



Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

April 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. 93-01
NRC Docket Nos. 50-295 and 50-304

Dear Dr. Murley:

Pursuant to 10CFR50.90, Commonwealth Edison Company (CECo) proposes to amend Appendix A, Technical Specifications, of Facility Operating Licenses DPR-39 and DPR-48. The amendment request proposes revisions to the Limiting Safety System Settings and Limiting Conditions for Operation related to the Source and Intermediate Range (SR and IR) Neutron Flux instrumentation channels. These changes are required to support the planned upgrade of the hardware utilized to process these instrumentation channels.

CECo plans to implement a modification to replace the existing SR and IR hardware during the upcoming Unit 1 refuel outage (Z1R13), planned to begin in October 1993. The modification will also be installed on Unit 2 during its next refuel outage (Z2R13). To support installation per this schedule, CECo requests that NRC review of this proposed amendment be completed by October 21, 1993.

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This amendment request is subdivided as follows:

1. Attachment A provides a Description and Safety Analysis of the proposed changes.
2. Attachment B describes CECO's evaluation performed in accordance with 10 CFR 50.92(c), which confirms that no significant hazards consideration is involved.
3. Attachment C provides the Environmental Assessment.
4. Attachment D includes marked-up Technical Specification pages with the requested changes indicated. Attachment D also includes typed copies of the revised Technical Specification pages.
5. Attachment E provides technical information developed to support the proposed amendment.

This proposed amendment has been reviewed and approved by both On-site and Off-site Review in accordance with Commonwealth Edison procedures.

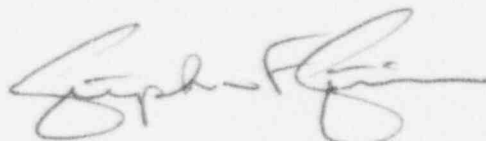
Commonwealth Edison is notifying the State of Illinois of our application for amendment by transmitting a copy of this letter and its attachments to the designated State office.

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,

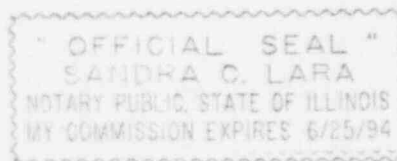


Stephen F. Stimac
Nuclear Licensing Administrator

- Attachments:
- A) Description and Safety Analysis of the Proposed Changes
 - B) Evaluation of Significant Hazards Consideration
 - C) Environmental Assessment
 - D) Marked-up Technical Specification Pages
 - E) Supporting Technical Information

- 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

State of Ill, County of DeWitt
 Signed before me on this 22 day
 of April, 1993 by SFS
 Notary Public [Signature]



ATTACHMENT A

Zion Nuclear Generating Station
Description and Safety Analysis of the
Proposed Technical Specification Changes
For License Amendment Request No. 93-01:

Change in Engineering Units Used to Measure
The Intermediate Range High Flux Trip from
"Amps" to "% Rated Power"

DESCRIPTION AND SAFETY ANALYSIS FOR
LICENSE AMENDMENT REQUEST No. 93-01

A. DESCRIPTION OF THE PROPOSED CHANGE:

An amendment to the Technical Specifications for Zion Nuclear Station, Units 1 and 2, is required because of the planned modification to source range and intermediate range nuclear detectors. This modification will replace the existing detectors with fission chamber detectors manufactured by Gamma Metrics of San Diego, California. The new intermediate range detectors are capable of calibration and indication in units of "% rated power" whereas the existing detectors indicate in units of detector current measured in "amperes". The purpose of this amendment is to restate the Technical Specification setpoints from units of detector current measured in "amperes" to units of "% rated power". The Technical Specifications will identify the setpoints in the existing units until the modification is completed.

The purpose of the modification is to upgrade Zion Station nuclear instrumentation to meet Regulatory Guide 1.97 recommendations for post accident neutron monitoring. Other benefits of the new detectors include improved reliability and signal to noise ratio, and the reduction in the frequency of detector replacement. The new detectors and the amendment to the Technical Specifications being proposed are similar to changes already implemented at other nuclear stations including Sequoyah and Kewaunee.

Installation of the Gamma Metrics detectors and instruments will not change the basic function or the operation of either the Source Range or the Intermediate Range instruments, or the associated high flux trips and the permissives that determine when these trips are functional.

