ITEMS FOR THE PROPOSED EXAMINATION

FOR THE PRAIRIE ISLAND RETAKE EXAMINATION - APR 2004

FEB 1 9 2004

L-PI-04-024
NUREG-1021

Regional Administrator
U S Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
DOCKET NOS. 50-282 AND 50-306
LICENSE NOS. DPR-42 AND DPR-60
EXAMINATION MATERIAL FOR PRAIRIE
ISLAND INITIAL LICENSE EXAMINATION

Enclosed are the validated written examinations and supporting reference materials requested in your February 5, 2004 letter for the initial license examinations to be administered at our facility on the week of April 19, 2004. This information is being provided in accordance with the guidelines ES-201 of NUREG 1021, "Operating License Examination Standard for Power Reactors," Draft Revision 9. Pursuant to 10 CFR 55.40(b)(3), the enclosed examinations have been approved by our authorized representative.

NUREG-1021 physical security requirements state that the enclosed examination materials shall be withheld from public disclosure until after the examination is complete.

Please direct any questions or comments regarding this material to Bill Markham at 651-388-1165, Ext. 5277.

This letter contains no new commitments and no revisions to existing commitments.

Joseph M. Solymossy
Site Vice President, Prairie Island Nuclear Generating Plant

C: Roger D. Lanksbury, USNRC, Region III w/o attachments
Dell McNeil (NRC lead examiner) w/ attachments

Attachments (to Dell McNeil only):

Level / Tier / Group	Randomly Selected K/A	Reason for Rejection
RO/1/1	009 EK3.19	Containment vent system has blank flange installed for isolation when not in Mode 5. ***Substituted 009 EK3.11***
RO/1/1	009 EK3.11	Unable to write a question at an appropriate difficulty level for this KA. Per discussion with NRC, replaced the KA. ***Substituted 009 EK3.07.***
RO/1/1	040 AK1.02	Unable to write acceptable question based on validation results. ***Substituted 040 AK1.05***
RO/1/1	057 K3.01	Unable to write a question to match this KA because PI does not have a specific EOP for loss of an instrument bus. ***Substituted 038 K3.06.*** Had to use a different event because event 057 had only 1 K3 series KA after pre-screening.
RO/1/2	003 2.2.22	The KA asks for LCO knowledge about a condition where we are not administratively allowed to operate. Plant procedures require a manual reactor trip for a dropped rod. ***Substituted 003 2.1.23.***
RO/1/2	068 AA1.20	Unable to write acceptable question based on procedure content. ***Substituted 068 AA1.06***
RO/2/1	006 K5.10	Unable to write acceptable question based on double jeopardy due to another selected KA and the thermal design of ECCS. ***Substituted 006 K5.07***
RO/2/1	007 K5.02	Unable to write a question for this KA. ***Substituted 007 A2.02.*** Had to select a different KA subject area because no other K5 KA had an RO importance greater than 2.5
RO/2/1	012 A2.02	This KA was eliminated to balance the "skyscaper" when the rejection of KA 007 K5.02 did not allow a same class substitution. This KA was selected because it was the only one whose system had an associated K5 KA. ***Substituted 012 K5.02***
RO/2/1	061 K6.02	Unable to write acceptable question without double jeopardy to a question #13 on the SRO portion of the exam. ***Substituted 061 K6.01***
RO/2/1	073 A1.01	Unable to match the KA because the operators do not change radiation level by operating controls in PRMS. ***Substituted 073 A4.02.***

