ATTACHMENT

PROPOSED TECHNICAL SPECIFICATION

IN THE MATTER OF AMENDING

LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT TWO

DOCKET NO. 50-368

DESCRIPTION OF PROPOSED CHANGES

The proposed amendment would change the following ANO-2 Technical Specifications (TS):

- Index is being revised to reflect changes and to correct three typographical errors.
- Section 1.13 reflects a revised definition of SHUTDOWN MARGIN.
- Section 1.38 is being added to the Definitions section to define the CORE OPERATING LIMITS REPORT (COLR).
- Sections 3.1.1.1 and 4.1.1.1.1 change the specific shutdown margin requirement of 5.5% $\Delta k/k$ to that specified in the COLR.
- Sections 3/4.1.1.2 change the specific shutdown margin requirement of 5.0% $\Delta k/k$ to that specified in the COLR.
- Section 3.1.1.4 changes specific Moderator Temperature Coefficient (MTC) limits to those specified in the COLR except for the maximum upper design limits.
- The action statements of sections 3.1.2.2, 3.1.2.4, 3.1.2.6, and 3.1.2.8 change the specific shutdown margin of 5.0% $\Delta k/k$ to that specified in the COLR.
- Section 3.1.3.1 changes reference to Figure 3.1-1A for required power reduction after a Control Element Assembly (CEA) deviation to reference the COLR.
- Section 3.1.3.1 and 3.1.3.6 change references to Figure 3.1-2 for CEA insertion limits versus thermal power to reference the COLR.
- Section 3.1.3.7 changes reference to Figure 3.1-3 for the part length CEA insertion limit versus thermal power to reference the COLR.
- Sections 3.2.1 and 4.2.1.2 change reference to Figure 3.2-1 for the allowable peak linear heat rate versus burnup to reference the COLR.
- Section 3.2.3 changes specific azimuthal power tilt limit to that specified in the COLR.
- Sections 3.2.4 and 4.2.4.2 change reference to Figures 3.2-2 and 3.2-3 for Departure from Nucleate Boiling Ratio (DNBR) margin operating limit with Core Operating Limits Supervisory System (COLSS) out of service to reference the COLR.
- Section 3.2.7 changes the specific Axial Shape Index (ASI) limits to those specified in the COLR.
- Bases sections 3/4.1.1, 3/4.1.2, 3/4.2.1, 3/4.2.3 and 3/4.2.4 are being updated to reflect the changes made to the individual specifications.
- The text of sections 3/4.1, 3/4.2, and 6.0 has been rearranged to remove pages deleted by previous amendments.
- Section 6.9.5 is being added to describe the requirements for the Core Operating Limits Report (COLR).

The pages would be revised as follows:

Remove	Insert
I	I
II	II
IV	IV
V	V
XVII	XVII
1-1	1-1
1-2	1-2
1-3	1-3
1-4	1-4
1-5	1-5
1-6	1-6
1-7	1-7
3/4 1-1	3/4 1-1
3/4 1-3	3/4 1-3
3/4 1-5	3/4 1-5
3/4 1-8	3/4 1-8
3/4 1-10	3/4 1-10
3/4 1-12	3/4 1-12
3/4 1-15	3/4 1-15
3/4 1-17	3/4 1-17
3/4 1-18	3/4 1-18
3/4 1-19a	----
3/4 1-25	3/4 1-25
3/4 1-27	3/4 1-27
3/4 1-28	----
3/4 1-29	----
3/4 2-1	3/4 2-1
3/4 2-2	3/4 2-2
3/4 2-3	3/4 2-3
3/4 2-4	3/4 2-4
3/4 2-5	3/4 2-5
3/4 2-6	3/4 2-6
3/4 2-7	3/4 2-7
3/4 2-7a	----
3/4 2-8	3/4 2-8
3/4 2-9	3/4 2-9
3/4 2-10	3/4 2-10
3/4 2-10a	----
3/4 2-11	----
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3/4 2-14	----
B 3/4 1-1	B 3/4 1-1
B 3/4 1-2	B 3/4 1-2
B 3/4 1-3	B 3/4 1-3
B 3/4 2-1	B 3/4 2-1
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B 3/4 2-3	B 3/4 2-3
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BACKGROUND

Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications", encouraged licensees to remove cycle-specific parameter limits from their Technical Specifications and place them in a formal report provided the limits are developed using NRC-approved methodologies. This involves the addition of an administrative reporting requirement to submit the formal report on a reload cycle dependent basis and modifications to Technical Specifications to replace these limits with a reference to the defined formal report. These proposed changes will, in the future, remove an unnecessary administrative burden on the licensee and the NRC to prepare and review reload license amendments.

The current ANO-2 Technical Specification definition of shutdown margin states that it is the amount of reactivity by which the reactor is subcritical assuming all full length shutdown and regulating CEAs are fully inserted except for the single CEA of highest reactivity worth. This CEA is assumed to be fully withdrawn. Entergy Operations proposes to revise this definition to be consistent with NUREG-1432, Revision 0, "Revised Standard Technical Specifications (RSTS) for CE Plants" to allow use of an all CEAs inserted shutdown margin. The use of this revised definition will reduce the quantity of borated water needed during a plant shutdown to assure compliance with the current requirement. In reducing the quantity of borated water, the cost associated with processing it during a plant shutdown will be reduced.

DISCUSSION OF CHANGE

This amendment request removes cycle-specific core operating limits from the ANO-2 Technical Specifications in a manner consistent with the guidance provided in Generic Letter 88-16. These cycle-specific limits will be placed into a formal report called the CORE OPERATING LIMITS REPORT (COLR). The limits that are removed from Technical Specifications will not change for the current cycle of operation (Cycle 10). They will only be transferred into the COLR. The Technical Specifications that are affected will refer the user to the COLR for that particular limit or setpoint when needed. These limits and setpoints are calculated as a part of the reload report for each cycle for which a 10CFR50.59 review will be performed. The analytical techniques employed in the analysis have been previously approved by the NRC and referenced in the COLR. The COLR will be submitted to the NRC to provide the cycle-specific parameters. An amendment allowing a similar approach was granted to the Palo Verde Nuclear Generating Station by the NRC on December 30, 1992.

Each accident analysis addressed in the ANO-2 Safety Analysis Report (SAR) has been considered in the reload report for a particular cycle. This is done with respect to changes for any cycle-specific parameters to ensure that thermal performance during hypothetical transients is acceptable. For core reloads, the margins of safety for fuel system design, nuclear design, and thermal-hydraulic design are addressed in the reload report. The applicable limits and setpoints are determined to be within allowable limits and requirements for acceptable operation for a particular cycle.

The following discusses the major Technical Specifications impacted by the proposed amendment:

The shutdown margin definition of Technical Specification 1.13 is being revised to be consistent with NUREG-1432 Revision 0. This revised definition will allow use of an all CEAs inserted shutdown margin when verified by two independent means. The shutdown margin definition includes use of plant specific requirements allowed by RSTS. The RSTS statement "In Modes 1 and 2, the fuel and moderator temperatures are changed to the [nominal zero power design level]". This statement is not being included in the ANO-2 shutdown margin definition because it is not applicable to the ANO-2 shutdown margin calculation method. ANO-2 verifies shutdown margin in Modes 1 and 2 in accordance with Technical Specification 4.1.1.1.1.b by verifying that the CEA group withdrawal is within the Transient Insertion Limits of Specification 3.1.3.6. The requirements of the shutdown margin in RSTS have been compared with the ANO-2 Technical Specifications. The ANO-2 currently specified shutdown margin Technical Specification actions and surveillance requirements are more restrictive than those specified in RSTS and are not being revised at this time.

