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January 19, 1988

Office of Nuclear Reactor Regulation
ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: LaSalle County Station Unit 1
Proposed Amendment to Technical
Specification for Facility Operating
License NPF-11 - Reload Licensing
Package for Cycle 3
NRC Docket Nos. 50-373

References: See Enclosure 1

Dear Sir:

Pursuant to 10 CFR 50.59, Commonwealth Edison proposes to amend Appendix A, Technical Specification, to Facility Operating License NPF-11. These changes are being submitted for your staff's review and approval and are in support of the second reload for LaSalle Unit 1. Startup for Cycle 3 is currently scheduled for June, 1988.

Attachment A provides background and discussion. The proposed changes are summarized in Attachment B. Attachment C provides a list of affected Technical Specification changes. Marked up copies of affected pages are enclosed as Attachment D. The attached change has received both On-Site and Off-Site review and approval. We have reviewed this amendment request and find that no significant hazards consideration exists. Our review is documented in Attachment E.

Attachment F is the GE reload licensing submittal. Also included as Attachment H is the Extended Operating Domain and Equipment Out of Service Analysis which provide expanded operational flexibility. Attachment G and Attachment I are proprietary versions of licensing information to support the new bundle enrichment and LOCA analysis of the reload fuel for Cycle 3. These proprietary attachments are submitted under separate cover with the request that they be treated as proprietary and withheld from public disclosure in accordance with the provisions of 10 CFR 2.790, under the GE affidavit of proprietary information.

IF26 /8 Change: PDR 1 INP, LPDR 1 INP, NSIC 1 INP; Ltr Encl; w/check $150 # 0016492

Commonwealth Edison is notifying the State of Illinois of our request for this amendment by transmitting a copy of this letter and its non-proprietary attachments to the designated State Official.

In accordance with the requirements of 10 CFR 170, a fee remittance in the amount of $150 is enclosed.

Please direct any questions you may have regarding this matter to this office.

Very truly yours,

C M Allen

C. M. Allen
Nuclear Licensing Administrator

lm

Enclosures 1: List of References
2: List of Attachments
3: Check for $150.00

Attachments

cc: Region III Inspector - LSCS
P. Shemanski - NRR
M. C. Parker - IDNS

SUBSCRIBED AND SWORN to
before me this 19th day
of January, 1988
Lelia F. Mayo
Notary Public

4081K

ENCLOSURE 1

LIST OF REFERENCES

1. NRC letter, MFN-082-855, C. O. Thomas to J. S. Charnley, "Acceptance for Referencing of Licensing Topical Report NEDE-24011-P-A-6, Amendment 10, 'General Electric Standard Application for Reactor Fuel,'" dated May 28, 1985.

2. NRC letter, MFN-148-85, C. O. Thomas to J. S. Charnley, "Acceptance for Approval of Fuel Designs Described in Licensing Topical Report NEDE-24011-P-A-6, Amendment 10 for Extended Burnup Operation," dated December 3, 1985.

3. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel", Revision 8. (GESTAR)

4. GE letter JSC-005-85, "Amendment 11 to GE LTR NEDE-24011-P-A", dated February 27, 1985.

5. GE letter JSC-005-86, "Revised Supplementary Information Regarding Amendment 11 to GE Licensing Topical Report NEDE-24011-P-A", dated January 16, 1986.

6. NEDC-23785P, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident," Volumes I, II, and III.

7. GE letter REP-87-093, R. E. Parr (GE) to J. L. Anderson (CECo), "Potential Technical Specification Changes for Implementation of Advanced Methods," dated May 6, 1987.

8. NRC letter from C.O. Thomas (NRC) to J.S. Charnley (GE), "Acceptance for Referencing of LTR NEDE-24011-P-A (Rev. 6, Amendment 11), GE Standard Application for Reactor Fuel" dated November 5, 1985.

9. NRC memo, MFN-061-85 C.O. Thomas (NRC) to H.C. Pfefferlen (NRC), "Acceptance for Referencing of Licensing Topical Report NEDE-24011, Rev. 6, Amendment 8, "Thermal-Hydralic Stability Amendment for GESTAR II", dated April 24, 1985.

ENCLOSURE 2

LIST OF ATTACHMENTS

A. Background and Discussion

B. Summary of Proposed Technical Specification Changes.

C. List of Affected Technical Specification Pages

D. Proposed Technical Specification Changes.

E. Significant Hazards Evaluation.

F. GE document 23A5836 "Supplemental Reload Licensing Submittal for LaSalle County Station Unit 1 Reload (Cycle 3)," dated September 1987.

G. GE document 23A5836, Rev. 0, "Supplement 1 Supplemental Reload Licensing Submittal for LaSalle County Station Unit 1 Reload 2 (Cycle 3)," dated September 1987, Proprietary.

H. GE document NEDE-31455, "Extended Operating Domain and Equipment Out of Service for LaSalle County Station Units 1 and 2," dated November 1987, with addenda.

I. GE document NEDE-31510P, "LaSalle County Station Units 1 and 2 SAFER/GESTAR-LOCA Loss-off-Coolant Accident Analyses," dated December 1987, Proprietary

ATTACHMENT A

BACKGROUND AND DISCUSSION

A. BACKGROUND:

LaSalle County Station Unit 1 Cycle 3 will utilize 112 BC320B and 112 BC301A new fuel assemblies. The new fuel assemblies are of the GE8x8EB fuel type. Additional information on the Cycle 3 reload may be found in the "Supplemental Reload Licensing Submittal for LaSalle County Station Unit 1, Reload 2 (Cycle 3)," Document 23A5836, which is included as Attachment F. Key input parameters and assumptions for the transient and accident analyses were reviewed by Nuclear Fuel Services (NFS) Safety Analysis, NFS Plant Support, and station Nuclear Engineering Group prior to initiation of the analyses by General Electric (GE).

