Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609

APR 0 4 1994

TVA-BFN-TS-322, Revision 1 10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter Of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 - TECHNICAL SPECIFICATION (TS) NO. 322, REVISION 1 - ELIMINATION OF MAIN STEAM LINE RADIATION MONITOR (MSLRM) SCRAM AND ISOLATION FUNCTIONS

In accordance with the provisions of 10 CFR 50.4 and 50.90, TVA is submitting a request for an amendment (TS-322, Revision 1) to licenses DPR-33, DPR-52, and DPR-68 to change the BFN Technical Specifications for Units 1, 2, and 3. This submittal supersedes the March 25, 1993, TS-322 submittal. The March 25, 1993 submittal requested a proposed amendment to eliminate the reactor scram and the main steam line isolation functions associated with the MSLRMs. This submittal requests a proposed amendment to eliminate the remaining isolation functions associated with the MSLRMs as well.

The proposed amendment revises TS Sections 3.1./4.1, 3.2/4.2, 3.7/4.7, and 3.8/4.8 to delete the scram and isolation functions associated with the MSLRMs. The MSLRMs currently initiate the following: 1) reactor scram, 2) main steam isolation valves (MSIV) closure, 3) main steam line drain valves closure, 4) reactor recirculation sample line valve closure and, 5) main condenser mechanical vacuum pump isolation and trip. The elimination of the reactor scram and

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the MSIV closure function is based on the NRC approval of General Electric Licensing Topical Report, NEDO-31400, "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Line Isolation Valve Closure Function and Scram Function of the Main Steam Line Radiation Monitor", prepared for the Boiling Water Reactor Owners Group. The elimination of the remaining isolation functions is based on TVA BFN site specific dose calculations. NEDO-31400 and the additional dose calculations show that the isolation functions and reactor scram function associated with the MSLRMs are not required to ensure compliance with the radiation dose guidelines of 10 CFR Part 100. The elimination of the MSLRMs scram and isolation functions provides improved availability of the main condenser for removal of decay heat and reduces the possibility of inadvertent reactor scrams.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The BFN Plant Operations Review Committee and the BFN Nuclear Safety Review Board have reviewed the proposed change and determined that operation of BFN Units 1, 2, and 3 in accordance with the proposed change will not endanger the health and safety of the public. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Alabama State Department of Public Health.

Enclosure 1 to this letter provides the description and evaluation of the proposed change. This includes TVA's evaluation that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Enclosure 2 contains copies of the appropriate TS pages from Units 1, 2, and 3 marked-up to show the proposed change. Enclosure 3 forwards the revised TS pages for Units 1, 2, and 3 that incorporate the proposed change. Enclosure 4 is a list of commitments contained in this letter.

This amendment is needed to support Unit 3 restart. By letter dated December 23, 1993, TVA provided needed dates for NRC approval of those TS changes needed to support Unit 3 restart. TVA requests NRC approval of this enclosed change by April 26, 1995. As noted in the December 23, 1993, letter

any significant changes to this need date will be communicated through the staff's Project Manager for BFN. TVA requests that the revised TS be made effective within 30 days of NRC approval.

If you have any questions about this change, please telephone me at (205) 729-2636.

Sincerely,

Pedro Salas
Manager of Site Licensing

Enclosures
cc: See page 4

Subscribed and sworn to before me
on this 4th day of April 1994.

Barbara A. Blanton
Notary Public

My Commission Expires 10-30-94

My Commission Expires _____

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE
TS-322, REVISION 1
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

I. DESCRIPTION OF THE PROPOSED CHANGE

The proposed amendment revises the TS to delete the scram and trip closure functions associated with the Main Steam Line Radiation Monitors (MSLRMs). MSLRMs measure the radiation level present in the main steam lines. If the MSLRMs high radiation level setpoint is exceeded, reactor scram and Main Steam Isolation Valve (MSIV) closure are initiated. Additionally, the MSLRM high radiation signal is used for main condenser mechanical vacuum pump (MVP) de-energization, MVP line isolation, main steam line drain valve (MSLDV) closure, and reactor water sample line valve closure. On the TS pages affected by the proposed change, the words "operable" and "operability" are changed to upper case and "INOPERABLE" is changed to lower case.

The following is a detailed description of the proposed change for Units 1, 2, and 3.

1. Delete the Main Steam Line (MSL) scram function from Table 3.1.A on page 3.1/4.1-4 (Units 1 and 2) and page 3.1/4.1-3 (Unit 3).