The shutdown margin requirements of Technical Specifications 3.1.1.1 and 3.1.1.2 ensure that the reactor remains subcritical following a design basis accident or anticipated operational occurrence. The shutdown margin could change from cycle to cycle as a result of reload fuel management. The requirements related to shutdown margin are evaluated each cycle as a part of the reload analyses. The action statements of Technical Specifications 3.1.2.2, 3.1.2.4, 3.1.2.6, and 3.1.2.8 list specific shutdown margin requirements which will be consistent with that specified in the COLR.

The MTC limits of Technical Specification 3.1.1.4 are a strong function of the core reload design as well as core burnup. The reload analyses performed each cycle ensure that the MTC is bounded by the safety analysis assumptions. The MTC limits defined in the Technical Specifications are maximum upper design limits. Actual operating limits are specified in the COLR.

For Technical Specification 3.1.3.1, CEA position for movable control assemblies, the cycle-specific safety analyses include the evaluation of CEA misoperation events to ensure that adequate margin is provided in the event of a CEA misalignment. Cycle-specific core physics parameters are input to the safety analyses to derive acceptable limits. A bounding limits curve, previously specified as Technical Specification Figure 3.1-1A, will be relocated to the COLR.

The power dependent insertion limits provided by Technical Specifications 3.1.3.6 and 3.1.3.7 for regulating and part length CEA insertion limits, respectively, ensure that the core is operated within the initial condition assumptions used in the safety analyses. The limits can change from cycle to cycle to ensure that the results of the safety analyses are acceptable. The limits impact the cycle-specific safety analyses since they define an initial condition analysis range for CEA position. The CEA positions are used to determine the range of CEA-related physics parameters to be used in the safety analyses.

The linear heat rate limit provided by Technical Specification 3.2.1 ensures that the peak fuel cladding temperature will not exceed 2200 °F in the event of a loss of coolant accident (LOCA). The LOCA analyses are dependent on this and other limits that are specified in the core reload design.

The cycle-specific reload analyses include allowances for the maximum amount of azimuthal power tilt. The analyses performed each cycle include appropriate allowances for the maximum tilt in conjunction with other core physics related parameters. The maximum tilt limit specified in Technical Specification 3.2.3 may change to ensure that the results of the safety analyses are acceptable.

The DNBR margin related limits given by Technical Specification Figures 3.2-2 and 3.2-3 which will be relocated to the COLR, are determined each cycle for the core protection calculators (CPCs) and/or the COLSS in a degraded condition (COLSS out of service and/or CEAC inoperable). The limits given by these figures are dependent on the cycle-specific margin requirements for the given conditions, and the margin requirements are affected by the reload core design. These margins ensure acceptable minimum DNBR throughout all anticipated operational occurrences.

The ASI range limits provided by Technical Specification 3.2.7 ensure that the actual value of core average ASI is maintained within the range of values used in the safety analyses. The limits include the uncertainties associated with the CPC and COLSS calculations of the actual ASI. These uncertainties are affected by the core reload design and are evaluated as part of the reload analyses.

In Bases sections 3/4.1.1, and 3/4.1.1.2, reference to 5.5% $\Delta k/k$ shutdown margin is being removed since these values are now being located in the COLR. In Bases section 3/4.1.1.4, the MTC limits (design verses operating) are being clarified with design limits being maintained in the Technical Specifications and operating limits being maintained in the COLR. In Bases section 3/4.1.2, reference to 5% $\Delta k/k$ shutdown margin is being referenced to the COLR. In Bases section 3/4.2.1, reference to Figure 3.2-1 is being changed to reference the COLR. In Bases section 3/4.2.3 the azimuthal power tilt limit of 0.10 is being changed to reference the COLR. Finally, in Bases section 3/4.2.4, Figures 3.2-2 and 3.2-3 are being changed to reference the COLR.

Technical Specification 6.9.5 references the analytical methods used to determine the core operating limits. Technical Specification 6.9.5 references documentation of the Staff's approval of those methodologies for which approval is not readily identifiable from the topical designaton (containing an "A" in the title).

By letter dated February 24, 1993 (2CAN029305), Entergy Operations submitted a Technical Specification change request based upon a large break LOCA (LBLOCA) reanalysis using the updated Combustion Engineering methodology of CEN-132, Supplement 3-P-A. This change is currently pending NRC Staff approval. Upon Staff approval of this change request (2CAN029305), Entergy Operations requests that an additional reference be added to Technical Specification 6.9.5.1 as follows:

"Calculative Methods for the CE Large Break LOCA Evaluation Model for the Analysis of CE and W Designed NSSS," CEN-132, Supplement 3-P-A, June 1985 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Entergy Operations has performed an analysis of the proposed change in accordance with 10CFR50.91(a)(1) regarding no significant hazards consideration using the standards in 10CFR50.92(c). A discussion of those standards as they relate to this amendment request follows:

Criterion 1 - **Does Not Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated.**

The removal of cycle dependent variables from Technical Specifications and placing them into a COLR has no impact on plant operation or accident analyses since the proposed changes are administrative in nature. The Technical Specifications will continue to require operation within the core operational limits for each cycle reload calculated by the approved reload design methodologies. The appropriate actions required if limits are violated will remain in the Technical Specifications. The values or setpoints placed in the COLR are addressed in the reload report. The reload report presents the results of a cycle-specific evaluation of accidents addressed in the ANO-2 SAR. The cycle-specific evaluation demonstrates that changes in the fuel cycle design and the corresponding COLR do not involve a significant increase in the probability or consequences of an accident previously evaluated. Therefore, the removal of cycle dependent variables from Technical Specification does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Changing the definition of shutdown margin to be consistent with RSTS allows the use of an all CEAs inserted shutdown margin. The proposed change has no impact on the safety analyses because all CEAs will be verified fully inserted by two independent means, prior to not accounting for the single CEA of the highest reactivity worth fully withdrawn in the shutdown margin calculation. Therefore, the shutdown margin definition revision does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Criterion 2 - **Does Not Create the Possibility of a New or Different Kind of Accident from any Accident Previously Evaluated.**

The proposed changes to relocate the cycle-specific variables from Technical Specifications to the COLR are administrative in nature. No change in the design, configuration, or method of operation of the plant is made by this amendment. The cycle-specific variables will continue to be calculated using NRC approved methods. Technical Specifications will continue to require operation within the required core operating limits and appropriate actions will be taken if the limits are exceeded. Therefore, the removal of cycle-specific variables does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Changing the definition of shutdown margin does not introduce any new plant equipment or change the current plant design; therefore, the shutdown margin definition revision does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Criterion 3 - **Does Not Involve a Significant Reduction in a Margin of Safety.**

Existing Technical Specification operability and surveillance requirements are not reduced by the proposed changes to relocate cycle-specific parameters to another document. The development of limits for a particular cycle will still conform to methods described in NRC approved documentation. The Technical Specifications still require that the core be operated within these limits and specify appropriate actions to be taken if the limits are violated. The cycle-specific COLR limits for future reloads will also be developed based on NRC approved methodologies. Each reload will involve a 10CFR50.59 safety review to assure that operation of the unit within the cycle-specific limits will not involve a significant reduction in a margin of safety. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Changing the definition of shutdown margin to be consistent with RSTS allows the use of an all CEAs inserted shutdown margin. This change does not decrease the margin to safety since all CEAs will be verified fully inserted by two independent means, prior to not accounting for the single CEA of the highest reactivity worth in the shutdown margin calculation.

