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September 14, 1988

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

Subject: LaSalle County Station Unit 2  
Proposed Amendment to Technical  
Specification for Facility Operating  
License NPF-18 - Reload Licensing  
Package for Cycle 3  
NRC Docket No. 50-374

- References (a): Unit 1, Cycle 3 Reload Licensing Submittal  
and Technical Specifications Changes, dated  
January 19, 1988. Approved June 23, 1988 as  
Amendment 58 to NPF-11.
- (b): GE Document NEDE-31455, "Extended Operating  
Domain and Equipment Out-of-Service for LaSalle  
County Nuclear Station Units 1 and 2". dated  
November 1987.
- (c): GE Document NEDC-31510P, "LaSalle County Station  
Units 1 and 2 SAFER/GESTR-LOCA Loss-of-Coolant  
Accident Analyses", dated December, 1987  
Proprietary.

Dear Sir:

Pursuant to 10 CFR 50.59, Commonwealth Edison proposes to amend  
Appendix A, Technical Specification, to Facility Operating License NPF-18.  
These changes are being submitted for your staff's review and approval and are  
in support of the second reload for LaSalle Unit 2. Startup for Cycle 3 is  
currently scheduled for January 1989.

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.

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September 14, 1988

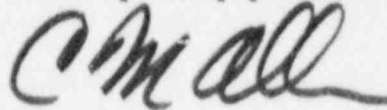
Enclosure 1 lists all attachments to this letter. Note that Attachment G is GE proprietary. This proprietary attachment is submitted under separate cover with the request that it be treated as proprietary and withheld from public disclosure in accordance with the provisions of 10 CFR 2.790, under the GE affidavit of proprietary information.

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 \$150.00 is enclosed.

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

Very truly yours,



C. M. Allen  
Nuclear Licensing Administrator

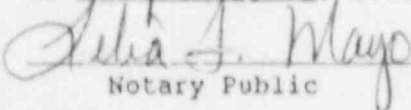
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Enclosure 1: List of Attachments  
2: Check for \$150.00

Attachment

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

SUBSCRIBED AND SWORN to  
before me this 14<sup>th</sup> day  
of September, 1988

  
Notary Public

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ENCLOSURE 1 OF ATTACHMENT A

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 23A5841, "Supplemental Reload Licensing Submittal for LaSalle County Station Unit 2 Reload (Cycle 3)", dated July 1988.
- G. GE Document NEDE-3151OP, "LaSalle County Station Units 1 and 2 SAFER/GESTR-LOCA Loss-of-Coolant Accident Analyses," dated December 1987, Proprietary.
- H. GE Standard Licensing Stability Analysis Results

## ATTACHMENT A

### BACKGROUND AND DISCUSSION

#### A. BACKGROUND

LaSalle County Station Unit 2 Cycle 3 will utilize 96 BC320C and 144 BC300D new fuel assemblies. The new fuel assemblies are of the GE 8x8EB fuel type, which is further discussed in Section B. Additional information on the Cycle 3 reload may be found in the "Supplemental Reload Licensing Submittal for LaSalle County Station Unit 2, Reload 2 (Cycle 3), "Document 23A5841, which is included as Attachment F. Key input parameters and assumptions for the transient and accident analyses were reviewed by NFS Safety Analysis, NFS Plant Support, and station personnel prior to initiation of the analyses.

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 methods rather than the SAFE/REFLOOR-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 included 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 4. Table 1 summarizes the analyzed combined modes of operation.

The analyses and methods used for LaSalle 2 Cycle 3 were previously approved by the NRC for LIC3 (Reference 1).

The following sections provide a discussion on the key features of this reload.

#### B. DISCUSSION

##### 1. GE 8x8EB Fuel

The reload fuel for Cycle 3 is of the same design as reviewed and approved for LaSalle Unit 1, Cycle 3. However, the NRC has not reviewed the specific bundle types to be used for LaSalle Unit 2 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 GE report which will be referenced in GESTAR. This will eliminate the NRC approval of specific bundle types in GESTAR and will require the licensee 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 or the Cycle 3 bundle types, CECO is required to submit bundle-specific information to the NRC. This data is included as Attachment I which replaces Appendix B of the previously reviewed "SAFER/GESTR-LOCA" report and therefore includes the previously approved information on the U1C3 reload bundles as well as the new information on the U2C3 reload bundles. The bundle types have been analyzed with the approved methods and comply with the approved limits described in GESTAR.