2. Delete notes 9 and 20 from Table 3.1.A and revise operable to upper case (Unit 1 only) and INOPERABLE to lower case on page 3.1/4.1-6 (Units 1 and 2) and page 3.1/4.1-5 (Unit 3).

3. Delete the MSL High Radiation functional test requirements from Table 4.1.A on page 3.1/4.1-9 (Units 1 and 2) and page 3.1/4.1-8 (Unit 3).

4. Delete the MSL High Radiation calibration requirements from Table 4.1.B on page 3.1/4.1-11 (Units 1 and 2) and page 3.1/4.1-10 (Unit 3).

5. Delete note 3 from Table 4.1.B and revise operable to upper case (Unit 1 only) on page 3.1/4.1-12 (Units 1 and 2) and page 3.1/4.1-11 (Unit 3).

6. Delete the discussion of MSL High Radiation scram from the Bases on page 3.1/4.1-15 (Units 1 and 2) and page 3.1/4.1-14 (Unit 3).

7. Delete the MSL High Radiation isolation function from Table 3.2.A on page 3.2/4.2-8 (Units 1, 2, and 3).

8. Delete note 13 from Table 3.2.A on page 3.2/4.2-13 (Units 1, 2, and 3).

9. Delete MSL High Radiation surveillance requirements from Table 4.2.A on page 3.2/4.2-40 (Units 1 and 2) and 3.2/4.2-39 (Unit 3).

10. Delete discussion of the MSL High Radiation isolation from the Bases and revise operable to upper case (Units 1 and 3) on pages 3.2/4.2-66 and 67 (Unit 1), page 3.2/4.2-67 (Unit 2) and 3.2/4.2-65 and 66 (Unit 3).

11. Delete discussion of the MSL High Radiation Group 1 isolation from the Bases on Page 3.7/4.7-34 (Units 1 and 2) and 3.7/4.7-33 (Unit 3).

12. Delete the limiting condition for operation, and the surveillance requirements for the Mechanical Vacuum Pump on page 3.8/4.8-4 (Units 1, 2 and 3).

13. Delete the discussion of the Mechanical Vacuum Pump from the Bases on page 3.8/4.8-9 (Units 1, 2, and 3).

II. REASON FOR THE PROPOSED CHANGE

The proposed amendment revises the TS to delete the scram and isolation functions associated with the MSLRMs. The isolation functions and reactor scram function of the MSLRMs are not required to ensure compliance with the radiation dose guidelines of 10 CFR Part 100 for any design basis accidents. The elimination of the reactor scram and MSIV isolation function provides improved availability of the main condenser for removal of decay heat and reduces the possibility of inadvertent reactor scrams. Since the MSLDV closure, the reactor recirculation sample line valve closure, and the main condenser MVP isolation and trip associated with the MSLRMs are not required to ensure compliance with the radiation dose guidelines, they do not have an accident mitigation function. Thus, these remaining functions can be removed from the plant TS. TVA is planning a modification to the logic of the MSLRMs to physically eliminate the reactor scram and isolation functions except the main condenser MVP isolation and trip

function. The modification is scheduled prior to Unit 3 restart and this proposed TS change is needed to support the restart of Unit 3.

The words "operable" and "operability" are changed to upper case and "INOPERABLE" is changed to lower case. These changes are made for a consistent use of these words. This use follows the standard convention of using upper case for TS definition terms.

III. SAFETY ANALYSIS

The proposed amendment revises the TS to delete the scram and isolation functions associated with MSLRMs. The MSLRMs currently initiate the following: 1) reactor scram, 2) MSIV closure, 3) MSLDV closure, 4) reactor recirculation sample line valve closure, and 5) main condenser MVP isolation and trip. A review of design basis accidents described in BFN Updated Final Safety Analysis Report (UFSAR) Chapter 14 was performed. Based on this review, TVA determined that the MSLRM functions of reactor scram and primary containment isolation system (PCIS) group 1 isolation were utilized only in the analysis for mitigating a Rod Drop Accident (RDA). Therefore, this safety analysis only addresses mitigation of an RDA without MSLRM functions. In addition, NEDO-31400 addresses the elimination of the MSLRM functions and the resulting effects/consequences of an RDA only since "this is the only design basis event which assumes that the primary vessel isolation signal comes from the MSRLM." The applicability of NEDO-31400 to elimination of the MSLRM functions is discussed below.

