

TECHNICAL EVALUATION REPORT

Audit of Plant Specific License Conversion  
to Standard Technical Specifications:  
Crystal River Unit 3

Docket No. 50-298

K. M. Spencer

Published December 1994

Lockheed Idaho Technologies Company  
Idaho National Engineering Laboratory  
Idaho Falls, Idaho 83415

Prepared for the  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
Under DOE Contract No. DE-AC07-94ID13223  
FIN No. J2038, Task Order No. 1 Rev. 2  
TAC No. M88674

## SUMMARY

This report documents the results of an audit of the Crystal River Unit 3 improved Technical Specifications, and appropriate associated documentation to ensure that the improved Technical Specifications reflect the facility as described in the licensee Final Safety Analysis Report (FSAR) and docketed correspondence, and that the improved Technical Specifications and licensee procedures and controls reflect all the appropriate provisions or conditions of the NRC approval as documented in the NRC Safety Evaluation (SE).

NRC staff performed this audit, assisted by Idaho National Engineering Laboratory personnel.

The auditors found the licensee has taken the necessary steps to ensure their improved Technical Specifications reflect the facility as described in the FSAR and docketed correspondence, and the improved Technical Specifications, procedures, and controls reflect all the appropriate provisions or conditions of the NRC approval documented in the SE.

FIN No. J2038, Task No. 1, Rev. 2  
B&R No. 320-19-15-05-0  
Docket No. 50-298  
TAC No. M88674

## PREFACE

This report is supplied as part of the "Technical Assistance in Support of Audits on Plant-Specific License Conversions to Standard Technical Specifications." Lockheed Idaho Technologies Company, National Nuclear Operations Analysis Department, supplies it for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Project Support.

# ACRONYMS

AC	Alternating Current
ASME	American Society of Mechanical Engineers
COLR	Core Operating Limits Report
CP	Compliance Procedure
CR-3	Crystal River Unit 3
DC	Direct Current
EDG	Emergency Diesel Generator
EFIC	Emergency Feedwater Initiation and Control System
EFW	Emergency Feedwater
ESAS	Engineered Safeguards Actuation System
FSAR	Final Safety Evaluation Report
Improved TS	Improved Technical Specification(s)
KW	Kilowatt
LCO	Limiting Condition for Operation
NRC	U.S. Nuclear Regulatory Commission
PT	Performance Test
RB	Reactor Building
RC	Reactor Coolant
RCS	Reactor Coolant System
RPS	Reactor Protection System
SE	Safety Evaluation
SL	Safety Limit
SP	Surveillance Procedure
SR	Surveillance Requirement
TS	Technical Specification(s)
TSP-C	Tri-Sodium Phosphate - Dodecahydrate
V	Volt(s)

## CONTENTS

SUMMARY . . . . .	ii
PREFACE . . . . .	iii
ACRONYMS . . . . .	iv
1. INTRODUCTION . . . . .	1
2. NRC SPECIFIED REQUESTED ACTIONS . . . . .	2
3. EVALUATION . . . . .	3
3.1 Site Audit Verification Process . . . . .	3
3.2 Safety Limits . . . . .	3
3.3 Reactor Protection System . . . . .	5
3.4 Engineered Safety Feature Actuation System . . . . .	5
3.5 Emergency Feedwater Initiation and Control Systems . . . . .	6
3.6 Containment Spray and Cooling Systems . . . . .	7
3.7 Containment Isolation Valves . . . . .	10
3.8 RCS Pressure Isolation Valve Leakage . . . . .	10
3.9 Electrical Power Systems . . . . .	10
3.10 Administrative Controls . . . . .	12
3.11 FSAR Text With TS Relocated Material . . . . .	13
3.12 Additional Avenues of Inquiry . . . . .	24
4. CONCLUSIONS . . . . .	25
5. REFERENCES . . . . .	26

Audit of Plant Specific License Conversion to  
Standard Technical Specifications: Crystal River Unit 3

1. INTRODUCTION

During low-power testing at the Grand Gulf 1 plant, some discrepancies were found to exist between the plant Technical Specifications (TS) and the Final Safety Analysis Report (FSAR), the Safety Evaluation (SE), or the as-built condition of the plant. As a result of the discrepancies, the NRC started a program to audit the TS for Near-Term Operating License plants. Experience from these audits showed the NRC the need for audits of the licensees who are converting their TS to improved Technical Specifications (improved TS), based on the new Standard Technical Specifications (NUREG-1430 through NUREG-1434).

This report provides the results of an audit of the Crystal River Unit 3 (CR-3) improved TS (based on NUREG-1430) and appropriate associated documentation to ensure that the improved TS reflect the facility as described in the licensee FSAR and docketed correspondence, and that the improved TS and licensee procedures and controls reflect all the appropriate provisions or conditions of the NRC approval documented in the NRC SE.

