September 1, 2004

Mr. Randall K. Edington
Vice President-Nuclear and CNO
Nebraska Public Power District
P. O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION (CNS) - ISSUANCE OF AMENDMENT ON LOSS-OF-COOLANT ACCIDENT (LOCA) DOSE METHODOLOGY AND RESOLUTION OF REMAINING LICENSE CONDITION 2.C.(6) ISSUES (TAC NO. MC1572)

Dear Mr. Edington:

The Commission has issued the enclosed Amendment No. 206 to Facility Operating License No. DPR-46 for the CNS. The amendment consists of changes to the Updated Safety Analysis Report (USAR) and Operating License in response to your application dated December 9, 2003, as supplemented by letters dated March 8 and June 8, 2004.

The amendment would revise the following: 1) incorporate into the USAR the overall main steam isolation valve leakage pathway configuration (including the post-accident manual actions necessary to establish that configuration), 2) incorporate into the CNS licensing basis the LOCA dose calculation methodology (previously approved on an interim basis), and 3) delete License Condition 2.C.(6), eliminating the commitment to provide potassium iodide to the control room personnel during LOCA conditions with core damage.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Michelle C. Honcharik, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosures: 1. Amendment No. 206 to DPR-46
2. Safety Evaluation

cc w/encls: See next page

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ACCESSION NO: ML042470174 *No substantive changes

OFFICE	PDIV-1/PM	PDIV-1/LA	IROB-A/SC	SPSB-C/SC	OGC(NLO)	PDIV-1/SC
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DATE	7/12/04	7/13/04	7/15/04	7/19/04	8/27/04	8/27/04

OFFICE	IROB/SC	SPLB/SC	EMEB/SC
NAME	DTrimble	DSolorio	KManoly
DATE	6/23/04*	5/13/04*	4/9/04*

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NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 206
License No. DPR-46

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Nebraska Public Power District (the licensee) dated December 9, 2003, as supplemented by letters dated March 8 and June 8, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly:

   A. The license is amended to authorize revisions to the Updated Safety Analysis Report to reflect the permanent changes to the calculation methodology for assessing the radiological consequences of design-basis accidents as approved in the enclosed safety evaluation.

   B. The license is amended by deletion of Paragraph 2.C.(6) of the Facility Operating License No. DPR-46, as indicated in the attachment to this license amendment.

3. The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the operating license

Date of Issuance: September 1, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 206

FACILITY OPERATING LICENSE NO. DPR-46

DOCKET NO. 50-298

Replace the following page of the operating license with the enclosed revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
4	4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 206 TO

FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By application dated December 9, 2003, as supplemented by letters dated March 8 and June 8 2004, (References 1 through 3) Nebraska Public Power District (the licensee), requested changes to the Updated Safety Analysis Report (USAR) and Operating License (OL) for Cooper Nuclear Station (CNS). Reference 1 also provided the response to the Nuclear Regulatory Commission (NRC) staff request for additional information dated October 2, 2003 (Reference 4). The supplements dated March 8 and June 8, 2004, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 2, 2004 (69 FR 9861).

The proposed changes, requested in References 1 through 3, would revise the following: 1) incorporate into the USAR the overall main steam isolation valve (MSIV) leakage pathway configuration (including the post-accident manual actions necessary to establish that configuration), 2) revise the USAR loss-of-coolant accident (LOCA) analysis to reflect permanent approval of the dose calculation methodology (previously approved on an interim basis), and 3) delete License Condition 2.C.(6), eliminating the commitment to provide potassium iodide to the control room personnel during LOCA conditions with core damage.

By letter dated December 22, 1999, as supplemented by letters dated March 20, March 24 (2), March 29, and April 5, 2000 (References 5 through 10), the licensee requested approval of an amendment to revise the CNS design-basis accident (DBA) radiological assessment calculational methodology. CNS Amendment No. 183 dated April 7, 2000 (Reference 11) approved revisions to the radiological assessment calculational methodology for the LOCA and the control rod drop accident (CRDA). The NRC staff deferred the review of implementing this change on a permanent basis; therefore, License Condition 2.C.(6) was added to the OL. Also, the NRC staff deferred review of the radiological assessment methodology revisions for the fuel handling accident (FHA) and the main steam line break (MSLB) accident methodologies.

By application dated February 28, 2001 (Reference 12), the licensee submitted an amendment request related to DBA radiological assessment calculational methodology. CNS Amendment No. 187 dated October 23, 2001 (Reference 13) provided NRC staff approval of the revised

FHA methodology and extended the interim approval of revised dose assessment methodologies for the LOCA and CRDA. The approval was contingent upon the licensee maintaining the ability to monitor radiological conditions during emergencies and administering potassium iodide to control room personnel to maintain radiological exposure doses below the guidelines of General Design Criterion 19, “Control room.” The review of the MSLB accident dose assessment methodology was deferred to allow the licensee to complete seismic analyses of the MSIV leakage pathway.