General Electric (GE) prepared Licensing Topical Report, NEDO-31400, "Safety Evaluation For Eliminating The Boiling Water Reactor Main Steam Line Isolation Valve Closure Function and Scram Function of the Main Steam Line Radiation Monitor," dated May 1987, for the Boiling Water Reactor Owner's Group (BWROG). NEDO-31400 justified the elimination of the MSLRM scram and MSIV closure function. The NRC Safety Evaluation Report (SER) dated May 15, 1991, documented NRC acceptance of NEDO-31400 for use as a reference in a licensee application provided the following three conditions in the SER are satisfied:

- Demonstrate that the assumptions with regard to input values (including power per assembly, Chi/Q, and decay times) made in the generic analysis bound those for the specific plant.

- Include sufficient evidence (implemented or proposed operating procedures, or equivalent commitments) to provide reasonable assurance that increased significant

levels of radioactivity in the main steam lines will be controlled expeditiously to limit both occupational doses and environmental releases.

- Standardize the MSLRM and offgas radiation monitor alarm setpoint 1.5 times the nominal nitrogen-16 background dose rate at the monitor locations, and commit to promptly sample the reactor coolant to determine possible contamination levels in the plant reactor coolant to determine the need for additional corrective actions, if the MSLRM or offgas radiation monitors or both exceed their alarm setpoints.

With regard to the above NRC SER conditions, TVA's compliance position for BFN is demonstrated as follows:

- TVA has determined that the assumptions made with regard to the input values (e.g., dose calculation, power per assembly and fission product release input values) in the RDA analysis presented in NEDO-31400 bound those for the BFN RDA. Table A provides a comparison of the key input parameters for the BFN RDA analysis and the NEDO-31400 RDA analysis.

- TVA has procedures in place which specify the actions required in the event of high radiation in the main steam lines. The initial operator actions taken in response to MSLRMs alarm conditions are outlined in existing BFN Alarm Response Procedure, Panel 9-3. This procedure provides immediate operator actions and refers to several other existing procedures that provide detailed guidance for investigating the cause of the alarms, and taking appropriate actions to reduce activity or shutdown the plant.

  In addition to the MSLRMs, BFN has three other radiation monitor subsystems that provide indication of the increased reactor coolant activity (see UFSAR section 7.12). These three subsystems are the air ejector offgas radiation monitors (pretreatment and post treatment), the main stack radiation monitor, and the wide range gaseous effluent radiation monitor. Each of these subsystems provides an alarm to operators indicating increasing radioactivity levels. Procedures are in place to specify the actions required if one of these monitors alarm. Additionally, the offgas post-treatment subsystem provides trips to limit the release to the environs.

- The MSLRMs are set to alarm at 1.5 times normal full-power background which includes the nitrogen-16 contribution. An alarm response procedure requires prompt sampling of the reactor coolant to determine possible contamination levels and the need for

additional corrective actions if the MSLRM or offgas radiation monitors or both exceed their alarm setpoints. The pretreatment offgas radiation monitor alarm setpoint is sufficient to provide an early indication of potential release problems, or an early indication of fuel problems.

Using the suggested 1.5 times nominal N-16 background dose rate to determine an action level for the pretreatment offgas radiation monitor is inappropriate for BFN. The pretreatment offgas monitor is intended to be able to identify small changes in the offgas gross fission-product concentration, and thus it is designed to be in a low background area. It is located within the process path at a point which allows short-lived activation gases (e.g., nitrogen-16) to decay to extremely low levels. Thus, using nitrogen-16 activity level as a basis for setting an action level for potential fuel failure is inappropriate.

Two alarm values (high and high/high alarm values) are associated with the offgas pretreatment radiation monitors. The high/high alarm is set to limit the offgas release rate at the stack to approximately 1 Ci/sec. The high alarm is set to one-half the high/high alarm setpoint. These alarm setpoints ensure that the NEDO-31400 Section 7 assumptions for the offgas pretreatment monitor are met, since t NEDO stated that a change associated with a noble as release rate in the range of 1 to 10 Ci/sec. would be promptly alarmed. Thus TVA considers that the offgas pretreatment monitor will give early indication of problems with the fuel.

The post-treatment offgas radiation monitor alarm and trip setpoints are set in accordance with the Offsite Dose Calculation Manual which limits the releases to the environs in accordance with TS 6.8.4.1.

The basis for eliminating the five MSLRM functions is discussed below. The elimination from TS of the reactor scram and MSIV isolation function associated with the MSLRMs is justified by the NRC approved NEDO-31400. For the other three functions associated with the MSLRMs, TVA has provided justification to support the elimination of these items from TS.