A. 1 of 2

		Had to select a different KA subject area because no other A1 KAs exist for this system.
RO/2/1	078 K4.03	Unable to write acceptable question because the system design does not include the KA base concept. ***Substituted 078 K4.01***
RO/2/1	103 A2.05	Unable to write a question for this KA. ***Substituted 103 A2.03***
RO/2/2	033 A1.01	Unable to write a question at the appropriate cognitive level. This KA was a replacement for an original KA. ***Substituted 041 A1.02*** Had to use a different system because system 033 had no other A1 KAs and no K6 KAs. (K6 was considered because K6 was the subject area which not randomly selected for this tier 2/ group 2.)
RO/2/2	033 A1.02	There is no interface between radiation monitoring and spent fuel pool cooling system at Prairie Island. ***Substituted 033 A1.01***
SRO/1/2	033 AA2.11	Unable to write acceptable SRO question based on validation results. ***Substituted 033 2.1.33***
SRO/1/2	076 AA2.01	Unable to write an SRO only question. This KA was a replacement for an original KA. ***Substituted 076 AA2.02***
SRO/1/2	076 AA2.05	Could not write an SRO level question on this KA. ***Substituted 076 AA2.01***
SRO/1/2	E02 2.1.14	Unable to write acceptable SRO question based on validation results. ***Substituted E02 2.4.4***
SRO/2/1	062 A2.14	Ground isolation procedure is not performed by Operations. ***Substituted 062 A2.05***
SRO/2/2	027 2.2.22	This system has no associated T.S. LCO. ***Substituted 027 2.4.6***
SRO/2/2	075 A2.01	Unable to write acceptable SRO question based on validation results. ***Substituted 075 2.4.6***
SRO/3/3	2.3.5	Use of personnel monitoring equipment is not SRO-only level knowledge. ***Substituted 2.3.11***

Facility: PRAIRIE ISLAND Date of Exam: 4-23-04 Exam Level: (RO/SRO)

Item Description					Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility				✓	DS	bm
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available				✓	DS	bm
3.	~~RO/SRO overlap is no more than 75 percent, and~~ SRO questions are appropriate per Section D.2.d of ES-401				✓	DS	bm
4.	Question selection and duplication from the last two NRC licensing exams appears consistent with a systematic sampling process						bm
5.	Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: ✓ the audit exam was systematically and randomly developed; or __ the audit exam was completed before the license exam was started; or __ the examinations were developed independently; or __ the licensee certifies that there is no duplication; or __ other (explain)				✓	DS	bm
6.	Bank use meets limits (no more than 75 percent from the bank at least 10 percent new, and the rest modified); enter the actual RO / SRO-only question distribution(s) at right	Bank 17 / 3	Modified 17 / 3	New 41 / 19	✓	DS	bm
7.	Between 50 and 60 percent of the questions on the RO exam ~~(including 10 new questions)~~ are written at the comprehension/analysis level; the SRO exam may exceed 60 percent if the randomly selected K/As support the higher cognitive levels; enter the actual RO / SRO question distribution(s) at right	Memory 35 / 11	C/A 40 / 14		✓	DS	bm
8.	References/handouts provided do not give away answers				✓	DS	bm
9.	Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the Tier to which they are assigned; deviations are justified				✓	DS	bm
10.	Question psychometric quality and format meet ES, Appendix B, guidelines				✓	DS	bm
11.	The exam contains ~~100~~; the required number of one-point, multiple choice items; the total is correct and agrees with value on cover sheet				✓	DS	bm

	Printed Name / Signature	Date
a. Author	JOHN KEMPKES	2-12-04
b. Facility Reviewer (*)	DOUG SMITH	2-12-04
c. NRC Chief Examiner (#)	DELL MCNEIL /	2/19/04
d. NRC Regional Supervisor	RD LANKSBURY / RL	3/10/04

Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c;" chief examiner concurrence required.

Handouts to be provided with the SRO Examination

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Rod Group Alignment Limits.

LCO 3.1.4 All shutdown and control rods shall be OPERABLE.

AND

Individual actual rod positions shall be within 24 steps of their group step counter demand position when the demand position is between 30 and 215 steps, or within 36 steps of their group step counter demand position when the demand position $\leq$ 30 steps, or $\geq$ 215 steps.

----------NOTE----------
Individual RPIs may be outside their limits for $\leq$ 1 hour following substantial rod movement.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more rod(s) inoperable.	A.1.1	Verify SDM is within the limits provided in the COLR.	1 hour
	OR		
	A.1.2	Initiate boration to restore SDM to within limit.	1 hour
	AND		
	A.2	Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One rod not within alignment limits.	B.1.1 Verify SDM is within the limits provided in the COLR.	1 hour
	OR	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	
	B.2.1.1 Perform SR 3.2.1.1 and SR 3.2.1.2.	8 hours
	AND	
	B.2.1.2 Perform SR 3.2.2.1.	8 hours
	OR	
	B.2.2 Reduce High Neutron Flux Trip Setpoint to ≤ 85% RTP.	8 hours
	AND	
	B.3 Verify SDM is within the limits provided in the COLR.	Once per 12 hours
	AND	

