

ATTACHMENT 1

ZION NUCLEAR POWER STATION

PROPOSED AMENDMENT TO
TECHNICAL SPECIFICATIONS
SECTION 3.9 AND 4.9
CONTAINMENT ISOLATION

PAGES MODIFIED

111
202
210

PAGES ADDED

NONE

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NONE

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LIMITING CONDITION FOR OPERATION

3.9.6 CONTAINMENT VENTILATION SYSTEM

- A. The containment purge supply and exhaust isolation valves, and the containment pressure and vacuum relief isolation valves shall be opened only for safety related reasons, as described in the bases on P. 210. The containment purge supply and exhaust isolation valves shall be limited to a maximum opening of 50 degrees.
- B. The containment pressure and vacuum relief line shall be isolated whenever a containment purge line is open.

APPLICABILITY: MODES 1, 2, 3, 4, and 7

- ACTION:
- a. With a containment purge supply or exhaust isolation valve inoperable, which includes valve(s) opened greater than 50 degrees:
1. Within 1 hour, terminate PURGE operations and close at least one in-series purge isolation valve, and within the following 3 hours isolate each affected penetration by use of at least one deactivated automatic valve secured in the isolation position, or
 2. Be in at least MODE 3 within the next 6 hours and in MODE 5 within the following 30 hours.
- b. With the containment pressure and vacuum relief line and the containment purge line open simultaneously, isolate one of the flow paths within 1 hour or be in at least MODE 3 within the next 6 hours and in MODE 5 within the following 30 hours.

SURVEILLANCE REQUIREMENT

4.9.6 CONTAINMENT VENTILATION SYSTEM

- A.
1. Verify containment purge supply and exhaust isolation valves are closed upon completion of PURGING operations.
 2. Verify containment pressure and vacuum relief isolation valves are closed upon completion of VENTING operations.
 3. Verify at least once per 18 months that the containment purge supply and exhaust isolation valves cannot be opened greater than 50 degrees.
- B. Verify prior to containment PURGING that the containment pressure and vacuum relief line is isolated.

Basis 3.9 (Continued)

The main steam isolation valves serve to limit an excessive Reactor Coolant System cooldown rate and resultant reactivity insertion following a main steam line break accident. Their ability to close fully shall be verified at each refueling outage. A closure time of 5 sec. was selected since this is the closure time assumed in the safety evaluation. (4) The partial valve stroke test will take place to verify the freedom of the valve disc to function as required. A limit switch in the test circuit prevents the valve disc from entering the flow stream and slamming the valve shut during in-service testing.

The main steam bypass valves and lines are sized so that the reactor will remain subcritical after reactor trip or a spurious opening of a bypass valve or a double-ended rupture of a bypass line. (4)

Containment integrity requirements are based on reactor coolant system conditions. COLD SHUTDOWN assures that no steam will be formed and hence there would be no pressure buildup in the containment if the reactor coolant system ruptures.

The shutdown conditions of a reactor are selected based on the type of activities that are being carried out. When a reactor head is not to be removed, the specified COLD SHUTDOWN margin of 1% WK/K precludes criticality under any occurrence. During refueling a reactor is subcritical by 10% WK/K. This precludes criticality under any circumstances even though fuel is being moved or control rods withdrawn. Positive reactivity addition by rod motion from an initial 10% WK/K subcritical reactor condition precludes criticality because the reactor would be substantially subcritical even if all control rods were completely withdrawn. Positive reactivity changes by boron dilution may be required or small fluctuations may occur during preparation for, recovery from, or during refueling, but maintaining the reactor subcritical by at least 10% WK/K precludes criticality under any circumstances. (5)

It is estimated that approximately 2000 hrs of PURGING per 365 days will be required in order to maintain the containment atmosphere at less than 100 MPC and thereby reducing personnel radiation exposure levels. The 50 degree limit on valve position was agreed to by the NRC as a very conservative interpretation of CYGNA Energy Services final report #B3003/1/F and /2/F of December 23, 1982. Safety related reasons for opening of containment PURGE supply and exhaust isolation valves are: a) containment pressure control when the pressure/vacuum relief system is inoperable, b) containment temperature control when all available reactor containment fan coolers (RCFC's) are unable to maintain temperature less than the Technical Specification limit of 120°F, c) containment atmosphere cleanup to allow for personnel entry for inspection, tests, and/or maintenance activities, d) containment explosive gas removal, or e) performing maintenance or surveillance testing of individual isolation valves. Safety related reasons for opening the containment pressure and vacuum relief valves are: a) prior to opening the containment PURGE supply and exhaust isolation valves, b) containment pressure/vacuum relief, c) containment explosive gas removal, or d) performing maintenance or surveillance testing of individual isolation valves.