A. <u>Reactor Scram</u>

A review of the BFN UFSAR determined that the RDA analysis utilizes the Average Power Range Monitors (APRMs) for initiating a reactor scram in lieu of the

MSLRMs. The APRMs will scram the reactor during an RDA upon detection of high neutron flux.

In response to NRC questions on NEDO-31400, the BWROG reviewed the BWR designs of the participating utilities, including BFN. This review showed that APRMs detect an RDA and scram the reactor within approximately 5 seconds following event initiation. By comparison, about 13 to 17.5 seconds would elapse before the MSLRMs initiated a reactor scram. Actual MSLRMs response time will vary according to core transport time (i.e., core flow rate), steam dome evacuation time (i.e., steam flow rate), and detector location along the main steam lines. Therefore, the plant response to an RDA would be unchanged even with the removal of the MSLRMs scram (i.e., the modes for reactor scram and timing of the scram remain the same). Based on this, the MSLRMs scram function is not required to mitigate an RDA and can be eliminated from the plant TS.

B. MSIV Closure

NEDO-31400 provides the resulting RDA offsite doses (without the MSIV isolation and scram functions) as functions of Atmospheric Dispersion Coefficients (CHI/Q) and holdup times in the form of graphs. Individual utilities may determine their respective RDA offsite doses by applying site specific CHI/Q values and holdup times. The assumptions made in NEDO-31400 RDA analysis must be shown to bound the corresponding parameters for the site.

The BFN RDA analysis is presented in UFSAR section 14.6.2 and GE Licensing Topical Report NEDE-24011-P-A, "GESTAR II." These analyses assume MSIV closure such that only a limited amount of the RDA source term reaches the condenser prior to MSIV closure. The resulting BFN RDA offsite doses (see Table B) were determined assuming continuous operation of the MVP exhausting only the limited amount of RDA source term that reached the condenser (i.e., MVP does not isolate).

The UFSAR BFN RDA and NEDE-24011-P-A RDA analysis were compared with the NEDO-31400 RDA analysis. This comparison review noted that the NEDO-31400 analysis assumed the MSIVs do not isolate but the MVP is isolated.

If the MVP isolation occurs, the NEDO-31400 RDA analysis and assumptions bound that for BFN. A comparison of the key input parameters is shown in Table A. Utilizing the NEDO-31400 offsite dose graphs

and the BFN CHI/Q values and holdup times, the resulting BFN RDA offsite doses are well within the required limits specified in Standard Review Plan 15.4.9 (See Table B, cases 1 & 2).

C. Mechanical Vacuum Pump (MVP) Trip and Isolation

The MSLRMs initiation of MVP isolation and trip will remain functional but it does not need to be considered as a TS requirement. MVP trip and isolation function was not designed or installed as a safety related function at BFN and is not credited in any accident analyses. Furthermore, this function does not meet any of the four criteria for inclusion in TS as described in the NRC "Final Policy Statement on Technical Specifications." The MVP isolation and trip function is currently in plant procedures which are controlled by the 10CFR50.59 process.

TVA has performed an additional BFN offsite dose calculation with the same assumptions and input parameters as NEDO-31400 except the MVP continues to operate. The resulting offsite doses (see Table B, cases 3 & 4) from this calculation are also well within the required Standard Review Plan (SRP) 15.4.9 limits.

Therefore, based on the NEDO-31400 RDA analysis and the additional BFN offsite dose calculation, MVP trip and isolation function of the MSLRMs is not required to mitigate an RDA and can be eliminated from the plant TS.

D. Main Steam Line Drain Valve (MSLDV) Closure

The three-inch main steam line drain header at BFN discharges directly to the condenser. Since the NEDO-31400 analysis and the additional BFN offsite dose calculation is based on the entire RDA source term being instantaneously deposited into the condenser via the 24" main steam lines, the main steam line drains cannot increase the source term in the condenser nor can they create an additional release path if they are not isolated. Therefore, the MSLDV closure function of the MSLRMs is not required to mitigate an RDA and can be eliminated from the plant TS.

E. Reactor Recirculation Sample Line Isolation

The MSLRMs also provide an isolation signal to the primary containment isolation valves on the reactor recirculation sample line. The 3/4" reactor recirculation sample line is connected to the discharge of a reactor recirculation pump and is

normally isolated by its primary containment isolation valves. The sample line is used as an alternate path for monitoring the conductivity of the reactor coolant. This line is normally closed unless the normal sample paths from the Reactor Water Cleanup (RWCU) demineralizers are out of service. The RWCU system has three sample lines which are the normal means for continuously monitoring the reactor coolant per TS 4.6.B.

