



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Docket Nos. 50-327
and 50-328

August 11, 1989

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: EMERGENCY AMENDMENTS FOR INOPERABLE COLD LEG INJECTION ACCUMULATOR
LEVEL INSTRUMENTATION (TAC 74151/74152) (TS 89-37) - SEQUOYAH
NUCLEAR PLANT, UNITS 1 AND 2

The Commission has issued the enclosed Amendment No. 124 to Facility Operating License No. DPR-77 and Amendment No. 113 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2, respectively. These amendments are in response to your applications dated August 7, 1989, revised August 10, 1989.

These amendments temporarily add two additional Action statements for the Limiting Condition for Operation (LCO) 3.5.1.1., Cold Leg Injection Accumulators, of the Sequoyah Nuclear Plant, Units 1 and 2, Technical Specifications (TS). The two Action statements state that (1) with one water level or pressure channel inoperable per accumulator, return the inoperable channel to operable status within 30-days or shut down the unit and (2) with more than one channel, water level or pressure, inoperable per accumulator, immediately declare the affected accumulators inoperable and enter Action statement "a" to return the inoperable channels to operable status within one hour or shut down the unit. These changes to the TS are temporary. They are only effective from the date of this letter until the restart of Unit 2 from the Unit 2 Cycle 4 refueling outage.

These amendments resolve your immediate problem with level instrumentation on the accumulators but these amendments are not considered a final solution. The problem which caused the need to amend the TS is generic to Westinghouse pressurize water reactors (PWR). The Westinghouse Owners Group on Standard Technical Specifications will be requested to propose to the staff appropriate technical specifications for inoperable accumulator instrumentation channels to be made a part of the NRC Standard Technical Specifications for Westinghouse PWR. This should be completed before the restart of Unit 2 from the Unit 2 Cycle 4 refueling outage. You would then propose these new technical specifications to be added to the Sequoyah TS.

These amendments are being issued under the provisions of 10 CFR 50.91 without the normal 30-day public comment period after the Notice of Consideration of Issuance of an amendment is issued in the Federal Register.

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As explained in your application dated August 7, 1989, one water level channel on an accumulator for each unit is inoperable and the TS do not specifically address inoperable instrumentation channels for the accumulators. The Action statement for LCO 3.5.1.1 assumes the accumulator is inoperable and the action for an inoperable accumulator is to repair the cause of the inoperability within one hour or proceed to shut down the affected units. You concluded that the inoperable water level channel for each unit did not warrant shutting down the two units because the accumulators were still meeting the LCO using the remaining operable instrumentation channels. You requested emergency relief from the TS to prevent shutting down the two units.

As discussed in the enclosed Safety Evaluation, the Commission (1) granted you a Waiver of Compliance at 1:30 p.m. on August 7, 1989 for Sequoyah to not have to comply with Surveillance Requirement 4.5.1.1.2 until the staff could act on this application but no later than September 6, 1989 and (2) determined pursuant to 10 CFR 50.91 that an emergency situation exists and that failure to act on this application in a timely manner would result in the shutdown of a unit or units. We conclude that you have acted in good faith to promptly address the inoperability of the level channel for each unit but could not avoid the need for an emergency situation. We also conclude that the emergency situation at both units did not represent a significant hazard to the public health and safety.

A Notice of Issuance of these amendments will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

Dennis M. Crutchfield, Associate Director
for Special Projects
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 124 to License No. DPR-77
- 2. Amendment No. 113 to License No. DPR-79
- 3. Safety Evaluation

cc w/enclosures:
See next page

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Mr. Oliver D. Kingsley, Jr.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY
DOCKET NO. 50-327
SEQUOYAH NUCLEAR PLANT, UNIT 1
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 124
License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The applications for amendment by Tennessee Valley Authority (the licensee) dated August 7, 1989, as revised August 10, 1989, 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.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 124, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



B. D. Law, Director
TVA Projects Division
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 11, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 124

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf pages* are provided to maintain document completeness.