The reload analyses were performed by GE using their new advanced reload licensing methods. These new methods are known as the GEMINI methods and are discussed in Section B.2. The GEMINI methods replace the GENESIS methods. The reload was also analyzed with GE's SAFER/GESTR-LOCA methodology rather than the SAFE/REFLOOD-LOCA methods.

Also, included as part of this reload are analyses for the Equipment Out-of-Service (EOOS) and Extended Operating Domain (EOD) operating modes. EOOS analyses include feedwater heater(s) out-of-service (FWHOOS), safety/relief valve out-of-service (RVOOS), main turbine bypass system out-of-service (TBOOS), and recirculation pump trip system out-of-service (RPTOOS). EOD analyses include Extended Load Line Limit Analysis (ELLLA), Increased Core Flow (ICF) and Final Feedwater Temperature Reduction (FFWTR). The results of these analyses are provided in this report and in Attachment H.

B. DISCUSSION:

1. GE8x8EB FUEL

The reload fuel for Cycle 3 is of the new GE8 barrier fuel design including the option for multiple lattice types (axial zoned gadolinia). This is the first LaSalle 1 reload to use the multiple lattice fuel. The GE8x8EB fuel design has been reviewed and approved generically by the NRC (References 1 and 2) and has been incorporated into Revision 8 of GESTAR (Reference 3). However, the NRC has not yet approved the specific bundle types to be used for LaSalle Unit 1 Cycle 3. GE has submitted to the NRC an amendment to GESTAR which will remove the specific bundle types from GESTAR and place them into a separate General Electric Report which will be referenced in GESTAR. This will eliminate the NRC approval of specific bundle types in GESTAR and will require the licensees to submit bundle specific information to the NRC with the MAPLHGR changes for each reload.

Since the NRC has not yet approved the GE amendment nor the Cycle 3 bundle types, CECo is submitting bundle specific information to the NRC. This information is provided as Attachment G and is GE proprietary information. The bundle types have been analyzed with the approved methods and comply with the approved limits described in GESTAR.

The new fuel type has several improved features. Mechanical improvements include increased pressurization for increased exposure capability, an increased pellet diameter resulting in a smaller pellet to clad gap, an option for additional water rods for improved fuel cycle costs, single diameter upper end plug shafts, and a streamlined upper tie plate to reduce the two-phase pressure drop. Some of the nuclear features include higher bundle enrichments for longer operating cycles and increased discharge burnup, axially zoned gadolinia and the option for additional water rods mentioned earlier. Overall these features allow improved fuel cycle costs, increased flexibility and improved operating margins including an increase in the Linear Heat Generation Rate (LHGR) limit from 13.4 kw/ft to 14.4 kw/ft.

1.a LHGR Limit

The purpose of the thermal limits on the LHGR are to prevent plastic strain of the cladding from exceeding 1% and to prevent fuel centerline melting. Since the LHGR's are a function of fuel type, exposure and gadolinia, GE has calculated a new LHGR limit of 14.4 kw/ft for the GE8x8EB fuel, which conservatively applies to any exposure or gadolinia content. This LHGR limit was calculated using GESTR-MECHANICAL, the GE fuel rod thermal-mechanical performance model (see Section 3.b). The NRC has found the use of the GESTR-MECHANICAL code acceptable for determining this limit (References 1 and 2). NRC also indicated in Reference 2 that GE has demonstrated, using the GESTR-MECHANICAL code, compliance with the fuel design basis criteria of:

1. No fuel centerline melting during normal steady-state operation and whole core anticipated operational occurrences;

2. A small amount of fuel centerline melting and cladding strain not exceeding 1% for local anticipated operational occurrences.

These are satisfied for GE8x8E and GE8x8EB to their peak pellet burnup limit of 60,000 MWd/ST.

The "T" factor of APRM Setpoint T.S. 3.2.2 is not affected by varied LHGR limits since the FLPD value for any node is that node's LHGR divided by its own LHGR limit. However, the MFLPD may not be the highest LHGR node in the core, but the node with the highest ratio of LHGR to that node's limit.

1.b MAPLHGR Curves

In recent years MAPLHGR curves have served to provide secondary limits in fuel mechanical design supplementing the traditional LHGR limit. This is in addition to their original purpose in assuring that initial conditions assumed in the ECCS analyses remain valid. With the improved SAFER/GESTR-LOCA analysis (Attachment I), the LOCA initial condition MAPLHGR values allowed are 12.8 kw/ft for BP8x8R and 13.8 kw/ft for GE8x8EB fuel. These values are independent of nodal exposure. The MAPLHGR limit values are not limited by fuel performance during the LOCA. Rather, the values are restricted to assure that the LHGR limits of 14.4 kw/ft and 13.4 kw/ft are not compromised and, consequently, fuel rod mechanical integrity is maintained. The MAPLHGR limit values are actually determined from the relationship of LHGR = APLHGR x LPF, where LPF is a known value of local peaking factor for a given nodal exposure. The MAPLHGR limit values are provided in Attachment G. (Proprietary)

These lattice specific MAPLHGR values will be used in the core monitoring code, while the most limiting curve for each fuel type will be included in T.S. Figure 3.2.1-3, with a reference to GE document 23A5836 (Attachment G). The amended T.S. figure includes a note stating that either the limiting curve or the lattice specific values shall be used to meet T.S. 3.2.1. The MAPLHGR curve in the T.S. will be used in the event that the process computer/core monitoring code is inoperable and manual surveillance is required.