1.a LHGR Limit

The Unit 2 Cycle 3 (L2C3) reload bundles (GE 8x8EB) have been designed to allow a LHGR limit of 14.4 kw/ft to ensure thermal mechanical integrity during analyzed transient events. The LHGR limit of 14.4 kw/ft for the GE 8x8EB fuel was previously approved by the NRC for LIC3.

1.b MAPLHGR Curves

Maximum Average Planar Heat Generation Rate (MAPLHGR) limit curves were calculated for both LaSalle Units 1 and 2 using the SAFER/GESTR-LOCA analysis. MAPLHGR limit curves for each lattice are developed and the MAPLHGR limits for the L2C3 reload fuel are provided in a supplement to NEDC-3151OP (Attachment G). These lattice specified 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 NEDC-3151OP.

2. ADVANCED RELOAD METHODS (GEMINI VS GENESIS)

The L2C3 analysis uses the same GE Advanced Reload Methods (designated GEMINI), as the LIC3 reload analysis approved in Reference 1.

3. SAFER/GESTR-LOCA

GE has reanalyzed the LaSalle units with an improved ECCS analysis code package called SAFER/GESTR-LOCA. This analysis was previously approved in the LaSalle 1 Cycle 3 licensing documents.

#### 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 SRV, out-of-service. This reload package includes T.S. change to support unrestricted operation with RVOOS, as was analyzed and approved by the U1C3 reload analysis.

##### 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, BC320C and BC300D, as described in Section B. The new fuel types have the same MCPR safety limit of 1.07.

##### 4.c Limiting MCPR Transient

The core wide transients analyzed for LaSalle 2 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 with the exception of the region of scram times ( $\tau$ ) between .818 and .860 when the RBM setpoint is 106%. For this region, the LRNBP becomes limiting, based on the transient analysis results from extended EOC with Increased Core Flow (page 12 of the Supplemental Reload Submittal 23A5841). This core wide transient result is the same as for U1C3, however, since the RWE results for U1C3 required a MCPR limit of 1.27, the core wide transient did not appear as limiting for any portion of T.S. Figure 3.2.3-1a.

##### 4.d Compliance to ASME Pressure Vessel Code

The results of the LaSalle 2 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 1232 psig and the peak vessel pressure will be 1267 psig, for the MSIV closure at EOC+190 MWd/ST with Increased Core Flow ("Additional information regarding the Supplemental Reload Licensing Submittal" - Attachment F). These values are within the T.S. Safety Limit of 1325 psig for steam dome pressure and the ASME vessel over-pressurization 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 CPR over the standard reload analysis. The effect of a SRV valve out-of-service was shown to be less than 20 psid.

## 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 CPR of 0.19 for a RBM setpoint of 106% and 0.23 for a RBM setpoint of 110%. Adding the CPR to the Safety Limit of 1.07 yields event LCO values of 1.26 and 1.30, respectively. As discussed in Sections 4.c and 6, the RWE is the limiting event during normal operation, because typical scram times are less than .687 seconds and well below the value at which the LRNBP becomes limiting.

### 5.b Fuel Loading Error Event

No Fuel Loading Error analysis is required for LaSalle 2 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. The NRC has given interim approval for this approach (see GESTAR Section S.2.5.4.1).

This misoriented bundle accident is not analyzed for C-lattice cores such as LaSalle because the misorientation causes an insignificant CPR change. This is due to uniform water gaps in C-lattice cores vs. D-lattice cores. Proper orientation during core loading is also readily verified visually. For a more detailed discussion, see GESTAR Section S.2.5.4.2.

## 6. LIMITING MCPRE EVENT

The transient MCPRE values for Cycle 3 were calculated using GE's advanced reload methods described in Section 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/CPRs to determine the RWE event MCPRE limit for the cycle; however, it is proposed to revise the MCPRE LCO to be a function of the RBM setpoint in a manner similar to what



was used for LaSalle 1 Cycle 3. Specifically, 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 1.26 shall be used when the RBM setpoint is 106% (and tau-average is less than .818 seconds). A MCPR limit of 1.30 shall be used when the RBM setpoint is 110%. These values are based on the results of the RWE analysis provided in Attachment F.

