

Commonwealth Edison 1400 Opus Place Downers Grove, Illinois 60515

February 22, 1993

Dr. Thomas E. Murley, Director Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Washington, DC 20555

Attn: Document Control Desk

Subject: Zion Station Units 1 and 2 Application for Amendment to Facility Operating Licenses DPR-39 & DPR-48 Appendix A, Technical Specifications License Amendment Request No. 92-03 Supplemental Information NRC Docket Nos. 50-295 and 50-304

erences:	(a)	September 1, 1992 letter from S.F. Stimac to T.E. Murley
	(b)	May 22, 1992 letter from S.F. Stimac to T.E. Murley
	(c)	January 28, 1993 letter from S.F. Stimac to T.E. Murley
	(d)	January 29, 1993 letter from J.A. Zwolinsk: to T.J. Kovach

Dear Dr. Murley:

Ref

Commonwealth Edison Company (CECo) proposed to amend Facility Operating Licenses DPR-39 and DPR-48 via Reference (a). The proposed amendment requested changes to Technical Specifications to achieve consistency with recently complied data related to reactor vessel integrity issues (Reference (B)). The purpose of this letter is to provide supplemental information regarding the proposed amendment.

Based upon analysis of the revised reactor vessel integrity data, changes to the Technical Specifications were proposed to revise reactor coolant system heatup and cooldown limitation curves, revise the Low Temperature Overpressure Protection (LTOP) system enable temperature, and to delete the allowance to maintain a safety injection pump aligned for injection into the reactor coolant system and operable when in the LTOP range. In addition, this request proposed administrative changes to delete the Reactor Vessel Toughness Data Tables, Fast Neutron Fluence Figures, Materials Irradiation Surveillance Specimen Inspection schedule, and the reactor coolant system pressure and temperature limitations from the Technical Specifications. These changes were described in the Reference (a) submittal.

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As a result of a recent engineering evaluation of Power Operated Relief Valve (PORV) operability during LTOP operation, CECo has identified the need to implement changes to the PORV setpoints identified in Technical Specification 3.3.2.G.1.a. This issue was resolved on a interim basis via NRC approval (Reference (d)) of a CECo request for Temporary Waiver of Compliance (Reference (c)). The supplemental information contained herein provides the permanent resolution of this issue. This supplement proposes relocation of the PORV LTOP setpoint to a Pressure and Temperature Limits Report (PTLR) consistent with the approach utilized in Reference (a) for relocation of the reactor coolant system pressure and temperature limitations. This approach, which will allow CECo to control the setpoint outside of Technical Specifications, is also consistent with CECo's commitment described in References (c) and (d) and with the guidance of the Improved Westinghouse Standard Technical Specifications, NUREG-1431, Revision O.

Enclosures 1, 2, 4, 5, and 6, originally transmitted with Reference (a), have been revised where appropriate to address the additional request to relocate the PORV LTOP setpoint to the PTLR and to add several minor clarifications. The following information is enclosed:

- 1. Enclosure 1 includes the revised Description and Safety Analysis.
- 2. Enclosure 2 contains the revised Significant Hazards Evaluation.
- The Environmental Assessment included as Enclosure 3 to Reference

   (a) is not affected by this supplement. For clarity, this Enclosure
   is included herein with the cover page revised.
- Enclosure 4 contains revised marked up and typed copies of the affected Technical Specification pages.
- 5. The supporting documentation originally transmitted with Enclosure 5 to Reference (a) is not affected by this supplement and therefore, has not been re-transmitted. Additional supporting documentation related to this supplement has been added to Enclosure 5 and is included herein.
- 6. Enclosure 6 contains the revised PTLR for Zion Units 1 and 2.

The revised enclosures include "revision bars" to clearly identify areas where revisions have been made.

This supplemental information has been reviewed and approved by both On-site and Off-site Review in accordance with Commonwealth Edison procedures. Commonwealth Edison is notifying the State of Illinois of this supplement to the application for amendment by transmitting a copy of this letter and its enclosures to the designated State office.

Commonwealth Edison requests that this amendment be effective as of the date of its issuance, to be implemented within 30 days from the date of issuance.

To the best of my knowledge and belief, the statements contained herein are true and correct. In some respects, these statements are not based on my personal knowledge but upon information received from other Commonwealth Edison and contractor employees. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Please direct any questions you may have regarding this matter to this office.

Respectfully,

Stephen F. Stimac Nuclear Licensing Administrator

Enclosures: 1) Description and Safety Analysis of the Proposed Change 2) Evaluation of Significant Hazards Consideration 3) Environmental Assessment

- 4) Marked-up Technical Specification Pages
- 5) Additional Supporting Documentation
- 6) Zion Units 1 and 2 PTLR

cc: A. Bert Davis, Regional Administrator - RIII J.D. Smith, Senior Resident Inspector - Zion C.Y. Shiraki, Project Manager - NRR Office of Nuclear Facility Safety - IDNS

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ENCLOSURE 1 ZION NUCLEAR GENERATING STATION DESCRIPTION AND SAFETY ANALYSIS OF THE SPECIFIC PROPOSED TECHNICAL SPECIFICATION CHANGES FOR

LICENSE AMENDMENT REQUEST NO. 92-03 REVISION 1 DESCRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS OF FACILITY OPERATING LICENSES DPR-39 AND D?R-48

#### A. DESCRIPTION OF PROPOSED CHANGE

This License Amendment Request (LAR) proposes to make the following changes:

- (1) Technical Specification 3.3.2 and 4.3.2 contain the reactor coolant system heatup and cooldown limitation curves effective up to 14 effective full power years (EFPY). Revised RT<sub>PTS</sub>, chemistry factor and margin factor values have been developed based on a reassessment of the end of life RT<sub>PTS</sub> values for the Zion Ur ts. As a result, updated heatup and cooldown limit curves bounding both plants have been generated and are being submitted for NRC approval. In addition, these Technical Specifications contain the Reactor Vessel Toughness Data Tables and Fast Neutron Fluence Figures. The information provided by these tables and figures is required only for deriving the heatup and cooldown limitation curves and are contained in Westinghouse Topical Reports (WCAPs). These figures and tables will be removed from the Technical Specifications since they only provide reference information and will be contained in the WCAPs. These WCAPs will be referenced in the UFSAR.
- (2) Technical Specification 3.3.2.G, "Low Temperature Overpressure Protection", (LTOP) item 1.a will be revised, relocating the PORV LTOP actuation setpoints to the PRESSURE AND TEMPERATURE LIMITS REPORT.
- (3) Technical Specification 3.3.2.G, "Low Temperature Overpressure Protection", requires that LTOP be enabled in Mode 4 when any RCS cold leg temperature is equal to or less than 250°F. Using the revised RT<sub>NDT</sub> values and the current method of calculating the enable temperature, a new enable temperature of 320°F is being proposed for the LTOP Applicability.
- (4) Technical Specification 3.3.2.G, "Low Temperature Overpressure Protection", item 2 will be revised to delete the allowance to have a maximum of one safety injection pump aligned for injection into the RCS and OPERABLE.
- (5) Technical Specification 4.3.4.D, "Materials Irradiation Surveillance Specimen Inspection", of the Technical Specifications will be revised to relocate the schedule to the UFSAR.
- (6) The reactor coolant system pressure and temperature limitations will be removed from the Technical Specifications and relocated to the PRESSURE AND TEMPERATURE LIMITS REPORT.

Changes to the Technical Specifications of Operating Licenses Nos. DPR-39 and DPR-48, NRC Docket Nos. 50-295 and 50-304, respectively are noted in the annotated copy of the affected pages of the Technical Specifications (Enclosure 4).

#### B. CURRENT REQUIREMENTS

The RCS heatup and cooldown limitations of Figures 3.3.2-1 and 3.3.2-2, Fast Neutron Fluence Figures 3.3.2-3 and 3.3.2-4, and Reactor Vessel Toughness Data of Tables 3.3.2-1 and 3.3.2-2 were approved in an NRC Safety Evaluation Report dated 03/13/87. The data for these Tables and Figures were derived from WCAP-11247, "Heatup and Cooldown Limits Curves for the Commonwealth Edison Company Zion Units 1 and 2 Reactor Vessel," dated August 1986.

The current RCS heatup and cooldown curves are applicable to 14 EFPY. These RCS heatup and cooldown pressure temperature limits were calculated in accordance with the requirements of 10CFR50 Appendix G. Pressure temperature limits calculated using Appendix G are dependent upon the initial reference temperature (RT<sub>NDT</sub>) for the limiting materials in the beltline and closure flange regions of the vessel and the increase in RT<sub>NDT</sub> due to neutron irradiation. The current curves are based on an initial RT<sub>NDT</sub> of 0°F for the limiting beltline material, weld metal WF-70, and the most limiting initial RT<sub>NDT</sub> (60°F) for the vessel and closure head regions of Units 1 and 2. The initial RT<sub>NDT</sub> was estimated using Branch Technical Position MTEB 5-2 "Fracture Toughness Requirements".

The increase in  $RT_{MDT}$  resulting from neutron irradiation damage was estimated using the methods of Revision 2 to Regulatory Guide 1.99, "Radiation Damage to Reactor Vessel Materials," and an estimated neutron fluence at the inside surface of the vessels at the beltline weld location of 0.93 x 10<sup>19</sup> n/cm<sup>2</sup>. The "Surveillance Data Available" method of Regulatory Guide 1.99 was utilized to calculate the increase in  $RT_{NDT}$ . The surveillance data used was from Capsules T, U and X for Unit 1 and Capsules U and T for Unit 2. The weld metal from Unit 1 was determined to be limiting and its surveillance data was used to calculate the pressure and temperature limit curves.

The limits for rate of temperature change of Specification 3.3.2.A control the thermal gradient through the reactor vessel wall and are used as inputs for calculating the heatup, cooldown and inservice hydrostatic and leak testing pressure temperature limit curves. Therefore, the limits for rate of temperature change restrict stresses caused by thermal gradients and also ensure the validity of the heatup and cooldown curves.

The current Low Temperature Overpressure Protection (LTOP) Specification 5 3.2.G.1.a requires two Pressurizer Power Operated Relief Valves (PORVs) with a pressure setpoint of 435 psig to be OPERABLE when using PORVs for LTOP. This setpoint was derived for a specific limiting RCS temperature using a Westinghouse LOFTRAN analysis. The Low Tenperature Overpressure Protection enable temperature of 250°F was approved in an NRC Safety Evaluation of April 28, 1980. The enable temperature is the temperature at which the low setpoint on the pressurizer relief valve is selected. The pressurizer relief valve low setpoint is used to mitigate the consequences of pressure transients at low temperatures. The 250°F enabling temperature setpoint was derived using a Westinghouse LOFTRAN analysis.