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- (1) FSAR Section 6.6.5
 - (2) FSAR Section 6.6.6
 - (3) FSAR Section 6.6.1
 - (4) FSAR Section 14.2.5
 - (5) FSAR Table 3.2.1-1

ATTACHMENT 2

ZION NUCLEAR POWER STATION

DESCRIPTION AND JUSTIFICATION

OF PROPOSED AMENDMENT

TO SECTION 3.9/4.9

ATTACHMENT 2

Description and Justification of Proposed Amendment

- References: 1) October 23, 1979 letter from A. Schwencer to D.L. Peoples
2) April 3, 1984 letter from S.A. Varga to D.L. Farrar
3) January 2, 1979 letter from Cordell Reed to D.L. Ziemann et. al.
4) September 9, 1981 letter from S.A. Varga to L.O. DelGeorge

The proposed amendment will impose new Technical Specification restrictions on containment purge and vent operations. The amendment will create two new Technical Specifications 3.9.6 and 4.9.6. The major elements of these new specifications are enumerated below:

1. When operating above Cold Shutdown conditions, the containment purge supply and exhaust isolation valves and the containment pressure and vacuum relief isolation valves shall only be opened for safety related reasons as described in the basis. The containment purge supply and exhaust isolation valves shall be limited to a maximum opening of 50 degrees, and their position must be verified closed upon completion of each purging operation. The containment pressure and vacuum relief isolation valves shall be verified closed upon completion of each venting operation.
2. At least once each 18 months, the purge supply and exhaust isolation valves shall be verified to NOT be capable of being opened greater than 50 degrees.
3. The containment pressure and vacuum relief line shall be isolated whenever the containment purge line is open.
4. A goal of 2000 hours of purging per year has been established and documented in the basis.
5. Capitalization of selected words - "PURGE", "PURGING", "VENTING" and "COLD SHUTDOWN".

DISCUSSION - Item #1

Reference (2) documented the results of the NRC's Safety Evaluation of the analysis supplied by Commonwealth Edison Company in regards to the demonstration of containment purge and vent valve operability for Zion Unit 1 and 2. The intermediate valve position of 50 degrees was found to be acceptable. Section 5.0 stated:

... We find the information submitted demonstrated the ability of the purge and vent valves 1/2 AOV-RV0001, 2, 3 and 4 to close from the intermediate 50 degree open position against a DBA-LOCA containment pressure rise...

Thus, the imposition of this new restriction has been thoroughly analyzed, reviewed, and has been found to be acceptable.

ATTACHMENT 2 (Continued)

Zion Station recognizes that containment purging should be minimized during reactor operation because the unit is inherently safer with the purge valves closed. However, containment purging is necessary in the interest of personnel safety and to promote as low as reasonably achievable exposure from airborne radioactivity to personnel entering containment during normal operation in order to perform safety related maintenance and surveillances. The containment purge system, if allowed to be used as designed, will fulfill these requirements. Therefore, this change will require the containment purge system to be used only for safety related reasons as described in the basis. This is in keeping within the guidance provided by reference (1).

It must be noted, that Zion Station has opted not to include in the Technical Specification that the isolation valves should be "locked closed" or "sealed closed" when not opened for purge or vent operation as suggested in the sample Tech Spec of reference (4) or per Standard Technical Specifications, Revision 4. The following reasons justifies this difference:

- a) The safety evaluation as approved by the NRC's Safety Evaluation Report reference (2) has determined that the containment purge supply and exhaust isolation valves are capable of closing against the pressure anticipated during a DBA-LOCA condition, provided they are restricted to a maximum opening of 50 degrees. The recent modification to the valves restricts the valves to a maximum opening of 50 degrees by use of mechanical stops on the valves.
- b) The operability requirements for Hydrogen Recombiners, Technical Specification 3.8.8.A, cannot be met if isolation valves AOV-RV0005 and 6 (containment pressure and vacuum relief line) are locked closed since they are required to be open for hydrogen recombiner operation.
- c) If isolation valves AOV-RV0001 and 3 are "locked closed" or "sealed closed", it would require containment entry to unisolate the valves. This would be undesirable if purging or venting was for removal of explosive gas from containment.