2. ADVANCED RELOAD METHODS (GEMINI VS GENESIS)

GE's Advanced Reload Methods (designated GEMINI), include new nuclear methods, the use of GESTR-MECHANICAL to determine the fuel rod gap performance and the revised version of ODYN described in References 4 and 5. The NRC has reviewed and approved GEMINI methods and their application with approval of amendment 11 to GESTAR. (Reference 8)

2.a New Nuclear Methods

GE has developed improved computer codes for modeling three dimensional power distributions in a BWR. The major improvements were made to the lattice physics code (TGBLA) which is used to generate nuclear data for use in the three dimensional simulator code, PANACEA, based on fuel pin and fuel lattice geometry, materials, enrichment, etc. The TGBLA changes include improved intermediate neutron energy resonance absorption approximations, and an improved isotope integration scheme. The PANACEA improvements primarily stem from receiving better physics data from TGBLA, but also include the use of an improved void-quality correlation and all the necessary TIP and LPRM instrumentation normalization provisions to enable PANACEA to be used as an advanced on-site core monitoring code.

GE has entitled these improved codes "new physics." The new physics codes are presently being phased into use for fuel management and licensing use.

2.b GESTR-MECHANICAL

An improved fuel mechanical design code, GESTR-MECHANICAL, was used for this reload. Among other improvements, this code incorporates improved fission gas release models and gap conductance models.

2.c ODYN

The improved version of ODYN used for this reload include revisions to make ODYN compatible with the improvements in PANACEA/TGBLA and improved time dependent gap conductance. These improvements result in smaller transient delta CPRs which give a lower (less limiting) MCPR LCO. ODYN also used less restrictive scram time inputs (τ_B) which are closer to actual plant data. The τ_B input scram time is still significantly slower than current LaSalle τ_{ave} times (typically less than 0.63 seconds versus τ_B analyzed value of 0.687 seconds).

3. SAFER/GESTR-LOCA

GE has analyzed the LaSalle unit for next cycle with an improved ECCS analysis code package called SAFER/GESTR-LOCA. GESTR-LOCA is a variation of the GESTR-MECHANICAL fuel mechanical design code and is used to calculate the initial fuel assembly stored energy at the beginning of a LOCA event. SAFER is the combination of previous GE ECCS codes SAFE and REFLOOD along with some modeling improvements. CHASTE is also used for fuel heatup calculations. The GE ECCS methodology is described in detail in Reference 6. In the SAFER/GESTR-LOCA

methodology, the break spectrum is modelled using "best estimate" input parameters. Once the entire break spectrum has been analyzed using nominal parameters, the most limiting break and other potentially limiting breaks are reanalyzed using input parameters fully consistent with 10CFR50 Appendix K criteria. This (when combined with a small uncertainty factor added) provides the licensing basis peak clad temperature (PCT). Additionally, uncertainties from experimental code BENCHMARK modeling and measurement techniques are combined with the nominal PCT calculation to provide an upper bound "95/95" PCT. GE has shown that the licensing basis PCT is greater than the upper bound PCT. In addition, there is an interim NRC restriction that the analyzed upper bound PCT must remain below 1600 F.

In order to allow for flexibility in future technical specification limits, the LaSalle SAFER/GESTR analysis was performed with more conservative ECCS initiation setpoints. All ECCS injection flows were calculated assuming the ECCS pump minimum flow valves remain open during injection. This reduces the assumed injection flow by the amount of bypassed flow. Additionally, reactor water level ECCS initiation setpoints were analyzed to occur conservatively below present T.S. limits as follows:

	Present T.S. Value	Analysis Input
Level 1 (LPCI,LPCS,ADS)	-136	-161
Level 2 (HPCS)	-57 inches	-97.6 inches

The LaSalle SAFER/GESTR was performed in three parts; a base analysis which addressed the reload fuel types (GE8x8EB and BP8x8R), an additional analysis which addressed the intial core fuel (8x8R), and an analysis which addresses single loop operation (SLO). The limiting calculated PCTs for two loop operation are listed below.

	GE8x8EB	BP8x8R	8x8R
Nominal PCT	587°F	650°F	854°F
Appendix K	1060°F	1136°F	1210°F
Licensing Basis PCT (App. K + Adder)	N/A	1138°F	1213°F
Upper Bound (95/95) PCT	N/A	1100°F	1200°F

Additionally, SLO was analyzed with SAFER/GESTR-LOCA. The nominal PCT increased from 854°F to 1071°F for the limiting 8x8R fuel, and from 650°F to 1085°F for the GE8x8EB and BP8x8R fuel. The Appendix K PCTs increased from 1210°F to 1276°F for the 8x8R fuel and from 1136°F to 1191°F for the GE8x8EB and BP8x8R fuel. Although the nominal and Appendix K PCTs for SLO are higher than the corresponding two loop values, the SLO PCTs are still well below the NRC imposed limit. Therefore, no MAPLHGR reduction factor is required for SLO.

All of the LOCA analyses were performed with the relief function of one safety/relief valve out-of-service (RVOOS); thus, no MAPLHGR penalty is required for one RVOOS.

4. CORE WIDE TRANSIENTS

4.a Relief Valve Out-of-Service (RVOOS)

All core wide transients and ECCS analyses were performed with the most restrictive relief valve, i.e., lowest pressure setpoint relief valve out-of-service. This reload package includes a T.S. change to support unrestricted operation with a RVOOS and is further discussed in Section 10 of this report and in Section B.4 of Attachment H.

4.b MCPR Safety Limit

The current MCPR fuel cladding integrity safety limit of 1.07 is maintained for Cycle 3. Two new fuel types are being introduced, BC320B and BC301A, as described in Section B.2. The new fuel types have the same MCPR safety limit.

In GESTAR GE provides the results of a statistical analysis which shows for a C-lattice plant with 8x8R, BP8x8R and GE8x8EB fuel that at a calculated MCPR of 1.07, 99.9% of the fuel rods in the core are expected to avoid boiling transition.