Therefore, based on the reasoning presented above and the previous discussion of this amendment request, Entergy Operations has determined that the requested changes do not involve a significant hazards consideration.

PROPOSED TECHNICAL SPECIFICATION CHANGES

DEFINITIONS

SECTION PAGE

1.0 DEFINITIONS

DEFINITIONS

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

ADMINISTRATIVE CONTROLS

DEFINED TERMS

1.1 The DEFINED TERMS of this section appear in capitalized type and are applicable throughout these Technical Specifications.

THERMAL POWER

1.2 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

RATED THERMAL POWER

1.3 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 2815 MWt.

OPERATIONAL MODE - MODE

1.4 An OPERATIONAL MODE (i.e. MODE) shall correspond to any one inclusive combination of core reactivity condition, power level and average reactor coolant temperature specified in Table 1.1.

ACTION

1.5 ACTION shall be those additional requirements specified as corollary statements to each principle specification and shall be part of the specifications.

OPERABLE - OPERABILITY

1.6 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

REPORTABLE OCCURRENCE

1.7 A REPORTABLE OCCURRENCE shall be any of those conditions specified in Section 50.73 to 10CFR Part 50.

CONTAINMENT INTEGRITY

1.8 CONTAINMENT INTEGRITY shall exist when:

1.8.1 All penetrations required to be closed during accident condition are either:

a. Capable of being closed by an OPERABLE containment automatic isolation valve system, or

b. Closed by manual valves, blind flanges, or deactivated automatic valves secured in their closed positions, except as provided in Table 3.6-1 of Specification 3.6.3.1.

1.8.2 All equipment hatches are closed and sealed,

1.8.3 Each airlock is OPERABLE pursuant to Specification 3.6.1.3,

1.8.4 The containment leakage rates are within the limits of Specification 3.6.1.2, and

1.8.5 The sealing mechanism associated with each penetration (e.g., welds, bellows or O-rings) is OPERABLE.

CHANNEL CALIBRATION

1.9 A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel including the sensor and alarm and/or trip functions, and shall include the CHANNEL FUNCTIONAL TEST. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

CHANNEL CHECK

1.10 A CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

CHANNEL FUNCTIONAL TEST

1.11 A CHANNEL FUNCTIONAL TEST shall be:

a. Analog channels - The injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions.

b. Bistable channels - The injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.

c. Digital computer channels - The exercising of the digital computer hardware using diagnostic programs and the injection of simulated process data into the channel to verify OPERABILITY.

CORE ALTERATION

1.12 CORE ALTERATION shall be the movement or manipulation of any component within the reactor pressure vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATION shall not preclude completion of movement of a component to a safe conservative position.

SHUTDOWN MARGIN

1.13 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming all full length shutdown and regulating control element assemblies (CEAs) are fully inserted except for the single CEA of highest reactivity worth which is assumed to be fully withdrawn. However, with all CEAs verified fully inserted by two independent means, it is not necessary to account for a stuck CEA in the SHUTDOWN MARGIN calculation. With any CEAs not capable of being fully inserted, the reactivity worth of these CEAs must be accounted for in the determination of SHUTDOWN MARGIN.

IDENTIFIED LEAKAGE

1.14 IDENTIFIED LEAKAGE shall be:

a. Leakage (except CONTROLLED LEAKAGE) into closed systems, such as pump seal or valve packing leaks that are captured, and conducted to a sump or collecting tank, or

b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be PRESSURE BOUNDARY LEAKAGE, or

c. Reactor coolant system leakage through a steam generator to the secondary system.

UNIDENTIFIED LEAKAGE

1.15 UNIDENTIFIED LEAKAGE shall be all leakage which is not IDENTIFIED LEAKAGE or CONTROLLED LEAKAGE.

PRESSURE BOUNDARY LEAKAGE

1.16 PRESSURE BOUNDARY LEAKAGE shall be leakage (except steam generator tube leakage) through a non-isolable fault in a Reactor Coolant System component body, pipe wall or vessel wall.

AZIMUTHAL POWER TILT - T_q

1.17 AZIMUTHAL POWER TILT shall be the power asymmetry between azimuthally symmetric fuel assemblies.

DOSE EQUIVALENT I-131

1.18 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (μCi/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY

1.19 - shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MEV) for isotopes, other than iodines, with half lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

STAGGERED TEST BASIS

1.20 A STAGGERED TEST BASIS shall consist of:

a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals, and

b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval.

FREQUENCY NOTATION

1.21 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2.

AXIAL SHAPE INDEX

1.22 The AXIAL SHAPE INDEX shall be the power generated in the lower half of the core less the power generated in the upper half of the core divided by the sum of these powers.

REACTOR TRIP SYSTEM RESPONSE TIME

1.23 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its trip setpoint at the channel sensor until electrical power is interrupted to the CEA drive mechanism.

ENGINEERED SAFETY FEATURE RESPONSE TIME

1.24 The ENGINEERED SAFETY FEATURE RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

PHYSICS TESTS

1.25 PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation and 1) described in Chapter 14.0 of the FSAR, 2) authorized under the provisions of 10 CFR 50.59, or 3) otherwise approved by the Commission.

SOFTWARE

1.26 The digital computer SOFTWARE for the reactor protection system shall be the program codes including their associated data, documentation and procedures.

PLANAR RADIAL PEAKING FACTOR - F_{xy}

1.27 The PLANAR RADIAL PEAKING FACTOR is the ratio of the peak to plane average power density of the individual fuel rods in a given horizontal plane, excluding the effects of azimuthal tilt.

SOURCE CHECK

1.28 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to the radioactive source.

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.29 An OFFSITE DOSE CALCULATION MANUAL (ODCM) shall be a manual containing the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints.

LIQUID RADWASTE TREATMENT SYSTEM

1.30 A LIQUID RADWASTE TREATMENT SYSTEM is a system designed and installed to reduce radioactive liquid effluents from the unit. This is accomplished by providing for holdup, filtration, and/or demineralization of radioactive liquid effluents prior to their release to the environment.

GASEOUS RADWASTE TREATMENT SYSTEM

1.31 A GASEOUS RADWASTE TREATMENT SYSTEM is any system designed and installed to reduce radioactive gaseous effluents from the plant by collecting offgases from radioactive systems and providing for decay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

VENTILATION EXHAUST TREATMENT SYSTEM

1.32 A VENTILATION EXHAUST TREATMENT SYSTEM is any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment. Such a system is not considered to have any effect on noble gas effluents. Atmospheric cleanup systems that are Engineered Safety Feature (ESF) actuated are not considered to be VENTILATION EXHAUST TREATMENT SYSTEMS.

MEMBER(S) OF THE PUBLIC

1.33 MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational or other purposes not associated with the plant.

PURGE-PURGING

1.34 PURGE or PURGING is the controlled process of discharging air or gas from a confinement to reduce airborne radioactive concentrations in such a manner that replacement air or gas is required to purify the confinement.

EXCLUSION AREA

1.36 The EXCLUSION AREA is that area surrounding ANO within a minimum radius of .65 miles of the reactor buildings and controlled to the extent necessary by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

UNRESTRICTED AREA

1.37 An UNRESTRICTED AREA shall be any area at or beyond the exclusion area boundary.

CORE OPERATING LIMITS REPORT

1.38 The CORE OPERATING LIMITS REPORT is the ANO-2 specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Technical Specification 6.9.5. Plant operation within these operating limits is addressed in individual specifications.