In addition, an analysis was performed to allow operation with certain equipment out-of-service. This analysis was previously approved for L1C3 operation. In these modes of operation, MCPR penalties are required. The cycle independent MCPR limits with EOC-RPT and Main Turbine Bypass inoperable are provided in Figure 3.2.3-1b of the revised Technical Specification 3/4.2.3 in Attachment E. This figure is identical to the corresponding figure approved for L2C3.

## 7. STABILITY ANALYSIS

GE SIL-380 recommendations have been included in the plant operating procedures and/or Technical Specifications; therefore, no cycle-specific stability analysis is required. NRC approval for deletion of a cycle-specific stability analysis is documented in GESTAR.

However, in light of past stability concerns, CECO requested that GE perform a cycle-specific stability analysis for L2C3. The analysis was performed using standard methodology and is included as Attachment H. The analysis results show a core-wide decay ratio of 0.72 which reflect a decreased stability margin from L2C2 which had been calculated to have a decay ratio of 0.60. As mentioned above, full implementation of the SIL 380 recommendations has been completed. The stability calculation results are included for information purposes only.

## 8. ACCIDENTS

### 8.a Loss of Coolant Accident (LOCA)

GE has analyzed the LaSalle units for the Loss of Coolant Accident (LOCA) with an improved ECCS analysis code package called SAFER/GESTR-LOCA. This re-analysis was previously submitted and approved for L1C3.

### 8.b Rod Drop Accident (RDA)

The RDA event has been statistically analyzed on a generic basis for plants which implement the Banked Position Withdrawal Sequence (BPWS) 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 generic RDA analysis has been approved by the NRC.



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8.c Fuel Loading Error Event

See Section 5.b.

9. EXTENDED OPERATING DOMAIN

Operation at greater than rated core flow or above the rated rod line is supported by the Reference 2 analysis which is applicable to both LSCS units for all cycles. Individual transient results are presented in the cycle-specific analyses in Attachment F. Operation in the Extended Operating Domain covered by these analyses was previously approved for L1C3.

10. RELIEF VALVE OUT-OF-SERVICE (RVOOS)

The analysis in Reference 2 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 plant transients. The analysis demonstrates further that the over-pressurization response is acceptable with one valve's safety function inoperable. This analysis was previously approved for L1C3.

11. FEEDWATER HEATERS OUT-OF-SERVICE (FWHOOS)

The analysis in Reference 2 was performed to justify operation at or below rated rod line with a 100°F reduction in feedwater temperature. This analysis was previously approved by the NRC in L1C3.

12. MAIN TURBINE BYPASS SYSTEM OUT-OF-SERVICE

Operation with the Main Turbine Bypass System out-of-service was previously approved by the NRC for L1C3. The implementation of this provision for L2C3 is the same as for L1C3.

13. RECIRCULATION PUMP TRIP OUT-OF-SERVICE

Operation with the Recirculation Pump Trip (RPT) system out-of-service was previously approved by the NRC for L1C3. The implementation of this provision for L2C3 is the same as for L1C3.

14. SUMMARY OF ANALYZED MODES OF OPERATION

Table 1 summarizes the analyzed combined modes operation for the equipment out-of-service and the expanded operating domain analyses. This summary of the possible modes of operation was previously approved by the NRC for L1C3.

C. CONCLUSION

The LaSalle Unit 2 Cycle 3 reload as described in the cycle specific licensing document (Attachment F), the Extended Operating Domain and Equipment Out-of-Service Analyses (Reference F and Attachment B) and supporting documents is acceptable for use in LaSalle Unit 2 Cycle 3. The T.S. changes described in Attachment D are required. These changes authorized Unit 2 for the same operating provisions as previously approved for Unit 1. Only minor differences exist in the transient analysis results between Units 1 and 2.

TABLE 1 OF ATTACHMENT A

ANALYZED COMBINED MODES OF OPERATION

<u>RECIRCULATION SYSTEM STATUS</u>	<u>PCWER FLOW EOD</u>	<u>EOOS</u>
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

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ATTACHMENT B

SUMMARY OF PROPOSED

TECHNICAL SPECIFICATION CHANGES

LASALLE COUNTY STATION UNITS 1 AND 2

NOTE

With the exception of minor calculational differences, the attached proposed Technical Specification changes for L2C3 are identical to the previously approved changes for L1C3.