The modification of the nuclear instrumentation will consist of the complete replacement of the existing Source Range and Intermediate Range detectors and the associated cables, connectors, containment penetrations, electronics and displays. Existing cable will be replaced and will be seismically supported. Instrument drawers for the Gamma Metrics detectors are configured to function like and look similar to the instrument drawers they replace. The new drawers will be installed in the existing instrument racks.

The Gamma Metrics detectors use wide range fission chambers. The detector for each channel consists of two fission chambers. One of the fission chambers is used for detection in the Intermediate Range and both fission chambers are used in the Source Range where greater sensitivity is required. The Gamma Metrics Intermediate Range will indicate over a range of 10 decades of reactor power versus 8 decades for the existing detectors. The Gamma Metrics and the existing Source Range detectors both indicate in counts per second over a range of six decades.

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	Existing Detector	Gamma Metrics
Source Range:	10^0 to 10^6 cps	10^0 to 10^6 cps
Intermediate Range:	10^{-11} to 10^{-8} amps	10^{-8} to $2 \times 10^2\%$ power

Justification for the new Limiting Safety System Setting (LSSS) and Limiting Condition for Operation (LCO) setpoints is based on an engineering evaluation using vendor recommendations. Currently, the setpoint for the Source Range high flux trip is set one decade below the upper end of the range of indication of the detector. The Intermediate Range high flux trip is set at a detector current calculated to approximate the Power Range low setpoint flux trip set at less than or equal to 25% of rated power. No formal analysis exists to support these specific setpoints. This lack of analysis stems from the difficulty relating Source Range count rate and Intermediate Range detector amps to a precise level of neutron flux in the core over the wide range of plant conditions under which the instruments and the trips are required to function. Consequently, no credit is taken for the operation of the Intermediate and Source Range Channels in the Accident Analysis. Instead, protection from a power excursion during startup is provided by the low setpoint of the power range high flux trip. The Source Range and Intermediate Range high flux trips provide redundancy and diversity to the power range high flux trip during startup. The LSSS and LCO setpoints for the high flux trip for both the Source Range and Intermediate Range for the Gamma-Metrics detectors were determined in a similar fashion.

The Source Range high flux trip will remain set one decade below the upper limit of indication of the Source Range detector. This setpoint prevents an uncontrolled or unintentional increase in reactor power above the Source Range and will ensure that proper Source Range to Intermediate Range overlap is established when increasing or decreasing power. This trip remains redundant and diverse to the power range (low setpoint) flux trip for protection against a startup rod withdrawal accident.

The Intermediate Range flux trip will remain set equal to the power range (low setpoint) flux trip but will be expressed directly in units of "% rated power". This will ensure that proper Intermediate Range to power range overlap is established when increasing or decreasing power. This trip remains redundant and diverse to the power range (low setpoint) flux trip for protection against a startup rod withdrawal accident.

The LSSS and LCO setpoints which permit blocking the Source Range trip (P-6) are set at the lower extreme of the range of indication of the existing Intermediate Range detectors. The P-6 LSSS and LCO setpoint were selected to allow blocking the Source Range high flux trip at the lowest possible power level after achieving Source Range to Intermediate Range overlap when increasing reactor power.

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This maximizes the ability to achieve overlap and prevent the trip that would occur if Source Range indication is above the trip setpoint before Intermediate Range indication is established. Similarly, when decreasing reactor power, having the P-6 setpoint at the lowest extreme of the Intermediate Range provides the greatest probability that Source Range count rate will be below the Source Range high flux trip setpoint before the Source Range trip is unblocked.

The Gamma Metrics Intermediate Range will indicate over a range of 10 decades of reactor power versus 8 decades for the existing detectors. This will provide an additional two decades of overlap between the Source Range and the Intermediate Range. Additionally, Gamma Metrics share the same detector for both source and intermediate range which also improves the ability to achieve satisfactory overlap between source and intermediate range. Therefore, the P-6 LSSS and LCO could be set at any level of Intermediate Range power that will overlap with Source Range indication. For convenience, the P-6 LSSS and LCO are maintained at approximately the existing power levels but the setpoints are restated in "% rated power" as follows:

" 5×10^{-11} amperes" is restated as " 10^{-6} % rated power"; and,

" 10^{-10} amps" is restated as " 10^{-5} % rated power".

