Before the United States
Nuclear Regulatory Commission

In the Matter of	)	
	)	
Omaha Public Power District	)	Docket No. 50-285
(Fort Calhoun Station	)	
Unit No. 1)	)	

APPLICATION FOR RESOLUTION OF AN UNREVIEWED SAFETY QUESTION AND AMENDMENT OF OPERATING LICENSE

Pursuant to Section 50.59 and Section 50.90 of the regulations of the U. S. Nuclear Regulatory Commission ("the Commission"), Omaha Public Power District, holder of Facility Operating License No. DPR-40, herewith requests that the Commission approve the resolution of an Unreviewed Safety Question and amendment of the operating license, allowing installation of capability for override of the Containment Isolation Actuation Signal (CIAS) closure signal to containment isolation valves for reactor coolant system letdown flow.

The proposed changes to the Updated Safety Analysis Report and the Appendix B of Technical Specifications are provided in Attachment A to this Application. A Discussion, Justification, and No Hazards Consideration Analysis, which demonstrates that the proposed changes do not involve significant hazards considerations, is appended in Attachment B. The proposed changes to the Updated Safety Analysis Report and the Appendix B of Technical Specifications would not authorize any change in the types or any increase in the amounts of effluents that will be released, or any change in the authorized power level of the facility.

WHEREFORE, Applicant respectfully requests that the Resolution of the Unreviewed Safety Question be approved and that the Updated Safety Analysis Report and the Appendix B of Technical Specifications be amended hereto as Attachment A.

A copy of this Application, including its attachments, has been submitted to the Director - Nebraska State Division of Environmental Health, as required by 10 CFR 50.91.

OMAHA PUBLIC POWER DISTRICT

By

W. G. Gates

W. G. Gates
Vice President

Subscribed and sworn to before me
this 28th day of September, 1998.

Julie B Kuhr

Notary Public

GENERAL NOTARY-State of Nebraska
JULIE B. KUHR
My Comm. Exp. April 4, 2000

United States of America
Nuclear Regulatory Commission

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AFFIDAVIT

W. G. Gates, being duly sworn, hereby deposes and says that he is the Vice President in charge of all nuclear activities of the Omaha Public Power District; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached information concerning the resolution of an Unreviewed Safety Review Question and Amendment of the Updated Safety Analysis Report and the Operating License dated September 25, 1998, concerning the installation of capability to override the Containment Isolation Actuation Signal to containment isolation valves for reactor coolant system letdown flow; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information, and belief.

W. G. Gates
Vice President

STATE OF NEBRASKA)
) ss
COUNTY OF DOUGLAS)

Subscribed and sworn to me, a Notary Public in and for the State of Nebraska on this 28th day of September, 1998.

Julie B Kuhr
Notary Public

GENERAL NOTARY-State of Nebraska
JULIE B. KUHR
My Comm. Exp. April 4, 2000

Attachment A
Requested Changes of the USAR and Operating License

During cooldown, the operator uses the letdown control valves and/or the charging pumps to adjust and maintain the level of water in the pressurizer. Makeup water is introduced at the shutdown boric acid concentration. The operator may switch the suction of the charging pumps to the safety injection and refueling water tank (SIRWT). The charging flow may be used as an auxiliary spray to cool the pressurizer when less than three reactor coolant pumps are in operation. This is required because minimal RCP spray flow is available with less than three RCPs in operation.

9.2.4.4 Hot Leg Injection

Long term response to a large break Loss of Coolant Accident (LOCA) requires that, in order to prevent boron precipitation in the core, simultaneous hot and cold leg injection must be initiated. The CVCS system provides a path for hot leg injection in post-LOCA long term cooling. (Ref. 9.2-5).

9.2.5 Design Evaluation

Under emergency conditions, the charging pumps are used to inject concentrated boric acid into the reactor coolant system. Either PPLS, CPHS or pressurizer level control automatically starts all charging pumps. Because this function is not credited in the USAR Section 14 safety analyses these pumps are not considered Engineered Safeguards equipment. The SIAS also transfers the charging pump suction from the volume control tank to the discharge of the boric acid pump. If the boric acid pumps are not operable, boric acid flows by gravity from the concentrated boric acid tank to the charging pump suction header. If the charging line inside the reactor containment building is inoperative, the line may be isolated outside of the reactor containment and concentrated boric acid solution may be injected by the charging pumps through the safety injection system. Containment integrity is maintained during post LOCA situations by maintaining a higher pressure in the charging line than the containment atmospheric pressure.