Technical Specification Table 2.2.1-1, Limiting Safety System Settings

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 and B2-3 are revised and Tables B2.1.2-1 through B2.1.2-4 are being deleted. These changes remove the input for the GEXL correlation and the GETAB statistical model. CECO considers this information overly detailed for the Technical Specification.

Technical Specification 3/4.1.4, Control Rod Program Controls

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 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

The LCO, which requires the APLHGR 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. 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

The APRM 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

The MCPR LCO has been itemized to allow for easier determination of the MCPR operating limit. The MCPR limit indicated on Figure 3.2.3-1a has been revised to reflect the cycle specific MCPR limit based on the RBM setpoint. The Specification provides for the use of two RBM setpoints (106% and 110%). This will allow more efficient use of the extended operating domain region. MCPR limits have also been added (Figure 3.2.3-1b) 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

This section has been revised to add the new LHGR limit of 14.4 kw/ft for the GE 8x8EB reload fuel.

#### Technical Specification 3/4.3.4.2, End-of-Cycle Recirculation Pump Trip System Instrumentation

This specification has been revised to allow indefinite 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 3.3.6.2, Control Rod Withdrawal Block Instrumentation Setpoints

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. The setpoints chosen for Cycle 3 are 106% and 110%. The setpoint during Cycle 2 was 107%. A footnote has been added to indicate that the RBM setpoint must be clamped at 100% drive flow to prevent the RBM setpoint from exceeding the analyzed value. In addition, the APRM upscale setpoints have been revised to include the operating region analyzed in the extended load line limit analyses.

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Technical Specification 3/4.4.1, Recirculation System

The action statement for single recirculation loop operation requiring that the MAPLHGR limit be reduced to 0.85 times the two loop limit has been deleted. This reduction is no longer required since the SAFER/GESTR-LOCA analysis has shown that the peak clad temperatures during a LOCA do not exceed the limits of Appendix K to 10 CFR Part 50. The change in Attachment D, "Proposed Technical Specification Changes", reflects a previous Technical Specification change submittal.

Technical Specification 3/4.4.2, Safety/Relief Valves

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. The other conditions required were also specified in the LCO statement (i.e., that installed SRV's must be closed and have position indication), because the specification previously did not have a formal way to require ACTION. The addition of the clause "of the above required" in ACTION C refers to installed valves, since any installed valve is required to have position indication per the LCO.

Technical Specification 3/4.6.1.1, Primary Containment Integrity

The footnote "See Special Test Exception 3.10.7" has been deleted.

Technical Specification 3/4.7.10, Main Turbine Bypass System

The specification has been revised to allow indefinite 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 Specification 3/4.10, Special Test Exception

Specifications 3/4.10.4 and 3/4.10.7 have been deleted since these tests are only allowed during startup testing and the first fuel cycle, and therefore, are no longer required.



Bases 3/4.2.1, Average Planar Linear Heat Generation Rate

The bases have been revised to delete the reference to a MAPLHGR multiplier for single loop operation and to include a discussion of the bases of the APLHGR curves for GE 8x8EB fuel being thermal-mechanical rather than LOCA dependent. The LOCA input parameters have also been deleted. CECO believes this information is 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

The references in this section have been revised to include licensing analyses used for LaSalle 2 Cycle 3. The discussion has been revised to incorporate the changes due to the new ODYN methods. A discussion on the proposed RBM setpoint dependent MCPR and MCPR penalties for operation with particular equipment out of service. In addition, the numerical values used in calculating and the actual value of have been revised to reflect the present values used in ODYN.

Bases 3/4.3.4, Recirculation Pump Trip Actuation Instrumentation

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

Based 3/4.4.2, Safety/Relief Valves

The bases have been updated to incorporate the results of the single SRV 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.

Bases 3/4.7.10, Main Turbine Bypass System

The bases have been revised to include a discussion on the analysis which allows continued operation with the main turbine bypass system inoperable.

Design Features 5.3.2, Control Rod Assemblies

The design features section has been revised to include the design of the ASEA-ATOM control rods which may be inserted for Cycle 3.