The current LTOP Specification 3.3.2.G.2 requires a maximum of one charging pump or safety injection pump, aligned for injection into the RCS, and no accumulators to be OPERABLE. The requirements reflect the assumptions made in the original LTOP analysis for Zion Units 1 and 2.

The Material Irradiation Surveillance Specimen Inspection Program of Specification 4.3.4.D was approved in an NRC Safety Evaluation Report dated July 20, 1987. The material surveillance program is required by 10CFR50 Appendix H. The program is designed to monitor changes in the fracture toughness properties of the ferritic materials in the reactor vessel beltline. In accordance with Appendix H, the program schedule must follow, to the extent practical, the requirements of ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessel, E706 (IF)". ASTM E 185-82 recommended that five capsules be withdrawn from the reactor vessel of each unit. Each unit originally had a total of eight capsules located at the inside of the reactor vessel wall. To date, the first four capsules have been removed from Unit 1 and three capsules have been removed from Unit 2. The fourth capsules should be withdrawn when the neutron fluence for the capsule reaches EOL fluence at the reactor vessel inner wall. The fifth capsule should be withdrawn when the neutron fluence for the capsule reaches the EOL peak fluence, or when the fluence is greater than once but less than twice the peak EOL fluence.

The July 20, 1987 approved schedule requires five capsules to be withdrawn from Unit 1 and four capsules from Unit 2. The fifth capsule in Unit 1 is scheduled to be withdrawn at 32 EFPY, the EOL peak fluence. The fourth capsule for Unit 2 is scheduled to be withdrawn at 13 EFPY, the peak EOL fluence. Because the fourth capsule will be exposed to the peak EOL fluence, a fifth capsule will not be required to be withdrawn from Unit 2. The safety evaluation found that this withdrawal schedule conformed to the ASTM guidelines.

#### C. REQUESTED REVISION

It is requested that the heatup and cooldown pressure temperature limit curves for both Zion Unit 1 and Unit 2 be replaced with new more limiting curves. These curves will be effective up to 14 ¿FPY. The new heatup and cooldown limit curves were developed as a result of a reassessment of the reference temperature Pressurized Thermal Shock (RT<sub>PTS</sub>) values in response to the May 15, 1991 amendment to 10CFR50.61.

The leak test limit curves were determined using the methods of IOCFR50 Appendix G and the NRC Standard Review Plan.

The criticality limit curves specify the pressure and temperature limits for critical operation and provide additional margin during power production as specified by 10CFR50 Append. .... The criticality limit curves were developed following the Appendix G guidance which states that the pressure and temperature limits for core operation must be equal to or greater than the minimum temperature required for the inservice hydrostatic test and at least 40°F higher than the minimum pressure and temperature curve for heatup and cooldown.

It is requested that Figures 3.3.2-3 and 3.3.2-4 "Fast Neutron Fluence (E > 1 MeV) as a function of Full Power Service Life (EFPY)" and Tables 3.3.2-1 and 3.3.2-2, "Reactor Vessel Toughners Data", be removed from the Technical Specifications and be relocated by reference to the UFSAR. These figures and tables do not provide any operating limits. The information provided by these figures and tables are solely used to produce the heatup and cooldown limit curves. These reference figures and data tables are contained in WCAP-10962, Rev. 2, "Zion Units 1 and 2 Reactor Vessel Fluence and  $RT_{PTS}$  Evaluations" (Enclosure 5 to the September 1, 1992 letter from S.F. Stimac to T.E. Murley).

The  $RT_{PTS}$  reassessment resulted in revised initial  $RT_{NDT}$ , chemistry factor and margin factor values. The reassessment was made using weld metal specific data accumulated by the Babcock and Wilcox Owners Group (BAWOG) for the weld metal WF-70. Weld metal WF-70 is the limiting beltline weld metal of the reactor pressure vessels at Zion Station.

The development of the heatup and cooldown limit curves was done in accordance with Appendix G of the ASME Boiler and Pressure Vessel Code and Regulatory Guide 1.99 Rev. 2, "Radiation Embrittlement of Reactor Vessel Materials" as described in WCAP-13406, "Heatup and Cooldown Limit Curves for Normal Operation for Zion Units 1 & 2" (Enclosure 5 to the September 1, 1992 letter from S.F. Stimac to T.E. Murley). Using the new weld metal specific data from BAWOG and Regulatory Guide 1.99 Rev. 2, the Adjusted RT<sub>NDT</sub> values were calculated using the "Surveillance Data Available Method" of the Regulatory Guide. Once the RT<sub>NDT</sub> values were determined, the methodology of Appendix G of the ASME code was used to determine the reference fracture toughness curve and then the allowable pressure versus coolant temperature curves. For the cooldown analysis the reference flaw of Appendix G of the ASME code was assumed to exist at the inside of the vessel wall which is the controlling location. Pressure temperature relations were calculated for both the steady state and cooldown rate situations from which composite limit curves were constructed for each cooldown rate of interest. The use of a composite curve is conservative and eliminates the problem that an allowable pressure may unknowingly be violated if the rate of cooling were decreased at various intervals during the cooldown ramp.