REMOVE

3/4 5-1
3/4 5-2

INSERT

3/4 5-1
3/4 5-2

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3/4.5.1 ACCUMULATORS

COLD LEG INJECTION ACCUMULATORS

LIMITING CONDITION FOR OPERATION

- 3.5.1.1 Each cold leg injection accumulator shall be OPERABLE with:
- The isolation valve open,
 - A contained borated water volume of between 7857 and 8071 gallons of borated water,
 - Between 1900 and 2100 ppm of boron, and
 - A nitrogen cover-pressure of between 385 and 447 psig.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION:

- With one cold leg injection accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- With one cold leg injection accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.
- # With one pressure or water level channel inoperable per accumulator, return the inoperable channel to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- # With more than one channel (pressure or water level) inoperable per accumulator, immediately declare the affected accumulator(s) inoperable.

*Pressurizer pressure above 1000 psig.

#Actions c and d are in effect until the restart of Unit 2 from the Unit 2 Cycle 4 refueling outage.

EMERGENCY CORE COOLING SYSTEMS (ECCS)

SURVEILLANCE REQUIREMENTS

- 4.5.1.1.1 Each cold leg injection accumulator shall be demonstrated OPERABLE:
- a. At least once per 12 hours by:
 1. Verifying, by the absence of alarms or by measurement of levels and pressures, the contained borated water volume and nitrogen cover-pressure in the tanks, and
 2. Verifying that each cold leg injection accumulator isolation valve is open.
 - b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the cold leg injection accumulator solution.
 - c. At least once per 31 days when the RCS pressure is above 2000 psig by verifying that power to the isolation valve operator is disconnected by removal of the breaker from the circuit.
 - d. At least once per 18 months by verifying that each cold leg injection accumulator isolation valve opens automatically under each of the following conditions:
 1. When an actual or a simulated RCS pressure signal exceeds the P-11 (Pressurizer Pressure Block of Safety Injection) setpoint,
 2. Upon receipt of a safety injection test signal.
- 4.5.1.1.2 Each accumulator water level and pressure channel shall be demonstrated OPERABLE:
- a. At least once per 31 days by the performance of a CHANNEL FUNCTIONAL TEST.
 - b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 113
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The applications for amendment by Tennessee Valley Authority (the licensee) dated August 7, 1989, as revised August 10, 1989, 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 as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 113, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



B. D. Law, Director
TVA Projects Division
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 11, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 113

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf pages* are provided to maintain document completeness.

REMOVE

3/4 5-1
3/4 5-2

INSERT

3/4 5-1
3/4 5-2

3/4.5 EMERGENCY CORE COOLING SYSTEMS

3/4.5.1 ACCUMULATORS

COLD LEG INJECTION ACCUMULATORS

LIMITING CONDITION FOR OPERATION

- 3.5.1.1 Each cold leg injection accumulator shall be OPERABLE with:
- a. The isolation valve open,
 - b. A contained borated water volume of between 7857 and 8071 gallons of borated water,
 - c. Between 1900 and 2100 ppm of boron, and
 - d. A nitrogen cover-pressure of between 385 and 447 psig.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION:

- a. With one cold leg injection accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With one cold leg injection accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.
- c. # With one pressure or water level channel inoperable per accumulator, return the inoperable channel to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- d. # With more than one channel (pressure or water level) inoperable per accumulator, immediately declare the affected accumulator(s) inoperable.

*Pressurizer pressure above 1000 psig.

#Actions c and d are in effect until the restart of Unit 2 from the Unit 2 Cycle 4 refueling outage.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS

4.5.1.1.1 Each cold leg injection accumulator shall be demonstrated OPERABLE:

- a. At least once per 12 hours by:
 1. Verifying, by the absence of alarms or by measurement of levels and pressures, the contained borated water volume and nitrogen cover-pressure in the tanks, and
 2. Verifying that each cold leg injection accumulator isolation valve is open.
- b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the cold leg injection accumulator solution.
- c. At least once per 31 days when the RCS pressure is above 2000 psig by verifying that power to the isolation valve operator is disconnected by removal of the breaker from the circuit.
- d. At least once per 18 months by verifying that each cold leg injection accumulator isolation valve opens automatically under each of the following conditions:
 1. When an actual or a simulated RCS pressure signal exceeds the P-11 (Pressurizer Pressure Block of Safety Injection) setpoint,
 2. Upon receipt of a safety injection test signal.

