

September 27, 2005

Mr. Christopher M. Crane, President
and Chief Executive Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION, UNIT 1 - ISSUANCE OF AN AMENDMENT -
RE: REVISION OF THE INSTRUMENT CHANNEL TRIP SETPOINT
ALLOWABLE VALUES (TAC NO. MC1323)

Dear Mr. Crane:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 168 to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit 1, in response to your application dated November 11, 2003, as supplemented April 16 and September 10, 2004, and March 30 and September 21, 2005. The amendment revises the instrument channel trip setpoint allowable values for thirteen Technical Specification functions at the Clinton facility.

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

Sincerely,

/RA/

Kahtan N. Jabbour, Senior Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosures: 1. Amendment No. 168 to NPF-62
2. Safety Evaluation

cc w/encls: See next page

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Clinton Power Station, Unit 1

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AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-461

CLINTON POWER STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 168

License No. NPF-62

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by AmerGen Energy Company, LLC (the licensee), dated November 11, 2003, as supplemented April 16 and September 10, 2004, and March 30 and September 21, 2005, 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 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, the license is amended by changes to the Technical Specifications contained in Appendix B, as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-62 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 168 are hereby incorporated into this license. AmerGen Energy Company, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by Jon Hopkins for/

Gene Y. Suh, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: September 27, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 168

FACILITY OPERATING LICENSE NO. NPF-62

DOCKET NO. 50-461

Replace the following pages of Appendix A, Technical Specifications, with the enclosed pages. The revised pages are identified by an amendment number and contain marginal lines indicating the areas of change.

Remove Pages

3.3-8
3.3-29
3.3-39
3.3-40
3.3-41
3.3-42
3.3-43
3.3-47
3.3-55
3.3-56
3.3-57
3.3-58
3.3-59
3.3-60
3.3-64
3.3-68
3.3-72
3.3-74

Insert Pages

3.3-8
3.3-29
3.3-39
3.3-40
3.3-41
3.3-42
3.3-43
3.3-47
3.3-55
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3.3-58
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3.3-60
3.3-64
3.3-68
3.3-72
3.3-74

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 168 TO FACILITY OPERATING LICENSE NO. NPF-62

AMERGEN ENERGY COMPANY, LLC

CLINTON POWER STATION, UNIT 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By application dated November 11, 2003, as supplemented April 16 and September 10, 2004, and March 30 and September 21, 2005, AmerGen Energy Company, LLC (AmerGen), the licensee, requested changes to the Technical Specifications (TSs) for Clinton Power Station (CPS), Unit 1. The proposed changes would revise the instrument channel trip setpoint allowable values (AVs) for thirteen TS functions. The licensee has determined that these AVs should be revised during a detailed review of CPS instrumentation trip setpoints and AVs.

Administrative controls consistent with the guidelines of NRC Administrative Letter 98-10, "Disposing of Technical Specifications that are Insufficient to Assure Plant Safety," were established to ensure that operability of systems and components would continue to be met. These administrative controls consisted of placing into effect conservative administrative limits for use in plant procedures as a short-term corrective action to ensure that the associated setpoints are maintained within the required AVs. These administrative controls ensure that adequate margins to the design, accident, or transient analyses assumptions are maintained until the final supporting calculations and changes to the TSs are approved as the long-term corrective action.

The licensee's application requested a revision to the AVs for the following TS functions.

- C Main Steam Isolation - Closure
- C Anticipated Transient Without Scram Recirculation Pump Trip Reactor Steam Dome Pressure - High
- C Reactor Vessel Pressure - Low (Injection Permissive)
- C Reactor Vessel Water Level - Low Low Low, Level 1
- C Reactor Vessel Water Level - Low Low, Level 2
- C High Pressure Core Spray (HPCS) System Reactor Vessel Water Level - High, Level 8
- C Reactor Core Isolation Cooling (RCIC) Storage Tank Level - Low
- C HPCS System Suppression Pool Water Level - High (Pump Suction Transfer)
- C Automatic Depressurization System (ADS) Initiation Permissive, Low Pressure
- C ADS Initiation Permissive, Low Pressure Coolant Injection (LPCI) Pumps Discharge Pressure - High
- C RCIC System Suppression Pool Water Level - High (Pump Suction Transfer)
- C Main Steam Line Pressure - Low (TS Table 3.3.6.1-1 (1.b)), and

C Safety Relief Valve (SRV) Relief and Low-Low Set functions channel calibration surveillance requirement

The supplements dated November 11, 2003, April 16 and September 10, 2004, and March 30 and September 21, 2005, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 16, 2004.