After Crystal River Unit 3 began implementing their improved TS, NRC performed a comparative audit of the improved TS and the previous version of the Crystal River TS (old TS), together with the relocated requirements from the old TS, the FSAR as amended, applicable docketed correspondence, and the SE. The audit included a review of the safety limits, limiting conditions for operation, or other operating requirements of these TS:

- a. Safety Limits
- b. Reactor Protection System
- c. Engineered Safety Feature Actuation System
- d. Emergency Feedwater Initiation and Control Systems
- e. Containment Spray and Cooling Systems
- f. Containment Isolation Valves
- g. Reactor Coolant System Pressure Isolation Valve Leakage
- h. Electrical Power Systems
- i. Administrative Controls

## 2. NRC SPECIFIED REQUESTED ACTIONS

The auditors made a comparison of the improved TS to the old TS and the updated FSAR to develop an audit scope for each of the above listed TS. This identified a scope for the audit review to (1) include a wide range of relocated and reformatted TS requirements, (2) cover material described in the SE, and (3) cover a variety of relocation complexity.

The subsequent performance of the site audit of licensee documents was to perform the following functions:

- a. Verify that relocated requirements are appropriately incorporated in applicable documents (e.g., FSAR or procedures) as discussed in the SE.
- b. Verify that any relocatable requirements that were modified are properly justified and traceable.
- c. Verify that appropriate controls are applied to former TS requirements while they are being relocated, and plans for documenting the relocated requirements into the FSAR or applicable licensee-controlled documents are implemented.
- d. Evaluate controls for implementation of and changes to relocated requirements are adequate.
- e. Assess execution of selected items from the SE, based on the audit scope, is appropriate.



### 3. EVALUATION

The scope of the audit required nine (9) specific areas of review of the CR-3 improved TS (listed in Section 1., Introduction), as well as the updated FSAR containing old TS relocated material. The review included the documents listed in Section 5., References. After the initial review, the auditors generated a list of questions and/or additional avenues of inquiry for the site audit. These questions and the audit findings are presented below, in the order of the areas of review listed in Section 1.

#### 3.1 Site Audit Verification Process

- The auditors performed the site audit to verify that the relocated TS are:
- a. appropriately incorporated in applicable documents described in the SE,
  - b. justified and traceable,
  - c. appropriately controlled during the relocation process,
  - d. implemented according to documentation requirements for relocations,
  - e. implemented with the same rigor as the previous TS items, or the documentation provided demonstrates appropriate review and justification for changes to the requirements, and
  - f. implemented per the documentation requirements of the licensee.

Deficient items required additional evaluation to determine where in the change control process the failure occurred and if a systematic error exists.

#### 3.2 Safety Limits (SLs)

Improved TS Sections reviewed:

- SL 2.1.1.1 - Fuel Pin Centerline Temperature
- SL 2.1.1.2 - Departure from Nucleate Boiling Ratio
- SL 2.1.1.3 - Reactor Coolant System Outlet Temperature and Pressure



### 3.2.1 SL 2.1.1.1 - Fuel Pin Centerline Temperature

SL 2.1.1.1 is assured by the Reactor Protection System (RPS) Instrumentation setpoints in LCO 3.3.1, given in the Core Operating Limits Report (COLR).

### 3.2.2 SL 2.1.1.2 - Departure from Nucleate Boiling Ratio

SL 2.1.1.2 is assured by operation within the RPS setpoints of LCO 3.3.1, as specified in the COLR.

### 3.2.3 SL 2.1.1.3 - Reactor Coolant System Outlet Temperature and Pressure

SL 2.1.1.3 Reactor Coolant System (RCS) core outlet temperature and pressure limits are given in improved TS Figure 2.1.1-1.

### 3.2.4 Core Operating Limits Report (COLR)

The COLR addresses the following SLs, Limiting Conditions for Operation (LCOs), and Surveillance Requirement (SR), as numbered in the improved TS:

SL 2.1.1.1 - Fuel Pin Centerline Temperature

SL 2.1.1.2 - Departure from Nucleate Boiling Ratio

LCO 3.1.1 - Shutdown Margin

LCO 3.1.3 - Moderator Temperature Coefficient Limit

SR 3.1.7.1 - Absolute Position Indicator/Relative Indicator Agreement Limits

LCO 3.2.1 - Regulating Rod Insertion Limits

LCO 3.2.2 - Axial Power Shaping Rod Insertion Limits

LCO 3.2.3 - Axial Power Imbalance Operating Limits

LCO 3.2.4 - Quadrant Power Tilt

LCO 3.2.5 - Power Peaking Factors

LCO 3.3.1 - Reactor Protection System Instrumentation

LCO 3.9.1 - Boron Concentration

The auditors reviewed the procedures used to input the setpoints for the "Nuclear Overpower RCS Flow and Measured Axial Power Imbalance." The review was to determine if the procedures (to input the setpoints of the Cycle 9 COLR, Rev. 1 (SL 2.1.1.1, SL 2.1.1.2, & LCO 3.3.1)) met the criteria identified above in the Site Audit Verification Process.

Conclusion: Surveillance Procedure (SP) SP-300, "Operating Daily Surveillance Log," did not contain the limits in Rev. 1 of the COLR. The licensee's staff were knowledgeable of the deficiency and had a corrective action plan in place to correct it and had reviewed the safety significance of the deficiency. The scheduled correction date is December 1995.