A CIAS terminates letdown flow by closing two containment isolation valves. During an uncontrolled heat extraction event, the CIAS to the letdown flow isolation valves may be manually overridden in order to reduce excessive RCS inventory. In this situation, it is required that HPSI stop and throttle criteria (as defined in Emergency Operating Procedure) be met prior to overriding CIAS.

APPENDIX B

ADDITIONAL CONDITIONS

FACILITY OPERATING LICENSE NO. DPR-40

Omaha Public Power District shall comply with the following conditions on the schedules noted below:

Amendment Number	Additional Condition	Implementation Date
181	The licensee is authorized to relocate certain technical specification requirements to licensee-controlled documents. Implementation of this amendment shall include the relocation of these technical specification requirements to the appropriate documents, as described in the licensee's application dated November 20, 1996, as supplemented by letters dated February 20, 1997, and March 25, 1997, and evaluated in the staff's safety evaluation dated March 27, 1997.	The amendment shall be implemented as of its date of issuance.
[To be assigned]	This amendment authorizes the licensee to incorporate in the Updated Safety Analysis Report (USAR) changes to the description of the facility allowing the installation of capability for override of the Containment Isolation Actuation Signal closure signal to the reactor coolant system letdown flow containment isolation valves. Implementation of this amendment is the incorporation of these changes as described in the licensee's application dated September 25, 1998 and evaluated in the staff's safety evaluation dated [to be assigned].	The amendment shall be implemented as of its date of issuance.

Attachment B
Discussion, Justification and No Significant Hazards Consideration

DISCUSSION, JUSTIFICATION AND NO SIGNIFICANT HAZARDS CONSIDERATION

DISCUSSION AND JUSTIFICATION:

Introduction:

A modification to Fort Calhoun Station Unit No.1 is proposed to provide manual override capability for the Containment Isolation Actuation Signal (CIAS) to the Reactor Coolant System (RCS) letdown isolation valves. Currently, the two redundant letdown isolation valves close upon receipt of a CIAS and cannot be re-opened until CIAS initiating signals are reset. The initiating signals are Pressurizer Pressure Low Signal (PPLS) and Containment Pressure High Signal (CPHS).

The proposed modification is an unreviewed safety question because it creates the possibility of an operator error which could result in operation of the letdown isolation valves in scenarios in which fuel damage is likely to occur. This error could, in turn, result in radiological conditions in some areas of the auxiliary building which are not bounded by existing analysis with respect to auxiliary building habitability and Electrical Equipment Qualification (EEQ).

Background

The reason that it is desirable to have CIAS override capability for the letdown isolation valves is to improve operational flexibility in response to an uncontrolled heat extraction (UHE) event such as a Main Steam Line Break (MSLB). In a MSLB, the main steam isolation valves (MSIVs) automatically close on the discharge lines of both steam generators in an attempt to isolate the break. If the break cannot be isolated (e.g., if it is in the containment building), the cooldown resulting from the blowdown of the affected steam generator and associated depressurization of the RCS will result in actuation of the High Pressure Safety Injection (HPSI) Pumps and high head charging pumps. If the HPSI pumps and charging pumps are not stopped or throttled within minutes after the blowdown of the affected steam generator is complete, the RCS can reach a water solid condition. Pressure control of the RCS is difficult when the system is water solid and can become more difficult by the fact that Fort Calhoun's single Atmospheric Dump Valve (ADV) is downstream of the MSIVs and, therefore, is isolated in this scenario, except for limited flow through the MSIV bypass valves. Two air-assisted Main Steam Safety Valves are installed upstream of the MSIVs; however, the operation of these valves is either fully open or fully closed, also making RCS temperature and pressure control more difficult.

While the means for adequate steam generator heat removal does exist via a combination of the bypass valves around the MSIVs and air-assisted safety valves, the time required to make use of these heat removal success paths, in combination with a water solid RCS, creates an operational difficulty in maintaining the procedurally specified RCS pressure band. Subsequent opening of Power Operated Relief Valves (PORVs) is also possible in this scenario. Operation of PORVs is a success path in the control of RCS pressure; however, it would be more desirable to provide operators with a contingency that reduces the need to use this means of pressure control.

DISCUSSION, JUSTIFICATION AND NO SIGNIFICANT HAZARDS CONSIDERATION

The capability to quickly override CIAS and establish control over RCS inventory would alleviate the RCS pressure control problem. It is true that the same effect could be achieved by resetting the Engineered Safety Features (ESF) relays. However, resetting the ESF relays cannot be done until containment pressure is below 3 psig, which may substantially delay operator response to the pressure control problem. Also, resetting ESF relays requires significant operator effort at a time when operator attention should be focused on mitigating the effects of the accident.