4.c Limiting MCPR Transient

The core wide transients analyzed for LaSalle 1 Cycle 3 include the Load Reject with No Bypass (LRNBP), Loss of Feedwater Heating (LOFWH), and Feedwater Controller Failure (FWCF) events. Of these the LRNBP transient is the most limiting, with an Option B MCPR limit of 1.22. This differs from Cycle 2 in which the FWCF was the most limiting transient. Although the LRNBP is the limiting core wide transient, the limiting MCPR transient for the cycle is the Rod Withdrawal Error (RWE) event. See Sections 5.a and b.

4.d Compliance to ASME Pressure Vessel Code

The results of the LaSalle 1 Cycle 3 analyses for the postulated MSIV closure with indirect (APRM) scram and no relief valve credit are provided in Attachment F. The results indicate that the peak steamline pressure will be 1226 psig and the peak vessel pressure will be 1266 psig. These values are within the T.S. Safety Limit of 1325 psig for steam dome pressure and the ASME vessel overpressurization limit of 1375 psig (110 percent of design pressure). Because the calculated values are less than the limits, the pressure response is acceptable.

This analysis was also performed with the safety functions of only 17 of the 18 safety/relief valves operable. This analysis showed only a slight change in pressure and no change in delta CPR. The peak steamline pressure increased to 1230 psig and the peak vessel pressure increased to 1269 psig. See Section 10 of this document for further information pertaining to the RVOOS analysis.

5. LOCAL TRANSIENTS

5.a Rod Withdrawal Error (RWE)

The RWE has been analyzed on a plant/cycle specific basis. The results of the analysis showed a delta CPR of 0.20 for a RBM setpoint of 106% and 0.24 for a RBM setpoint of 110%. Adding the delta CPR to the Safety Limit of 1.07 yields event LCO values of 1.27 and 1.31, respectively. As discussed in Section 4.c, the RWE is the limiting event during normal operation.

5.b Fuel Loading Error Event

No Fuel Loading Error analysis is required for LaSalle 1 Cycle 3. Neither mislocated nor misoriented bundle events are analyzed for BWR-5 reloads. The mislocated bundle accident is only performed for initial cores. Data from past reloads indicate that the probability of mislocating a fuel bundle so that the CPR violates the safety limit is sufficiently small that plant specific analyses are unnecessary. Also, the misorientation causes an insignificant CPR change due to uniform water gaps in C-lattice cores vs. D-lattice cores. Proper orientation during core loading is also readily verified visually. The NRC has given interim approval for this approach (see GESTAR Section S.2.5.4.1).

6. LIMITING MCPR EVENT

The transient MCPR values for Cycle 3 were calculated using GE's advanced reload methods described in Section B.2 of this report. The bounding cycle specific transient for this cycle is the Rod Withdrawal Error (RWE) event. In the past one RBM setpoint has been chosen from the table of analyzed setpoints and ΔCPRs to determine the RWE event MCPR limit for the cycle. This reload amendment revises the MCPR LCO to be a function of the RBM setpoint and includes multiple setpoints in the technical specifications. Two MCPR limits are plotted on Figure 3.2.1-1a. The appropriate limit will be chosen based on the corresponding RBM setpoint. For Cycle 3 a MCPR limit of 1.27 shall be used when the RBM setpoint is 106% and a MCPR limit of 1.31 shall be used when the RBM setpoint is 110%. These values are based on the results of the RWE analysis provided in Attachment F.

The two limit approach will allow greater use of the operating region above the rated rod line at low power/low flow. With the lower RBM setpoint, rod maneuvering in the region will be restricted due to frequent rod blocks. Increasing the setpoint will reduce the number of rod blocks to allow rod movement, while maintaining transient protection with the more restrictive MCPR limit. The flexibility of the variable RBM setpoint/MCPR limit allows efficient use of the Extended Load Line Limit Analysis domain (ELLLA region). Since Cycle 2 utilized a RBM setpoint of 107% and Cycle 3 will utilize 106% and 110%, revisions will be made to the RBM setpoint equations of T.S. Table 3.3.6-2.

The RWE event was not analyzed using ODYN option for improved scram times, therefore, the MCPR does not vary with the scram time measurements. However, the new statistical values used in the improved ODYN methods result in a change in the scram time at which the Option B MCPR limit is applicable (Reference 7). The new $_B$ is calculated in the Bases of the technical specifications and is indicated on the MCPR Figures 3.2.3-1a and 3.2.3-1b.

In addition, an analysis was performed to allow operation with certain equipment out-of-service. In these modes of operation MCPR penalties are required. The cycle independent MCPR limits with EOC-RPT and Main Turbine Bypass inoperable are provided on Figure 3.2.3-1b. These analyses are further discussed in Sections B.12 and B.13.

7. STABILITY ANALYSIS

The LaSalle 1 Cycle 3 decay ratio at the intersection of the natural recirculation line and the extrapolated APRM rod block line power level is 0.75. This decay ratio is less than the NRC upper limit of 0.80 for plants with no stability monitoring T.S. (Reference 9). Since existing T.S. do not allow continued operation in natural circulation, combinations of low flow and high power sufficient to produce unacceptable decay ratios are prohibited.

8. ACCIDENTS

8.a Loss of Coolant Accident (LOCA)

See Section 3 for the PCT results of the new SAFER/GESTR-LOCA analyses. Compliance with other 10CFR50.46 ECCS criteria was also demonstrated. The peak local oxidation was calculated to be less than .3% for all cases analyzed, meeting the criteria of less than or equal to 17%. The core-wide metal water reaction was determined to be less than 0.1%, again meeting the 10CFR50.46 criteria of 1%. In addition, a coolable geometry and long term cooling are maintained.