The recirculation sample line currently receives a PCIS Group 1 isolation signal on low-low-low reactor water level, main steam line high radiation, or main steam line break indicators (i.e., high MSL flow, high MSL area temperature, or low MSL pressure). If the MSLRM function is eliminated from the PCIS Group 1 logic, the recirculation sample lines would not isolate following an RDA, unless low-low-low reactor water level is reached. Recognizing the low-low-low level may not occur following an RDA, TVA has analyzed the consequences of not isolating the recirculation sample line following an RDA.

The three RWCU sample lines and the recirculation sample line feed the sample station. Both RWCU demineralizers would have to be out of service before the normal sample lines would not be available. Only then would the alternate sample line from the recirculation system be required to be open. These four sample lines feed the sample station which consists of various monitors and analyzers. The sample station is protected from overpressurization by pressure control valves, sample coolers, and relief valves (relief valves are in Unit 3 only). These overpressurization protection devices are not safety related. If the non-safety related overpressurization protection devices fail following an RDA, the result could potentially overpressurize the sample station piping or instruments and produce a continuous blowdown of reactor coolant into the reactor building.

Even though this scenario is deemed as very improbable, TVA has analyzed the radiological consequences. TVA has performed an analysis to show that the fission product release to the reactor building through a sample line break following an RDA would initiate isolation of secondary containment and start the Standby Gas Treatment System (SGTS) on high radiation in the reactor building exhaust ducts. This analysis contained several conservative assumptions with respect to the fission product released from the fuel and the transportation of the fission product within the vessel and out of the sample line. Fission products which may exit the secondary containment

prior to SGTS initiation have been considered and are treated as a ground level release. Once SGTS is initiated, the releases are modeled from the plant stack. The resulting offsite doses from the reactor coolant sample line release path are well below the 10 CFR 100 limits and the SRP 15.4.9 guidelines (See Table B, cases 5 & 6).

With regard to other Design Basis Accidents (DBAs), isolation of the recirculation sample line would occur on one of the remaining PCIS Group 1 signals. High Radiation in the Main Steam Lines (fuel failures) would be preceeded by a low-low-low water level PCIS Group 1 isolation since significant fuel failure only results from uncovering the fuel. The equipment required for Units 2 and 3 to mitigate an RDA has been reviewed and evaluated to ensure their environmental qualification is not adversely affected by the release to the reactor building from the recirculation sample line. The Unit 1 equipment required to mitigate an RDA will be reviewed and evaluated prior to the restart of Unit 1.

Based on this, the reactor recirculation sample line isolation function of the MSLRM is not required to mitigate an RDA and can be eliminated from the plant TS.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA has concluded that operation of Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3 in accordance with the proposed change to the technical specifications does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

A. The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The probability of occurrence of previously evaluated accidents is based on initial conditions and assumptions which are not dependent directly or indirectly on the functions of the Main Steam Line Radiation Monitors (MSLRMs). Elimination of the MSLRM scram and isolation functions does not affect the operation of the other Reactor Protection System or Primary Containment Isolation System functions required to mitigate a Rod Drop Accident (RDA). Also, eliminating the MSLRM functions does not affect the Control Rod Drive System and, hence, cannot increase the probability of RDA. The proposed change

does not involve any increase in the probability of an previously evaluated accident.

There is no significant increase in the consequences of any previously evaluated accident. Elimination of the MSLRM reactor scram and isolation functions could potentially increase the amount of radioactivity released following an RDA. However, the potential increase in release from those previously determined is not significant. Both the NEDO 31400 analysis and the additional BFN dose calculations determined that the resulting doses (See Table B) remain well below the limits of Standard Review Plan (SRP) 15.4.9 and 10 CFR 100.

B. <u>The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated</u>.

This proposed change deletes the reactor scram and isolation functions of the MSLRMs. The sole purpose of these functions is to assist in mitigating the consequences of an RDA, a previously analyzed event. This event is terminated by a high flux scram.