By letter dated February 26, 2002, and supplements dated June 9, September 13 and 27, November 25 (2), and December 19, 2002 (References 14 through 20), the licensee provided additional information in continuation of the request dated February 28, 2001, which was partially completed by Amendment No. 183 (Reference 11). CNS Amendment No. 196 dated February 21, 2003 (Reference 21) consisted of approval of changes to CNS DBA evaluation methodology and a revision to License Condition 2.C.(6).

CNS Amendment No. 196 approved: (1) the dose assessment methodologies for MSLB accident and CRDA, (2) the remaining meteorological assessments for the approval of the LOCA and the CRDA dose assessment methodologies, and (3) on an interim basis, the LOCA dose assessment methodology, for one additional fuel cycle. The final approval of the LOCA radiological dose assessment methodology was deferred pending approval of design and completion of modification of the MSIV leakage pathway.

CNS Amendment No. 196 also approved the proposed methodology for evaluating the seismic adequacy of the piping from the MSIVs to the main turbine condenser, the turbine condenser, and the turbine building (TB). The NRC staff did not review, in detail, the specifics relating to the proposed modifications to MSIV leakage pathway systems, because they were revised again by the licensee's letter dated December 19, 2002 (Reference 20). The review of Reference 20, which requested approval of a revised proposed modification of MSIV leakage pathway configuration, was deferred and conducted as a separate action. In the interim, the NRC staff approved the revised License Condition 2.C.(6) proposed in Reference 19.

The approval of amendment request dated December 9, 2003, and it’s supplements dated March 8 and June 8, 2004, completes all deferred items from Amendment Nos. 183, 187, and 196.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance for which the NRC staff based its acceptance are:

- Existing NRC review guidance for human factors engineering as found primarily in NUREG-800, "Standard Review Plan," Chapter 18.0, "Human Factors Engineering," (Rev.1, 2004). The NRC staff reviews license amendments involving plant changes that affect human actions to maintain safety by verifying that acceptable human factors engineering practices and guidance are incorporated into the plant's design basis and subsequent modifications to the basis. The purpose of the human factors engineering review is to assure that the proposed changes meet current regulations and do not compromise defense-in-depth. The review evaluates the applicant's safety analysis to determine that credited human actions are supported by appropriate training, procedures, changes to indications that are relied upon to successfully perform the

actions, and that the applicant verifies the human actions being credited are feasible and can be performed reliably.

- General Electric (GE) Topical Report (TR) NEDC-31858P-A, Revision 2, "BWROG Report for Increasing MSIV Leakage Limits and Elimination of Leakage Control Systems, as approved by NRC safety evaluation dated March 3, 1999. (Reference 22). This TR provides justification for increasing MSIV leakage rate limits and for eliminating the requirements for Leakage Control Systems, by use of the main steam piping and condenser as a method for MSIV leakage treatment to reduce radiological consequences of MSIV leakage.

3.0 TECHNICAL EVALUATION

The NRC staff reviewed the licensee's analysis in support of its proposed license amendment which is described in the licensee's submittals dated February 26 and December 19, 2002, December 9, 2003, and March 8 and June 8, 2004.

3.1 Alternate Leakage Treatment (ALT) Pathway Configuration

The licensee has selected the ALT pathway (also known as MSIV leakage pathway) as the MSIV leakage pathway configuration in accordance with the criteria of TR NEDC-31858P-A. The licensee indicated that this ALT pathway would limit the scope of the necessary main steam piping seismic review boundaries. TR NEDC-31858P-A provides an NRC-approved method for demonstrating seismic ruggedness of non-Class I structures, systems, and components (SSCs) in withstanding the loading of a safe shutdown earthquake (SSE). Further, this TR describes an acceptable ALT pathway and anticipates the need for potential manual actions to establish the required configuration. Accordingly, the pathway and the manual actions needed to configure it are acknowledged in the NRC safety evaluation of the TR as acceptable, provided that functional reliability is demonstrated for the MSIV ALT pathway for the licensee. The proposed MSIV ALT pathway, associated manual actions, and the functional reliability of the drain path are discussed below.