8.b Rod Drop Accident (RDA)

The RDA event has been statistically analyzed on a generic basis and is no longer analyzed on a plant cycle specific basis. The generic analysis provides assurance that the 280 cal/gram enthalpy deposition limit will not be violated. The highest deposition of enthalpy calculated was 158 cal/gram. This provides confidence on a 95/95 level that the T.S. limit will not be violated in the unlikely event of the postulated Design Basis RDA. The generic RDA analysis has been previously approved by the NRC.

8.c Fuel Loading Error Event

See Section F.2.

9. EXTENDED OPERATING DOMAIN

To permit improved power ascension capability to full power within the design bases, the operating envelope is modified to include an expanded operating region bounded by the 108% APRM rod block line (0.58W + 50%), the rated power line and the rated rod line. The region of operation above the rated rod line is known as the Extended Load Line Limit Analysis (ELLLA) region. In addition, the use of increased core flow (ICF) above 100% rated core flow can provide even greater operational flexibility in reaching and maintaining full power during the cycle and can extend the operating cycle at rated power.

The limiting operational transients analyzed at 100% power, 100% core flow (100P/100F) (see Attachment F) for the Unit 1 Cycle 3 supplemental reload licensing submittal were reevaluated to ensure that operation above the rated rod line and within the ICF region was acceptable. Nuclear transient data for 100% power, 87% core flow (100P/87F) and 100% power, 105% core flow (100P/105F) at the end-of-cycle exposure were developed. Although some parts of the analysis allow 108% rated core flow, 105% was selected as the procedural limit to provide consistency with the jet pump fatigue analysis. Where reduced feedwater temperature might affect the analysis, cases were run with a 100°F reduction in temperature, as well as the normal temperature. This assures that the analysis is good for cycle extension using Final Feedwater Temperature Reduction (FFWTR).

Analyses performed at the increased core flow (ICF) condition are more limiting than those at rated conditions. For Unit 1 Cycle 3 the results were still bounded by the cycle MCPR operating limit value of 1.27 determined from the RWE. Consequently, no additional MCPR penalty is required for operation within the extended operating region or ICF region and no changes to Technical Specification 3.2.3 are necessary as a result of these analyses.

In order that operation above the rated rod line may be achieved, it is necessary to revise the APRM flow biased simulated thermal power upscale scram and rod block setpoint equations. No hardware modifications are required for this as the equipment has adjustable slope provision.

To achieve full benefit of operation within the ELLLA region the slope of the RBM rod block setpoint equations also need to be changed. However, this change would require hardware modifications which cannot be completed at this time. Consequently, the slope of the RBM rod block setpoint equations will remain at 0.66. Revisions are made to Technical Specification 3.2.2 and Tables 2.2.1-1 and 3.3.6-2 which reflect the necessary limits although it does not allow full benefit of the ELLLA.

During SLO the normal drive flow to core flow relationship is altered by the back flow through the idle loop jet pumps caused by diverting flow away from the core. Because the flow biased setpoints must be referenced to drive flow, the setpoints are reduced during SLO to reestablish the correct relationship between drive flow and actual flow through the core. The core flow differential for SLO at 100% rated drive flow has been determined to be 8% for LaSalle Units 1 and 2. Based upon a slope of 0.58, the APRM setpoints must be reduced by 4.7% (8.0% times 0.58) during SLO. The RBM setpoint reduction will remain 5.3% (8.0% times 0.66) since the slope of the RBM flow-biased setpoint equation cannot be physically changed. Revisions are made to Technical Specification 3.2.2 and Tables 2.2.1-1 and 3.3.6-2 which reflect the necessary changes.

In order to maintain the margin to MCPR limits for the Rod Withdrawal Error (RWE), the RBM setpoints must be clipped so the setpoint does not exceed its analyzed value at greater than 100% core flow. Without such clipping, the flow biased setpoint would continue to increase as the flow increases beyond 100% with ICF. The clipping procedure requires an adjustment to the RBM trip setpoint at flows greater than 100% of rated is equal to the value at 100% rated flow. The RBM system has the provision for clamping the flow biased setpoint using the "Backup Rod Block" function. This function was previously arbitrarily set above the RBM setpoint, as it was not required by analysis. This adjustable clamp is the hardware equivalent of the APRM flow biased scram clamp and will be calibrated in a similar manner. Revisions are being proposed to Technical Specification Table 3.3.6-2 to reflect the necessary changes. The EOD analysis is further discussed in Section A of Attachment H.

10. RELIEF VALVE OUT OF SERVICE (RVOOS)

The ECCS consists of the Low Pressure Core Spray (LPCS) system, Low Pressure Coolant Injection (LPCI) system, High Pressure Core Spray (HPCS) system and the Automatic Depressurization System (ADS). In a small break LOCA the high pressure systems (ADS or HPCS) reduce vessel pressure so that the low pressure systems (LPCS or LPCI) may be used. The ADS consists of seven combined safety/relief valves.

The analysis in Attachment H considers the effects of the relief function of a safety/relief valve out of service on the LOCA and plant transients. The analysis concludes that one RVOOS has no effect on either the LOCA or the transients. Revisions to T.S. 3.4.2 are being proposed to support continued operation with a RVOOS. Operation with a RVOOS is permitted in both the ELLLA and ICF regions and in conjunction with SLO. No MCPR or MAPLHGR penalty is required for operation with one RVOOS. For a detailed description of the analysis results, see Section B.4 of Attachment H.

11. FEEDWATER HEATERS OUT OF SERVICE (FWHOOS)

Analyses were performed to justify operation above or below the rated rod line with a 100°F reduction in feedwater temperature. The FWHOOS analysis supports a contingency operating mode allowing continued operation with reduced feedwater temperature over a full fuel cycle. The use of final feedwater temperature reduction (FFWTR) was evaluated in ICF as a cycle extension strategy. See Section 9 of this document.