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.4	Re-evaluate safety analyses and determine the THERMAL POWER for which the results remain valid for duration of operation under these conditions.	30 days
C. Required Action and associated Completion Time of Condition B not met.	C.1	Be in MODE 3.	6 hours
D. More than one rod not within alignment limit.	D.1.1	Verify SDM is within the limits provided in the COLR.	1 hour
	OR		
	D.1.2	Initiate boration to restore required SDM to within limit.	1 hour
	AND		
	D.2	Be in MODE 3.	6 hours

C	STEAM GENERATOR TUBE LEAK	NUMBER: 1C4 AOP2 REV: 13 Page 1 of 19

CONTINUOUS USE

- ***Continuous use of procedure required.***
- ***Read each step prior to performing.***
- ***Mark off steps as they are completed.***
- ***Procedure SHALL be at the work location.***

O.C. REVIEW DATE:	OWNER:	EFFECTIVE DATE
10/13/00	D. Smith	2/14/02

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

1.0 PURPOSE

This procedure provides sampling and monitoring requirements for a steam generator tube leak and is designed to provide sufficient guidance to allow the crew to shutdown the unit prior to a leak progressing to a rupture. The leak rate limits of this procedure apply to each steam generator.

Minimum entry conditions:

- Radiochemistry analysis indicates greater than 5 gallons per day (GPD) in one steam generator.

OR

- **1R-15** increases 50% above a previously stable value. (e.g. **1R-15** increases from 50 to 75 CPM)

OR

- **1R-19** increases 50% above a previously stable value.

2.0 PROCEDURES

2.1 Symptoms

2.1.1 RCS leakage detected per 1C4 AOP1, Reactor Coolant Leak.

2.1.2 Increased radiation levels on **1R-15** or **1R-19**.

2.1.3 SGBD radiochemistry sample activity increasing.

2.1.4 Air ejector monitor radiochemistry sample activity increasing.

2.1.5 High radiation alarm on **1R-15** or **1R-19** (Procedure C47048).

2.1.6 ERCS alarm on calculated leak rate from **1U0016A**.

2.1.7 ERCS alarm on calculated rate-of-change of leak rate from **1U0019A**.

2.2 Automatic Actions

Blowdown isolation will occur on high radiation alarm from **1R-19**.

2.3 Immediate Manual Actions

NONE

2.4 Subsequent Manual Actions

2.4.1 IF at any time RCS inventory can not be maintained by available charging flow, THEN **perform** the following:

A. Manually **trip** the reactor - **enter** 1E-O, Reactor Trip or Safety Injection. _____

B. WHEN reactor is verified tripped, THEN **initiate** Safety Injection. _____

C. **Exit** this procedure. _____

2.4.2 Continuously **monitor 1R15** and **1R19** in the Control Room for further increase (Use XT24 or ERCS QP SGLEAK) _____

2.4.3 IF the following conditions are met prior to initially determining the leak rate by radiochemistry analysis THEN immediately **go** to section 2.8.

- **1R15** count rate has increased by more than 500 CPM during any 15 minute interval. _____

AND

- SG tube leakage is confirmed by at least one additional method (e.g. ERCS leak rate calculation, sample line cation column frisk, **1R-19** count rate increase). _____

NOTE:	**Other sources could result in 1R-15 increases such as a rapid change in RCS gaseous activity from a fuel leak, or introduction of air or oxygen into the primary system.**

2.4.4 IF the only indication of a SG tube leak is a radiochemical analysis greater than 5 GPD, THEN **direct** the Duty Chemist to obtain an additional analysis. Further action in this procedure may be delayed until the additional analysis results confirm SG tube leakage. _____

2.4.5 **Notify** the GSPO of the following:

- Entry into this AOP per SWI O-28. _____
- To determine if additional training on SG tube leak or rupture is desired. _____

2.4.6 **Notify** NRC Resident Inspector of entry into this AOP per SWI O-28. _____