The licensee depicted the proposed MSIV ALT pathway and associated boundary valves in Enclosure 1 to Attachment 1 of Reference 20; whereas, the manual actions required to establish that configuration are listed in Table 1 for NRC approval. According to the licensee, certain post-LOCA manual isolation actions are required to minimize the leakage past the seismic boundaries. Also, certain valves will be opened manually to establish one of the leakage pathways to the main condenser. The licensee has developed a station procedure that directs the manual actions necessary to configure the MSIV ALT pathway. Further, the licensee has performed walkdowns of the necessary manual actions and determined that CNS personnel have sufficient time to perform the manual actions before increased radiation exposure would become a concern.

3.1.1 Leakage Pathway Configuration and Associated Manual Actions

In its technical analysis, the licensee indicated that crediting certain manual actions is necessary to reduce the MSIV cross-sectional leakage area after a LOCA by manually adjusting the turbine stop valve actuator/control shaft positions through the use of a special, pre-staged tool. The licensee described the specific turbine stop valve manual actions and

additional manual actions being credited to establish the MSIV ALT pathway configuration in its letters dated December 9, 2003, and June 8, 2004.

The CNS ALT pathway meets this criteria because the preferred flowpath is 1-inch or larger, remains open without an orifice, and does not rely on the availability of offsite power. Therefore, essentially all of the CNS MSIV leakage release will be via the main condenser. The NRC staff considers this to be acceptable, because it meets the NEDC-318558P-A criteria stated above.

CNS has two turbine stop valves that are upstream of the one HP turbine. The turbine stop valves are located on the TB operating floor (elevation 932'-6"; 29 feet above grade elevation of 903'-6"). Both turbine stop valve shafts are located approximately 8 ½ feet above the floor and are approximately 20 feet apart. A dedicated ladder, maintained at a ladder station nearby the turbine stop valves, provides access to each valve. The valves have discs for isolating flow. Each disc is attached to a valve shaft that rotates 90 degrees from full open to full closed. The turbine stop valve shafts are located upstream of the valve discs when the valves are closed. A clearance area exists between the valve shafts and the valve bushings. The valve shaft penetrates the valve through a bushing and attaches to a spring actuator that assists in closing the valve by rotating the shaft for isolating flow to the turbine. During normal plant operation, this area is sealed by steam pressure that moves the shaft so that a seal ring located on the valve shaft is forced against the face of the valve bushing. However, during a LOCA, the shaft clearance area is assumed to be a potential leakage point from the MSIV leakage pathway.

In a request for additional information, the NRC staff requested that the licensee explain the role/purpose of the proposed turnbuckle device and its need relative to the guidance specified in NEDC-31858P-A, and to confirm that the fraction of MSIV leakage to the HP turbine (i.e., ratio of flow areas) satisfies the criteria specified in Appendix C of NEDC-31858P-A.

The licensee's response dated December 9, 2003, stated that the purpose of the turbine stop valve shaft adjustment tool (i.e., turnbuckle device) is to eliminate potential direct leakage from the ALT pathway to the TB via the two turbine stop valve shafts. This leakage could occur assuming a loss of gland seal steam. A shaft adjustment tool is installed on each turbine stop valve shaft (two total) to close the clearance by seating the shaft seal ring against the face of the valve shaft bushing. Sealing in this manner (shaft seal ring to bushing) is the sealing method that occurs during normal operation, except that steam provides the motive force instead of a shaft adjustment tool. Application of the turnbuckle device will isolate the leakage boundary at the turbine stop valve shafts. This action, in concert with isolation of the other boundary valves, will assure that MSIV leakage will reach the main condenser via the proposed ALT pathway. The NRC staff finds acceptable, because it meets the criteria specified in Appendix C of NEDC-31858P-A.

To address the potential leakage, CNS constructed and pre-staged two shaft sealing tools. The tools consist of one shaft sealing tool for each turbine stop valve shaft and a calibrated torque wrench for tightening the shaft sealing tool to a specific torque value. These items are located in a metal box on the outside of the TB operating floor concrete shield wall but near the turbine stop valves (approximately 25 to 35 feet away). The licensee indicated that each tool weighs approximately 25 pounds and can be handled and installed by a single person. There are no other special tools required to perform this task. The licensee indicated that an emergency

procedure will provide the guidance necessary for operators to install the shaft sealing tool (Commitment #1).