### 3.3 Reactor Protection System

The auditors determined not all RPS response times were relocated in the FSAR. They determined some response times (i.e. reactor coolant pump/power; over power - flow - axial power imbalance) were not in the FSAR, but were in design basis documentation. The licensee's staff agreed to add the response times to the FSAR.

### 3.4 Engineered Safety Feature Actuation System

Improved TS Sections reviewed:

LCO 3.3.5 - ESAS Instrumentation

LCO 3.3.6 - ESAS Manual Initiation

LCO 3.3.7 - ESAS Automatic Actuation Logic

The improved TS name this the "Engineered Safeguards Actuation System."

#### 3.4.1 LCO 3.3.5 - ESAS Instrumentation

SR 3.3.5.4 states, "Response time shall be within limits." Bases B3.3.5, on page B 3.3-56, says, "Response time testing acceptance criteria are on a Function basis and are included in [FSAR Chapter 7]." Old TS Table 3.3-5 had the values for the response times.

The site audit was not to check the individual values of the setpoints, but to determine if the relocation/change process met the criteria identified in the Site Audit Verification Process previously described.

Conclusion: The relocated requirement(s) met the criteria.

3.4.2 LCO 3.3.6 - ESAS Manual Initiation, and LCO 3.3.7 - ESAS Automatic Actuation Logic

There were no questions for Sections 3.3.6 and 3.3.7.

3.5 Emergency Feedwater Initiation and Control Systems (EFIC)

Improved TS Sections reviewed:

LCO 3.3.11 - EFIC Instrumentation

LCO 3.3.12 - EFIC Manual Initiation

LCO 3.3.13 - EFIC Automatic Actuation Logic

LCO 3.3.14 - EFIC Emergency Feedwater (EFW) Vector Valve Logic

LCO 3.7.5 - Emergency Feedwater System

3.5.1 LCO 3.3.11 - EFIC Instrumentation

SR 3.3.11.4 states, "Verify EFIC RESPONSE TIME is within limits." Neither the Bases nor the FSAR specifically state the "limits."

Once the response times were identified in current licensee documentation, the auditors determined the relocation/change process met the criteria identified in the Site Audit Verification Process described previously.

Conclusion: The relocated requirement(s) met the criteria.

### 3.5.2 LCO 3.7.5 - Emergency Feedwater System

SR 3.7.5.3 requires, "Verify each EFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated relocation signal."

Bases B3.7.5 for this surveillance says this SR also verifies the EFW control and block valves actuate on a simulated or actual vector valve control signal. Neither the old TS, under Section 3/4.7.1.2, nor the bases mentioned the vector logic.

FSAR ¶ 7.2.4.2 describes the "vector logic" OPEN/CLOSE commands based on steam generator pressure and level.

Since the SR does not reference the vector logic actuation, the auditors reviewed the licensee's documentation for SR 3.7.5.3 to assure the vector logic signals are included and the relocation/change process met the criteria listed in the Site Audit Verification Process identified previously.

Conclusion: The relocated requirement(s) met the criteria.

### 3.5.3 LCO 3.3.12 - EFIC Manual Initiation, LCO 3.3.13 - EFIC Automatic Actuation Logic, and LCO 3.3.14 - EFIC Emergency Feedwater (EFW) Vector Valve Logic

LCOs 3.3.12, 3.3.13, and 3.3.14 raised no questions.

## 3.6 Containment Spray and Cooling Systems

Improved TS Sections reviewed:

LCO 3.6.4 - Containment Pressure

LCO 3.6.5 - Containment Air Temperature

LCO 3.6.6 - Reactor Building Spray and Containment Cooling Systems

LCO 3.6.7 - Containment Emergency Sump pH Control System

### 3.6.1 LC0 3.6.4 - Containment Pressure

Old TS 3.6.1.4 required the primary containment internal pressure maintained between 17.7 and 12.7 psia. Improved TS 3.6.4 changed these limits to " $\geq -2.0$  psig and  $\leq +3.0$  psig." Review of the improved TS Bases B 3.6.4, which references FSAR (Rev. 20) § 14.2.2.5.9, disclosed a sequence timing change in the FSAR. The previous revision of this paragraph stated, "The RB spray started flowing at approximately 56 seconds, reaching full flow in approximately 71 seconds." The current revision states, "The RB spray is initiated and established at full flow within 120 seconds." No other changes concerning RB spray times were noted.

The auditors reviewed this relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process. Also, they reviewed changes to the maximum containment pressure of 53.9 psig (design = 55.0 psig).

Conclusion: After the review of several licensee documents associated with moving the reactor building spray pumps loading sequence, the auditors concluded the analysis during relocation was not properly performed. But, the licensee's administrative process discovered this error before implementing the change, and the licensee generated Problem Report 93-218 to correct the error. The FSAR is in error, saying the full flow is attained in 120 seconds. SP-135C, "Engineered Safeguards Actuation Channel 3 System Response Time Test," uses the correct value of 56 sec.