2.4.7 **Perform** the following steps WHILE continuing on in this procedure:

A. **Direct** the duty chemist to:

- Immediately conduct radiochemistry analysis of the primary-to-secondary leak rate per RPIP 4503 (condenser air ejector, preferred).
- Repeat radiochemistry analysis:
  - At least every 24 hours.
  - Whenever a 50% increase in count rate occurs.
  - Whenever process flows are changed.
- Inform the Control Room when each SG sample is drawn.
- Inform the Control Room when the leaking SG is identified (11 or 12 SG). _____

B. WHEN the duty chemist reports sample time, THEN **perform** Table 1, Step A. _____

2.4.8 **Stop** steam generator blowdown to the river until approval for release is given by the General Superintendent of Radiation Protection and Chemistry. _____

NOTE:

- **1U0015A is the rolling 10 minute average of 1U0015A, calculated every 1 minute.**
- **1U0019A is the rolling 15 minute average rate-of-change of 1U0015A, calculated every 1 minute. This point is valid only if 15 minutes have elapsed following entry of a new conversion factor.**
- **All three calculated points are valid only if process flows remain constant (air ejection flow, blowdown flow, steam flow).**

2.4.9 Continuously **monitor** the rate of change and GPD leak rate on ERCS using QP SGLEAK2.

NOTE:

The following step is a continuous action step for the remainder of this AOP. Normally ERCS is used to determine the Action Level, however, Action Levels may be determined using 1R15 estimated rate (ERCS OOS) OR chemistry sample results (1R-15 OOS)

2.4.10 **Determine** the appropriate procedure section:

Action Level	1U0016A CALC SG TUBE LEAK ROLLING AVG		1U0019A CALC SG TUBE LEAK RATE OF CHANGE	Go To Step
Increased Monitoring	≥ 5 GPD < 30 GPD		NA	2.5
1	≥ 30 GPD < 75 GPD		NA	2.6
2	≥ 75 GPD sustained for 1 hour	AND	< 30 GPD/hr	2.7
3	≥ 75 GPD	AND	≥ 30 GPD/hr	2.8

2.5 Subsequent Manual Actions for Increased Monitoring

This section addresses an increased monitoring action due to a SG leak rate of ≥5 GPD but < 30 GPD.

NOTE:	**The following steps may be done in any order.**

2.5.1 **Review** the leak rate trend using reports provided by the Radiation Protection Group or from the air ejector monitor (**1R-15**). This review should take place at a maximum of **six (6)** hour intervals.

SS

2.5.2 WHEN the radiation monitors approach the alarm setpoints, THEN **direct** I & C to reset the **1R-15** or **1R-19** alarm setpoints to 30 GPD equivalent CPM (from Table 1) (Ref. I&C SP 1783.1).

2.5.3 IF the air ejector radiation monitor is out of service, THEN:

A. **Direct** the Duty Chemist to sample the condenser air ejector, determine the leak rate, and report the results to the Shift Supervisor every 6 hours.

B. **Assign** the highest priority to the repair of **1R-15**.

NOTE	**IF the primary-to-secondary leak rate stabilizes at less than 30 GPD, THEN the sampling and monitoring requirements of this procedure may be relaxed to Normal Operation by the General Superintendent of Radiation Protection or the General Superintendent of Plant Operations.**

2.5.4 **Evaluate** the need for Plant Action to Minimize Radioactive Release per Attachment A.

2.6 Subsequent Manual Actions - Action Level 1

This section addresses an Action Level 1 due to a SG leak rate of ≥30 GPD but <75 GPD.

NOTE:	**Action Level 1 requires increased attention and monitoring to ensure the leak does not propagate rapidly to tube rupture without operator action.**

NOTE:	**The following steps may be done in any order.**

2.6.1 **Review** the leak rate trend using reports provided by the Radiation Protection Group or from the air ejector monitor (**1R-15**). This review should take place at a maximum of **two (2)** hour intervals. _____ SS

2.6.2 **Update** the alarm constant **1K0014** to 65.0 GPD in ERCS.