The shaft sealing or adjustment tool is a turnbuckle device that is installed on each turbine stop valve shaft to close the clearance by moving the shaft outward from the valve body such that a shaft sealing ring (located on the inside of the valve body) is sealed against the face of the valve bushing. One end of each turbine stop valve shaft has an internally threaded hole. The shaft sealing tools consist of a threaded fastener component that goes through an oversized hole in a steel squared "U" shaped bracket. The shaft tool is manually threaded into the shaft end until the bracket contacts the outside of the valve housing. Elimination of the clearance area is accomplished by torquing the threaded fastener component to 100 ft-lb. This forces the shaft seal ring against the valve bushing. This torque will create a force on the shaft that is more than twice the force needed to seal the clearance area and is well below the maximum allowable design torque of the tool's threaded fastener component. The shaft needs to move less than 1/10 of an inch to provide an effective seal. The 100 ft-lb torque is accomplished with a pre-staged calibrated torque wrench that is included in the metal box along with the shaft sealing tools near the turbine stop valves (Commitment #2).

The turbine stop valve manipulations will be performed by maintenance personnel who are dispatched from the Operations Support Center after an Emergency Response Organization (ERO) mobilization. Training for CNS personnel that will be implementing this portion of the procedure is being developed and will be made effective after receipt of NRC approval of these manual actions.

The turbine stop valves are located on the TB operating floor and the MSIVs are located in the Reactor Building. The turbine stop valves are located more than 200 feet downstream of the outboard MSIVs. For a LOCA, the MSIVs would close. The radiation level in the vicinity of the turbine stop valves would be minimal after MSIV isolation until the release via the MSIV leakage would reach the turbine stop valves. Because the time needed to accomplish the sealing of the turbine stop valve shaft leakage is small (approximately 30 minutes total for both valves) compared to the time it takes for the release via MSIV leakage (11.5 standard cubic foot/feet per hour per line) to reach the turbine stop valves, the shaft adjustments would be made before local radiation levels would be a personnel exposure concern. During a LOCA, the normal lighting in the TB is assumed not to be available due to a postulated loss-of-offsite power, however, battery operated emergency lighting is available in the area. Modifications to the existing emergency lighting configuration were completed during refueling outage (RFO) 21 to improve the capability of the system. Directly after a LOCA induced shutdown, the area surrounding the turbine stop valves would be hot from residual heat in the piping and valves. However, the majority of equipment in the area is insulated, the shaft sealing tool can be installed with minimal contact with the outside shaft of the turbine stop valve, and the stay time required to install both tools is minimal. After a LOCA, main steam is isolated; hence, the licensee does not expect that a harsh temperature environment will exist when performing the turbine stop valve shaft adjustments. Humidity, noise, smoke, and toxic gases would not be expected to be a concern during installation. When the MSIVs are closed and the pathway is opened to the main turbine condenser, the downstream piping is depressurized. Accordingly, protective equipment to cope with steam leaks would not be necessary for CNS personnel performing the installation. The licensee stated that personnel access to complete the installation task is not a concern.

The licensee indicated that the time to accomplish the above task is estimated at 30 minutes total for both of the turbine stop valves based on a walkdown of the area along with a practice installation to ensure the task can be completed effectively and in a timely fashion. The 30-minute time estimation includes the time for a single individual to reach the valves, obtain the pre-staged tools, setup the ladder, install the shaft adjustment tools, and apply the tools on the turbine stop valves. The 30-minute estimation began after the individual entered the TB. It did not include pre-entry logistics times such as ERO staffing time, pre-job brief, etc. However, the licensee indicated that even including those expected times, the total time to perform this evolution is well within the 30-hour time period for completion specified in the licensee's implementing emergency procedure.

The signals to the operators for starting the alignment consist of a concurrent high drywell pressure and high drywell radiation indication during LOCA conditions. The task is considered relatively simple to perform. The steps to accomplish this task along with a sketch showing the shaft sealing tool installation on the stop valves will be provided in a CNS emergency procedure. With the MSIV leakage assumed in the LOCA analysis and conservative assumptions, the licensee indicated that this evolution would be performed well before any radiological release to the TB will occur from turbine stop valve shaft clearance area leakage. In accordance with the CNS emergency procedure, operators have 30 hours within which to complete closure of the turbine stop valves. The licensee indicated that because of the short time frame required to complete the installation compared to the relatively long time available to perform this task, there would not be adverse effects to other immediate post-LOCA activities.

In Table 1 of Attachment 1 (Reference 20), the licensee clearly identified the boundary isolation valves and associated manual actions to configure the MSIV ALT pathway. The latest revision of Drawing CNS-MS-43 in Enclosure 1 (Reference 20) depicts six new manual boundary valves that have been installed. There are a total of 18 boundary valves (inclusive of the 6 new valves), of which 13 are locally closed, 2 remotely closed, and 3 are automatically closed to isolate the ALT pathway from the unanalyzed piping. The NRC staff reviewed the ALT pathway established by these boundary isolation valves and evaluated the associated manual actions and found them to be acceptable as proposed, because they meet the criteria set forth in Appendix C of NEDC-31858P-A.