The NEDO-31400 RDA analysis without the MSLRM scram and MSIV closure functions has been reviewed and accepted by the NRC. An RDA without the MSLRM MVP isolation function has been previously reviewed by the NRC as documented in section 14.6.2 of the Updated Final Safety Analysis Report (UFSAR). An RDA without the MSLRM recirculation sample line isolation coupled with a sample line break is no different than that if the normal RWCU sample path is in service (see Section III.C). However, TVA has evaluated the consequences of this event and determined the MSLRM sample line isolation function is not required to maintain radioactive releases within the acceptable limits.

The NEDO-31400 RDA analysis and the additional BFN offsite dose calculations show that the elimination of the MSLRM functions does not create the possibility of a new or different kind of accident from any accident previously evaluated.

C. <u>The proposed amendment does not involve a significant reduction in a margin of safety</u>.

A reliability assessment of the elimination of the MSLRM scram function on reactivity control failure frequency and core damage frequency was performed as part of the NEDO-31400 analysis. The results of the NEDO-31400 analysis indicated a negligible increase

in reactivity control failure frequency associated with deletion of the MSLRM scram function. However, this increase is offset by a reduction in the frequency of transient initiating events (inadvertent scrams). This reduction in transient initiating events represents a net reduction in core damage frequency of 0.3 percent.

BFN TS Bases 3.2 states that the MSLRMs are provided to detect gross fuel failures as in an RDA and provide main steam isolation valve closure to maintain radiological releases below the 10 CFR 100 limits. The BFN offsite dose calculations and the NRC's Safety Evaluation Report approving the NEDO-31400 RDA analysis document that the potential radiological release consequences following an RDA without the MSLRMs reactor scram and isolation functions are still well within the 10 CFR 100 limits. Thus, this change will not result in a significant reduction in a margin of safety.

V. ENVIRONMENTAL IMPACT CONSIDERATION

As shown above, the proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposure. Therefore, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

Table A

Comparison of Key Analysis Input Values*

Parameters	BFN FSAR	NEDO-31400A
Power	0.109 MW/Rod ** (105%)	0.12 MW/Rod (105%)
Failed Fuel Rods	850 (FSAR pg 14.6-3 and GESTAR II, NEDE-24011-P-A)	850
Operation	1000 days (FSAR pg 14.6-8)	Long Term
Releases (non melt) (melted)	10% Noble 10% Iod 100% Noble 50% Iod	10% Noble 10% Iod 100% Noble 50% Iod
CHI/Q Ground (EAB)	1.22×10^{-4} sec/m^3 (FSAR Table 14.6-7)	2.5×10^{-3} sec/m^3
CHI/Q Fumigation	2.4×10^{-5} sec/m^3	N/A
CHI/Q Elevated (EAB)	9.70×10^{-7} sec/m^3 (FSAR Table 14.6-7)	3.0×10^{-4} sec/m^3
Holdup (Delay Time)	7.3 days for Xenon 9.7 hours for Kr (FSAR pg 9.5-5)	Graphs provided for holdup times of 0-60 hours for Kr and 0-60 days for Xenon

* The values in this table are with regard to a RDA and are based on a design limit enthalpy of 280 cal/gm.

** Calculated as: (3293 x 1.05 x 1.5)MW / (764 x (64 - 2)) rods = 0.109 MW/rod

EAB - Exclusion area boundary

TABLE B
Comparison of Off Site Doses

CRDA	Thyroid Dose (rem)	Whole Body Dose (Rem)	Case Number
10 CFR 100 limits	300	25	N/A
SRP 15.4.9 Appendix A Acceptance Criteria (well within) (25% 10 CFR 100)	75	6	N/A
SRP 15.4.9 Appendix A Review Procedure Guidelines (10% 10 CFR 100)	30	2.5	N/A
BFN FSAR Limited Core (7 x 7 with MVP exhausting	0.001	0.012	N/A
GESTAR II Core (8x8 with MVP exhausting)	0.002	0.0024	N/A
NEDO-31400 Graph BFN CHI/Q (with MSIV closure) (with MVP trip)	0.49	0.035	1
NEDO-31400 Graph BFN CHI/Q & delay time (w/o MSIV closure) (with MVP trip)	0.49	1.4	2
NEDO-31400 Source Term with MVP exhausting (EAB)	15.8	2.42	3
NEDO-31400 Source Term with MVP exhausting (LPZ)	9.37	1.36	4
NEDO-31400 Source Term with recirc sample line break & MVP exhausting (EAB)	18.1	2.43	5
NEDO-31400 Source Term with recirc sample line break & MVP exhausting (LPZ)	12.6	1.37	6

EAB - Exclusion area boundary
LPZ - Low population zone