Step 1 **Place** the ERCS console in OVERRIDE. _____

Step 2 At the 'SELECT FUNC. KEY or TURN-ON CODE' prompt, **type** 'SUB'. _____

Step 3 At the 'ENTER POINT ID' prompt, **type** '1K0014'. _____

Step 4 At the 'ENTER SUBSTITUTE VALUE' prompt, **type** "65.0". _____

Step 5 **Return** the ERCS console to NORMAL mode. _____

2.6.3 **Direct** I & C to reset **1R-15** and/or **1R-19** alarm setpoints to 75 GPD equivalent CPM (from Table 1). (Ref. I&C SP 1783.1) _____

2.6.4 IF the air ejector radiation monitor is out of service, THEN:

A. **Direct** the Duty Chemist to sample the condenser air ejector, determine the leak rate, and report the results to the Shift Supervisor every 2 hours. _____

B. **Assign** the highest priority to the repair of **1R-15**. _____

NOTE

IF the leak rate remains stable for 24 hours, THEN the sampling and monitoring requirements may be relaxed to Normal Operation by the General Superintendent of Radiation Protection or the General Superintendent of Plant Operations.

2.6.5 **Evaluate** the need for Plant Action to Minimize Radioactive Release per Attachment A. _____

2.7 Subsequent Manual Actions – Action Level 2

This section addresses an Action Level 2 due to SG leak rates of ≥75 GPD, sustained for 1 hour, and < 30 GPD/hr increasing leak rate.

NOTE:	**If subsequent grab samples indicate SG tube leakage no longer meets Action Level 2 criteria, the load decrease may be suspended and the table in Section 2.4 consulted to determine the required action.**

NOTE:	**During the power reduction, changes in process flows will affect radiation monitor readings. 1R-15 leak rate estimation should not be used.**

2.7.1 IF the calculated SG tube leak rate of change (**1U0019A**) exceeds 30 GPD/hr, THEN **go** to section 2.8. _____

NOTE:	**Steps 2.7.3 through 2.7.7 may be performed during power decrease.**

2.7.2 Within 1 hour, **initiate** action to place the unit in Mode 3, Hot Shutdown (ITS: Hot Standby) AND **be** in at least Mode 3, Hot Shutdown (ITS: Hot Standby) within the following 6 hours. _____

2.7.3 **Direct** the Duty Chemist to sample the affected steam generator and determine the leak rate at least every thirty minutes per RPIP 4503. _____

2.7.4 **Consider** classification of event per F3-2 and reportability per 5AWI 3.6.3 and 3.6.4. _____

2.7.5 **Notify** Radiation Protection to perform Radiological Surveys per PINGP 1328 SG Tube Leak Surveys (C4 AOP2) _____

2.7.6 **Implement** Plant Action to Minimize Radioactive Release per Attachment A. _____

2.7.7 **Review** plant resources and request additional resources if needed, such as:

- Operations staffing
- Chemistry staffing
- Radiological Control staffing
- Plant Engineering
- Water processing capability
- Makeup water capability
- Secondary contamination and containment _____

2.7.8 WHEN shutdown, THEN **isolate** the affected steam generator to minimize the spread of contamination to the secondary plant using Attachment B, Isolation of Affected Steam Generator. _____

2.7.9 **Consult** plant engineering staff for guidance on cooling down the affected steam generator. _____

2.8 Subsequent Manual Actions – Action Level 3

This section addresses an Action Level 3 due to a SG leak rate of ≥75 GPD with increasing leak rate ≥30 GPD/hr OR 1R15 count rate indicates a rapidly increasing tube leak per Step 2.4.3.

NOTE:	**If subsequent grab samples indicate SG tube leakage no longer meets Action Level 3 criteria, the load decrease may be suspended and the table in section 2.4 consulted to determine the required action.**

NOTE:	**During the power reduction, changes in process flows will affect radiation monitor readings. 1R-15 leak rate estimation should not be used.**

NOTE:	**Steps 2.8.2 through 2.8.6 may be performed during power decrease.**

2.8.1 Within one hour, **reduce** power level <50% AND **be** in Mode 3, Hot Shutdown (T.S. Hot Standby) within the following 2 hours. _____

2.8.2 **Direct** the Duty Chemist to sample the affected steam generator and determine the leak rate at least every thirty minutes per RPIP 4503. _____