### 3.6.2 LC0 3.6.5 - Containment Air Temperature

SR 3.6.5.1 states, "Verify containment average air temperature is  $\leq 130^{\circ}\text{F}.$ " The Bases for this describes an arithmetic average calculated using measurements taken at several locations in the containment. The old TS listed four specific containment temperature locations for averaging.

The auditors reviewed this relocation/change to determine if it met the criteria listed under the Site Audit Verification Process criteria.

SP-300, "Operating Daily Surveillance Log," lists the same specific containment temperature locations identified in the old TS.

Conclusion: The relocated requirement(s) met the criteria. However, the quality control of process computer mathematical calculations was found to be questionable. The auditors could not determine the standards used by the licensee for checking the calculation the computer performs to establish average containment temperature. As this item was beyond the scope of the audit, the auditors gave this to the Resident Inspector for followup.

### 3.6.3 LCO 3.6.6 - Reactor Building Spray and Containment Cooling Systems

Old TS surveillance 4.6.2.1 identified a leak rate limit and surveillance on the reactor building spray system. The limit was  $\leq 6$  gal/hr.

The auditors reviewed the current applicability of this requirement and applied the criteria listed in the Site Audit Verification Process to the relocation/change process.

Conclusion: The relocated requirement(s) met the criteria.

### 3.6.4 LCO 3.6.7 - Containment Emergency Sump pH Control System

SR 3.6.7.3 states, "Verify TSP-C solubility is within limits." FSAR § 6.2 does not contain the "limits." The old TS had a limit of 0.5 lbs per 20 gallons of liquid heated to 180° F to maintain a pH of  $\geq 7.0$ .

Once the "limits" were located in current licensee documents, the auditors conducted the site audit to determine if the change process meets the criteria identified in the Site Audit Verification Process described earlier.

Additionally, FSAR Table 6-15, "Iodine Removal Evaluation Reactor Building Spray System," identifies the amount of TSP-C as 13,000 lbs. The SR 3.6.7.1 volume specification for TSP-C is  $\geq 246$  ft<sup>3</sup> and  $\leq 254$  ft<sup>3</sup>.



The auditors determined this relocation/change process met the criteria identified in the Site Audit Verification Process described previously.

Conclusion: The relocated requirement(s) met the criteria.

### 3.7 Containment Isolation Valves

Improved TS Section reviewed:

LC0 3.6.3 - Containment Isolation Valves

This area of concern is addressed above in Section 3.4.2.

### 3.8 RCS Pressure Isolation Valve Leakage

Improved TS Section reviewed:

LC0 3.4.13 - RCS Pressure Isolation Valve Leakage

#### 3.8.1 LC0 3.4.13 - RCS Pressure Isolation Valve Leakage

SR 3.4.13.2 and SR 3.4.13.3 are "new" to the Technical Specification arena.

The auditors reviewed this change to determine if it met the criteria listed under the Site Audit Verification Process. Also, the auditors conducted a review of the process for implementing "new" TS requirements.

Conclusion: This item of the audit check list was in error, therefore, not audited, as it was not a relocation.

### 3.9 Electrical Power Systems

Improved TS Sections reviewed:

LC0 3.8.1 - AC Sources - Operating

LC0 3.8.2 - AC Sources - Shutdown

LC0 3.8.3 - Diesel Fuel Oil, Lube Oil, and Starting Air



LC0 3.8.4 - DC Sources - Operating  
LC0 3.8.5 - DC Sources - Shutdown  
LC0 3.8.6 - Battery Cell Parameters  
LC0 3.8.7 - Inverters - Operating  
LC0 3.8.8 - Inverters - Shutdown  
LC0 3.8.9 - Distribution Systems - Operating  
LC0 3.8.10 - Distribution Systems - Shutdown

### 3.9.1 LC0 3.8.1 - AC Sources - Operating

FSAR (Rev. 20) Chapter 8, § 8.2.2.3, says the Startup Transformer supplies the power to the reactor coolant pumps, with the transfer switch in "manual."

The previous revision (Rev. 19) said the 6900V bus was supplied from the Auxiliary Transformer, but the pumps are not supplied by 1E power.

Although this is not a TS item, the audit was initially to look at this change to assure proper review was completed.

Conclusion: The auditors did not evaluate this as outside the audit scope.

### 3.9.2 LC0 3.8.3 - Diesel Fuel Oil, Lube Oil, and Starting Air

Improved TS SR 3.8.1.4 requires the Emergency Diesel Generator (EDG) day tank to have  $\geq 245$  gal. of fuel oil. The old TS placed this at  $\geq 400$  gal.

FSAR § 8.2.3.1 says that fuel oil storage for each unit provides for a minimum of 1 hour at all nameplate ratings.

Rev. 20 of the FSAR increased the identified load on the EDG "A" by 14.6KW (0.45%), as shown in Table 8-1.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

### 3.9.3 LCO 3.8.3 - Diesel Fuel Oil, Lube Oil, and Starting Air

Improved TS SR 3.8.3.1 requires the EDG fuel oil storage tank to contain  $\geq 18,589$  gallons of fuel. The old TS had a minimum volume of 20,300 gallons.