In addition to crediting the post-LOCA manual actions required for closing the turbine stop valves, the licensee is also crediting manual actions to configure the MSIV leakage pathway (16 separate valve openings and closures). The valves are all located in the TB and are accessed from floor elevations 882'6", 903'6", 909'6", and 932'6". Several valves are elevated and are manipulated using chain operators. The other valves are operated using hand wheels. All these valves are repositioned by a plant operator who is part of the normal on-shift operating crew. Operators have 2 ½ hours within which to perform the valve position changes for 14 of the 16 valves needed to configure the MSIV leakage pathway. The 2 ½ hour time limit was based on the time that it would take for MSIV leakage to migrate along the pathway within the Reactor Building to the point where the source term could potentially become a radiological hazard to the individual performing the manipulation in the TB. The remaining two valves are located on floor elevation 932'6" (in the vicinity of the two turbine stop valves) and, hence, have a 30-hour time limit for personnel to complete repositioning.

The licensee indicated that it had performed two separate walkdowns of the manual actions required to configure the MSIV leakage pathway. The first walkdown was conducted during

RFO20 prior to the installation of the new boundary valves by one operator and a design engineer. Subsequent to this walkdown four additional valves were added to the configuration. Although no valve manipulations were performed, the time to reposition the 14 valves was individually assessed, for a total estimated time of approximately 50 minutes (not including transit times). The second walkdown was performed following RFO21 by another operator, and documented the transit times starting at the Control Room to the various areas where the valves are located to be approximately four minutes. The licensee indicated that it is confident, based on the walkdown times and the other related activities (e.g., required procedure revisions, operator training) that the entire evolution can be readily accomplished within the required time frame.

3.1.2 Seismic Evaluation

TR NEDC-31858P-A provides an NRC-approved method for demonstrating the seismic ruggedness of non-Class I SSCs in withstanding the loadings of a SSE. The licensee selected an ALT pathway in accordance with the methodology of NEDC-31858P-A, as shown in Reference 1, and proposed to install manual isolation valves on main steam lines to limit the amount of piping to be credited for the MSIV leakage flowpath. In Reference 20, the licensee stated that these manual isolation valves are located in the TB, and are seismically robust.

The NRC staff requested the licensee provide information as to: (1) how those manual isolation valves are determined to be seismically adequate, (2) a comparison between the CNS MSIV leakage path proposed manual isolation valves and the earthquake experience database concerning seismic performance of this class of equipment, and (3) discussion on whether the manual isolation valves are part of the CNS Inservice Testing (IST) Program.

The licensee stated that there are 13 valves that are locally closed, 2 valves that are remotely closed, and 3 valves that are automatically closed to isolate the ALT pathway. The 13 locally closed isolation valves range in size from 3/4" to 5". The licensee indicated that these valves do not belong to any of the designated Seismic Qualification Utility Group (SQUG) generic implementation procedure (GIP) No. 2 (Reference 23) valve classes of equipment (i.e., Fluid Operated Valves, Motor Operated Valves, or Solenoid Operated Valves). They are classified in “Cooper Nuclear Station Verification of Seismic Adequacy of Mechanical and Electrical Equipment” (Reference 24) as inherently rugged equipment per the criteria of SQUG GIP-2. The licensee stated that the same methodology, which was previously reviewed and accepted by the NRC staff in Reference 21, was applied to the piping systems on which the new and existing isolation valves are configured. The licensee found that there is no outlier condition existed in the piping systems as result of the use of these valves and concluded that the manual isolation valves are seismically adequate.

The NRC staff concurs with the licensee’s conclusion, since the methodology used in the analysis for the piping systems on which the new and existing isolation valves are configured was previously reviewed and accepted by the NRC staff in Reference 21, and because there is no outlier condition that existed in the piping systems as a result of the use of these valves. Therefore, the NRC staff concludes that the manual isolation valves to be installed on main steam lines are seismically adequate.

The licensee stated that the proposed ALT pathway boundary valves are not in the 10 CFR 50.55(f) IST Program. The licensee indicated that the valves are not needed to be included

within the IST Program since: (1) these valves are not classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Class 1, 2, or 3 valves, and (2) their interpretation of the NRC safety evaluation of NEDC-31858P-A is that only motor-operated valves that are remote-manually opened to establish the pathway are candidates for inclusion in the IST Program.