2.8.3 **Consider** classification of event per F3-2 and reportability per 5AWI 3.6.3 and 3.6.4. _____

2.8.4 **Notify** Radiation Protection to perform radiological surveys per PINGP 1328 SG TUBE LEAK SURVEYS (C4 AOP2). _____

2.8.5 **Implement** Plant Action to Minimize Radioactive Release per Attachment A. _____

2.8.6 **Review** plant resources and request additional resources if needed, such as:

- Operations staffing
- Chemistry staffing
- Radiological Control staffing
- Plant Engineering
- Water processing capability
- Makeup water capability
- Secondary contamination and containment _____

2.8.7 WHEN shutdown, THEN **isolate** the affected steam generator to minimize the spread of contamination to the secondary plant using Attachment B, Isolation of Affected Steam Generator. _____

2.8.8 **Consult** plant engineer staff for guidance on cooling down the affected steam generator. _____

2.9 Recovery Actions

Restore ERCS constant **1K0014** to 30.0 GPD. _____

3.0 ATTACHMENTS

3.1 Table 1- SG Leakage Correlation to R-15 Counts

3.2 Attachment A- Plant Action to Minimize Radioactive Release

3.3 Attachment B- Isolation of Affected Steam Generator

4.0 REFERENCES

4.1 Developmental References

4.1.1 XH-1-7, Reactor Coolant System

4.1.2 NF-88740, Steam Generator Blowdown

4.1.3 NF-39249, Liquid Waste Disposal and Steam Generator Blowdown

4.1.4 NF-39216, Cooling Water System, Unit 1

4.1.5 NF-39220, Condensate System, Unit 1

4.1.6 Subsequent action of GSPO verification of operator preparedness in response to INPO SOER 93-01, Recommendation 4.c.

4.1.7 EPRI TR-104788, PWR Primary-to-Secondary Leak Guidelines

4.2 Implementing References

4.2.1 Technical Specification

4.2.2 C47048, Alarm Response Procedures

4.2.3 C41.5 ERCS alarms

4.2.4 RPIPs

4.2.5 SWI-O-28, Notification of GSPO & NRC Resident Inspector

4.2.6 1E-0, Reactor Trip or Safety Injection

4.2.7 1C1.4, Power Operation

4.2.8 F3-2, Classifications of Emergencies

4.2.9 5AWI 3.6.3, 10 CFR and Technical Specification Reporting Requirements

4.2.10 5AWI 3.6.4, Notifications Regarding Plant Media Sensitive Events or Conditions

4.2.11 C36, Heating System

4.2.12 SP 1783.1, Westinghouse Radiation Monitor Electronic Calibration

Table 1 SG Leakage Correlation to R-15 Counts

Directions for use:

A. Chemist sample vs 1R-15 action level correlation:

1. IF ERCS is NOT available, THEN **go** to Section B below. _____

2. WHEN the sample is drawn, THEN **record** sample date and time in the Date/Time column, the1R-15 average count rate (1U0018A) in Column A, and the air ejector flow in Column H. _____

3. WHEN the Chemist reports sample results, THEN **record** the leak rate in Column B. _____

4. **Determine** the conversion factor for each sample by dividing Column A by Column B. **Record** in Column C and **enter** into ERCS as follows:

NOTE:	**Changing the conversion factor will have an affect on the rolling average and rate-of-change calculations for a short period of time.**

a. **Update** the conversion constant **1K0015** for CPM/GPD in ERCS.

Step 1 **Place** the ERCS console in OVERRIDE. _____

Step 2 At the 'SELECT FUNC. KEY or TURN-ON CODE' prompt, **type** 'SUB'. _____

Step 3 At the 'ENTER POINT ID' prompt, **type** '1K0015'. _____

Step 4 At the 'ENTER SUBSTITUTE VALUE' prompt, **type** the new conversion value. _____

Step 5 **Return** the ERCS console to NORMAL mode. _____

5. To estimate the 1R-15 count rate for 30 and 75 GPD leak rates, **multiply** current conversion factor (Column C) by 30 and 75 and **record** in Columns D and E. _____