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN-T_{avg} > 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to that specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1, 2*, 3 and 4.

ACTION:

With the SHUTDOWN MARGIN less than that required above, immediately initiate and continue boration at ≥40 gpm of 2500 ppm boric acid solution or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to that specified in the CORE OPERATING LIMITS REPORT:

a. Within one hour after detection of an inoperable CEA(s) and at least once per 12 hours thereafter while the CEA(s) is inoperable. If the inoperable CEA is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable CEA(s).

b. When in MODES 1 or 2#, at least once per 12 hours by verifying that CEA group withdrawal is within the Transient Insertion Limits of Specification 3.1.3.6.

c. When in MODE 2##, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical CEA position is within the limits of Specification 3.1.3.6.

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of (e) below, with the CEA groups at the Transient Insertion Limits of Specification 3.1.3.6.

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* See Special Test Exception 3.10.1.

\# With $K_{eff} \geq 1.0$.

\## With $K_{eff} < 1.0$.

SHUTDOWN MARGIN-T_{avg} $\leq$ 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be greater than or equal to that specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 5.

ACTION:

With the SHUTDOWN MARGIN less than that required above, immediately initiate and continue boration at $\geq$40 gpm of 2500 ppm boric acid solution or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The SHUTDOWN MARGIN shall be determined to be greater than or equal to that specified in the CORE OPERATING LIMITS REPORT:

a. Within one hour after detection of an inoperable CEA(s) and at least once per 12 hours thereafter while the CEA(s) is inoperable. If the inoperable CEA is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable CEA(s).

b. At least once per 24 hours by consideration of at least the following factors:

1. Reactor coolant system boron concentration,
2. CEA position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration, and
6. Samarium concentration.

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

3.1.1.4 The moderator temperature coefficient (MTC) shall be within the limits specified in the CORE OPERATING LIMITS REPORT. The maximum upper design limit shall be:

a. Less positive than $+0.5 \times 10^{-4}$ $\Delta k/k/°F$ whenever THERMAL POWER is ≤70% of RATED THERMAL POWER,

b. Less positive than 0.0 $\Delta k/k/°F$ whenever THERMAL POWER is >70% of RATED THERMAL POWER, and

APPLICABILITY: MODES 1 and 2*#

ACTION:

With the moderator temperature coefficient outside any one of the above limits, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.1.4.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits.

4.1.1.4.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

b. At any THERMAL POWER, prior to reaching a RATED THERMAL POWER equilibrium boron concentration of 800 ppm.

c. At any THERMAL POWER, within 14 EFPD after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm.

*With $K_{eff} \geq 1.0$.

#See Special Test Exception 3.10.2.

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 The following boron injection flow paths shall be OPERABLE, depending on the volume available in the boric acid makeup tanks.

a. If the contents of ONE boric acid makeup tank meet the volume requirements of Figure 3.1-1, two of the following three flow paths to the Reactor Coolant System shall be OPERABLE:

1. One flow path from the appropriate boric acid makeup tank via a boric acid makeup pump and a charging pump.

2. One flow path from the appropriate boric acid makeup tank via a gravity feed connection and a charging pump.

3. One flow path from the refueling water tank via a charging pump.

OR

b. If the contents of Both boric acid tanks are needed to meet the volume requirements of Figure 3.1-1, four of the following five flow paths to the Reactor Coolant System shall be OPERABLE:

1. One flow path from boric acid makeup tank A via a boric acid makeup pump and a charging pump.

2. One flow path from boric acid makeup tank B via a boric acid makeup pump and a charging pump.

3. One flow path from boric acid makeup tank A via a gravity feed connection and a charging pump.

4. One flow path from boric acid makeup tank B via a gravity feed connection and a charging pump.

5. One flow path from the refueling water tank via a charging pump.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

With any of the boron injection flow paths to the Reactor Coolant System required in (a) or (b) above inoperable, restore the inoperable flow path to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least that specified in the CORE OPERATING LIMITS REPORT at 200°F within the next 6 hours; restore the flow paths to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least that specified in the CORE OPERATING LIMITS REPORT at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4 No additional Surveillance Requirements other than those required by Specification 4.0.5.

BORIC ACID MAKEUP PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 At least the boric acid makeup pump(s) in the boron injection flow path(s) required OPERABLE pursuant to Specification 3.1.2.2 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if the flow path through the boric acid makeup pump(s) in Specification 3.1.2.2 is OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one boric acid makeup pump required for the boron injection flow path(s) pursuant to Specification 3.1.2.2 inoperable, restore the boric acid makeup pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least that specified in the CORE OPERATING LIMITS REPORT at 200°F; restore the above required boric acid pump(s) to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.6 No additional Surveillance Requirements other than those required by Specification 4.0.5.

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. At least one of the following sources with a minimum solution temperature of 55°F.

1. One boric acid makeup tank, with the tank contents in accordance with Figure 3.1-1, or

2. Two boric makeup tanks, with the combined contents of the tanks in accordance with Figure 3.1-1, and

b. The refueling water tank with:

1. A contained borated water volume of between 464,900 and 500,500 gallons (equivalent to an indicated tank level of between 91.7% and 100%, respectively),

2. Between 2500 and 3000 ppm of boron,

3. A minimum solution temperature of 40°F, and

4. A maximum solution temperature of 110°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the above required boric acid makeup tank(s) inoperable, restore the make up tank(s) to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least that specified in the CORE OPERATING LIMITS REPORT at 200°F; restore the above required boric acid makeup tank(s) to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each of the above required borated water sources shall be demonstrated OPERABLE:

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and regulating) CEAs, and all part length CEAs which are inserted in the core, shall be OPERABLE with each CEA of a given group positioned within 7 inches (indicated position) of all other CEAs in its group.

APPLICABILITY: MODES 1* and 2*.

ACTION:

a. With one or more full length CEAs inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in at least HOT STANDBY within 6 hours.

b. With one full length CEA trippable but inoperable due to causes other than addressed by ACTION (a), above, and inserted beyond the Long Term Steady State Insertion Limits but within its above specified alignment requirements, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6.

c. With one full length CEA trippable but inoperable due to causes other than addressed by ACTION (a), above, but within its above specified alignment requirements and either fully withdrawn or within the Long Term Steady State Insertion Limits if in full length CEA group 6, operation in MODES 1 and 2 may continue.

d. With more than one full length or part length CEA trippable but inoperable due to causes other than addressed by ACTION a, above, restore the inoperable CEA(s) to OPERABLE status within 72 hours, or be in at least HOT STANDBY within the next 6 hours.

e. With one or more full length or part length CEAs trippable but misaligned from any other CEAs in its group by more than 7 inches but less than or equal to 19 inches, operation in MODES 1 and 2 may continue, provided that core power is reduced in accordance with the limits specified in the CORE OPERATING LIMITS REPORT and within 1 hour the misaligned CEA(s) is either:

    1. Restored to OPERABLE status within its above specified alignment requirements, or

*See Special Test Exceptions 3.10.2 and 3.10.4.