4.5.1.1.2 Each accumulator water level and pressure channel shall be demonstrated OPERABLE:

- a. At least once per 31 days by the performance of a CHANNEL FUNCTIONAL TEST.
- b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE 3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 124 TO FACILITY OPERATING LICENSE NO. DPR-77
AND AMENDMENT NO. 113 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By letters dated August 7 and 10, 1989, the Tennessee Valley Authority (TVA) requested a waiver of compliance with Surveillance Requirement (SR) 4.5.1.1.2 of the Sequoyah Nuclear Plant, Units 1 and 2, Technical Specification (TS). This SR applies to the water level and pressure instrumentation channels for the cold leg injection accumulators and requires that all these channels must be operable. TVA requested the waiver of compliance until the staff could act on an emergency TS change concerning the number of the water level and pressure channels for each accumulator that would be allowed to be inoperable.

These proposed amendments to the TS would temporarily add two additional Action statements for the Limiting Condition for Operation (LCO) 3.5.1.1, Cold Leg Injection Accumulator, of the Sequoyah Nuclear Plant, Units 1 and 2, Technical Specifications (TS). The two Action statements would state that (1) with one water level or pressure channel inoperable per accumulator, return the inoperable channel to operable status within 30-days or shut down the unit and (2) with more than one channel, water level or pressure, inoperable per accumulator, immediately declare the affected accumulators inoperable and enter Action statement "a" to return the inoperable channels to operable status within one hour or shut down the unit. These changes to the TS are temporary. They are only effective for both units from the date of this evaluation until the restart of Unit 2 from the Unit 2 Cycle 4 refueling outage. This is presently scheduled for late 1990.

On August 7, 1989, there was a water level channel on an accumulator for each unit which was inoperable. In its request, TVA stated that the TS do not specifically address the loss of only one instrumentation channel out of the two redundant channels on each accumulator. Each accumulator has two redundant pressure channels and two redundant water level channels. The Action statement for LCO 3.5.1.1 assumes the accumulator is inoperable and requires if the accumulator cannot be made operable within an hour the licensee shall shut down the affected unit. TVA concluded that the inoperable water level channel for the two respective accumulators did not warrant shutting down the two units because the affected accumulator for each unit was still meeting the LCO with

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the other water level channel which is operable. The water level channels could not be repaired in an hour. Therefore, TVA requested emergency relief from the TS to prevent shutting down the units.

As discussed below, the Commission (1) granted TVA a Waiver of Compliance at 1:30 p.m. on August 7, 1989 for Sequoyah to not have to comply with Surveillance Requirement 4.5.1.1.2 until the staff could act on this application but no later than September 6, 1989 and (2) determined pursuant to 10 CFR 50.91 that emergency conditions existed and these amendments should be implemented as soon as possible to prevent shutdown of Units 1 and 2. We concluded that TVA acted in good faith to promptly address the inoperability of the level channel for each unit but could not avoid the need for an emergency TS change.

By telephone call on August 11, 1989, TVA explained the status of the repairs to the inoperable water level channels. The inoperable channel for Unit 2 was returned to service on August 9, 1989. After returning this channel to service, it was determined that the redundant water level channel was inoperable. The redundant channel was reading slightly different from the channel which was returned to service -- the readings were within 5 percent -- and the cause for this was with the redundant channel. The inoperable channel for Unit 1 was returned to service on August 11, 1989. Therefore, emergency conditions still exist.

2.0 EVALUATION

The cold leg injection accumulators are four pressure vessels filled with borated water and pressurized with nitrogen gas. There is one accumulator for each cold leg of the reactor coolant system (RCS). During normal operation, each accumulator is isolated from the RCS by check valves. Should the RCS pressure fall below the accumulator pressure, as during an accident, the borated water in the accumulators is forced into each cold leg of the RCS. The accumulators are designed for the large break loss-of-coolant accident (LOCA).

The proposed changes are to add requirements to the TS to specifically address the loss of instrumentation channels for the accumulators. Each accumulator has four instrumentation channels: two redundant pressure channels and two redundant water level channels. These four channels are required in the NRC Standard Technical Specifications for Westinghouse pressurized water reactors (STSWPWR) to determine operability of the accumulators and are recommended in Regulatory Guide (RG) 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following An Accident." The STSWPWR and RG 1.97 apply to Sequoyah.

TVA has proposed that with the loss of one channel per accumulator, the unit may continue operating while the channel is being repaired. With only one channel being inoperable per accumulator, there is one parameter, pressure or water level, with redundant operable channels available and the other parameter with a single operable channel. Therefore, both the pressure and the water level of the accumulators can still be measured and TVA can still determine if the accumulator is operable. There is an alarm function on each channel so that the LCO setpoints for the accumulators will not be exceeded and this function will remain for both pressure and water level for each accumulator

although one channel is inoperable. If there is more than one accumulator of the four with a water level or a pressure channel that is inoperable, TVA is expected to address the possibility of a common mode failure and additional channels may in fact be inoperable.