For the heatup analysis, three separate calculations were necessary to determine the limit curves. First pressure and temperature relations were developed for heatup and steady state conditions assuming the Appendix G flaw at the 1/4 T location on the inside of the wall. Both conditions (heatup and steady state) were analyzed to ensure that for any given coolant temperature, the lower value of allowable pressure was obtained. Next, the flaw was assumed to exist at the 3/4 T location where the thermal gradients during the heatup produce tensile stresses that reinforce any pressure stresses present. The magnitude of the thermal stress depends both on the rate of heatup and coolant temperature. Therefore, each heatup rate must be analyzed individually. Once the pressure and temperature curves for both steady state and finite heatup rate situations were determined, composite curves were developed. The use of the composite curve ensures that the pressure limit is at all times based on the analysis of the most critical criteria.

Next, Appendix G of 10CFR50 requires the calculation of the minimum allowable temperature of the closure head flange and vessel flange regions for when the pressure exceeds 20 percent of the preservice hydrostatic test pressure (621 psig for Zion Units 1 and 2). The minimum allowable temperature is based on the limiting initial RT<sub>NDT</sub> in the vessel and closure flange regions of Zion Units 1 and 2. Therefore, using the most limiting initial RT<sub>NDT</sub> value of 60°F bounding Zion Units 1 and 2 from WCAP-13406, the minimum allowable temperature in these regions is 180°F at pressures greater than 621 psig. These limits are less restrictive than those limits calculated during the heatup and cooldown analysis.

Margins of 10°F and 60 psig have been added to the limit curves for possible instrument error. Margins have not been added to these curves to address the additional uncertainties and correction factors such as pressure sensor locations and RCS and RHR pump operational configurations as addressed in the January 28, 1993 letter from S.F. Stimac to T.E. Murley. These uncertainties and correction factors will be applied independent of curve development (i.e. applied to the measured values through administrative contols). In this fashion, actual conditions at the critical location will be accounted for. It is requested that PORV actuation setpoints for LTOP in Specification 3.3.2.G.1.a be removed from Technical Specifications and relocated to a Pressure and Temperature Limits Report. The term PRESSURE AND TEMPERATURE LIMITS REPORT is being added to the Definitions Section of Technical Specifications (Definition 1.31a). A new administrative requirement is being added (Specification 6.6.1.G) to existing reporting requirements of Technical Specifications. Specification 3.3.2.G.1.a and its applicable Bases are being revised to state that the setpoints for the PORVs when used for LTOP shall be maintained within the limits identified in the PRESSURE AND TEMPERATURE LIMITS REPORTS.

Specifications 3.3.2.G.1.a addresses the PORV LTOP actuation setpoints which change over plant life as a result of vessel fluence thus requiring changes to Technical Specifications to update these setpoints for each reactor vessel fluency period. These limits will be developed using NRC approved methodology. Therefore, the license amendment process is an unnecessary burden on the NRC and Commonwealth Edison Company. An alternative to including the PORV LTOP setpoints in Specification 3.3.2.G.1.a is responsive to industry and NRC efforts on improvements in Technical Specifications and is provided in this license amendment request. The change is consistent with the philosophy of NRC Generic Letter 88-16, "Removal of Cycle - Specific Parameter Limits from Technical Specifications" and NUREG 1431 "Westinghouse Standardized Technical Specifications".

It is also requested that the Low Temperature Overpressure Protection (LTOP) enabling temperature be revised from 250°F to 320°F. The current enabling temperature of 250°F is nonconservative compared to the evaluation of the materials data provided from Babcock and Wilcox (B&W) in WCAP-13406. The reference transition temperature at 14 EFPY from WCAP-13406 yields an enabling temperature of 320°F. The methodology used to develop the enabling temperature is described in Enclosure 5 to the September 1, 1992 letter from S.F. Stimac to T.E. Murley. As stated on page 15 of the LTOP Enable Temperature Methodology, "the enable temperature setpoint must be calculated for the largest possible plant heatup rate using the equation,  $ET = RT_{NDT} + 90^{\circ}F + delta T."$  In order to remain consistent with existing administrative limits and minimize impact on existing procedures, a heatup rate of 60°F/hr is utilized. To further simplify administrative changes and minimize unit differences in procedures, a single enabling temperature is developed based on the most conservative (highest) value of RT<sub>NDT</sub> of the two units. From Table Al of the methodology (at 14 EFPY) the most limiting value for RT<sub>NDT</sub> + 90°F is 296°F. Referring to Table 1 of the methodology and utilizing a metal temperature at the controlling location (1/4 T) of 300°F (as a conservative representation for the 296°F value) a water to metal temperature difference of 15°F is obtained. Adding this temperature difference to 296°F (value for the RT<sub>NDT</sub> + 90°F) yields an enabling temperature of 311°F. In order to provide a conservative value which is easily retained, this value is further rounded up to 320°F.

The allowance in Specification 3.3.2.G.2 to have a maximum of one safety injection pump aligned for injection into the RCS and OPERABLE is proposed to be deleted. The requirements of this Specification are being revised to reflect the assumptions of the LTOP analysis for mass addition to the RCS. The current LTOP analysis did not analyze the inadvertent actuation of a safety injection pump. In addition, the wording of Specifications 3.3.2.G.2 and 4.3.2.G.2 has been revised to ensure mass addition assumptions of the LTOP analysis (all safety injection pumps, all accumulators and all but one of the charging pumps are incapable of injection into the RCS) are met. As a result, this change is being made to achieve consistency with the existing LTOP analysis and to ensure that an RCS mass addition transient can be relieved by the operation of a single power or prated relief valve or the limiting conditions placed on the pressu. 7c.