ACTION: (Continued)

2. Declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6 provided:

   a) Within one hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits specified in the CORE OPERATING LIMITS REPORT; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

   b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

Otherwise, be in at least HOT STANDBY within the next 6 hours.

f. With one full length or part length CEA trippable but misaligned from any other CEA in its group by more than 19 inches, operation in MODES 1 and 2 may continue, provided that core power is reduced in accordance with the limits specified in the CORE OPERATING LIMITS REPORT and within one hour the misaligned CEA is either:

1. Restored to OPERABLE status within its above specified alignment requirements, or

2. Declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6 provided:

   a) Within one hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits specified in the CORE OPERATING LIMITS REPORT; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

   b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

Otherwise, be in at least HOT STANDBY within the next 6 hours.

REGULATING CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The regulating CEA groups shall be limited to the withdrawal sequence and to the insertion limits specified in the CORE OPERATING LIMITS REPORT:

a. CEA insertion between the Long Term Steady State Insertion Limit and the Transient Insertion Limit restricted to:

   1. $\leq$ 5 Effective Full Power Days per 30 Effective Full Power Day intervals, and

   2. $\leq$ 14 Effective Full Power Days per calendar year.

b. CEA insertion between the Short Term Steady State Insertion Limit and the Transient Insertion Limit shall be restricted to $\leq$ 4 hours per 24 hour interval.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

a. With the regulating CEA groups inserted beyond the Transient Insertion Limit, except for surveillance testing pursuant to Specification 4.1.3.1.2, within two hours either:

   1. Restore the regulating CEA groups to within the limits, or

   2. Reduce THERMAL POWER to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the CEA group position using the CORE OPERATING LIMITS REPORT.

b. With the regulating CEA groups inserted between the Long Term Steady State Insertion Limit and the Transient Insertion Limit for intervals > 5 EFPD per 30 EFPD interval or > 14 EFPD per calendar year, either:

   1. Restore the regulating groups to within the Long Term Steady State Insertion Limit within two hours, or

   2. Be in at least HOT STANDBY within 6 hours.

* See Special Test Exceptions 3.10.2 and 3.10.4.

With $K_{eff} \geq 1.0$.

REACTIVITY CONTROL SYSTEMS

PART LENGTH CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.7 The part length CEA group shall be limited to the insertion limits specified in the CORE OPERATING LIMITS REPORT with PLCEA insertion between the Long Term Steady State Insertion Limit and the Transient Insertion Limit restricted to:

a. ≤ 5 Effective Full Power Days per 30 Effective Full Power Day interval, and

b. ≤ 14 Effective Full Power Days per calendar year.

APPLICABILITY: MODE 1*.

ACTION:

a. With the part length CEA groups inserted beyond the Transient Insertion Limit, except for surveillance testing pursuant to Specification 4.1.3.1.2, within two hours either:

   1. Restore the part length CEA group to within the limits, or

   2. Reduce THERMAL POWER to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the PLCEA group position as specified in the CORE OPERATING LIMITS REPORT.

b. With the part length CEA groups inserted between the Long Term Steady State Insertion Limit and the Transient Insertion Limit for intervals > 5 EFPD per 30 EFPD interval or > 14 EFPD per calendar year, either:

   1. Restore the part length group to within the Long Term Steady State Insertion limits within two hours, or

   2. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENT

4.1.3.7 The position of the part length CEA group shall be determined to be within the Transient Insertion Limit at least once per 12 hours. The accumulated time during which the part length CEA group is inserted beyond the Long Term Steady State Insertion Limit but within the Transient Insertion Limit shall be determined at least once per 24 hours.

*See Special Test Exception 3.10.2.

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 LINEAR HEAT RATE

LIMITING CONDITION FOR OPERATION

3.2.1 The linear heat rate limit shall be maintained by either:

a. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on linear heat rate (when COLSS is in service); or

b. Operating within the region of acceptable operation specified in the CORE OPERATING LIMITS REPORT using any operable CPC Channel (when COLSS is out of service).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

a. With COLSS in service and the linear heat rate limit not being maintained as indicated by COLSS calculated core power exceeding the COLSS calculated core power operating limit based on linear heat rate, within 15 minutes initiate corrective action to reduce the linear heat rate to within the limit and either:

   1. Restore the linear heat rate to within its limits within 1 hour of the initiating event, or

   2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

b. With COLSS out of service and the linear heat rate limit not being maintained as indicated by operation outside the region of acceptable operation specified in the CORE OPERATING LIMITS REPORT, either:

   1. Restore the linear heat rate to within its limits within 2 hours of the initiating event, or

   2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The provisions of Specification 4.0.4 are not applicable.

4.2.1.2 The linear heat rate shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the linear heat rate, as indicated on any OPERABLE CPC channel, is within the limit specified in the CORE OPERATING LIMITS REPORT.

4.2.1.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on linear heat rate.

RADIAL PEAKING FACTORS

LIMITING CONDITION FOR OPERATION

3.2.2 The measured PLANAR RADIAL PEAKING FACTORS (F^m_{xy}) shall be less than or equal to the PLANAR RADIAL PEAKING FACTORS (F^c_{xy}) used in the Core Operating Limit Supervisory System (COLSS) and in the Core Protection Calculators (CPC).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER*

ACTION:

With a F^m_{xy} exceeding a corresponding F^c_{xy}, within 6 hours either:

a. Adjust the CPC addressable constants to increase the multiplier applied to PLANAR RADIAL PEAKING FACTOR by a factor equivalent to $\geq F^m_{xy}/F^c_{xy}$ and restrict subsequent operation so that a margin to the COLSS operating limits of at least $[(F^m_{xy}/F^c_{xy}) - 1.0] \times 100\%$ is maintained; or

b. Adjust the affected PLANAR RADIAL PEAKING FACTORS (F^c_{xy}) used in the CLOSS and CPC to a value greater than or equal to the measured PLANAR RADIAL PEAKING FACTORS (F^m_{xy}); or

c. Be in at least HOT STANDBY.

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 The measured PLANAR RADIAL PEAKING FACTORS (F^m_{xy}), obtained by using the incore detection system, shall be determined to be less than or equal to the PLANAR RADIAL PEAKING FACTORS (F^c_{xy}) used in the COLSS and CPC at the following intervals:

a. After each fuel loading with THERMAL POWER greater than 40% but prior to operation above 70% of RATED THERMAL POWER, and

b. At least once per 31 days of accumulated operation in MODE 1.

*See Special Test Exception 3.10.2.

AZIMUTHAL POWER TILT - T_q

LIMITING CONDITION FOR OPERATION

3.2.3 The AZIMUTHAL POWER TILT (T_q) shall be less than or equal to the AZIMUTHAL POWER TILT Allowance used in the Core Protection Calculators (CPCs).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.*

ACTION:

a. With the measured AZIMUTHAL POWER TILT determined to exceed the AZIMUTHAL POWER TILT Allowance used in the CPCs but within the limit specified in the CORE OPERATING LIMITS REPORT within two hours either correct the power tilt or adjust the AZIMUTHAL POWER TILT Allowance used in the CPCs to greater than or equal to the measured value.

b. With the measured AZIMUTHAL POWER TILT determined to exceed the limit specified in the CORE OPERATING LIMITS REPORT:

   1. Due to misalignment of either a part length or full length CEA, within 30 minutes verify that the Core Operating Limit Supervisory System (COLSS) (when COLSS is being used to monitor the core power distribution per Specifications 4.2.1 and 4.2.4) is detecting the CEA misalignment.

   2. Verify that the AZIMUTHAL POWER TILT is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Linear Power Level - High trip setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

   3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the AZIMUTHAL POWER TILT is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

*See Special Test Exception 3.10.2.