TVA proposed that one channel of water level or pressure per accumulator may be inoperable for up to 30-days before the affected accumulator must be declared inoperable. This 30-day period is consistent with SR 4.5.1.1.2 for determining the operability of the channels and is consistent with the importance of the channels. The accumulators are a passive system with no active control functions. When the RCS pressure drops below the nitrogen pressure in the accumulator, the borated water in the accumulator is forced into the RCS cold legs. The redundant pressure and water level channels monitor the pressure and water level in each accumulator but do not perform a control or actuation function. They are Type D Category 2 channels in RG 1.97 in that they provide information to indicate the status of a safety system and have less stringent requirements imposed on them by the staff than on channels which have actuation functions as instrumentation channels in the reactor protection system.

The current TS on the accumulators are the same as in the STSWPWR and in the TS for many Westinghouse PWR; therefore, the proposed amendments may be considered as the solution for any PWR with such a problem as TVA is experiencing with the inoperable instrumentation channels on the accumulators at Sequoyah. The staff acts to avoid using the emergency license amendment provisions of 10 CFR 50.91 to issue such amendments. Therefore, these amendments, will be effective until the restart of Unit 2 from its Cycle 4 refueling outage. This will provide approximately 18-months for the staff to develop a generic solution to this problem which is applicable for all Westinghouse PWR. TVA is expected to submit these proposed changes following staff resolution of the generic issue.

The staff, based on its review, concludes that TVA's proposed changes are acceptable.

3.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA and the NRC staff have evaluated these proposed changes with regard to the determination of whether or not a significant hazards consideration is involved. The Commission has provided standards for a significant hazards consideration determination in 10 CFR 50.92(c). Therefore, in accordance with 10 CFR 50.92, such a determination has been made by the staff and is given below.

The proposed amendments will not involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed changes allow one of two instrumentation channels per accumulator to be inoperable. The remaining operable channel will provide the required indication of either pressure or water level in the accumulator to allow TVA to determine if the accumulator is itself operable in accordance with LCO 3.5.1.1. The accumulator is a passive system which does not rely on the instrumentation channels to perform its intended function during an accident.

The proposed amendments will not create the possibility of a new or different accident from any previously analyzed. The instrumentation channels only

provide information on the status of the accumulators and do not provide any control function for operation of the accumulators. These channels are not needed for the accumulators to perform their intended function during an accident.

These amendments do not significantly reduce a margin of safety. Although one channel per accumulator is inoperable, the remaining three channels are operable so that both the pressure and the water level of the accumulators are still being measured. The inoperable channel will be allowed to remain inoperable for only 30-days before the affected accumulator is itself declared inoperable and the unit is shut down. The inoperable channel does not prevent the affected accumulator from performing its function during an accident.

On August 10 and 11, 1989, the State of Tennessee was contacted by telephone and the proposed amendments were discussed. On August 11, 1989, the State of Tennessee had no comments on the determination that the amendments were not a significant hazards consideration and could be issued without a prior hearing. No public comments were received by close of business August 11, 1989.

4.0 FINDINGS THAT THE EMERGENCY WARRANTED AMENDMENTS WITHOUT PRIOR NOTICE

TVA's application for an emergency TS change pursuant to 10 CFR 50.91 has been timely. TVA stated that the need for the proposed changes was only recently identified and it has pursued the changes on a priority basis. The staff concludes that failure to grant the proposed changes in a timely manner would cause an unnecessary shutdown of both Sequoyah units. We find that TVA could not reasonably have avoided the situation causing the TS to be changed, that TVA has responded in a timely manner and that TVA has not delayed its application to take advantage of the emergency license amendment provisions of 10 CFR 50.91. Accordingly, the staff concluded that TVA satisfied the requirements of 10 CFR 50.91(a)(5) and that a valid emergency existed.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendments involve 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 made a final no significant hazards consideration finding with respect to these amendments. Accordingly, the amendments meet 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 nor environmental assessment need to be prepared in connection with the issuance of these amendments.

6.0 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, and (2) such activities will

be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principle Contributor: Jack Donohew

Dated: August 11, 1989