The equivalence of these setpoints was determined by an engineering evaluation using vendor recommendations. The difference between the LSSS and LCO was increased to one full decade to take advantage of the additional overlap when using Gamma Metrics.

B. CURRENT REQUIREMENTS:

The existing Westinghouse system uses BF_3 , filled proportional counters for the Source Range and Compensated Ionization Chambers for the Intermediate Range.

The Source Range high flux trip is governed by the following LSSS and LCO:

- 2.1.1.A.3 High flux, source range, (high set point):
neutron flux less than or equal to 10^5 counts/second.

Table 3.1-1 Reactor Trip Channel Description

Item 6 Source Range Neutron Flux Interlocked with P-6 and P-10.
Setpoint: 10^5 Counts/sec

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Neither the LSSS nor the LCO for the Source Range trip will be affected by the installation of the Gamma Metric detectors. Justification for using the same setpoints has been previously discussed.

The Source Range trip must be blocked to permit reactor power to increase above the source range. The Source Range trip may be blocked only when proper tracking of reactor power is established in the intermediate range. When reactor power is decreasing, the Source Range trip must be unblocked before power decreases below the intermediate range. This means that a signal from the Intermediate Range detectors determines when the Source Range trip must be functional.

The Source Range blocks and permissives have the following LSSS and LCO:

- 2.1.2.D The source range high flux, high setpoint trip shall be unblocked when the intermediate range nuclear flux is less than or equal to 5×10^{-11} amperes.

Table 3.1-1 Reactor Trip Channel Description

Table 3.1-1 Permissives
P-6 Setpoint 10^{-10} amps

The Intermediate Range high flux trip is governed by the following LSSS and LCO:

- 2.1.1.A.2 High flux, intermediate range (high set point) current equivalent to less than or equal to 25% of full power.

Table 3.1-1 Reactor Trip Channel Description

Item 7 Intermediate Range Neutron Flux-
Interlocked with P-10
Setpoint: 25% of Rated Neutron Flux

The Intermediate Range trip must be blocked to permit reactor power to increase to $\geq 25\%$ of rated power. The Intermediate Range trip may be blocked only when proper tracking of reactor power is established in the power range. When reactor power is decreasing, the Intermediate Range trip must be unblocked before power decreases below the power range indication. This means that a signal from the power range detectors determines when the Intermediate Range trip must be functional.

The blocks and permissives for the Intermediate Range high flux trip have the following LSSS and LCO:

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- 2.1.2.C The power range high flux, low setpoint trip and the intermediate range high flux, high setpoint trip shall be unblocked when power is less than or equal to 10% of rated power.

Table 3.1-1 Reactor Trip Channel Description
Table 3.1-1 Permissives
P-10 Setpoint 10% of Rated Neutron Flux

These setpoints are generated from the power range detectors and are not affected by the installation of the Gamma Metrics detectors and instruments.

C. REQUESTED REVISION:

LSSS REVISIONS

Specification 2.1.1.A.2 has been modified by removing the statement "current equivalent to", substituting "rated power" for "full power", and by adding a footnote referencing the Intermediate Range High Flux Trip setpoint to be set at the current equivalent to $\leq 25\%$ of rated power until the Gamma Metrics detectors are installed. Installation of the Gamma Metric Intermediate Range detectors allows the elimination of the term "current equivalent to" since the new detectors are calibrated and indicate in "% rated power" instead of amps. The substitution of "rated power" for "full power" is being made for consistency in reference to power level with no change of intent. The addition of the footnote will preserve the current Intermediate Range High Flux Trip setpoint in the appropriate units of measure (current equivalent to) until the installation of the Gamma Metrics detectors is complete. The acceptability of these setpoints is discussed in Section A above.

Specification 2.1.2.D has been modified by substituting " $\leq 10^{-6}\%$ rated power" for " $\leq 5 \times 10^{-11}$ amperes", and by adding a footnote referencing that the Source Range High Flux Trip shall be unblocked when the Intermediate Range Nuclear Flux is $\leq 5 \times 10^{-11}$ amperes until the installation of the Gamma Metrics detectors. Installation of the Gamma Metrics Intermediate Range detectors allows the value for when the Source Range High Flux Trips are to be instated to be referenced in % of rated power. The addition of the footnote will preserve the current setpoint in the appropriate units of measure (amperes) until installation of the Gamma Metrics detectors is complete. The acceptability of these setpoints is discussed in Section A above.