The capsule withdrawal schedule is requested to be removed from Technical Specifications (T.S. 4.3.4.D) since it is already located in the Zion UFSAR. The re-baselined UFSAR has the capsule withdrawal schedule included in Section 5, Reactor Coolant System and Connected Systems. (5.3.1.1 Material Surveillance). The removal of tabular listings (capsule withdrawal schedule) from the Technical Specifications is a line item improvement of Technical Specifications that has been identified by the Industry and the NRC. NRC Generic Letter 91-01 provides guidance for removal of capsule withdrawal schedules from Technical Specifications. The removal of the capsule withdrawal schedules is an administrative matter which will allow future changes to be made without a license amendment. This will relieve both the NRC and Commonwealth Edison Company (CECO) of an unnecessary administrative burden and is consistent with the guidance of NRC Generic Letter 91-01.

Lastly, it is requested that the reactor coolant system pressure and temperature limits be removed from Technical Specifications and relocated to a Pressure and Temperature Limits Report. The term PRESSURE AND TEMPERATURE LIMITS REPORT is being added to the Definitions Section of Technical Specifications (Definition 1.31a). A new administrative reporting requirement is being added (Specification 6.6.1.G) to existing reporting requirements of Technical Specifications. Specifications 3.3.2.A and 3.3.2.B and the applicable Bases are being revised to state that the values of reactor coolant system pressure and temperature parameters shall be maintained within the limits identified in the Pressure and Temperature Limits Report. Specifications 3.3.2.A and 3.3.2.B address pressure and temperature limits associated with parameters that may change with reactor vessel fluence requiring processing of changes to Technical Specifications to update these limits for each reactor vessel fluency period. These limits are developed using NRC approved methodology. Therefore, the license amendment process is an unnecessary burden on the NRC and Commonwealth Edison Company. An alternative to including the values of these reactor coolant system fluence dependent parameters in Specifications 3.3.2.A and 3.3.2.B is responsive to industry and NRC efforts on improvements in Technical Specifications and is provided in this license amendment request. The change is consistent with the philosophy of NRC Generic Letter 88-16 "Removal of Cycle-Specific Parameter Limits from Technical Specifications" and NUREG 1431 "Westinghouse Standardized Technical Specifications".

Conforming changes have also been made to the Table of Contents, List of Figures, List of Tables and Bases of Sections 3.3.2/4.3.2, 3.3.2.G/4.3.2.G and 4.3.4 to incorporate the changes described above. Editorial changes have also been made. The reference to the "FSAR" in Definition 1.31, PHYSICS TESTS, has been changed to UFSAR, to be consistent with Zion Station terminology. In the Bases for 3.3.2 and 4.3.2, Fracture Toughness Properties, typographical errors are being corrected. On page 91, "references stress intensity factor" is being changed to "reference stress intensity factor" and "KIT". On page 93a in references 13 and 14, "Setpoing" is being changed to "Setpoint". Typographical errors are also being corrected on page 94 of the Bases for 3.3.2.G and 4.3.2.G, Low Temperature Overpressure Protection. These corrections are to numbering of the Bases ("3.2.2.G & 4.2.2.G" are being changed to "3.3.2.G & 4.3.2.G") and the reference to the high pressurizer level deviation alarm ("hi" is being changed to "high"). These changes are administrative in nature and have no impact on plant safety.

### D. IMPACT OF PROPOSED CHANGE

The revised heatup and cooldown limit curves conservatively define limits for ensuring prevention of non ductile failure of the Zion Station Reactor Vessels. These revised curves were produced from WCAP-13406 "Heatup and Cooldown Limit Curves for Normal Operation for Zion Units 1 & 2" which addresses the acceptability of these calculations. The revised limitations provide an equivalent level of protection to the previous limitations. The removal of the "eactor Vessel Toughness Data Tables and Fast Neutron Fluences Figures has no impact since the information provided in these tables and figures was only used for deriving the heatup and cooldown limitation curves. Therefore, this information is for reference purposes only and will be included by reference in the UFSAR. Changes to the UFSAR will be evaluated per the requirements of IOCFR50.59.

Increasing the enabling temperature for LTOP will put the overpressure protection in place sooner (higher 'emperature) and leave it enabled for a longer period of time. The change is conservative since it will provide LTOP protection in a wider span of temperatures than presently exists. Furthermore, this change is consistent with the current analysis of materials data described in WCAP-13406.

Deletion of the allowance in the LTOP Specification 3.3.2.G.2 to have a maximum of one safety injection pump aligned for injection into the RCS and OPERABLE achieves consistency with the existing LTOP analysis. The change ensures that assumptions of the LTOP analysis are maintained since inadvertent actuation of a safety injection pump was not analyzed. This change represents an additional restriction on plant operations. However, current Zion Station procedures do not utilize this allowance. In addition, the rewording of Specifications 3.3.2.G.2 and 4.3.2.G.2 is being done for clarity and consistency with the LTOP analysis assumptions for mass addition to the RCS. As such the change is administrative in nature.