Table 1 SG Leakage Correlation to R-15 Counts

B. 1R-15 to leak rate and rate of change manual calculation (ERCS OOS):

1. **Enter** the current date and time in the Date/Time column, the current 1R-15 counts in Column A, and the air ejector flow in Column H. _____
2. **Determine** the current leak rate by dividing the 1R-15 counts by the most recent conversion factor (Column C) and **enter** in Column F. _____
3. **Determine** the rate of change (ROC) by dividing the change in leak rate (change in Column F by the change in time (change in Date/Time column in hours)) for the two most recent entries and **enter** in Column G. _____

	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H
Date/Time	1R-15 Counts (CPM) 1U0018A	Leak rate from Chemist (GPD)	Conversion Factor (CPM/GPD)	1R-15 Counts for 30 GPD Leak	1R-15 Counts for 75 GPD leak	1R-15 Leak rate (GPD)	1R-15 Leak rate ROC (GPD/HR)	Air Ejector flow (cfm)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 RCS Specific Activity

LCO 3.4.17 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) ≥ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 1.0 μCi/gm.	----------Note---------- LCO 3.0.4 is not applicable. ----------	
	A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.17-1.	Once per 4 hours
	AND	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Gross specific activity of the reactor coolant not within limit.	B.1 Be in MODE 3 with $T_{avg} < 500°F$.	6 hours
C. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.17-1.	C.1 Be in MODE 3 with $T_{avg} < 500°F$.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.17.1	Verify reactor coolant gross specific activity $\leq 100/\bar{E}\ \mu Ci/gm$.	7 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.17.2	----------NOTE---------- Only required to be performed in MODE 1. ----------	
	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	14 days AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.17.3	----------NOTE---------- Not required to be performed until 31 days after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. ----------	
	Determine $\bar{E}$ from a sample taken in MODE 1 after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours.	184 days