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Table 3.1-1 Revisions

The format of page 30 has been modified to apply a specific footnote reference to each setpoint rather than generically apply a single footnote to the header of the setpoint column. This change has been made to allow flexibility in assigning unique footnote references to the various setpoints on the page as described below. This approach is consistent with the approach utilized currently on pages 31, 31a and 32.

On page 32, the double plus sign (++) footnote has been modified such that it only refers to the April 1992 setpoint study which is now applicable to the channels of both Units 1 and 2 for which this footnote is referenced. Since completion of the Eagle 21 Process Protection System upgrade on both Units, the August 1971 setpoint document no longer applies to these channels. Reference to the August 1971 document is maintained for certain channels, where appropriate, via continued reference to the existing triple pound sign (###) footnote. In addition, a new quadruple pound sign (####) footnote has been added to reference the new setpoint study which has been prepared to address the new Gamma Metrics hardware ("Zion NSSS Setpoint Evaluation, Protection System Channels, Eagle 21 Version, Non-Westinghouse Channels, Revision 0, March 1993").

The tolerances and instrument channel setpoint errors for the Gamma Metrics source and Intermediate Range channels included in the March 1993 document have been developed using channel accuracy methodology consistent with that used to develop the April 1992 setpoint study. Previous NRC approval of the April 1992 setpoint study methodology is documented in the staff's Safety Evaluation Report related to Zion Station Technical Specification amendment Nos. 139/128, dated June 26, 1992. Control of these tolerances and instrument channel setpoint errors will be as before, in that any revision would require a Technical Specification amendment to change the document referenced in the table.

Line items 6 and 7 on page 30 (Source Range Neutron Flux and Intermediate Range Neutron Flux) have been changed to 6a and 7a with the addition of new line items 6b and 7b. Additionally, footnotes have been added to these line items to specify the appropriate setpoint documents which will control the channel's tolerances. This change is required due to the phased implementation of this modification, which for a given period of time, will result in two differing setpoint documents for the Source and Intermediate Range Monitors due to hardware differences.

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A minor typographical error is also corrected in the proposed amendment. This correction is to item 5 on page 30, Negative Power Range Flux Rate. This amendment inserts a minus sign in the setpoint so that the setpoint will read "-5% of Rated Neutron Flux/2 Sec" consistent with the LSSS specified for this trip in Specification 2.1.1.C.7.

On page 31, line items 13b and 17b and their associated footnotes have been deleted from Table 3.1-1 and the number designation for line items 13a and 17a has been changed to 13 and 17. These line items were previously separated during the phased implementation of the Eagle 21 upgrade on Units 1 and 2. These differing setpoints are no longer required since the Eagle 21 upgrade has been completed for both Units. As such, this change is administrative in nature.

The setpoints associated with the P-6 interlock function on page 32 have been modified by specifying the setpoint as " 10^{-10} amps until Gamma Metrics detectors are installed" and as " 10^{-5} % Rated Power after Gamma Metrics detectors are installed". The acceptability of these setpoints is discussed in Section A above. In addition, footnotes are included to reference the appropriate setpoint tolerance document to be applied for each of these setpoints. The quadruple pound sign (####) footnote has been specified as applicable to the P-6 interlock function after Gamma Metrics installation. The Gamma Metrics P-6 interlock function utilizes the same established tolerances as the Intermediate Range Neutron Flux channels since the same instrument channels and detectors are used for both functions. Bases section 3.1 has been clarified to reflect this information.

The setpoint notation for the P-8 Interlock function on page 32 has been modified by deleting reference to the differing setpoints required during the phased implementation of Eagle 21. This change is administrative in nature, in that the notation is no longer required since Eagle 21 has been installed on both Units.

Table 3.4-1 Revisions

On page 131b, the double plus sign (++) footnote has been modified such that it only refers to the April 1992 setpoint study which is now applicable to the channels of both Units 1 and 2 for which this footnote is referenced. Since completion of the Eagle 21 Process Protection System upgrade on both Units, the August 1971 setpoint document no longer applies to these channels. Reference to the August 1971 document is maintained for certain channels, where appropriate, via continued reference to the existing asterisk (*) footnote. An existing typographical error in the asterisk (*) footnote has been corrected by changing "CEW-2652" to "CEW-652" consistent with the footnote used in Table 3.1-1. These changes are administrative in nature.