Transient events have been analyzed with FWHOOS. With reduced feedwater temperature the LRNBP and TTNBP events will be less severe because of the reduced core steaming rate and lower initial void fraction. However, the FWCF event will become more severe with a FWHOOS and could become the limiting transient for a given cycle.

The Unit 1 Cycle 3 analysis for FWHOOS was performed using bounding nuclear parameters from a more top-peaked axial power distribution than the nominal power shape. For the bounding analysis it was determined that the FWCF event with FWHOOS yielded operating limit MCPR values of 1.24 and 1.22 for Options A and B, respectively. These values are conservative for the assumed event since a bounding exposure was used. They are, however, less than the operating limit MCPR value of 1.27 determined from the most limiting cycle specific transient analysis, the RWE. Therefore, operation with FWHOOS for Cycle 3 is bounded by the cycle specific analysis and no additional MCPR penalty is required for operation with FWHOOS. No T.S. changes are necessary.

12. MAIN TURBINE BYPASS SYSTEM OUT-OF-SERVICE

The limiting pressurization transient for LaSalle is the LRNBP. Since the analysis of this transient assumed that the Main Turbine Bypass System is unavailable, the results are applicable whether or not the Main Turbine Bypass System is out-of-service. To establish a cycle independent limit, the LRNBP transient event was run with a bounding power shape.

The bounding power shape assumes a top peaked axial power distribution. This increases the time before the control rod insertion becomes effective during a transient. The delay in scram effectiveness produces a larger, more conservative delta CPR change.

The cycle independent MCPR limit for LRNBP is 1.29 for Option B. This limit appears as the contingent MCPR operating limit in T.S. 3.2.1. To assure that this limit remains valid for future cycles, the following checks on standard reload operating limits are required:

1. The standard reload MCPR operating limits for LRNBP and TTNBP events shall be less than or equal to 1.33 and 1.29 for Options A and B, respectively.

2. The standard reload MCPR operating limits for the FWCF event shall be less than 1.25 and 1.21 for Options A and B, respectively, when analyzed with normal feedwater temperature.

The item (2) requirement maintains the spread between the LRNBP and FWCF events, to assure that FWCF does not become the limiting transient with the Main Turbine Bypass System out of service.

The Main Turbine Bypass System is not assumed for the LOCA analyses. Therefore, the system out of service does not affect the analyses or their resulting PCTs.

Technical Specification 3.2.3 is being revised, including the addition of Figure 3.2.3-1b, to provide for the determination of the MCPR operating limit during operation with the Main Turbine Bypass System out of service.

Also, Technical Specification 3.7.10 is being revised to allow continued operation with the Main Turbine Bypass System inoperable, provided a new MCPR operating limit is determined and at least four turbine bypass valves are capable of accepting steam flow. However, if two or more turbine bypass valves are incapable of accepting steam flow, continued operation above 25% of RCTP is permitted only for a short period of time. Operation with the Main Turbine Bypass Out-of-Service (MTBPOOS) in the ELLLA Region is permitted. However, analysis does not provide operation with MTBPOOS in the ICF region. Operation with MTBPOOS in the ICF region will be administratively prohibited. Additional information may be found in Section B.2 of Attachment H.

13. RECIRCULATION PUMP TRIP OUT OF SERVICE (RPTOOS)

The Recirculation Pump Trip (RPT) system reduces the severity of turbine trip and load reject transients by running back the recirculation pumps. To support operation with RPT out of service, the limiting transient (LRNBP) was analyzed without RPT. In order that a cycle independent limit may be established, the LRNBP transient was analyzed with a bounding power shape.

The bounding power shape assumes a top peaked axial power distribution. This increases the time before the control rod insertion becomes effective during a transient. The delay in scram effectiveness produces a larger, more conservative delta CPR. The delta CPR is about 0.05 worse than the nominal power shape delta CPR.

The cycle independent MCPR limit for RPTOOS is 1.33 for Option B. This limit appears as the contingent MCPR operating limit in Technical Specification 3.2.1. To assure that this limit remains valid for future cycles, the following checks on standard reload operating limits are required:

1. The standard reload MCPR operating limits for LRNBP and TTNBP events shall be less than or equal to 1.33 and 1.29 for Options A and B, respectively.

2. The standard reload MCPR operating limits for the FWCF event shall be less than 1.25 and 1.21 for Options A and B, respectively, when analyzed with normal feedwater temperature.

The item (2) requirement maintains the spread between the LRNBP and FWCF events, to assure that FWCF does not become the limiting transient with the RPT out of service.

The RPT is not assumed for the LOCA analyses. Therefore, the system out of service does not affect the analyses or their resulting PCTs.

Technical Specification 3.2.3 is being revised, including the addition of Figure 3.2.3-1b, to provide for the determination of the MCPR operating limit during operation with the RPTOOS. In addition, T.S. 3.3.4.2 is being revised to allow determination of a new MCPR operating limit and continued operation with the RPT system inoperable. Operation with the RPTOOS in the ELLLA Region is permitted. However, the analysis does not provide for operation with RPTOOS in the ICF region. Operation with the RPTOOS in the ICF region will be administratively prohibited. Additional information may be found in Section B.2 of Attachment H.

14. SUMMARY OF ANALYZED MODES OF OPERATION

Table 1 summarizes the analyzed combined modes of operation for the equipment out of service and the expanded operating domain analyses. The analyses performed (with the exception of the RVOOS) assumed a single failure only. Therefore, one equipment out of service may not be used in conjunction with another equipment out of service. The analysis does provide for operation with a single RVOOS in conjunction with single or dual recirculation loop operation. Operation with more than one equipment out of service will be administratively prohibited.