Consideration of Safety Implications

As stated above, the current plant design permits reinstatement of letdown after reset of ESF relays. Therefore, the proposed modification does not create a new capability to reinstate letdown after ESF actuation. The modification only allows letdown to be placed in service sooner than it otherwise might be possible in a real event, i.e., before plant parameters have returned to a value which would permit ESF relays to be reset. Override capability will be provided to operators via CIAS override switches mounted on the main control panel in proximity to the associated control switches. Override capability for CIAS-isolated letdown is a design feature currently included in several other Combustion Engineering (CE) plants, including San Onofre and Palo Verde.

In order to establish letdown with a CIAS present using currently existing capability, it is necessary to reset both initiating signals: Containment Pressure High Signal (CPHS) and Pressurizer Pressure Low Signal (PPLS). PPLS relays can be reset by means of operator-controlled blocking relays which permit the PPLS actuation of CIAS to be removed. CPHS relays can be manually reset only after containment pressure has been reduced to a value below the actuation setpoint of the initiation instruments, procedurally specified at 3 psig. There is no blocking capability for CPHS. The proposed modification will permit overriding the CIAS closure signal to the letdown isolation valves without having to meet the containment pressure criterion. That is, the proposed CIAS override capability will permit the letdown isolation valves to be opened without resetting CPHS and without resetting or blocking PPLS.

The significance of permitting override of CIAS to the letdown isolation valves while the containment pressure is above CPHS reset criterion during a UHE is evaluated as follows. The design basis of the CIAS as it relates to the function of the two letdown isolation valves is to maintain the containment as a fission product barrier in the event of an accident which could result in a challenge to one or both of the other fission product barriers; i.e., the design basis of the CIAS ensures that the containment isolation function is maintained in the event that either the fuel cladding or the RCS has been damaged. In an UHE, both the RCS and the fuel cladding are expected to remain intact because the UHE does not result in exceeding parameters which would result in RCS failure or fuel failure. Therefore, it can be concluded that allowing the CIAS to the letdown valves to be overridden during an UHE will not adversely impact the design basis associated with containment isolation.

DISCUSSION, JUSTIFICATION AND NO SIGNIFICANT HAZARDS CONSIDERATION

It will be a requirement that HPSI stop-and-throttle criteria[1] be met prior to utilization of the proposed override capability to ensure that adequate inventory control is being maintained in the RCS. This is consistent with procedural controls employed by other CE plants that have CIAS override capability. It is also consistent with the CEN-152, "Combustion Engineering Emergency Procedure Guidelines" (EPGs) used by CE plants. The NRC issued Supplement 1 to a Safety Evaluation Report (dated April 16, 1985) which evaluates Revision 02 of CEN-152. Paragraph 2.7 of this SER discusses the guidance in Revision 02 of CEN-152 for the throttling or stopping of the Safety Injection System. The SER concludes that, with modifications identified in two other paragraphs, Revision 02 of CEN-152 is acceptable for implementation. OPPD Emergency Operating Procedures (EOPs) currently have guidance for restoration of letdown following an UHE, including requirements to meet HPSI stop-and-throttle criteria.

HPSI stop-and-throttle criteria, in combination with the safety function status check required by EOPs, provide assurance that no safety functions will be placed in jeopardy as a result of the reinstatement of letdown flow. Stop-and-throttle criteria also ensure that there is minimal probability that fuel damage will occur as a result of the postulated event. In a MSLB scenario, no abnormal loss of RCS inventory has occurred. Therefore, reinstating letdown is not expected to adversely impact inventory control. Pressure control will be enhanced by allowing operators to establish a steam bubble in the pressurizer.

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[1] HPSI stop-and throttle criteria are currently defined as follows:

1. RCS subcooling is greater than or equal to 20°F.
2. Pressurizer level is greater than or equal to 45% and not lowering.
3. At least one steam generator is available for RCS heat removal.
4. Reactor vessel level is above the top of the hot leg (43% as indicated on the reactor vessel level monitoring system).

Note: Consideration is currently being given to changing the acceptance criterion for pressurizer level. The new criterion will be consistent with Emergency Procedure Guidelines and will not impact the arguments given in this document.

DISCUSSION, JUSTIFICATION AND NO SIGNIFICANT HAZARDS CONSIDERATION

Reinstatement of letdown flow during or after an UHE will not adversely impact radiological conditions in the auxiliary building due to the fact that significant fuel damage is not expected during an UHE event. This is because no thermal limits are exceeded during the event as demonstrated by the UHE (MSLB) analysis. Consequently, the current design basis analyses for UHE (MSLB) radiological consequences assume no additional fuel damage above the 1% failed fuel allowed by Technical Specifications for normal plant operation. The Chemical and Volume Control System (CVCS), which receives letdown flow during normal plant operation, will already have contained reactor coolant which could have been contaminated by the 1% failed fuel prior to the initiation of the event. Therefore, the radiological consequences for the UHE will not be changed by assuming that letdown is reinitiated after the start of the event and will still be bounding.