The capsule withdrawal schedule listed in Specification 4.3.4.D ensures that the effect of neutron irradiation and the thermal environment on the fracture toughness of the reactor vessel is periodically monitored. As a result, changes in the fracture toughness properties of reactor vessel materials may be identified to facilitate updating the heatup and cooldown limitations for reactor vessel integrity. The capsule withdrawal schedule is being removed from the Technical Specifications and relocated to the UFSAR. An existing surveillance procedure adequately addresses the information contained in the tabular listing for the capsule withdrawal schedule. These surveillance procedures are subject to the change control provisions specified in the Administrative Controls Section of the Technical Specifications (Section 6.2.3). In addition, any changes to the capsule withdrawal schedule will be in accordance with the NRC approved methodology in BAW-1543, "Master Integrated Reactor Vessel Surveillance Program". The requirements for capsule withdrawal will remain in the Technical Specifications. The relocation of this information is an administrative matter which will allow future changes to be made without a license amendment. This will relieve both the NRC and CECo of an unnecessary administrative burden. An evaluation in accordance with 10CFR50.59 will be performed for changes to the capsule withdrawal schedule in the UFSAR. These changes will only be implemented after review by the On-Site Review function.

It is essential to safety that the units be operated within the bounds of the reactor coolant system pressure and temperature limits and that the PORV actuation setpoints be set at an appropriate bounding limit. Additionally, it is essential to safety that a requirement to maintain the units within the appropriate bounds be retained in the Technical Specifications. However, the specific values of these limits may be modified by licensees, without affecting nuclear safety, provided the changes are determined using NRC approved methodology and consistent with all applicable limits (e.g., heatup limits, cooldown limits, inservice leak and hydrostatic testing limits, and low temperature overpressure protection limitations). A Pressure and Temperature Limits Report is being submitted to the NRC with the values of these limits. This allows continued trending of this information, even though prior NRC approval of the changes to these limits would not be required. The Pressure and Temperature Limits Report documents the specific values of the parameter limits resulting from Commonwealth Edison Company calculations including any revisions to such parameter values. The methodology for determining pressure and temperature limits is detailed in WCAP-13406, "Heatup and Cooldown Limit Curves For Normal Operation For Zion Units 1 & 2", dated July 1992. As a consequence, the NRC review of proposed changes to the pressure and temperature limits is primarily limited to confirmation that the updated limits are calculated using an NRC approved methodology and consistent with all applicable analysis limits.

Any changes to the report will be provided to the NPC upon issuance as required by the proposed Specification 6.6.1.G. Controlled copies of the Pressure and Temperature Limits Report will be maintained at Zion Station and will be revised as required by the future Zion Units 1 and 2 reactor vessel fluency periods. Enclosure 6 provides a copy of the Pressure and Temperature Limits Report for information purposes only.

### E. SCHEDULE REQUIREMENTS

It is requested that this amendment be effective as of the date of its issuance and be implemented within 30 days from the date of issuance.

### ENCLOSURE 2

## ZION NUCLEAR GENERATING STATION

# SIGNIFICANT HAZARDS CONSIDERATION

### EVALUATION

FOR

# LICENSE AMENDMENT REQUEST NO. 92-03

REVISION 1

### SIGNIFICANT HAZARDS CONSIDERATION 1 FOR THE ZION NUCLEAR GENERATING STATION

Commonwealth Edison Company has evaluated the proposed changes associated with this License Amendment Request and determined that they involve no significant hazards considerations. According to 10CFR50.92(c), a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not:

- Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- 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.

The proposed Amendment revises requirements associated with Reactor Coolant System (RCS) Heatup and Cooldown Limitations and Low Temperature Overpressure Protection. The specific changes addressed by this significant hazards consideration are as follows:

- Updating RCS Heatup and Cooldown Limit Curves.
- Relocating RCS Pressure and Temperature Limitations and PORV LTOP actuation setpoints to the PRESSURE AND TEMPERATURE LIMITS REPORT.
- The proposed Technical Specification changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The removal and updating of the pre-ure and temperature limits has no influence or impact on the probabilicy or consequences of any accident previously evaluated. The reactor vessel pressure and temperature and LTOP PORV actuation setpoints are not assumed to be initiators of analyzed events. However, pressure and temperature limits do preclude operation in an unanalyzed condition. The revised limitations provide an equivalent level of protection to the previous limitations. In addition, the acceptance criteria for the calculations performed have not been significantly altered. Thus, there will be no change in the probability of vessel failure through crack propagation. Reactor vessel integrity is assumed in mitigating the consequences of design basis accidents. The revised limitations will not affect the performance of any safety systems or structures beyond ensuring the continued integrity of Zion reactor vessels. Therefore, the change to the pressure and temperature limits does not involve significant increases in the probability or consequences of an accident previously evaluated. The pressure and temperature limits and LTOP PORV actuation setpoints, although not in Technical Specifications, will continue to be followed and maintained in the operation of Zion Station.