All the equipment out of service (with the exception of FWHOOS) were analyzed for continued operation within the ELLLA Region. FWHOOS in conjunction with operation in the ELLLA Region is analyzed only if dual recirculation loop stability monitoring technical specifications are utilized. Since LaSalle Unit 1 Cycle 3 will not utilize dual recirculation loop stability monitoring techncial specifications, FWHOOS in the ELLLA Region will be administratively prohibited.

With the exception of the RVOOS, operation with equipment out of service in the ICF Region is not permitted. The analysis does not provided for continued operation in the ICF Region with a single RVOOS. Operation in the ICF Region in conjunction with the other equipment out of service will be administratively prohibited.

TABLE 1

ANALYZED COMBINED MODES OF OPERATION

RECIRCULATION SYSTEM STATUS	POWER/FLOW EOD	EOOS
DLO	ELLLA	N/A
DLO	ELLLA	RVOOS
DLO	N/A	FWHOOS
DLO	ELLLA	EOC-RPTOOS
DLO	ELLLA	TBOOS
DLO	ICF	N/A
DLO	ICF	RVOOS
DLO	ICF + FFWTR	N/A
DLO	FFWTR	N/A
SLO	ELLLA	N/A
SLO	ELLLA	RVOOS

EOD - Extended Operating Domain
EOOS - Equipment Out of Service
DLO - Dual Loop Operation
SLO - Single Loop Operation
ELLLA - Extended Load Line Analysis
ICF - Increased Core Flow
FFWTR - Final Feedwater Temperature Reduction
RVOOS - Safety/Relief Valve Out of Service
FWHOOS - Feedwater Heater Out of Service
EOC-RPTOOS - End of Cycle Recirculation Pump Trip Out of Service
TBOOS - Turbine Bypass System Out of Service

ATTACHMENT B

SUMMARY OF PROPOSED TECHNICAL SPECIFICATION CHANGES
LASALLE UNIT 1 CYCLE 3

TECHNICAL SPECIFICATION Table 2.2.1-1, LIMITING SAFETY SYSTEM SETTINGS (Page 2-4)

The reactor protection system APRM flow biased scram trip setpoint and allowable values, for two loop and single loop operation, are revised to incorporate the extended load line limit analyzed region.

SAFETY LIMIT BASES (Pages B2-2 through B2-7)

Pages B2-2 and B2-3 are revised and Tables B2.1.2-1 through B2.1.2-4 are deleted. These changes remove the input for the GEXL correlation and the GETAB statistical model. This information is overly detailed for inclusion in the Technical Specifications.

TECHNICAL SPECIFICATION 3/4.1.3, REACTIVITY CONTROL SYSTEM (Pages 3/4 1-6, 1-7, 1-8 and 1-11)

Sections 3.1.3.2, 3.1.3.3, 3.1.3.4, and 3.1.3.6 are revised to delete the Cycle 2 specific exceptions for control rod 10-47.

TECHNICAL SPECIFICATION 3/4.1.4, CONTROL ROD PROGRAM CONTROLS (Page 3/4 1-16)

Surveillance Requirement 4.1.4.1a has been revised to require the RWM to be demonstrated operable prior to reaching 20% of RATED THERMAL POWER when reducing thermal power, rather than prior to RWM automatic initiation. This administrative change is required since the RWM does not function prior to automatic initiation.

TECHNICAL SPECIFICATION 3/4.2.1, AVERAGE PLANAR LINEAR HEAT GENERATION RATE (Page 3/4 2-1)

The LCO which requires the APLHGR limit reduction of 0.85 when operating with a single recirculation loop has been deleted, since the SAFER/GESTR-LOCA analysis has shown that the reduction factor is not required. Also MAPLHGR plots for the two reload fuel types have been added as Figure 3.2.1-3 (Page 3/4 2-2b). The MAPLHGR values plotted are the most limiting MAPLHGR values of the limiting lattices (excluding natural Uranium). These plots are being provided for information and will be used in the event that the core monitoring code is inoperable. The lattice specific MAPLHGR values will be used in the core monitoring code.

TECHNICAL SPECIFICATION 3/4.2.2, APRM SETPOINTS (Page 3/4 2-3)

The APRM flow biased simulated thermal power-upscale scram and rod block trip setpoints have been revised to incorporate the extended load line limit operating region. Also, the definition of the variable "T" has been revised for clarification.

TECHNICAL SPECIFICATION 3/4.2.3, MINIMUM CRITICAL POWER RATIO (Pages 3/4 2-4, 3/4 2-5, and 3/4 2-5a)

The MCPR LCO wording has been rearranged to allow for easier determination of the MCPR operating limit. Figure 3.2.3-1a (Page 3/4 2-5) has been revised to reflect the cycle specific MCPR limit based on the RBM setpoints which will allow more efficient use of the extended operating domain region. MCPR limits have also been added (Figure 3.2.3-1b) (Page 3/4 2-5a) to allow for operation with the End-of-Cycle Recirculation Pump Trip or Main Turbine Bypass systems out of service.

TECHNICAL SPECIFICATION 3/4.2.4, LINEAR HEAT GENERATION RATE (Page 3/4 2-7)

This section has been revised to add the new LHGR limit of 14.4 kw/ft for the GE8x8EB reload fuel.

TECHNICAL SPECIFICATION 3/4.3.4.2, END-OF-CYCLE RECIRCULATION PUMP TRIP INSTRUMENTATION (Page 3/4 3-39)

Revised to allow continued operation with the EOC-RPT System out of service provided the MCPR limit is increased within two hours to the limit specified in Specification 3/4.2.3, to ensure transient protection.