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D. IMPACT OF THE PROPOSED CHANGE:

The installation of the Gamma Metrics detectors and instruments and restatement of the setpoints in units of "% Rated Power" will not change the basic function or the operation of either the Source Range or the Intermediate Range instruments or the associated high flux trips and the permissives that determine when these trips are functional. The proposed administrative and typographical corrections are being made to clarify the Technical Specifications with no change of intent proposed. The tolerances and instrument channel setpoint errors which are referenced for the Gamma Metrics channels have been developed utilizing the methodology previously approved for this application at Zion.

E. IMPLEMENTATION SCHEDULE:

Installation of the new detectors is currently scheduled for Unit 1 during the Fall 1993 outage and for Unit 2 during the Spring 1995 outage. Therefore, this change must be implemented during the Fall 1993 outage prior to completion of installation for each channel. The Technical Specifications will continue to identify the setpoints in units of "Amps" until the modification is completed on both units.

ATTACHMENT B

Evaluation of Significant Hazards Consideration
for Proposed
Technical Specification changes
For License Amendment Request No. 93-01:

Change in Engineering Units Used to Measure
The Intermediate Range High Flux Trip from
"Amps" to "% Rated Power"

EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION

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

1. Involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated;
 2. Create the possibility of a new or different kind of accident from any previously analyzed; or,
 3. Involve a significant reduction in a margin of safety. The following evaluation is provided for the three categories of the significant hazards consideration standards:
1. Do the changes involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated?

The installation of the Gamma Metrics detectors and instruments will not change the function, operation or capability of the Source Range and Intermediate Range detectors as described in the UFSAR. Additionally, there is no effect on any of the accident analyses in UFSAR Chapter 15 because operation of the Intermediate and Source Range Channels and associated trips and permissives is not credited as primary protection in the accident analyses. The proposed typographical and administrative changes are being made to clarify the Technical Specifications with no change of intent. As such, the proposed changes do not represent a significant increase in the probability of occurrence or consequences of accidents previously evaluated.

2. Do the changes create the possibility of a new or different kind of accident from any previously analyzed?

Installation of the Gamma Metrics detectors and instruments will not change the basic function, operation or use of either the Source Range or the Intermediate Range instruments or the associated high flux trips and the permissives that determine when these trips are functional. The setpoints for the Intermediate Range and Source Range high flux trips and associated permissives are functionally equivalent to the existing setpoints. The proposed typographical and administrative changes are being made to clarify the Technical Specifications with no change of intent presented. Therefore, there is no possibility that the proposed changes create a new or different kind of accident from any previously analyzed in the Updated Safety Analysis Report.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Installation of the Gamma Metrics detectors and instruments will not change the basic function, operation or use of either the Source Range or the Intermediate Range instruments or the associated high flux trips and the permissives that determine when these trips are functional. The setpoints for the Intermediate Range and Source Range high flux trips and associated permissives are functionally equivalent to the existing setpoints. The protection trips associated with the source and intermediate range neutron flux detectors are not credited as primary protection for any analyzed event. The proposed typographical and administrative changes are being made to clarify the Technical Specifications with no change of intent. Therefore, the proposed changes do not create a significant reduction in a margin of safety.

ATTACHMENT C

Environmental Assessment for
Proposed Technical Specification changes
For License Amendment Request No. 93-01:

Change in Engineering Units Used to Measure
The Intermediate Range High Flux Trip from
"Amps" to "% Rated Power"

ENVIRONMENTAL ASSESSMENT

The changes proposed by 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:

Although the proposed changes involve changes to Limiting Safety System Settings and Limiting Conditions for Operation:

- (i) The proposed changes involve no significant hazards consideration as evaluated in Attachment B of this License Amendment Request;
- (ii) There is no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off-site since the proposed changes do not affect the generation of any radioactive effluents nor do they affect any of the permitted release paths; and,
- (iii) There is no significant increase in individual or cumulative occupational radiation exposure associated with this proposed change.

Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10CFR51.22(c) (9). Based on the aforementioned and pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment to the Licenses incorporating the proposed changes.