An action statement for a purge supply or exhaust valve being opened greater than 50 degrees requires that within one hour to return the valve(s) to an acceptable position or terminate purge operations, and close at least one in-line isolation valve or shutdown. This is consistent with the intent of the sample Tech Spec provided in reference (4). For other conditions that may cause an isolation valve to be inoperable, Technical Specification 3.9.3.A action statements a, b, c and d provide proper response.

DISCUSSION - Item #2

Since the valves have been modified to limit their travel to 50 degrees by the use of a mechanical stop, an 18 months surveillance requirement will ensure that limits are maintained in order to meet the requirements of the safety analyses.

ATTACHMENT 2 (Continued)

Reference (2) stated that the closure time of the valves should also be verified each refueling to close within 7.0 seconds. This has also been shown to result in acceptable off-site doses per 10 CFR 100 in reference (3). This requirement has been previously implemented into the Technical Specification 4.9.3.A.2.d. per Amendments 105/95. Other surveillance requirements for the isolation valve are included in Technical Specification 4.9.3.A.

DISCUSSION - Item #3

This condition is a conservative restriction that simplifies the control of radioactive release paths and rates. This precludes the existence of multiple containment release paths.

DISCUSSION - Item #4

The goal of 2000 hours per year is based on the need to limit the concentration of radioactive materials in the containment atmosphere to less than 100 times the maximum permissible concentration per 10 CFR 20. This will ensure personnel safety during any required containment entries. This goal will also help to prevent excessive purging during reactor operation.

DISCUSSION - Item #5

The capitalization of the words "PURGE", "PURGING", "VENTING" and "COLD SHUTDOWN" has been done to identify they are Zion Technical Specification definitions.

ATTACHMENT 3
ZION NUCLEAR POWER STATION
PROPOSED AMENDMENT
TO TECHNICAL SPECIFICATIONS
SECTION 3.9/4.9
EVALUATION OF SIGNIFICANT
HAZARDS CONSIDERATION

ATTACHMENT 3

Evaluation of Significant Hazards Consideration

Proposed Changes to Zion Technical Specification, Appendix A, Section 3.9 and 4.9 - Containment Isolation

DESCRIPTION OF AMENDMENT REQUEST

An amendment to Zion Facility Operating License is proposed to include restrictions on containment purge and vent operations. When operating above Cold Shutdown conditions, the containment purge supply and exhaust isolation valves shall only be opened for safety related reasons. The valves will be limited to 50 degrees opened and the containment pressure and vacuum relief valves will remain closed whenever the purge valves are opened.

BACKGROUND

10 CFR 50.92 states that a proposed amendment will involve a no significant hazards consideration if the proposed amendment does not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or
2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
3. Involve a significant reduction in a margin of safety.

In addition, the Commission has provided guidance in the practical application of these criteria by publishing eight examples in 48 FR 14870.

The discussion below addresses each of these three criteria and demonstrates that the proposed amendment involves a no significant hazards.

BASIS FOR NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Does the proposed amendment:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or
2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
3. Involve a significant reduction in a margin of safety?

ATTACHMENT 3 (Continued)

DISCUSSION - Item #1

The imposition of these restrictions results in more conservative operation than was previously allowed by the Zion Technical Specifications. The 50 degree maximum opening limit provided by a permanent mechanical stop results in more reliable containment isolation than a full open valve. Thus, the excessive release of radioactive material following a postulated LOCA is less likely with the valve opening limited to 50 degrees.

The additional restriction of only purging or venting the containment for safety related reasons will ensure that unnecessary operation of the system will not be performed. Thus, the potential consequences of any previously evaluated accidents have been reduced. In addition, the imposition of these tighter controls over the purge and vent operations does not affect the probability of any previously evaluated accident.