2.0 REGULATORY EVALUATION

The following regulatory bases and guidance documents are applicable to the systems discussed in the license amendment application.

Criterion 13, "Instrumentation and Control," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, *Code of Federal Regulations* (CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, among other things, that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges.

Criterion 20, "Protection System Functions," of Appendix A to 10 CFR Part 50 requires, among other things, that the protection system be designed to initiate operation of appropriate systems to ensure that specified acceptable fuel design limits are not exceeded.

Paragraph (c)(1)(ii)(A) of 10 CFR Section 50.36, "Technical Specifications," requires that the TSs include limiting safety system settings. This paragraph specifies, among other things, that "where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded." Accordingly, limits for instrument channels that initiate protective functions must be included in the TSs.

Regulatory Guide (RG) 1.105, "Setpoints for Safety-Related Instrumentation," describes a method acceptable to the NRC staff for complying with the NRC regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits.

3.0 TECHNICAL EVALUATION

General Electric (GE) initially prepared the CPS instrument setpoint calculations for the Nuclear Steam Supply System (NSSS) parameters and systems. The setpoint calculations were prepared, reviewed and approved using the GE instrument setpoint methodology. These calculations were not entered into the configuration control process at CPS. In addition, the available documentation from the review of these calculations did not describe the review criteria or scope. This technical quality concern was addressed in an adverse trend condition report (CR) written in July 1998. As part of the corrective actions resulting from this adverse trend CR, the CPS Setpoint Calculation Project was created to formally document the design basis for the TS AVs and the nominal trip setpoints. The project created 36 new calculations that were placed in the CPS design basis.

The AVs proposed in this application were calculated in accordance with the guidance provided in RG 1.105, "Instrument Setpoint," and the Instrument Society of America (ISA) Standard

S67.04, "Setpoints for Nuclear Safety Related Instrumentation," Parts I and II, dated September 1994, as implemented by the licensee's Setpoint Methodology. Part II of the standard, not endorsed by the NRC staff, includes three methods (called Methods 1, 2, or 3) for calculating an AV. In the three methods, ISA S67.04 states that the allowance between the AV and the trip setpoint should account for: (1) drift based on the surveillance interval (monthly, quarterly, or refueling); (2) instrument calibration uncertainties for the portion of the instrument channel tested; and (3) instrument uncertainties during normal operation that are measured during testing.

In Methods 1 and 2, the AV is determined by calculating the instrument channel uncertainties identified above. The result is then subtracted from the analytical limit to establish the AV. However, Method 3 first calculates the trip setpoint and then an allowance for the combination of uncertainties (drift, calibration uncertainties, and uncertainties during normal operation) is calculated. This allowance is then added to the trip setpoint to establish the AV. Method 3 calculation should provide a large enough allowance to account for those uncertainties not measured during the test so that the reasonable assurance regarding the conservatism of the calculated AV values is met.

The staff has determined that an approach based on the performance of the instrument channel should provide the required reasonable assurance. This "performance-based" approach sets limits (i.e., as-left tolerance and as-found tolerance) on the acceptable nominal trip setpoints and on the deviations in the measured setpoints from the end of one test to the beginning of the next.

The licensee submitted the CPS Setpoint Methodology (i.e., CI-01.00, "Instrument Setpoint Calculation Methodology") which establishes the AVs associated with limiting safety system settings (LSSSs). The licensee used Method 3 to calculate the AVs for 4 functions of the 13 TS functions where AV revisions were proposed. For the remaining 9 functions, the AVs were calculated using Method 1. For the 4 functions that use Method 3, the licensee has proposed performance-based TSs by modifying the TS functions for the Reactor Vessel Water Level - Low Low Low, Level 1; the Reactor Vessel Water Level - Low Low, Level 2; High Pressure Core Spray (HPCS) System Reactor Vessel Water Level - High, Level 8; and Main Steam Line Pressure - Low.