FSAR (Rev. 20) § 8.2.3.1 says that minimum fuel oil storage be sufficient for either EDG unit to supply post-accident power for 7 days. It increased the identified load on the EDG "A" by 14.6KW (0.45%), as shown in Table 8-1.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

### 3.9.4 LCO 3.8.4 - DC Sources - Operating

Improved TS SRs 3.8.4.3, 3.8.4.4, 3.8.4.6, 3.8.4.7, and 3.8.4.8 contain the requirements of Old TS SRs 4.8.2.3.2 c, d, and e. They expanded the frequency for the battery service test from 18 months to 24 months and increased the charger voltage specification from 120 V to 125 V.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

### 3.9.5 Other LCOs 3.8

LCOs 3.8.2, 3.8.5, 3.8.6, 3.8.7, 3.8.8, 3.8.9, and 3.8.10 had no questions.

### 3.10 Administrative Controls

The auditors looked at two administrative controls, Plant Review Committee, and Qualified Reviewers.

### 3.10.1 Plant Review Committee

The auditors reviewed the Plant Review Committee Meeting minutes. Items of interest included:

- Quorum - Chairperson or alternate, and five members or alternates.
- Unreviewed safety question determination of reviewed material.

Conclusion: The relocated requirement(s) met the criteria.

### 3.10.2 Qualified Reviewers

The auditors conducted a review of the procedures used in training and qualifying "Qualified Reviewers."

Conclusion: The relocated requirement(s) met the criteria.

## 3.11 FSAR Text With TS Relocated Material

Florida Power Corporation interoffice correspondence, "FSAR Text Containing Tech Spec Relocated Material," is the basis for this section.

### 3.11.1 FSAR § 1.2.7

FSAR (Rev. 20) § 1.2.7, "Snubbers," says procedures define visual inspection and functional testing of the snubbers. Old TS 3/4.7.9.1, "Snubbers," described the visual inspections, and gave acceptance criteria. It also described the functional test (excluding 50,000-lb types).

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: SP-200, "Hydraulic Snubber Functional Testing," Rev. 12; and SP-201, "Hydraulic Snubbers Visual Inspection," Rev. 27.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.2 FSAR § 1.12

FSAR (Rev. 20) § 1.12, "Reporting Commitments," was formerly Section 6.9.1 of TS. No question.

#### 3.11.3 FSAR § 2.3.3.1

FSAR (Rev. 20) § 2.3.3.1, "Meteorological Facility Operations," says procedures exist to qualitatively assess and calibrate this instrumentation.

Old TS 3.3.3.4 required a minimum number of operable instrumentation channels, daily channel checks, and semi-annual calibration. It says the instrumentation is consistent with the guidance of Regulatory Guide 1.23, "Onsite Meteorological Programs" (February 1972). This instrumentation evaluates the need for initiating protective measures to protect the public.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: SP-157A, "Meteorological System Surveillance (Daily Surveillance, Weekly, and Monthly Checks)," Rev. 9; and SP-153, "Primary System Meteorological Monitoring Instrumentation Calibration," Rev. 5.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.4 FSAR § 2.4.2.4.1

FSAR (Rev. § 2.4.2.4.1, "Operational Requirements," documents that procedures exist to monitor water level of the Gulf and obtain meteorological forecasts when a Hurricane Watch or a Hurricane Warning is in effect.

Old TS 3/4.7.6.1 forced limits on operations based on Gulf water level and Hurricane Warning. The 98' level is the maximum elevation at which facility flood control measures provide protection to safety related equipment.

FSAR ¶ 2.4.2.4, "Facilities Required for Flood Protection," lists these equipments, required to remain functional during the potential hurricane:

- On-site diesel power generators, and their support equipment
- Reactor decay heat removal equipment:
  - Nuclear Services Closed Cycle Cooling System
  - Decay Heat Removal System
  - Decay Heat Closed Cycle Cooling System
  - Nuclear Service & Decay Heat Seawater System

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: Emergency Plan Implementing Procedure EM-220, "Violent Weather," Rev. 6; and Procedure Review Record PRR #7, for EM-220, 8/12/94.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.5 FSAR ¶ 2.5.4.4

FSAR (Rev. 20) ¶ 2.5.4.4, "Seismic Monitoring Instrumentation," lists the ranges of various sensors & their locations. It says procedures exist to qualitatively assess, functionally test, and calibrate this instrumentation. Old TS 3.3.3.3 required a special report submitted after 30 days of the system/instrument being inoperable.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: PT-378, "Functional Testing and Calibration of the Triaxial Time-History Accelographs and Triaxial Seismic Switch," Rev. 2;

PT-379, "Equipment Check of the Triaxial Peak Recording Accelerometers," Rev. 0; & PT-381, "Triaxial Time-History Accelograph Equipment Check," Rev. 0.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.6 FSAR §2.6.4

FSAR (Rev. 20) §2.6.4, "Radiological Environmental Monitoring Program," requires the environs around the plant monitored for radiological releases. Old TS 6.8.4.b previously addressed this requirement.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.7 FSAR Sections 4.2.3.3 and 4.2.3.4

FSAR (Rev. 20) Sections 4.2.3.3, "Heatup," and 4.2.3.4, "Cooldown," address the pressurizer limit of 170°F in any 1 hour period (heatup or cooldown). This change is consistent with the old TS 3.4.9.2 limit. Improved TS 3.4.3, "RCS Pressure & Temperature (P/T) Limits," indicates the limit is in the Pressure Temperature Limits Report. It excludes the pressurizer.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process. Also, they were going to review the document that "bounds" the exclusion.

