the control room and Technical Support Center area are included.

Request 2.2.2.b

(1) Revise Emergency Plan to designate dedicated channels on the GAI-TRONICS for communication between the Technical Support Center and the Control Room and the Technical Support Center and the Emergency Control Center.

(2) Revise Emergency Plan to designate an Emergency Duty Officer as the Technical Support Center Coordinator.

(3) Commit to a date for operational condition for the computer display of plant parameters inside the Technical Support Center.

Action/Discussion

(1) A revision to the Emergency Plan, section 5.3.1.1.1, has been initiated that provides for channel 3 of the GAI-TRONICS system to be dedicated for communications between the control room, Emergency Control Center (ECC), and the Technical Support Center (TSC).

(2) A revision to the Emergency Plan, section 5.2.2.2.2.1.2.c, has been initiated to require that, upon a second Emergency Duty Officer (EDO) reporting to the ECC, one will remain at the ECC and the other will report to the TSC to act as TSC Coordinator.

(3) Computer display of plant parameters in the TSC will be operational within 30 days of plant startup following Cycle 6 reload.

Attachment A

Request 2.1.4, Containment Isolation

The Fort Calhoun Station Unit No. 1 reactor containment building is provided with an automatic actuation system which operates containment penetration isolation valves (both to the open and to the closed position) to mitigate the consequences of an accident. The automatic systems are the Containment Isolation Actuation Signal (CIAS) and the Ventilation Isolation Actuation Signal (VIAS). It should be noted that VIAS is redundant to CIAS in that it also generates a valve closure signal for certain isolation valves closed by CIAS; specifically, the containment purge and relief lines.

The CIAS, as well as Safety Injection Actuation Signal (SIAS), is generated if either a Pressurizer Pressure Low Signal (PPLS) or a Containment Pressure High Signal (CPHS) is generated by an accident condition in the primary system and/or containment building. The actual mechanism of isolation is designed to meet single failure criteria. The CIAS system consists of two redundant isolation channels (or trains) which are actuated by sensors, in a two-out-of-four logic, monitoring the primary system and containment pressure. When the actuation logic is satisfied, a signal is then generated which actuates the PPLS or CPHS "86" lockout relay which mechanically seals in the accident signal. The accident signal in turn actuates the emergency core cooling system and CIAS via an "86" lockout relay which mechanically seals in the CIAS control function. In addition, the Fort Calhoun Station Engineered Safety Feature System is provided with an additional control relay whereby Channel A control may "reach across" and actuate Channel B equipment and vice versa. This provides increased availability of safety equipment. The CIAS train separation is maintained at the line isolation valves; Channel A will operate the A valve, and B the B valve (exceptions are dealt with later in the discussion).

When the "86" CIAS relay is actuated, relays in the CIAS panel AI-43A and AI-43B are de-energized, causing the isolation valves to assume their accident position. In general, this electrically de-energizes a seal in control relay, which in turn de-energizes a solenoid valve which allows the air operated diaphram to go to zero pressure closing the valve.

The previously discussed circuit is such that when the accident signal is reset the valves remain in their accident positions. The valves may then be manually reset valve-by-valve (or pairs of valves as in the case of certain cooling systems). No group resets exist. In addition, in general when the accident signal is present manual repositioning of the valves is blocked. Exceptions will be dealt with in the following discussion of essential and non-essential systems.

## NON-ESSENTIAL SYSTEMS

| | System & Function | Isolation Valves | Reason for Isolation |
|---|---|---|---|
| ** 1. | Primary System Letdown | HCV-204, TCV-202 | Direct Connection with RCS |
| ** 2. | Reactor Coolant Pump Bleedoff | HCV-241, HCV-206 | Direct Connection with RCS |
| * 3. | SI Tank Cooler Flow | HCV-2983 | Direct Connection with RCS |
| 4. | Reactor Coolant Sample | HCV-2504A, HCV-2504B | Direct Connection with RCS |
| 5. | Containment Sump | HCV-506A, HCV-506B | Direct Connection with Containment Atmosphere |
| 6. | Reactor Coolant Drain Tank Discharge | HCV-500A, HCV-500B | Direct Connection with Containment Atmosphere |
| 7. | Makeup to Pressurizer Quench Tank | HCV-1560A, HCV-1560B | Potential Connection to RCS |
| 8. | Demineralized Water Supply | HCV-1559A, HCV-1559B | Direct Connection with Containment Atmosphere |
| 9. | RC Drain Tank Vent | HCV-507A, HCV-507B | Potential Exposure to DBA Conditions |
| 10. | Pressurizer Quench Tank Sample Line | HCV-509A, HCV-509B | Potential Exposure to DBA Conditions |
| 11. | RC Drain Tank Sample | HCV-508A, HCV-508B | Potential Exposure to DBA Conditions |
| 12. | $N_2$ Supply | HCV-2603A, HCV-2603B | Potential Connection with Containment Atmosphere |
| 13. | $N_2$ Supply to Pressurizer Quench Tank | HCV-2604A, HCV-2604B | Potential Connection with Containment Atmosphere |
| 14. | Containment Radiation | PCV-742E, F, G, H | Direct Connection to Containment Atmosphere |
| 15. | Containment Relief | HCV-746A, HCV-746B | Direct Connection to Containment Atmosphere |
| 16. | Service Air | HCV-1749 (inboard valves are manual closed) | Direct Connection to Containment Atmosphere |