The proposed amendment still requires exactly the same actions to be taken when or if limits or setpoints are exceeded as is required by current Technical Specifications. The limits within the Pressure and Temperature Limits Report (PTLR) will be implemented and controlled per Zion procedures. Any changes to the PTLR will be in accordance with NRC approved methodologies discussed in WCAP-13406, "Heatup and Cooldown Limit Curves for Normal Operation for Zion Units 1 & 2" or the "LTOP PORV Actuation Setpoint Methodology". Changes to the PTLR will be performed per the requirements of 10CFR50.59. This ensures that future changes to the pressure and temperature limits or LTOP PORV actuation setpoints in the PTLR will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes do not necessitate a physical alteration of the plant (no new or different types of equipment will be installed). The removal and updating of the pressure and temperature limitations or LTOP PORV actuation setpoints has no affect on any of the systems or structures at Zion Station. No safety related equipment or safety function will be altered as a result of this proposed change. The imposition of more conservative heatup and cooldown limitations will not interact with any other phase of operation at Zion Station. The updated limitations provide an equivalent level of protection to the previous limitations. In addition, acceptance criteria for the calculations have not been significantly altered. The pressure and temperature limits and LTOP PORV actuation setpoints are calculated using NRC approved methods and submitted to the NRC to allow the Staff to continue to trend the values of these limits. The Technical Specifications will continue to require operation within the required pressure and temperature limits and with the required LTOP PORV actuation setpoints and appropriate actions will be taken, when or if limits or setpoints are exceeded. Therefore, the proposed amendment does not in any way create the possibility of a new or different kind of accident from any accident previously evaluated.

 The proposed changes do not involve a significant reduction in a margin of safety.

The margin of safety is not affected by the removal and updating of the pressure and temperature limits and the removal of the LTOP PORV Actuation setpoints. WCAP-13406 "Heatup and Cooldown Limit Curves for Normal Operation for Zion Units 1 & 2" and the "LTOP PORV Actuation Setpoint Methodology" address the criteria for acceptability of these calculations. The methodology of WCAP-13406 was used for revising the heatup and cooldown limitations. The revised heatup and cooldown limitations for Zion Station provide an equivalent level of safety to that which previously existed and ensures that the requirements of 10CFR50 Appendix G are satisfied. In addition, the allowable stresses that the reactor vessel could be subjected to have not been altered from the currently existing levels. Appropriate measures exist to control the values of the pressure and temperature limits and the LTOP PORV actuation setpoints. The proposed amendment continues to require operation within the pressure and temperature limits and LTOP PORV actuation setpoints as obtained from the NRC approved methodologies and appropriate actions to be taken, when or if limits are exceeded.

The development of the changes to the pressure and temperature limits will continue to conform to those methods described in the NEC approved documentation. In addition, each change to the pressure and temperature limits or LTOP PORV actuation setpoints will involve a 10CFR50.59 safety review to assure that operation of the unit within the limits will not involve a significant reduction in a margin of safety. Therefore, the proposed changes are administrative in nature and do not impact the operation of the Zion Station in a manner that involves a reduction in the margin of safety.

### SIGNIFICANT HAZARDS CONSIDERATION 2 FOR THE ZION NUCLEAR GENERATING STATION

Commonwealth Edison Company has evaluated the proposed changes associated with this Licensee Amendment Request and determined that they involve no significant hazards considerations. According to IOCFR50.92(c), a proposed anendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not:

- Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- 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.

The proposed Amendment revises requirements associated with Reactor Coolant System (RCS) Heatup and Cooldown Limitations and Low Temperature Overpressure Protection. The specific changes addressed by this significant hazards consideration are as follows:

- Relocating the capsule withdrawal schedule from the Technical Specifications to the UFSAR.
- Relocating from the Technical Specifications the Reactor Vessel Toughness Data Tables and Fast Neutron Fluence Figures to a UFSAR reference.
- The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The removal of the capsule withdrawal schedule, the Reactor Vessel Toughness Data Tables, and the Fast Neutron Fluence Figures, from the Zion Station Technical Specifications has no influence or impact on the probability or consequences of any accident previously evaluated. The capsule withdrawal schedule, although not in Technical Specifications, will be followed in the operation of the Zion Station. The proposed amendment still requires exactly the same actions to be taken as is required by current Technical Specifications. The capsule withdrawal schedule will be implemented and controlled per Zion procedures. The capsule withdrawal schedule will be in accordance with UFSAR Section 5.3.1.1. In addition, the Reactor Vessel Toughness Data Tables and the Fast Neutron Fluence Figures only provide information that is used in deriving the heatup and cooldown limitation curves. This same information, the Reactor Vessel Toughness Data Tables and Fast Neutron Fluency Figures, is located in the Westinghouse Topical Reports that describe the methodology used to derive the heatup and cooldown limitation curves. The Westinghouse Topical Reports will also be referenced in the UFSAR. Changes to the capsule withdrawal schedule or the reference to the Westinghouse Topical Report will be performed per the requirements of 10CFR50.59. This ensures that future changes to the capsule withdrawal schedule or the reference to the Westinghouse Topical Report will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The removal of the capsule withdrawal schedule and the Reactor Vessel Toughness Data Tables, and the Fast Neutron Fluence Figures has no influence or impact, nor does it contribute in any way to the probability or consequences of an accident. No safety related equipment, safety function, or plant operations will be altered as a result of this proposed change. The capsule withdrawal schedule is in accordance with NRC opproved documentation. The Technical Specifications will continue to require capsules be withdrawn on the required schedules. The Tables and Figures provide information only and will be referenced in the UFSAR. Therefore, the proposed amendment does not in any way create the possibility of a new or different kind of accident from any accident priously evaluated.

The proposed change does not involve a significant reduction in a margin of safety.