Conclusion: The auditors determined this item was outside the scope of the audit, since there was no change to the previous TS requirement.



### 3.11.8 FSAR § 4.2.3.6.3

FSAR (Rev. 20) § 4.2.3.6.3, "Water Quality," says procedures exist to periodically verify compliance to the chemistry limits listed in Table 4-10. The values are consistent with old TS 3/4.3.4.7, "RCS Chemistry," Table 3.4-1. The old TS listed actions required if the chemistry was out of specifications.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: CP-142, "Primary Water Chemistry Guidelines," Rev. 0; and SP-702, "Reactor Coolant System Chemistry and Specific Activity Surveillance Program," Rev. 13.

Conclusion: The relocated requirement(s) met the criteria.

### 3.11.9 FSAR § 4.2.3.10

FSAR (Rev. 20) § 4.2.3.10, "Reactor Coolant System Vents," says procedures exist to demonstrate each of the flow paths are functional.

Old TS Surveillance 4.4.11 required 18-month operability/position checks of the open valves, cycling remote operated valves, and actual system flow check. Also, the action curtailed operations if two vent systems became inoperable.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: SP-381, "Locked/Sealed Valve Checklist," Rev. 55; and PT-171, "Reactor Coolant High Point Vents Functional Test," Rev. 0.

Conclusion: The relocated requirement(s) met the criteria.



3.11.10 FSAR § 4.2.4.3

FSAR (Rev. 20) § 4.2.4.3, "Pressurizer Spray," now includes the  $\Delta 410^{\circ}\text{F}$  between the pressurizer steam temperature and the RCS cold leg temperature.

Bases for old TS 3/4.3.4.9.2b, "RCS Pressurizer," say the limit is within the design criteria assumed for the fatigue analysis performed in accordance with American Society of Mechanical Engineers (ASME) Code requirements.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Document: SP-422, "RC System Heatup and Cooldown Surveillance," Rev. 24.

Conclusion: The relocated requirement(s) met the criteria.

3.11.11 FSAR § 4.2.5.5

FSAR (Rev. 20) § 4.2.5.5, "Emergency Boration Requirements," is new. This describes many limits for the boron injection systems and says procedures exist to periodically verify compliance with these limits. Old TS Section 3/4.1.2, "Boration Control," listed these requirements.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: SP-347, "ECCS and Boration Systems Flow Path," Rev. 40; and SP-320, "Operability of Boron Injection Sources and Pumps," Rev. 63.

Conclusion: The relocated requirement(s) met the criteria.

3.11.12 FSAR § 4.3.11.4

FSAR (Rev. 20) § 4.3.11.4, "System Minimum Operational Components," has the pressurizer safety valve criteria during MODES 4 & 5 and before criticality.

It has the operating limits if no valves are operable. Old TS 3/4.3.4.3.1, "RCS Relief Valves," previously had these requirements.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Document: SP-650, "ASME Code Safety Valves Test," Rev. 26.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.13 FSAR ¶ 7.3.3.4

FSAR (Rev. 20) ¶ 7.3.3.4, "Operational Requirements," is new. It describes the instrumentation available for surveillance of the axial power imbalance and quadrant tilt. It says procedures exist to qualitatively assess and calibrate the incore detection instruments.

Old TS 3/4.2, "Power Distribution Limits," placed limits on the Power Imbalance Operating Limits and the Quadrant Power Tilt as specified in the COLR. Improved TS 3.2.3, "Axial Power Imbalance Operating Limits," and 3.2.4, "Quadrant Power Tilt," contain these limits. The COLR identifies these LCOs.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: PT-152, "Incore Neutron Detector System Calibration," Rev. 2; and PT-438, "Incore Neutron Detectors Channel Check," Rev. 0.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.14 FSAR ¶ 9.1.2.5

FSAR (Rev. 20) ¶ 9.1.2.5, "Leakage Considerations (Makeup & Purification System)," describes requirements for makeup pump availability during various MODES. Old TS LCOs 3.1.2.4.1, 3.1.2.4.2, and 3.1.2.3 previously identified these requirements and actions. (This relates with number 3.11.11. above.)