The licensee's setpoint methodology establishes a setting tolerance for all TS setpoints. The setting tolerance is the uncertainty of the calibration procedure allowance used by the technician in the calibration process. The setting tolerance is a tighter band around the trip setpoint than the AV range. Plant procedures ensure that instrument channels will not be left outside a specific setting tolerance (i.e., the as-left tolerance). This practice leaves the as-left trip setpoint within the calculated setting tolerance and near the trip setpoint value. In addition, this practice meets the intent of the regulations and, therefore, it is acceptable.

In the NRC's letter dated March 31, 2005, to the Nuclear Energy Institute, the staff stated that the safety limit (SL) is protected by the practice of setting the instrument trip setpoint at, or more conservative than, the calculated trip setpoint (TSP) that accounts for credible uncertainties, rather than the AVs. However, existing AV-based TSs for the reactor protection system (RPS) and emergency core cooling system (ECCS) do not require that licensees control the instrument setting based on TSP. To resolve this issue, the TSs should include a requirement to return the

as-left instrument setting to the TSP established to protect the SL. Therefore, the LSSS becomes the setpoint limit rather than the AV.

It should be noted that the licensee defines the calculated TSP as the Nominal TSP (NTSP), and the Actual TSP (ATSP) is a more conservative value than the NTSP. Based on the above, the licensee has modified the TSs associated with the RPS and ECCS functions to add the following notes:

1. If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined As-Found Tolerance band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value within the As-Left Tolerance of the Actual Trip Setpoint; otherwise, the channel shall be declared inoperable.
3. The Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the predefined As-Found Tolerance and As-Left Tolerance bands shall be specified in the ORM [Operational Requirements Manual].

For CPS, the above notes achieve the intent of the regulations to protect the SL by adjusting the ATSP to within the As-Left Tolerance, and follow the guidance of the March 31, 2005, letter. Therefore, the notes, and their addition to the appropriate TSs, are acceptable. Also, the staff has evaluated the CPS Setpoint Methodology and concludes that the methodology demonstrates that the trip setpoint and the As-Found and the As-Left tolerances are established and held within specified limits to protect the SL. Therefore, the methodology is acceptable.

4.0 TS Changes

The licensee proposed the following TS changes:

1. TS Section 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Table 3.3.1.1-1, Function 6 specifies an Allowable Value for the Main Steam Isolation Valve (MSIV) – Closure of " $\leq 12\%$ closed." Function 6 is being revised to reflect an Allowable Value of " $\leq 13\%$ closed."
2. TS Section 3.3.4.2, "Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation," Surveillance Requirement (SR) 3.3.4.2.4.b requires performance of a channel calibration on the Reactor Steam Dome Pressure – High function. This SR specifies an Allowable Value of " ≤ 1150 psig." This Allowable Value is being revised to " ≤ 1143 psig."
3. TS Section 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," Table 3.3.5.1-1.