DISCUSSION - Item #2

As discussed above, the proposed amendment will impose tighter restrictions on purge and vent operations than the existing Technical Specifications. There have been no design changes as a result of this change. Thus, the imposition of limits on purge valve position and closure time as previously addressed in Specification 4.9.3.A.2.d per Amendments 105/95, will result in more conservative operation and will not create the possibility of a new or different kind of accident.

DISCUSSION - Item #3

The imposition of the more conservative limits on purge valve position and reduced closure time of 7.0 seconds as addressed in item #2 will increase the margin of safety. Also, these new restrictions on valve opening, closure time, and only purging and venting for safety related reasons will reduce the likelihood of an excessive release of radioactive materials following a postulated LOCA. Thus, the margin of safety will be increased.

Note that the proposed amendment meets and exceeds the example (ii) of the Commissions guidance provided in 48 FR 14870:

- (ii) A change that constitutes an additional limitation, restriction, or control not presently included in the Technical Specification: for example, a more stringent surveillance requirement.

Therefore, since the application for amendment satisfies the criteria in 10 CFR 50.92 and is similar to examples for which no significant hazards consideration exists, Commonwealth Edison Company has made a determination that the application involves no significant hazards consideration.

ATTACHMENT 4

ZION NUCLEAR POWER STATION
COMPARISON OF PROPOSED REVISION
TO ORIGINAL TECH SPEC SUBMITTAL

ATTACHMENT 4

SUMMARY OF DIFFERENCES BETWEEN THE PROPOSED

TECHNICAL SPECIFICATION AND THE PROPOSED

SUBMITTAL OF FEBRUARY 21, 1986 AND JULY 21, 1989

1. Throughout the changes, the words "PURGE", "PURGING" and "VENTING" have been capitalized, to identify that since they are Zion Technical Specification definitions.
2. Limiting Condition for Operation (LCO) 3.9.6.A has been changed to state that the PURGE supply and exhaust isolation valves, and the containment pressure and vacuum relief isolation valves are to be closed and deactivated closed. The term "deactivated" has been selected to define how the valves will be prevented from being inadvertently opened versus the term "sealed closed" as used in Standard Technical Specifications. This is because the term "deactivated" is used for a similar purpose in Zion Station Technical Specifications 3.9.3.A, Containment Isolation Valves, Action b. In addition, the term "sealed closed" is not a commonly used term at Zion Station.
3. LCO 3.9.6.B remains as submitted in the proposed change of July 21, 1989.
4. Surveillance Requirement 4.9.6.A.1 has been revised to reflect LCO 3.9.6.A.1 in that valves are to be closed and deactivated closed upon completion of PURGING or VENTING operations.
5. Surveillance Requirement 4.9.6.A.2 remains as submitted in the proposed change of July 21, 1989.
6. Surveillance Requirement 4.9.6.B remains as submitted in the proposed change of July 21, 1989.
7. LCO ACTION statement "a" has been revised to allow for 4 hours to return a PURGE supply or exhaust isolation valve to an acceptable position that is open greater than 50 degrees, or is inoperable. Changing the previous 1 hour time limit to 4 hours is consistent with Standard Technical Specification, Rev. 5 and Commonwealth Edison Byron/Braidwood Technical Specification 3.6.1.7. It is also similar to Zion Technical Specification 3.9.3.A for other Containment Isolation Valves. In addition "HOT SHUTDOWN and COLD SHUTDOWN" modes of operation have been replaced with MODES 3 and 5 respectively. This is done in order to be consistent with other recent Technical Specification changes. Zion Station desires to use the numbering system for modes of operation rather than the noun name, since we are inconsistent with Standard Technical Specifications terminology for the different modes.

ATTACHMENT 4
(Continued)

8. LCO ACTION statement "b" has been revised by changing "HOT SHUTDOWN" and "COLD SHUTDOWN" to MODES 3 and 5 respectively.
9. Basis on page 2'0a has been revised to include the following:
 - a) added date of CYGNA Energy Services final report of December 23, 1982.
 - b) added statement on how isolation valves can be deactivated.
 - c) added additional safety related reason for opening of valves for performing surveillance testing of individual isolation valves.