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: SP-340C, "MUP-1A, MUP-2B, and Valve Surveillance," Rev. 9; and SP-340F, "MUP-1C and Valve Surveillance," Rev. 9.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.15 FSAR § 9.4.2.7

FSAR (Rev. 20) § 9.4.2.7, "Operational Requirements (Decay Heat Removal System)," contains a new paragraph to describe requirements for Decay Heat pump availability and various MODES. Old TS LCO 3.1.2.5 identified these requirements/actions. (This item relates to numbers 3.10.11 and 3.10.14.)

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: SP-340B, "DHP-1A, BSP-1A and Valve Surveillance," Rev. 26; and SP-340E, "DHP-1B, BSP-1B and Valve Surveillance," Rev. 9.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.16 FSAR § 9.6.2.4

FSAR (Rev. 20) § 9.6.2.4, "Operational Requirements," describes procedures for assessing various crane interlocks, communications, and ventilation filter trains for fuel handling. Old TS Section 3.9, "Refueling Operations," previously had these requirements.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: PT-172, "Verification of Initial Conditions Prior To Spent Fuel Cask Handling," Rev. 0; PT-530, "Demonstration of Auxiliary Building Overhead Crane (FHCR-5) Interlock Operability," Rev. 0;

PT-670, "Main Fuel Handling Bridge (FHCR-1) Load Test," Rev. 0; and SP-406, "Refueling Operations Daily Data Requirements," Rev. 20.

Conclusion: The relocated requirement(s) met the criteria.

Old TS LCO 3/4.3.9.1 specified limits on boron concentration for the RCS and the refueling canal during periods when the vessel head was removed. Improved TS LCO 3.9.1 transferred the specific limits to the COLR.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

#### 3.11.17 FSAR § 9.7.2.7

FSAR (Rev. 20) § 9.7.2.7, "Operational Requirements (Plant Ventilation Systems)," contains a paragraph describing the Auxiliary Building Ventilation Exhaust requirements during "operational modes." The old TS Section 3/4.7.8, "Auxiliary Building Ventilation Exhaust System," had many surveillance requirements on inspection and testing. FSAR (Rev. 20) § 9.7.4.2, "Auxiliary Building Exhaust Air & Adsorption Filters," increased the limit on filter efficiency from > 99% filtration of dioctyl phthalate to "less than 0.05%" penetration. Old TS Surveillance 4.7.8.1.b defined a flow of 156,680 cfm while testing. Old TS 4.7.8.1.e specified the same flow as FSAR Rev. 20 (39,170 cfm).

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Document: CP-148, "Ventilation Filter Testing Program," Rev. 0.

Conclusion: The relocated requirement(s) met the criteria.

The FSAR specifies the differential pressure across the HEPA filters and absorbers to be < 6 in. of water when tested at a flow of 39,170 cfm. Old TS 4.7.8.1.d specified this limit at a flow of 156,680 cfm.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

3.11.18 FSAR ¶ 9.7.3.1

FSAR (Rev. 20) ¶ 9.7.3.1, "Chlorine and Sulfur Operational Requirements," gives alarm setpoints for chlorine and sulfur dioxide detection instruments. It says procedures exist to qualitatively assess, functionally test, and calibrate these instruments. Old TS LCOs 3.3.3.11.1 and 3.3.3.11.2 actions required control room ventilation in the recirculation mode.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Documentation: PT-366, "Toxic Gas Detection System Calibration (Train A)," Rev. 0; PT-367, "Toxic Gas Detection System Calibration (Train B)," Rev. 0; and PT-368, "Toxic Gas Detector Functional Test," Rev. 0.

Conclusion: The relocated requirement(s) met the criteria.

3.11.19 FSAR ¶ 10.1.3

FSAR (Rev. 20) ¶ 10.1.3, "Operational Limitations (Steam and Power Conversion System)," now says a procedure exists to assess compliance to the limit of the secondary temperature > 110°F in the steam generators, when the secondary pressure is > 273 psig. Old TS 3/4.7.2 required hourly surveillance after secondary coolant in each steam generator has been determined at 110°F.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.

3.11.20 FSAR § 11.4.2.1.1

FSAR (Rev. 20) § 11.4.2.1.1, "Area Gamma Monitoring System," now says procedures exist to qualitatively assess, functionally test, and calibrate the fuel storage pool area radiation monitor. Old TS 3/4.3.3.3.1, "Monitoring Instrumentation," Table 3.3-6 previously contained these requirements.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Document: SP-745, "Channel Functional Test and Calibration for Radiation Monitor RM-G14," Rev. 7.

Conclusion: The relocated requirement(s) met the criteria.

3.11.21 FSAR § 14B.5.4.7

FSAR (Rev. 20) § 14B.5.4.7, "Operational Requirements (Evaluation of Purging as a Means of Controlling Post-Accident Hydrogen Accumulation)," is new to the FSAR. It says that procedures exist to verify proper function of the ventilation and filtration aspects of the hydrogen purge system. Old TS 3/4.3.6.4.2, "Containment System Hydrogen Purge System," previously contained these requirements.

The hydrogen purge system is better described as a purge "process." The purge process uses these systems: Containment Monitoring, Reactor Building Leak Rate Testing, and Reactor Building Purge Exhaust.