Analyses which establish the basis for equipment controlled under the EEQ program assume gross fuel failures have occurred. Therefore, assumptions made in EEQ analyses are conservative with respect to conditions which will exist in an actual UHE event. Radiological conditions in the auxiliary building will not be significantly different from those which can be encountered during normal plant operation.

The probability of operator error is minimized by the following aspects of the proposed modification:

1. Procedural controls will be established to ensure that the override feature cannot be used except when HPSI stop-and-throttle criteria are met during or after initiation of an UHE. The requirement to first identify an UHE minimizes the probability that fuel damage will be present, thus ensuring that the introduction of letdown into the auxiliary building will be bounded by analyzed radiological conditions.

2. Operators will be trained to observe procedural limitations regarding the use of the override feature.

3. Annunciation will be provided to give audible and visual indication that override of CIAS to the letdown isolation valves has been initiated. This feature ensures that override initiation was an intentional act and not due to operation of the incorrect switches for another purpose.

4. Timing relays will be included to permit the override condition to exist for a limited amount of time to minimize the consequences of operator error. The timing relays would operate so that, after a fixed amount of time, the CIAS, if active, would re-close the isolation valves. The time delay will be less than one hour.

5. The override switches themselves will not open the isolation valves. Additional action to manipulate the control switches will be required.

6. Two separate switches for overriding CIAS to the redundant isolation valves will be provided.

Two types of operator errors are considered. First, an error during normal plant operations occurs in which the CIAS override is actuated when not intended. When CIAS override is actuated during normal plant operations with the letdown isolation valves open, the valves will not automatically close in the event of an accident which initiates CIAS. The annunciator will call this situation to the attention of the operator and the installed timers will limit the exposure to the inadvertent override. Operators will also have the capability of removing the override condition by means of a reset position on the override switches. The timer setting will be such that the override signal cannot be left active for more than 60 minutes. This is consistent with Technical Specifications which allow a loss of containment integrity of up to one hour before requiring a plant shutdown.

The second type of operator error considered is one in which letdown is reinstated when it should not be reinstated; that is, when stop-and-throttle criteria is not met or significant fuel damage exists. The likelihood of this error is minimized by procedural controls, training and annunciation. Use of the override feature will be permitted only in an UHE scenario which strictly limits the probability that fuel damage exists.

USAR CHANGES:

A proposed change to the USAR is attached. This change identifies the override feature and the requirement to meet HPSI stop-and-throttle criteria prior to use.

DISCUSSION, JUSTIFICATION AND NO SIGNIFICANT HAZARDS CONSIDERATION

BASIS FOR NO SIGNIFICANT HAZARDS CONSIDERATION:

The proposed modification does not involve significant hazards consideration because operation of Fort Calhoun Station Unit No.1 in accordance with these changes would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed modification does not change the probability of any accident previously evaluated since it does not change any mode of normal operation. Neither the accident signal (CIAS) nor the override feature is an initiator of an analyzed event. The consequences of an accident are also not changed significantly due to the fact that design and administrative controls ensure that previous accident analyses are bounding. The associated isolation valves will operate as they have in the past in response to an accident signal. There is no single failure that would prevent the letdown isolation function from occurring. The CIAS override feature can only be used if operators have verified that an UHE is the event which has taken place and safety functions are being met. This ensures that no significant fuel failures will occur due to the event and the consequences of overriding CIAS will not adversely impact radiological conditions in the auxiliary building.

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed modification does not create any failure mode which could impact the operation of the RCS or associated systems in a manner that would create a new or different kind of accident. With respect to the letdown isolation function, the plant will operate as it previously has and will respond the same way, automatically, to an accident signal. No new accidents have been identified.

(3) Involve a significant reduction in a margin of safety.

The procedural restrictions associated with the use of the CIAS override feature will ensure that existing analyses addressing the consequences of an UHE will be bounding and that safety functions will be maintained as defined in EOPs. The radiological consequences of letdown restoration in the auxiliary building will be similar to normal operating conditions and will be bounded by that assumed in the EEQ analysis. RCS inventory and pressure control will be maintained within the established procedural limits.

Letdown restoration capability already exists after ESF reset. The modification permits letdown restoration to occur earlier than it would previously have been possible.