The NRC staff further requested the licensee to provide information as to how the functional testing will be performed and how the testing will monitor and address degrading performance of the isolation valves. The licensee stated that the manual isolation valves, that are either: (1) closed to configure the boundaries of the ALT pathway, or (2) opened to establish a flowpath to the main turbine condenser, will be cycled during each RFO to ensure their functionality (Commitment #3). The licensee also indicated that it will describe this testing in their USAR (Commitment #4). Furthermore, the cycling of the manually operated valves will be controlled via a Station Surveillance Procedure and the scheduling and tracking of performance will be controlled under the station's surveillance program. The licensee indicated that cycling the valves to ensure their functionality under the surveillance program is an appropriate alternative to detect potential degradation of the valves' function to be manually repositioned, and deficiencies noted during the surveillance will be entered into the corrective maintenance process, or Corrective Action Program, as appropriate. Based on the information provided above, the NRC staff accepts the licensee's plan to maintain the functionality of the valves.

The licensee also proposed a plan to reduce the cross-sectional leakage area by mechanically adjusting the turbine stop valve actuator/control shaft positions through use of a special pre-staged tool, applied as a post-LOCA manual action. The NRC staff requested the licensee to provide information on: (1) how the mechanically adjusted turbine stop valve actuator/control shaft with a special pre-staged tool will be seismically adequate, and (2) a comparison between the MSIV leakage path turbine stop valve actuator with the proposed adjustment and the earthquake experience database concerning seismic performance of the equipment class that encompasses the reconfigured turbine stop valve.

The licensee stated that there are two turbine stop valves at CNS, and they are located on the TB operating floor. The licensee used the SQUG GIP-2 criteria for the Fluid Operated Valves equipment class to evaluate the turbine stop valves, and no outliers were identified. The licensee indicated that the post-LOCA installation of the shaft sealing tool has negligible effect on the turbine stop valve evaluation. The structurally simple and seismically robust tool is manually threaded into the pre-threaded end of the 5" diameter turbine stop valve shaft and torqued to a specified value of 100 ft-lb. The weight of each tool is approximately 25 pounds which is insignificant compared to the weight of the large turbine stop valve. The tool creates a very small and negligible eccentric load on the valve. In the event of a postulated SSE, the tool will remain intact and perform its sealing function because its threaded fastener component is preloaded to several thousand pounds of force which is more than adequate for preventing the tool from becoming loosened during a postulated SSE. In addition, under normal and SSE loading conditions, the tool will not induce any loading that could adversely affect the turbine stop valve. Therefore, the NRC staff finds the licensee's plan to reduce the cross-sectional leakage acceptable.

3.1.3 ALT Pathway Configuration Conclusion

Based on the considerations discussed above, the NRC staff concludes that the licensee has established an appropriate MSIV leakage pathway to the main turbine condenser and manual actions necessary to establish that configuration that are consistent with the NRC-approved criteria stated in TR NEDC-31858P-A and the review criteria for reviewing changes to human actions contained in NUREG-0800, Chapter 18.0, “Human Factors Engineering.” Therefore, the NRC staff finds the proposed ALT pathway, boundary valves, and associated manual actions acceptable with respect to the MSIV leakage pathway configuration.

Based on the above evaluation, the NRC staff concludes that the proposed manual isolation valves to be installed on the main steam lines in order to limit the amount of piping to be credited for the MSIV leakage flowpath will be seismically adequate. The NRC staff’s conclusion is based on: (1) the methodologies used for the piping analyses have been previously reviewed and accepted by the NRC for other plants, and (2) the non-seismically analyzed leakage path piping is represented by piping in the earthquake experience database that demonstrated good seismic performance, and (3) the analyses performed for the non-seismic portion of the main steam drain lines with the new and existing isolation valves indicated adequate safety margins for piping stresses and support loads.

In addition, the NRC staff accepts the licensee’s plan to maintain and ensure the functionality of the valves. Furthermore, the NRC staff accepts the licensee’s proposal to reduce the cross-sectional leakage area by mechanically adjusting the turbine stop valve actuator/control shaft positions through use of a special pre-staged tool, applied as a post-LOCA manual action.

It should be noted that the NRC staff’s acceptance of the experience-based methodology in SQUG GIP-2 as presented by the licensee in this safety evaluation is restricted to its application for ensuring the pressure boundary integrity and functionality of the MSIV leakage pathway system. The NRC staff’s acceptance of the methodology for this application is not an endorsement for the use of the SQUG GIP-2 experience-based methodology for other applications at CNS.