Again, the filter efficiency listed on FSAR page 9-64b was increased from the old TS value of > 99% filtration to less than 0.05% penetration.

The auditors reviewed the relocation/change process to determine if it met the criteria listed under the Site Audit Verification Process.

Conclusion: The relocated requirement(s) met the criteria.



### 3.12 Additional Avenues of Inquiry

The auditors looked at other avenues for possible discrepancies.

#### 3.12.1 Licensee Sponsored Audits/Reviews

Review completed licensee sponsored audits/reviews of the implementation of the improved TS and the action plans these reviews may have generated.

Conclusion: The licensee had completed at least one additional review of the SE and implementation documentation and generated a revision to internal documentation to address three deficiencies.

#### 3.12.2 NRC Response

If available, review the NRC response addressing the anomalies identified by the licensee in interoffice correspondence dated 3/3/94, "FSAR Text Containing Tech Spec Relocated Material."

Conclusion: Response correspondence was not available.



#### 4. CONCLUSIONS

The licensee for Crystal River Unit 3 (CR-3), Florida Power Corporation, has taken the necessary steps to ensure their improved Technical Specifications reflect the facility as described in the FSAR and docketed correspondence, and the improved Technical Specifications, procedures, and controls reflect all the appropriate provisions or conditions of the NRC approval documented in the SE. The auditors identified no safety related deficiencies. The deficiencies noted were:

- a. The process of implementing revisions of the COLR to operating procedures needs enhancement. The staff at CR-3 knew about this deficiency and had an action plan in place to correct it. (See Section 3.2, Safety Limits.)
- b. The old TSs gave values for various RPS response times. The improved TS response time limits should have been relocated to the FSAR. However, the response times for 1) reactor coolant pump/power, and 2) over power - flow - axial power imbalance, were not in the FSAR, but were in other design basis documentation. The staff at CR-3 agreed to add the response times to the FSAR. (See Section 3.3, Reactor Protection System.)
- c. A revision to Section 14.2.2.5.9 of the FSAR added 49 seconds to the reactor building full flow response time. Evaluation of this change revealed the change was not adequately reviewed, however, the change had not been implemented because the error had been discovered by the licensee. (See Section 3.6.1.)
- d. An item discovered during this audit, but outside the scope, was identified to the Resident Inspector for follow up. This item concerned the quality control of the process computer generated mathematical calculations. (See Section 3.6.2.)

## 5. REFERENCES

- a. Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 149 to Operating License No. DPR-72.
- b. Crystal River Unit 3 Technical Specifications (Amendment No. 149).
- c. Crystal River Unit 3 Technical Specifications (All Amendments before 149).
- d. Florida Power Corporation interoffice correspondence, NL94-0010, "FSAR Text Containing Tech Spec Relocated Material," March 3, 1994.
- e. Florida Power Corporation letter, "Cycle 9 Core Operating Limits Report," Rev. 1, March 28, 1994.
- f. Final Safety Analysis Report (Revision 20).
- g. Final Safety Analysis Report (Revision 19).

**BIBLIOGRAPHIC DATA SHEET**

(See instructions on the reverse)

**1. REPORT NUMBER**

(Assigned by NRC. Add Vol., Page, Ser., and Publication Statement, if any.)

INEL-94/0256

**2. TITLE AND SUBTITLE**

Audit of Plant Specific License Conversion to Standard  
Technical Specifications: Crystal River Unit 3

**3. DATE REPORT PUBLISHED**

MONTH  
December

YEAR  
1994

**4. FIN OR GRANT NUMBER**

J2038

**5. AUTHOR(S)**

K. M. Spencer

**6. TYPE OF REPORT**

Technical Evaluation Rpt.

**7. PERIOD COVERED** (Customer Data)

**8. PERFORMING ORGANIZATION - NAME AND ADDRESS** (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)

National Nuclear Operations Analysis  
Lockheed Idaho Technologies Company  
P.O. Box 1625  
Idaho Falls, ID 83415-3870

**9. SPONSORING ORGANIZATION - NAME AND ADDRESS** (If NRC, type "None or None"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)

Division of Operating Reactor Support  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

**10. SUPPLEMENTARY NOTES**

**11. ABSTRACT** (200 words or less)

This report documents the results of an audit of the Crystal River Unit 3 improved Technical Specifications, and appropriate associated documentation to ensure that the improved Technical Specifications reflect the facility as described in the licensee Final Safety Analysis Report and docketed correspondence, and that the improved Technical Specifications and licensee procedures and controls reflect all the appropriate provisions or conditions of the NRC approval as documented in the NRC Safety Evaluation.

**12. KEY WORDS/DESCRIPTORS** (List words or phrases that will assist researchers in locating the report.)

Crystal River Unit 3  
Improved Technical Specifications  
NUREG-1430

**13. AVAILABILITY STATEMENT**

Unlimited Distribution

**14. SECURITY CLASSIFICATION**

(This Page)  
Unclassified

(This Report)  
Unclassified

**15. NUMBER OF PAGES**

31

**16. PRICE**