SURVEILLANCE REQUIREMENTS

4.2.3 The AZIMUTHAL POWER TILT shall be determined to be within the limit above 20% of RATED THERMAL POWER by:

a. Continuously monitoring the tilt with COLSS when the COLSS is OPERABLE.

b. Calculating the tilt at least once per 12 hours when the COLSS is inoperable.

c. Verifying at least once per 31 days, that the COLSS Azimuthal Tilt Alarm is actuated at an AZIMUTHAL POWER TILT greater than the AZIMUTHAL POWER TILT Allowance used in the CPCs.

d. Using the incore detectors at least once per 31 days to independently confirm the validity of the COLSS calculated AZIMUTHAL POWER TILT.

DNBR MARGIN

LIMITING CONDITION FOR OPERATION

3.2.4 The DNBR limit shall be maintained by one of the following methods:

a. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and at least one CEAC is operable); or

b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by 13.0% (when COLSS is in service and neither CEAC is operable); or

c. Operating within the region of acceptable operation specified in the CORE OPERATING LIMITS REPORT using any operable CPC channel (when COLSS is out of service and at least one CEAC is operable); or

d. Operating within the region of acceptable operation specified in the CORE OPERATING LIMITS REPORT using any operable CPC channel (when COLSS is out of service and neither CEAC is operable).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

a. With COLSS in service and the DNBR limit not being maintained as indicated by COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR, within 15 minutes initiate corrective action to reduce the DNBR to within the limits and either:

   1. Restore the DNBR to within its limits within 1 hour of the initiating event, or

   2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

b. With COLSS out of service and the DNBR limit not being maintained as indicated by operation outside the region of acceptable operation specified in the CORE OPERATING LIMITS REPORT, either:

   1. Restore the DNBR to within its limits within 2 hours of the initiating event, or

   2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on any OPERABLE CPC channel, is within the limit specified in the CORE OPERATING LIMITS REPORT.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

POWER DISTRIBUTION LIMITS

RCS FLOW RATE

LIMITING CONDITION FOR OPERATION

3.2.5 The actual Reactor Coolant System total flow rate shall be greater than or equal to 120.4×10^6 lbm/hr.

APPLICABILITY: MODE 1

ACTION:

With the actual Reactor Coolant System total flow rate determined to be less than the above limit, reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5 The actual Reactor Coolant System total flow rate shall be determined to be within its limit at least once per 12 hours.

REACTOR COOLANT COLD LEG TEMPERATURE

LIMITING CONDITION FOR OPERATION

3.2.6 The Reactor Coolant Cold Leg Temperature (T_c) shall be maintained between 542°F and 554.7°F.

APPLICABILITY: MODE 1 above 30% of RATED THERMAL POWER.

ACTION:

With the Reactor Coolant Cold Leg Temperature exceeding its limit, restore the temperature to within its limit within 2 hours or reduce THERMAL POWER to less than 30% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.6 The Reactor Coolant Cold Leg Temperature shall be determined to be within its limit at least once per 12 hours.

POWER DISTRIBUTION LIMITS

AXIAL SHAPE INDEX

LIMITING CONDITION FOR OPERATION

3.2.7 The core average AXIAL SHAPE INDEX (ASI) shall be maintained within the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.*

ACTION:

With the core average AXIAL SHAPE INDEX (ASI) exceeding its limit, restore the ASI to within its limit within 2 hours or reduce THERMAL POWER to less than 20% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.7 The core average AXIAL SHAPE INDEX shall be determined to be within its limits at least once per 12 hours using the COLSS or any OPERABLE Core Protection Calculator channel.

*See Special Test Exception 3.10.2.

PRESSURIZER PRESSURE

LIMITING CONDITION FOR OPERATION

3.2.8 The average pressurizer pressure shall be maintained between 2025 psia and 2275 psia.

APPLICABILITY: MODE 1.

ACTION:

With the average pressurizer pressure exceeding its limits, restore the pressure to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.8 The average pressurizer pressure shall be determined to be within its limit at least once per 12 hours.

3/4.1 REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.1 BORATION CONTROL

3/4.1.1.1 and 3/4.1.1.2 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS T_{avg}. The most restrictive condition occurs [illegible] with T_{avg} at no load operating temperature, and is associated with a postulated steam line break accident, and resulting uncontrolled RCS cooldown. In the analysis of this accident, a minimum SHUTDOWN MARGIN is required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN requirement is based upon this limiting condition and is consistent with FSAR safety analysis assumptions. With T_{avg} ≤200°F, the reactivity transients resulting from any postulated accident are minimal and the shutdown margin provides adequate protection.

3/4.1.1.3 BORON DILUTION

A minimum flow rate of at least 2000 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual during boron concentration reductions in the Reactor Coolant System. A flow rate of at least 2000 GPM will circulate an equivalent Reactor Coolant System volume of 6,650 cubic feet in approximately 25 minutes. The reactivity change rate associated with boron concentration reductions will therefore be within the capability of operator recognition and control.

3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC)

The limitations on MTC are provided to ensure that the assumptions used in the accident and transient analysis remain valid through each fuel cycle. The surveillance requirements for measurement of the MTC during each fuel cycle are adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentrations associated with fuel burnup. The confirmation that the measured MTC value is within its limit provides assurances that the coefficient will be maintained within acceptable values throughout each fuel cycle. The MTC limits defined in the Technical Specification are maximum upper design limits. Actual operating limits are specified in the CORE OPERATING LIMITS REPORT.

3/4.1.1.5 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 525°F. This limitation is required to ensure 1) the moderator temperature coefficient is within its analyzed temperature range, 2) the protective instrumentation is within its normal operating range, 3) the pressurizer is capable of being in an OPERABLE status with a steam bubble, and 4) the reactor pressure vessel is above its minimum RT_{NDT} temperature.

3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operations. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid makeup pumps, 5) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of that specified in the CORE OPERATING LIMITS REPORT after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires boric acid solution from the boric acid makeup tanks in the allowable concentrations and volumes of Specification 3.1.2.8 and a small fraction of the borated water from the refueling water tank required in Specification 3.1.2.8.

The requirement in Technical Specification 3.1.2.8 for a minimum contained volume of 464,900 gallons of 2500-3000 ppm borated water in the refueling water tank ensures the capability for borating the RCS to the desired concentration. The value listed is consistent with the plant ECCS requirements.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is based upon providing a sufficient SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires either borated water from the refueling water tank or boric acid solution from the boric acid makeup tank(s) in accordance with the requirements of Specification 3.1.2.7.

The contained water volume limits includes allowance for water not available because of discharge line location and other physical characteristics. The 61,370 gallon limit for the refueling water tank is based upon having an indicated level in the tank of at least 7.5%.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

The limits on contained water volume and boron concentration of the RWT also ensure a pH value of between 8.8 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of CEA misalignments are limited to acceptable levels.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met.

The ACTION statements applicable to a stuck or untrippable CEA or a large misalignment (≥ 19 inches) of two or more CEAs, require a prompt shutdown of the reactor since either of these conditions may be indicative of a possible loss of mechanical functional capability of the CEAs and in the event of a stuck or untrippable CEA, the loss of SHUTDOWN MARGIN. CEAs that are confirmed to be inoperable due to problems other than addressed by ACTION a of Specification 3.1.3.1 will not impact SHUTDOWN MARGIN as long as their relative positions satisfy the applicable alignment requirements.