3.2 Permanent Approval of LOCA Dose Calculation Methodology

In Reference 21, the NRC staff issued CNS License Amendment No. 196. The amendment provided interim approval of the LOCA dose calculation methodology, expiring upon CNS entering Mode 4 of RFO22. There were no outstanding technical issues related to this methodology. However, since the methodology credits iodine plateout in the main turbine condenser, the licensee understands that the LOCA dose calculation methodology cannot be incorporated into the CNS licensing basis on a permanent basis until the License Condition 2.C.(6) seismic evaluation has been fully approved by the NRC staff and implemented at CNS. Accordingly, the licensee has requested in Attachment 1 to Reference 1, permanent approval of the LOCA dose calculation methodology. The licensee stated that the resolution of the remaining technical issues of the MSIV leakage pathway and completion of the remaining implementation activities for the pathway are prerequisites to incorporating permanent LOCA methodology approval into the CNS licensing basis.

Permanent approval of the LOCA dose calculation methodology becomes an administrative matter once the License Condition 2.C.(6) seismic evaluation is implemented at CNS. The

licensee stated in Reference 1 that the implementation will be accomplished by the time the issued License Amendment becomes effective.

As discussed in Section 3.1.3 of this safety evaluation, the NRC staff approves the remaining technical issues of the MSIV leakage pathway (i.e. the License Condition 2.C.(6) seismic evaluation has been fully approved by the NRC staff). Therefore, the LOCA dose calculation methodology is approved by the NRC staff; the approval is no longer on an interim bases and will not expire upon CNS entering Mode 4 of RFO22.

3.3 License Condition 2.C.(6)

With NRC approval of the MSIV leakage pathway configuration, implementation of the necessary actions to establish that configuration, and permanent approval of the LOCA dose calculation methodology, License Condition 2.C.(6) will have been rendered a historical requirement whose results have been incorporated in the CNS current licensing basis. Accordingly, as an administrative matter, the licensee requested deletion of License Condition 2.C.(6) in Attachment 1 of Reference 1. Removal of this License Condition will formalize the elimination of the compensatory measure to provide potassium iodide to the control room personnel during a LOCA with core damage.

As discussed above, the deletion of License Condition 2.C.(6) from the CNS OL becomes an administrative matter once the seismic evaluation is fully approved by the NRC and implemented at CNS, and permanent approval of the LOCA dose calculation methodology is obtained. As discussed in Section 3.2, the NRC staff has granted approval of the LOCA dose calculation methodology; therefore, the License Condition 2.C.(6) is no longer necessary and has been deleted.

4.0 COMMITMENTS

In Attachment 3 to Reference 1, the licensee listed regulatory commitments listed below.

	Commitment	Date/Outage
1	NPPD will implement the necessary procedure change reflecting the approved manual actions to configure the MSIV Leakage Pathway.	60 Days after receipt of License Amendment
2	Training for CNS personnel that will be implementing [the Turbine Stop Valve shaft alignment] portion of the procedure is being developed and will be made effective after receipt of NRC approval of these manual actions.	60 days after receipt of License Amendment
3	The manual valves that are either: a) closed to configure the boundaries of the ALT pathway, or b) opened to establish a flow path to the Main Turbine Condenser, will be cycled during each Refueling Outage to assure their functionality.	Each RFO following receipt of License Amendment

4	NPPD will describe the testing performed for the manual valves [that configure the MSIV Leakage Pathway] in the USAR.	Within 6 months after receipt of License Amendment

The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitments are best provided by the licensee's administrative processes, including its commitment management program (See Regulatory Issue Summary 2000-017, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff"). The above regulatory commitments do not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and authorizes revisions to the USAR. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding published March 2, 2004 (69 FR 9861). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

8.0 REFERENCES

1. Letter, Nebraska Public Power District to U.S. NRC, "LAR for LOCA Dose Calculation Methodology and Resolution of Remaining License Condition 2.C.(6) Issues," dated December 9, 2003. (ADAMS Accession No. ML033490541)

2. Letter, Nebraska Public Power District to U.S. NRC, "Response to RAI Regarding Proposed License Amendment Request for LOCA Dose Calculation Methodology and Resolution of Remaining License Condition 2.C.(6) Issues," dated March 8, 2004. (ADAMS Accession No. ML040720324)

3. Letter, Nebraska Public Power District to U.S. NRC, "Response to Request for Additional Information Regarding Loss-of-Coolant Accident (LOCA) Dose Calculation Methodology and Resolution of Remaining License Condition 2.C.(6) Issues," dated June 8, 2004. (ADAMS Accession No. ML041680627)

4. Letter, U.S. NRC to Nebraska Public Power District, "Request For Additional Information Regarding Modification of The Main Steam Isolation Valve Leakage Pathway And License Condition 2.C.(6) (MB7376)," dated October 2, 2003. (ADAMS Accession No. ML032770006)

5. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculational Methodology Revision," dated December 22, 1999. (ADAMS Accession No. ML003671625)

6. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculational Methodology - Response to Request for Additional Information," dated March 20, 2000. (ADAMS Accession No. ML003696301)

7. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculational Methodology - Supplemental Information," dated March 24, 2000. (ADAMS Accession No. ML003696396)

8. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculational Methodology - Response to Request for Additional Information (Question #6)," dated March 24, 2000. (ADAMS Accession No. ML003697414)

9. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculational Methodology - Supplemental Seismic Information," dated March 29, 2000. (ADAMS Accession No. ML003700275)

10. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculational Methodology - Supplemental Information," dated April 5, 2000. (ADAMS Accession No. ML003705012)

11. Letter, U.S. NRC to Nebraska Public Power District, "Cooper Nuclear Station - Issuance of Amendment on Design Basis Accident Radiological Assessment Calculational Methodology Revision (TAC NO. MA7758)," Amendment No. 183, dated April 7, 2000. (ADAMS Accession No. ML003700347)

12. Letter, Nebraska Public Power District to U.S. NRC, "Proposed License Amendment Related to Design Basis Accident Radiological Assessment Calculational Methodology," dated February 28, 2001. (ADAMS Accession No. ML010660067)

13. Letter, U.S. NRC to Nebraska Public Power District, "Cooper Nuclear Station - Issuance of Amendment Regarding Revised Radiological Dose Assessment and Technical Specification Changes (TAC NO. MB1419)," Amendment No. 187, dated October 23, 2001. (ADAMS Accession No. ML012960618)

14. Letter, Nebraska Public Power District to U.S. NRC, “License Condition 2.C.(6) Seismic Evaluation,” dated February 26, 2002. (ADAMS Accession No. ML020650643)

15. Letter, Nebraska Public Power District to U.S. NRC, "Supplemental Information Related to License Condition 2.C.(6) Seismic Evaluation,” dated June 9, 2002. (ADAMS Accession No. ML021680460)

16. Letter, Nebraska Public Power District to U.S. NRC, "Response to Revised DBA Methodology-Request for Additional Information,” dated September 13, 2002. (ADAMS Accession No. ML022610469)

17. Letter, Nebraska Public Power District to U.S. NRC, "Response to Request for Additional Information Related to Nebraska Public Power District’s Seismic Reevaluation Proposed to Address Cooper Nuclear Station License Condition 2.C.(6),” dated September 27, 2002. (ADAMS Accession No. ML022740448)

18. Letter, Nebraska Public Power District to U.S. NRC, "Response to Draft Request for Additional Information On the Supplemental Information Submitted By Nebraska Public Power District For Cooper Nuclear Station License Condition 2.C.(6),” dated November 25, 2002. (ADAMS Accession No. ML023360355)

19. Letter, Nebraska Public Power District to U.S. NRC, "Design Basis Accident Radiological Assessment Calculation Methodology-Additional Information,” dated November 25, 2002. (ADAMS Accession No. ML023370163)

20. Letter, Nebraska Public Power District to U.S. NRC, “Additional Information Related to License Condition 2.C.(6) Seismic Evaluation,” dated December 19, 2002. (ADAMS Accession No. ML023600458)

21. Letter, U.S. NRC to Nebraska Public Power District, “Cooper Nuclear Station - Issuance of Amendment Regarding Design Basis Accidents’ Radiological Dose Assessment Methodologies, And Revision to License Condition 2.C.(6) (TAC NO. MB4654),” Amendment No. 196, dated February 21, 2003. (ADAMS Accession No. ML030560804)

22. General Electric Topical Report NEDC-31858P-A, Revision 2, "BWROG Report for Increasing MSIV Leakage Limits and Elimination of Leakage Control Systems," August 1999. (ADAMS Accession No. ML993440253 for approved Topical Report and ADAMS Accession No. ML010640286 for NRC Staff Safety Evaluation, dated March 3, 1999)

23. Supplemental Safety Evaluation Report No. 2 on Seismic Qualification Utility Group, “Generic Implementation Procedure (GIP) Seismic Verification of Nuclear Power Plant Equipment,” Revision 2, Corrected February 14, 1992. (ADAMS Accession No. 9212140073)

24. “Cooper Nuclear Station Verification of Seismic Adequacy of Mechanical and Electrical Equipment, Unresolved Safety Issue A-46 (SQUG),” Nebraska Public Power District.

25. Letter, Nebraska Public Power District to U.S. NRC, "Clarification of License Amendment 196 Safety Evaluation Information," dated May 15, 2003. (ADAMS Accession No. ML031400397)

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