The margin of safety is not affected by the removal of the capsule withdrawal schedule, the Reactor Vessel Toughness Data Tables and the Fast Neutron Fluence Figures from the Technical Specifications. The margin of safety presently provided by current Technical Specifications remains unchanged. Appropriate measures exist to control the capsule withdrawal schedule, the Reactor Vessel Toughness Data Tables and the Fast Neutron Fluence Figures. The proposed amendment also continues to require capsules to be withdrawn on a required schedule obtained from the NRC approved methodology. The development of the changes to the capsule withdrawal schedule will continue to conform to those methods described in the NRC approved documentation. In addition, each change to the capsule withdrawal schedule and any change to the reference to the Westinghouse Topical Report (containing the reactor vessel toughness data tables and fast neutron fluence figures) will involve a IOCFR50.59 safety review to assure that operation of the unit within the limits will not involve a significant reduction in a margin of safety. Therefore, the proposed change is administrative in nature and does not impact the operation of the Zion Station in a manner that involves a reduction in the margin of safety.

### SIGNIFICANT HAZARDS CONSIDERATION 3 FOR THE ZION NUCLEAR GENERATING STATION

Commonwealth Edison Company has evaluated the proposed changes associated with this Licensee Amendment Request and determined that they involve no significant hazards considerations. According to 10CFR50.92(c), a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not:

- Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- 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.

The proposed Amendment revises requirements associated with the Reactor Coolant System (RCS) Heatup and Cooldown Limitations and Low Temperature Overpressure Protection (LTOP). The specific changes addressed by this significant hazards consideration are as follows:

- Revising the LTOP enable temperature.
- Deleting the allowance to have a maximum of one safety injection pump aligned for injection into the RCS and OPERABLE.
- The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The LTOP enable temperature has been shifted in the conservative direction by enabling LTOP at a higher temperature (320°F) than the current 250°F. This revision will provide the LTOP protection in a wider span of temperatures than presently exists. The pressurizer power operated relief valves (PORVs) will provide reactor vessel protection within the revised heatup and cooldown curves. As is the case currently, a potential exists for a spurious PORV opening with the resultant loss of inventory from the RCS. With the revised LTOP enable temperature, the exposure to spurious PORV opening is increased. However, the additional exposure (between 250°F and 320°F) is minimal and existing mitigating features for this event are maintained. The PORVs are instrumented to annunciate if one were to open. Also, the PORVs are provided with block valves that will allow operator action to isolate a PORV if it fails to close. If a PORV were to spuriously open, station operating procedures direct operators to isolate it. Operators would have ample time to isolate because of the significantly lower pressures that are typical of LTOP operation. These compensatory measures assure that this revision to the LTOP enable temperature does not significantly increase the probability or consequences of any accident previously evaluated.

An inadvertent safety injection pump actuation with injection into the RCS was not assumed to be an initiator of an analyzed event since operation of the safety injection pumps is prohibited. Deletion of the allowance to have a safety injection pump aligned for injection into the RCS and OPERABLE during LTOP conditions helps ensure an inadvertent safety injection to the RCS does not occur. This change ensures the assumptions of the LTOP analysis for mass addition to the RCS are maintained. This change also ensures that an RCS mass addition transient can be relieved by the operation of a single power operated relief valve or the limiting conditions placed on the pressurizer. Therefore, the deletion of the allowance for a safety injection pump to be aligned to the RCS and OPERABLE does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The change does not physically alter the plant nor does it affect any of Zion's systems or structures. The revised LTOP enable temperature actually expands the region covered by the conservative lower PORV setpoint and therefore provides an equivalent or higher level of protection. The deletion of the allowance to have a safety injection pump aligned for injection into the RCS and OPERABLE achieves consistency with the assumptions of the current LTOP analysis for mass addition to RCS. In addition, the design criteria for LTOP remains unaffected by this revision. Therefore, the change does not create the possibility of a new or a different kind of accident.

 The proposed changes do not involve a significant reduction in a margin of safety.

The margin of safety is not reduced by the changes. The Technical Specification requirements for LTOP remain unchanged except for the conservative raising of the enable temperature and the deletion of the allowance to have a safety injection pump aligned for injection into the RCS and OPERABLE. The expanded region of LTOP coverage provides assurance that protection is available during the conditions when an LTOP event could occur. Deletion of the allowance to have a maximum of one safety injection pump aligned for injection into the RCS and OPERABLE achieves consistency with the LTOP analysis. This ensures the assumptions of the LTOP analysis are maintained since inadvertent actuation of a safety injection pump was not analyzed. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

# ENCLOSURE 3

# ZION NUCLEAR GENERATING STATION

### ENVIRONMENTAL ASSESSMENT

FOR

### LICENSE AMENDMENT REQUEST NO. 92-03

REVISION 1

ZNLD/2512/20

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### ENVIRONMENTAL CONSIDERATION

The proposed changes of this license amendment request have been evaluated against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10CFR51.21. It has been determined that the proposed changes meet the criteria for categorical exclusion as provided for under 10CFR51.22(c)(9). The following is a discussion of how the proposed changes meet the criteria for categorical exclusion:

10CFR 51.22(c)(9): Although the proposed changes involve changes to the installation or use of facility components or to Surveillance Requirements.

- The proposed changes involve no significant hazards considerations (refer to the significant hazards consideration section of this license amendment request).
- (ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, since the proposed changes do not affect the generation of any radioactive effluent nor do they affect any of the permitted release paths, and
- (iii) There is no significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10CFR51.22(c)(9). Based on the forementioned and pursuant to 10CFR51.22(b), no environmental assessment or environmental impact statement need be prepared in connection with issuance of a license amendment incorporating these proposed changes.