NON-ESSENTIAL SYSTEMS
(Continued)

| | System & Function | Isolation Valves | Reason for Isolation |
|---|---|---|---|
| 17. | Containment Air Purge | PCV-742A, B, C, D | Direct Connection to Containment Atmosphere |
| 18. | Nuclear Instrument Detector Well Cooling | HCV-467A, B, C, D | Closed on Containment Isolation |
| 19. | SI Leakage Cooler | HCV-425A, B, C, D | Closed on Containment Isolation |
| 20. | Blowdown (SG) | HCV-1387A/B<br>HCV-1388A/B | Closed on Containment Isolation |
| 21. | Blowdown Sample (SG) | HCV-2507A, B<br>HCV-2506A, B | Closed on Containment Isolation |

*HCV-2983 receives an isolation signal from both trains of CIAS. The remaining valves associated with this penetration are closed by a safety injection signal and are part of the safety injection/leakage cooler pressure protection system.

**Control switch will reposition valve with accident signal present; however, will immediately reclose when switch spring returns to normal.

The remaining valves discussed in this section are provided with a containment isolation signal; however, in order to provide maximum flexibility, operation differs from the previous discussion. Those systems considered essential and the justification for this designation are specifically called out within the text.

1. The instrument air header valve PCV-1849 closes on low air pressure (70 psig) and CIAS. With a normal operating pressure above accident pressure, the air header is left in service unless low air pressure is detected. The availability of air enhances reactor shutdown. It must be emphasized that air failure will in no way inhibit shutdown. PCV-1849 fails open.

2. The hydrogen purge system HCV-881, 882, 883A/C, 884A/C is required for operation in a post-accident condition. The supply and exhaust, HCV-881 and 882, are equipped with automatic valves inside containment only. These valves are closed by CIAS, but fail open on loss of control power or air. The valve isolation function is backed up by redundant locked closed manual valves. The sample valves, HCV-883A/C and HCV-884A/C, have a similar arrangement; however, the automatic valves outside containment, HCV-883A and 884A, fail closed and are closed by CIAS. Override switches are provided to override the CIAS function. The system is used to detect and remove hydrogen in a post-accident environment.

3. The auxiliary feedwater system (which is not directly connected to the RCS or containment atmosphere) HCV-1107A/B and 1108A/B are opened by CIAS and fail open. Override switches are provided for post-accident valve positioning. Circuit modification to these valves will be dealt with under the Auxiliary Feedwater Section of NUREG-0578. This is considered an essential system because it provides for decay heat removal.

4. The main feedwater penetration isolation valve HCV-1385 and 1386 are motor operated valves which close on CIAS. These valves fail "as is", but are connected to a vital 480 volt bus to ensure closing. In addition, there are check valves in the system as redundant valves. This system is not directly connected to the RCS or containment atmosphere. To enhance the ability to mitigate a small break LOCA, a design change is being evaluated to provide automatic isolation of HCV-1385 and HCV-1386 on CPHS or SGLS, similar to the main steam isolation valves. It should be noted that decay heat removal may always be accomplished by auxiliary feedwater. The availability of main feedwater will enhance accident response ability to remove decay heat in some accident situations. With an accident signal present, if an attempt is made to open the valves manually, they will drive open then immediately back closed.

5. The containment air cooling units' cooling water supply valves HCV-400A/C, B/D, 401A/C, B/D, 402A/C, B/D, and 403A/C, B/D are opened by CIAS and fail open. This is considered an essential system. This system functions to limit containment pressure.

6. The reactor coolant pump lube oil cooler and seal cooler supply and return line HCV-438A, B, C, D close on CIAS. The valves inside containment (A and C) fail open. The valves have override switches to open after CIAS to reinstate cooling water. The failure of valves or closure on CIAS will not trip the reactor coolant pump motors.

The remaining penetrations not actuated by CIAS are those which are associated with shutdown or a different type accident. These systems are listed below.

1. Safety injection - opens under accident signal. This is considered an essential system, which supplies borated water to the reactor core.

2. Containment spray - opens on CPHS and PPLS. This is considered an essential system to limit containment pressure.

3. Shutdown cooling - locked closed, it functions as part of the RHRS system.

4. Containment sump recirculation - part of ECCS actuates on RAS. This is considered an essential system, since it functions as part of the post-accident heat removal system.

5. Main steam isolation valves - closed upon SGLS (Steam Generator Low Signal) and CPHS (Containment Pressure High Signal) part of closed system not in contact with RCS or containment atmosphere. They function to mitigate a main steam line break accident.

6. Charging - does not isolate. This is considered an essential system that provides boric acid to the core. This system is not considered in the safety analysis, but helps assure plant safety.

7. Containment pressure monitoring penetrations (4 total) - remain open, generate CPHS. They allow for monitoring containment pressure.

The design requirements of NUREG-0578 are presently satisfied, and no changes to the initiation scheme or to the circuit design are necessary. The deletion of HCV-438A, B, C, and D from CIAS closure is under evaluation; but this will not affect the isolation requirements of NUREG-0578. Essential systems, identified above, are those which are not isolated on CIAS. All non-essential systems are isolated.