For small misalignments (< 19 inches) of the CEAs, there is 1) a small effect on the time dependent long term power distributions relative to those used in generating LCOs and LSSS setpoints, 2) a small effect on the available SHUTDOWN MARGIN, and 3) a small effect on the ejected CEA worth used in the safety analysis. Therefore, the ACTION

3/4.2 POWER DISTRIBUTION LIMITS

BASES

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Core Operating Limit Supervisory System (COLSS) and the Local Power Density channels in the Core Protection Calculators (CPCs), provide adequate monitoring of the core power distribution and are capable of verifying that the linear heat rate does not exceed its limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating a core power operating limit corresponding to the allowable peak linear heat rate.

The COLSS calculated core power and the COLSS calculated core power operating limits based on linear heat rate are continuously monitored and displayed to the operator. A COLSS alarm is annunciated in the event that the core power exceeds the core power operating limit. This provides adequate margin to the linear heat rate operating limit for normal steady state operation. Normal reactor power transients or equipment failures which do not require a reactor trip may result in this core power operating limit being exceeded. In the event this occurs, COLSS alarms will be annunciated. If the event which causes the COLSS limit to be exceeded results in conditions which approach the core safety limits, a reactor trip will be initiated by the Reactor Protective Instrumentation. The COLSS calculation of the linear heat rate limit includes appropriate uncertainty and penalty factors necessary to provide a 95/95 confidence level that the maximum linear heat rate calculated by COLSS is greater than or equal to that existing in the core. To ensure that the design margin to safety is maintained, the COLSS computer program includes an F_{xy} measurement uncertainty factor of 1.053, an engineering uncertainty factor of 1.03, a THERMAL POWER measurement uncertainty factor of 1.02 and appropriate uncertainty and penalty factors for rod bow.

Parameters required to maintain the operating limit power level based on linear heat rate, margin to DNB and total core power are also monitored by the CPCs. Therefore, in the event that the COLSS is not being used, operation within the limits specified in the CORE OPERATING LIMITS REPORT can be maintained by utilizing a predetermined local power density margin and a total core power limit in the CPC trip channels. The above listed uncertainty and penalty factors are also included in the CPCs.

3/4.2.2 RADIAL PEAKING FACTORS

Limiting the values of the planar radial peaking factors (F^c_{xy}) used in the COLSS and CPCs to values equal to or greater than the measured planar radial peaking factors (F^m_{xy}) provides assurance that the limits calculated by COLSS and the CPCs remain valid. Data from the incore detectors are used for determining the measured planar radial peaking factors. The periodic surveillance requirements for determining the measured PLANAR RADIAL PEAKING FACTORS provides assurance that the PLANAR RADIAL PEAKING FACTORS used in COLSS and the CPCs remain valid throughout the fuel cycle. Determining the measured PLANAR RADIAL PEAKING FACTORS after each fuel loading prior to exceeding 70% of RATED THERMAL POWER provides additional assurance that the core was properly loaded.

3/4.2.3 AZIMUTHAL POWER TILT T_q

The limitations on the AZIMUTHAL POWER TILT are provided to ensure that design safety margins are maintained. An AZIMUTHAL POWER TILT greater than the limit specified in the CORE OPERATING LIMITS REPORT is not expected and if it should occur, operation is restricted to only those conditions required to identify the cause of the tilt. The tilt is normally calculated by COLSS. The surveillance requirements specified when COLSS is out of service provide an acceptable means of detecting the presence of a steady state tilt. It is necessary to explicitly account for power asymmetries because the radial peaking factors used in the core power distribution calculations are based on an untilted power distribution.

AZIMUTHAL POWER TILT is measured by assuming that the ratio of the power at any core location in the presence of a tilt to the untilted power at the location is of the form:

$$P_{tilt}/P_{untilt} = 1 + T_q \, g \cos(\theta - \theta_o)$$

where:

T_q is the peak fractional tilt amplitude at the core periphery

g is the radial normalizing factor

θ is the azimuthal core location

θ_o is the azimuthal core location of maximum tilt

P_{tilt}/P_{untilt} is the ratio of the power at a core location in the presence of a tilt to the power at that location with no tilt.

3/4.2.4 DNBR MARGIN

The limitation on DNBR as a function of AXIAL SHAPE INDEX represents a conservative envelope of operating conditions consistent with the safety analysis assumptions and which have been analytically demonstrated adequate to maintain an acceptable minimum DNBR throughout all anticipated operational occurrences. Operation of the core with a DNBR at or above this limit provides assurance that an acceptable minimum DNBR will be maintained in the event of any anticipated operational occurrence.

Either of the two core power distribution monitoring systems, the Core Operating Limit Supervisory System (COLSS) and the DNBR channels in the Core Protection Calculators (CPCs), provide adequate monitoring of the core power distribution and are capable of verifying that the DNBR does not violate its limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating a core operating limit corresponding to the allowable minimum DNBR. The COLSS calculation of core power operating limit based on DNBR includes appropriate uncertainty and penalty factors necessary to provide a 95/95 confidence level that the core power at which a DNBR of less than 1.25 could occur, as calculated by COLSS, is less than or equal to that which would actually be required in the core. To ensure that the design margin to safety is maintained, the COLSS computer program includes an F_{xy} measurement uncertainty factor of 1.053, an engineering uncertainty factor of 1.03, a THERMAL POWER measurement uncertainty factor of 1.02 and appropriate uncertainty and penalty factors for rod bow.

Parameters required to maintain the margin to DNB and total core power are also monitored by the CPCs. Therefore, in the event that the COLSS is not being used, operation within the limits specified in the CORE OPERATING LIMITS REPORT can be maintained by utilizing a predetermined DNBR as a function of AXIAL SHAPE INDEX and by monitoring the CPC trip channels. The above listed uncertainty and penalty factors are also included in the CPC.

A DNBR penalty factor has been included in the COLSS and CPC DNBR calculations to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by that assembly. Fuel assemblies that incur higher average burnup will experience a greater magnitude of rod bow. Conversely, lower burnup assemblies will experience less rod bow. In design calculations, the penalty for each batch required to compensate for rod bow is determined from a batch's maximum average assembly burnup applied to the batch's maximum integrated planar-radial power peak. A single net penalty for COLSS and CPC is then determined starting 48 hours prior to the first sample in which the limit was exceeded; (4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and (5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

MONTHLY OPERATING REPORT

6.9.1.6 Routine reports of operating statistics and shutdown experience shall be submitted on a monthly basis to the Director, Office of Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the Regional Office no later than the 15th of each month following the calendar month covered by the report.

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Administrator of the Regional Office within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

a. ECCS Actuation, Specifications 3.5.2 and 3.5.3.

b. Inoperable Seismic Monitoring Instrumentation, Specification 3.3.3.3.

c. Inoperable Meteorological Monitoring Instrumentation, Specification 3.3.3.4.

d. Seismic event analysis, Specification 4.3.3.3.2.

e. Inoperable Fire Detection Instrumentation

f. Inoperable Fire Suppression Systems

g. Deleted.

h. Radioactive Effluents, Specifications 3.11.1.1, 3.11.1.2, 3.11.1.3, 3.11.2.2, 3.11.2.3, 3.11.2.4, 3.11.2.5, and 3.11.3.

This report shall include the following:

1) Description of occurrence.

2) Identify the cause(s) for exceeding the limit(s)

3) Explain corrective action(s) taken to mitigate occurrence.

4) Define action(s) taken to prevent recurrence.

5) Summary of consequence(s) of occurrence.