- 3.1 Function 1.a specifies an Allowable Value for the Reactor Vessel Water Level – Low Low Low, Level 1 of " ≥ -147.7 inches." Function 1.a, is revised to reflect an Allowable Value of " ≥ -148.1 inches."
- 3.2 Function 1.d specifies an Allowable Value for the Reactor Vessel Pressure – Low (Injection Permissive) of " ≥ 452 psig and ≤ 478 psig." Function 1.d is being revised to reflect an Allowable Value of " ≥ 454 psig and ≤ 494 psig."
- 3.3 Function 2.a specifies an Allowable Value for the Reactor Vessel Water Level – Low Low Low, Level 1 of " ≥ -147.7 inches." Function 2.a is revised to reflect an Allowable Value of " ≥ -148.1 inches."
- 3.4 Function 2.d specifies an Allowable Value for the Reactor Vessel Pressure – Low (Injection Permissive) of " ≥ 452 psig and ≤ 478 psig." Function 2.d is being revised to reflect an Allowable Value of " ≥ 454 psig and ≤ 494 psig."
- 3.5 Function 3.a specifies an Allowable Value for the Reactor Vessel Water Level – Low Low, Level 2 of " ≥ -47.7 inches." Function 3.a is revised to reflect an Allowable Value of " ≥ -48.1 inches."
- 3.6 Function 3.c specifies an Allowable Value for the Reactor Vessel Water Level – High, Level 8 of " ≤ 54.2 inches." Function 3.c is revised to reflect an Allowable Value of " ≤ 54.6 inches."
- 3.7 Function 3.d specifies an Allowable Value for the RCIC Storage Tank Level – Low of " ≥ 2.5 inches." Function 3.d is revised to reflect an Allowable Value of " ≥ 3.0 inches."
- 3.8 Function 3.e specifies an Allowable Value for the Suppression Pool Water Level – High of " ≤ 12 inches." Function 3.e is revised to reflect an Allowable Value of " ≤ 11 inches."
- 3.9 Function 4.a specifies an Allowable Value for the Reactor Vessel Water Level – Low Low Low, Level 1 of " ≥ -147.7 inches." Function 4.a, is revised to reflect an Allowable Value of " ≥ -148.1 inches."
- 3.10 Function 4.e specifies an Allowable Value for the LPCS Pump Discharge Pressure – High of " ≥ 125 psig." Function 4.e is revised to reflect an Allowable Value of " ≥ 125 psig and ≤ 176.3 psig."
- 3.11 Function 4.f specifies an Allowable Value for the LPCI Pump A Discharge Pressure – High of " ≥ 115 psig." Function 4.f is revised to reflect an Allowable Value of " ≥ 115 psig and ≤ 135 psig."
- 3.12 Function 5.a specifies an Allowable Value for the Reactor Vessel Water Level – Low Low Low, Level 1 of " ≥ -147.7 inches." Function 5.a, is revised to reflect an Allowable Value of " ≥ -148.1 inches."

- 3.13 Function 5.e specifies an Allowable Value for the LPCI Pumps B & C Discharge Pressure – High of " ≥ 115 psig." Function 5.e is revised to reflect an Allowable Value of " ≥ 115 psig and ≤ 135 psig."
4. TS Section 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," Table 3.3.5.2-1.
- 4.1 Function 1 specifies an Allowable Value for the Reactor Vessel Water Level – Low Low, Level 2 of " ≥ -47.7 inches." Function 1 is revised to reflect an Allowable Value of " ≥ -48.1 inches."
- 4.2 Function 3 specifies an Allowable Value for the RCIC Storage Tank Level – Low of " ≥ 2.5 inches." Function 3 is revised to reflect an Allowable Value of " ≥ 3.0 inches."
- 4.3 Function 4 specifies an Allowable Value for the Suppression Pool Water Level – High of " ≤ -3 inches." Function 4 is revised to reflect an Allowable Value of " ≤ -5 inches."
5. TS Section 3.3.6.1, "Primary Containment and Drywell Isolation Instrumentation," Table 3.3.6.1-1.
- 5.1 Function 1.a specifies an Allowable Value for the Main Steam Line Isolation Reactor Vessel Water Level – Low Low Low, Level 1 of " ≥ -147.7 inches." Function 1.a, is revised to reflect an Allowable Value of " ≥ -148.1 inches."
- 5.2 Function 1.b specifies an Allowable Value for the Main Steam Line Pressure – Low of " ≥ 837 psig." Function 1.b is being revised to reflect an Allowable Value of " ≥ 840 psig."
- 5.3 Function 2.a specifies an Allowable Value for the Primary Containment and Drywell Isolation Reactor Vessel Water Level – Low Low, Level 2 of " ≥ -47.7 inches." Function 2.a is revised to reflect an Allowable Value of " ≥ -48.1 inches."
- 5.4 Function 2.e specifies an Allowable Value for the Reactor Vessel Water Level – Low Low, Level 2 (HPCS NSPS Div 3 and 4) of " ≥ -47.7 inches." Function 2.e is revised to reflect an Allowable Value of " ≥ -48.1 inches."
- 5.5 Function 2.j specifies an Allowable Value for the Primary Containment and Drywell Isolation Reactor Vessel Water Level – Low Low Low, Level 1 of " ≥ -147.7 inches." Function 2.j is revised to reflect an Allowable Value of " ≥ -148.1 inches."
- 5.6 Function 3.h specifies an Allowable Value for the RCIC System Isolation Reactor Vessel Water Level – Low Low, Level 2 of " ≥ -47.7 inches." Function 3.h is revised to reflect an Allowable Value of " ≥ -48.1 inches."
- 5.7 Function 4.f specifies an Allowable Value for the Reactor Water Cleanup (RWCU) System Isolation Reactor Vessel Water Level – Low Low, Level 2 of " ≥ -47.7 inches." Function 4.f is revised to reflect an Allowable Value of " ≥ -48.1 inches."