TECHNICAL SPECIFICATION Table 3.3.6-2, CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTAITON SETPOINTS (Page 3/4 3-39)

The control rod withdrawal block instrumentation setpoints (RBM and APRM upscale) have been revised to reflect the change in the selected setpoint based on the Rod Withdrawal Error. In addition, the APRM upscale setpoints have been revised to include the operating region analyzed in the extended load line limit analyses. A footnote has been added to indicate that the RBM setpoint is clamped at 100% drive flow to prevent the RBM setpoint from exceeding the analyzed value.

TECHNICAL SPECIFICATION 3/4.4.1, RECIRCULATION SYSTEM (Page 3/4 4-1)

The action statement requiring that the MAPLHGR limit be reduced by 0.85 when in single recirculation loop operation has been deleted. This reduction is no longer required since the SAFER/GESTR-LOCA analysis has shown that the reduction factor is not required. The footnote "See Special Test Exception 3.10.4" has been deleted.

TECHNICAL SPECIFICATION 3/4.4.2, SAFETY/RELIEF VALVES (Page 3/4 4-5)

As a result of the one safety/relief valve out of service analysis, the LCO statement was reworded to reflect that only 17 SRV's are required for safety valve actuation. Clarification is added to indicate that each of the required valves must be closed with position indication operable.

TECHNICAL SPECIFICATION 3/4.6.1.1, PRIMARY CONTAINMENT INTEGRITY (Page 3/4 6-1)

The footnote "See Special Test Exception 3.10.7" has been deleted as no longer applicable.

TECHNICAL SPECIFICATION 3/4.7.10, MAIN TURBINE BYPASS SYSTEM (Page 3/4 7-33)

The Specification has been revised to allow continued operation with the main turbine bypass system inoperable per the surveillance requirements, provided at least four turbine bypass valves are capable of accepting steam flow and the MCPR limit for this condition of operation is met within 2 hours per Specification 3.2.3. If two or more turbine bypass valves are incapable of accepting steam flow, operation is allowed for only 14 hours, provided the MCPR limit for this condition of operation is met within 2 hours per Specification 3.2.3.

TECHNICAL SPECIFICATIONS 3/4.10.4 and 3/4.10-7, SPECIAL TEST EXCEPTION (Pages 3/4 10-4 and 3/4 10-7)

This administrative change deletes these specifications as they are no longer applicable.

BASES 3/4.2.1, AVERAGE PLANAR LINEAR HEAT GENERATION RATE (Pages B3/4 2-1 and B3/4 2-2)

The bases has been revised to delete the reference to a APLHGR multiplier for single loop operation and to include a discussion of the bases of the APLHGR curves for GE8x8EB fuel being fuel thermal-mechanical rather than LOCA dependent. The LOCA input parameters have also been deleted. This information too detailed for the Technical Specifications and no longer fully applicable to this section, since the APLHGR values are no longer LOCA dependent as a result of the SAFER/GESTR-LOCA analysis.

BASES 3/4.2.3, MINIMUM CRITICAL POWER RATIO (Pages B3/4 2-3 through B3/4 2-6)

The References in this section have been revised to include licensing analyses used for LaSalle 1 Cycle 3. The discussion has been revised to incorporate the changes due to the new ODYN methods and the RBM setpoint dependent MCPR and MCPR penalties for operation with particular equipment out of service. In addition, the numerical values used in calculating $_B$ and the actual value of $_B$ have been revised to reflect the present values used in ODYN.

BASES 3/4.3.4, RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION (Page B3/4 3-3)

The bases has been revised to include a discussion regarding the analysis which allows the EOC-RPT system to be inoperable.

BASES 3/4.4.2, SAFETY/RELIEF VALVES (Page B3/4 4-1)

The bases has been updated to incorporate the results of the single S/RV out-of-service analysis, and to reflect the fact that the LCO has been expanded to include a statement requiring SRV's to be closed and to have position indication be operable.

BASES 3/4.7.10, MAIN TURBINE BYPASS SYSTEM (Page B3/4 7-5)

The bases has been revised to include a discussion of the analysis which allows continued operation with the main turbine bypass system inoperable per the surveillance requirements.

DESIGN FEATURES 5.3.2, CONTROL ROD ASSEMBLIES (Page 5-4)

The design features section has been revised to include a discussion of the ASEA-ATOM control rods which may be inserted for operation during Cycle 3 or subsequent cycles.

BASES 3/4 5.1, ADS

The bases statement for ADS was revised to correct an existing error. The LOCA (Small break) analysis assumed 6 ADS valves rather than 5 as stated previously. The change does not represent any change in the analysis or methodology used.

ATTACHMENT C

LIST OF AFFECTED TECHNICAL SPECIFICATION PAGES

Changed Page #	New Page #	Comment	Deleted Page #
XIX			B2-4
2-4		Table 2.2.1-1	B2-5
B2-2			B2-6
B2-3			B2-7
3/4 1-6			3/4 2-5
3/4 1-7			3/4 10-4
3/4 1-8			3/4 10-7
3/4 1-11			B3/4 2-2
3/4 1-16			
3/4 2-1			
	3/4 2-2b	Figure 3.2.1-3	
3/4 2-3			
3/4 2-4		Insert "A"	
3/4 2-5		Redrawn Figure 3.2.3-1a	
	3/4 2-5a	Figure 3.2.3-1b	
3/4 2-7		Insert "B"	
3/4 3-39			
3/4 3-53		Insert C1 & C2 to Table 3.3.6-2	
3/4 3-53a		Table 3.3.6-2 (Cont'd)	
3/4 4-1			
3/4 4-5		Insert "D"	
3/4 6-1			
3/4 7-33		Insert "E"	
B3/4 2-1		Insert "F"	
B3/4 2-3		Insert "G"	
B3/4 2-4			
B3/4 2-6			
B3/4 3-3		Insert "H"	
B3/4 4-1		Insert "I"	
B3/4 5-2			
B3/4 7-5		Insert "J"	
5-4		Design Features	