6) Describe levels exceeding 40CFR190 in accordance with 10CFR20.405(c).

i. Inoperable Containment Radiation Monitors, Specification 3.3.3.1.

j. Steam Generator Tubing Surveillance -- Category C-3 Results, Specification 4.4.5.5.

k. Maintenance of Spent Fuel Pool Structural Integrity, Specification 3.7.12.

l. Radiological Environmental Monitoring Sample Analysis, Specification 3.12.1.

m. Unplanned Offsite Release during one hour period of 1) more than 1 curie of radioactive material in liquid effluents, 2) more than 150 curies of noble gas in gaseous effluents, or 3) more than 0.05 curies of radioiodine in gaseous effluents. This report shall be submitted within 30 days of the occurrence of the event and shall include the following information:

1. Description of the occurrence.

2. Identify the cause(s) of exceeding the limit(s).

3. Explain corrective action(s) taken to mitigate occurrence.

4. Define action(s) taken to prevent recurrence.

5. Summary of the consequence(s) of occurrence.

n. Inoperable Reactor Vessel Level Monitoring System (RVLMS), Specification 3.3.3.6, Table 3.3-10 Item 14.

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT*

6.9.3 Routine radioactive effluent release reports covering the operating of the unit during the previous 6 months of operations shall be submitted within 60 days after January 1 and July 1 of each year.

6.9.3.1 The radioactive effluent release report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste release from the unit. The data will be summarized on a quarterly basis following the format of Regulatory Guide 1.21, Revision 1.

6.9.3.2 Any changes in the OFFSITE DOSE CALCULATION MANUAL and PCP shall be included in the semiannual report for the period in which the change(s) was made effective.

6.9.3.3 The radioactive effluent release reports shall include the following information for all unplanned releases to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents:

1. Description of the occurrence.
2. Identify the cause(s) for exceeding the limit(s).
3. Explain corrective actions taken to mitigate occurrence.
4. Define action(s) taken to prevent recurrence.
5. Summary of consequence(s) of occurrence.

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*A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste system, the submittal shall specify the releases of radioactive material from each unit.

6.9.3.4 The first report filed each year shall contain:

1. A summary of the hourly meteorological data collected over the previous calendar year. In lieu of including this summary in the report, the data may be retained by the licensee for NRC review and noted as such in the report.

2. A summary of radiation doses due to radiological effluent during the previous calendar year calculated in accordance with the methodology specified in the OFFSITE DOSE CALCULATION MANUAL.

3. The radiation dose to members of the public due to their activities inside the site boundary. This calculated dose shall include only those dose contributions directly attributed to operation of the unit and shall be compared to the limits specified in 40 CFR 190.

6.9.3.5 The first report filed each year shall contain description of licensee initiated major changes to the radioactive waste systems (liquid, gaseous and solid) during the previous calendar year.*

*This information may be included in the annual FSAR update in lieu of inclusion in this report.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.4 Routine radiological environmental operating reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of year.

a. The annual radiological environmental operating report shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by Specification 3.12.2. If harmful effects or evidence of irreversible damage are detected by the monitoring, the report shall provide an analysis of the problem and a planned course of action to alleviate the problem.

b. The annual radiological environmental operating reports shall include summarized and tabulated results of all radiological environmental samples taken during the report period. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

c. The report shall also include the following: a summary description of the radiological environmental monitoring program; a map of all sampling locations keyed to a table giving distances and directions from one reactor; and the results of licensee participation in the Interlaboratory Comparison Program, required by Specification 3.12.3.

*A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

CORE OPERATING LIMITS REPORT

6.9.5 The core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT prior to each reload cycle or any remaining part of a reload cycle.

6.9.5.1 The analytical methods used to determine the core operating limits addressed by the individual Technical Specifications shall be those previously reviewed and approved by the NRC for use at ANO-2, specifically:

1) "The ROCS and DIT Computer Codes for Nuclear Design", CENPD-266-P-A, April 1983 (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.4 for MTC, and 3.1.3.6 for Regulating CEA Insertion Limits).

2) "CE Method for Control Element Assembly Ejection Analysis," CENPD-0190-A, January 1976 (Methodology for Specification 3.1.3.6 for Regulating CEA Insertion Limits and 3.2.3 for Azimuthal Power Tilt).

3) "Statistical Combination of Uncertainties, Combination of System Parameter Uncertainties in Thermal Margin Analyses for Arkansas Nuclear One Unit 2," CEN-139(A)-P, November 1980 (Methodology for Specification 3.2.4 for DNBR Margin and 3.2.7 for ASI).

4) "Calculative Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, August 1974 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

5) "Calculational Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, Supplement 1, February 1975 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

6) "Calculational Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, Supplement 2-P, July 1975 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

7) "Calculational Methods for the CE Small Break LOCA Evaluation Model," CENPD-137-P, August 1974 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

8) "CESEC-Digital Simulation of a Combustion Engineering Nuclear Steam Supply System," December 1981 (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margin, 3.1.1.4 for MTC, 3.1.3.1 for Movable Control Assemblies - CEA Position, 3.1.3.6 for Regulating CEA Insertion Limits, and 3.1.3.7 for Part Length CEA Insertion Limits).

CORE OPERATING LIMITS REPORT

9) Letter: O.D. Parr (NRC) to F.M. Stern (CE), dated June 13, 1975 (NRC Staff Review of the Combustion Engineering ECCS Evaluation Model). NRC approval for 6.9.5.1.4, 6.9.5.1.5, and 6.9.5.1.7 methodologies.

10) Letter: O.D. Parr (NRC) to A.E. Scherer (CE), dated December 9, 1975 (NRC Staff Review of the Proposed Combustion Engineering ECCS Evaluation Model changes). NRC approval for 6.9.5.1.6 methodology.

11) Letter: 2CNA038403, dated March 20, 1984, J.R. Miller (NRC) to J.M. Griffin (AP&L), "CESEC Code Verification." NRC approval for 6.9.5.1.8 methodology.

6.9.5.2 The core operating limits shall be determined so that all applicable limits (e.g. fuel thermal-mechanical limits, core thermalhydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

6.9.5.3 The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

If our submittal of February 24, 1993 (2CAN029305) is approved, please substitute the previous pages 6-21 and 6-22 with the following pages.

CORE OPERATING LIMITS REPORT

6.9.5 The core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT prior to each reload cycle or any remaining part of a reload cycle.

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1) "The ROCS and DIT Computer Codes for Nuclear Design", CENPD-266-P-A, April 1983 (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.4 for MTC, and 3.1.3.6 for Regulating CEA Insertion Limits).

2) "CE Method for Control Element Assembly Ejection Analysis," CENPD-0190-A, January 1976 (Methodology for Specification 3.1.3.6 for Regulating CEA Insertion Limits and 3.2.3 for Azimuthal Power Tilt).

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5) "Calculational Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, Supplement 1, February 1975 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

6) "Calculational Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, Supplement 2-P, July 1975 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

7) "Calculative Methods for the CE Large Break LOCA Evaluation Model for the Analysis of CE and W Designed NSSS," CEN-132, Supplement 3-P-A, June 1985 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

8) "Calculational Methods for the CE Small Break LOCA Evaluation Model," CENPD-137-P, August 1974 (Methodology for Specification 3.2.1 for Linear Heat Rate).

CORE OPERATING LIMITS REPORT

9) "CESEC-Digital Simulation of a Combustion Engineering Nuclear Steam Supply System," December 1981 (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margin, 3.1.1.4 for MTC, 3.1.3.1 for Movable Control Assemblies - CEA Position, 3.1.3.6 for Regulating CEA Insertion Limits, and 3.1.3.7 for Part Length CEA Insertion Limits).

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