- 5.8 Function 5.d specifies an Allowable Value for the Residual Heat Removal (RHR) System Isolation Reactor Vessel Water Level – Low Low Low, Level 1 of "≥ -147.7 inches." Function 5.d, is revised to reflect an Allowable Value of "≥ -148.1 inches."
6. TS Section 3.3.6.2, "Secondary Containment Isolation Instrumentation," Table 3.3.6.2-1, Function 1 specifies an Allowable Value for the Reactor Vessel Water Level – Low Low, Level 2 of "≥ -47.7 inches." Function 1 is revised to reflect an Allowable Value of "≥ -48.1 inches."
7. TS Section 3.3.6.3, "Residual Heat Removal (RHR) Containment Spray System Instrumentation," Table 3.3.6.3-1, Function 3 specifies an Allowable Value for the Reactor Vessel Water Level – Low Low Low, Level 1 of "≥ -147.7 inches." Function 3, is revised to reflect an Allowable Value of "≥ -148.1 inches."
8. TS Section 3.3.6.4, "Suppression Pool Makeup (SPMU) System Instrumentation," Table 3.3.6.4-1, Function 2 specifies an Allowable Value for the Reactor Vessel Water Level – Low Low Low, Level 1 of "≥ -147.7 inches." Function 2 is revised to reflect an Allowable Value of "≥ -148.1 inches."
9. TS Section 3.3.6.5, "Relief and Low-Low Set (LLS) Instrumentation," Surveillance requirement (SR) 3.3.6.5.3 requires performance of a channel calibration of the safety relief valve (SRV) Relief and LLS functions. Items a. and b. provide the Allowable Values for these functions. The proposed change revises the Relief and LLS Allowable Values as follows:

From:

a. Relief Function

Low: 1103 ± 15 psig
Medium: 1113 ± 15 psig
High: 1123 ± 15 psig

b. LLS Function

Low open: 1033 ± 15 psig
close: 926 ± 15 psig
Medium open: 1073 ± 15 psig
close: 936 ± 15 psig
High open: 1113 ± 15 psig
close: 946 ± 15 psig

To:

a. Relief Function

Low: ≤ 1118 psig
Medium: ≤ 1128 psig
High: ≤ 1138 psig

b. LLS Function

Low open: ≤ 1044 psig
 close: ≤ 937 psig
Medium open: ≤ 1084 psig
 close: ≤ 947 psig
High open: ≤ 1124 psig
 close: ≤ 957 psig

The NRC staff has reviewed the licensee's proposed TS changes to the AVs, and the addition of the above notes to the appropriate TS instrumentation associated with the RPS and the ECCS functions. The addition of the notes provides reasonable assurance that the plant will operate in accordance with the safety analyses and the operability of the instrumentation is ensured. Also, for the instrumentation in non-RPS and non-ECCS functions, the licensee will use its setpoint calibration procedures to maintain the trip setpoint within the established setting tolerance to ensure that the instruments will be capable of performing their specified safety functions. Based on its review of the licensee's setpoint calculations and justifications, the staff finds that the proposed TS changes to the AVs are acceptable for the functions identified in Section 1 of this safety evaluation.

5.0 STATE CONSULTATION

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

6.0 ENVIRONMENTAL CONSIDERATION

This 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 or changes a surveillance requirement. 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 (69 FR 12363). 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 staff 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.

Principal Contributors: S. Rhow
C. Schulten

Date: September 27, 2005