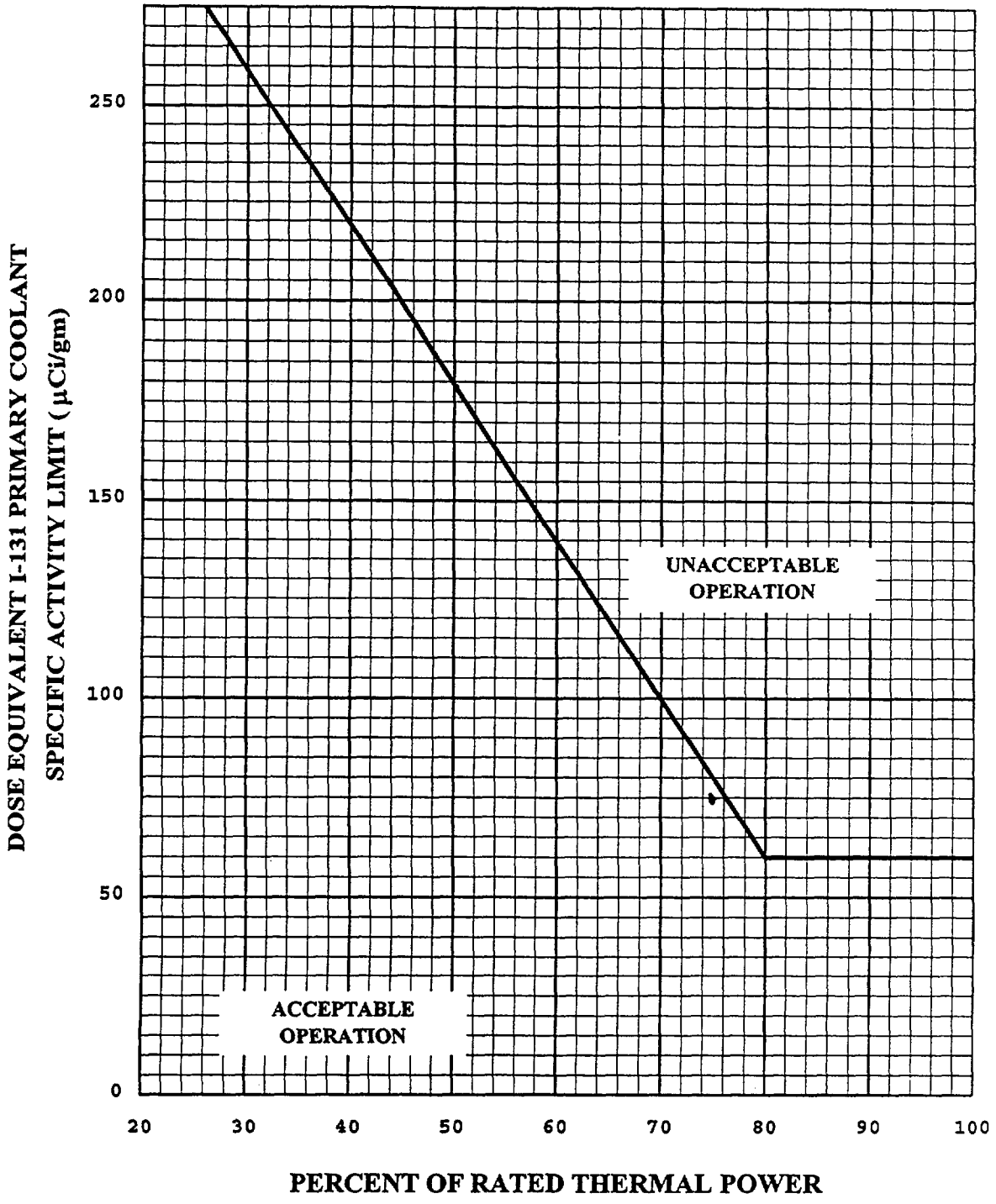

Figure 3.4.17-1 (page 1 of 1)
Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity
Limit Versus Percent of RATED THERMAL POWER

5AWI	OPERABILITY DETERMINATIONS	NUMBER: 5AWI 3.15.5
		REV: 8

INFORMATION USE

- *Procedure may be performed from memory.*
- *User remains responsible for procedure adherence.*
- *Procedure should be available, but not necessarily at, the work location.*

O.C. REVIEW DATE:	OWNER:	EFFECTIVE DATE
NR	M. Werner	7-11-03

1.0 PURPOSE

There are few responsibilities for the Prairie Island staff greater than ensuring that key safety systems remain ready to respond to plant events in order to protect the health and safety of the public. The Instruction establishes the standardized NMC Fleet Operability Determination procedure (FP-OP-OL-01) at Prairie Island. This process provides guidance for the prompt determination of OPERABILITY for safety-related systems, structures and components (SSC) included in Technical Specifications, the Prairie Island licensing basis, and for equipment important to safety.

Appendix A of this procedure provides additional guidance on the technical and administrative implementation of the Operability Determination process at Prairie Island. Appendices B and C are NRC Inspection Manual 9900 Technical Guidance related to Operability. Appendix C is also part of Generic Letter 91-18, Revision 1, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions." The information in Appendices B and C is provided in its entirety to allow consideration of Inspection Manual information to ensure appropriate technical decisions are made regarding OPERABILITY.

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The process of establishing OPERABILITY will be performed as described in the NMC Operability Determination procedure. However, due to the complexity of some issues related to determining OPERABILITY, the additional guidance in this appendix is provided to ensure all necessary technical considerations are made to adequately support OPERABILITY determination. In addition, the Appendix describes the administrative activities to be used to implement the Operability Determination process.

1.0 PROMPT OPERABILITY SCREENING EXPECTATIONS

1.1 Issues are frequently identified to the Shift Manager that require consideration for the effect on Operability. Figure 1 provides a guideline for Shift Managers reviewing CAP Action Requests for Operability.

1.2 In the course of assessing issues for Operability, a Shift Manager may find that he does not have all of the information required to make a decision. For example, the Shift Manager may not have all necessary facts about the issue identified or the licensing basis of the SSC associated with the concern. As shown in Figure 1, in these cases, the Shift Manager **SHALL** obtain additional information either through personal investigation of the condition, investigation by watchstanders, or through assistance of the plant staff to define the issue. Determination of Operability must be an informed decision; the Shift Manager faced with an issue **SHALL** make every effort to obtain the information necessary to assure a well-informed decision. In these cases, SSC's remain Operable until adequate information is available to determine that a reasonable assurance of Operability no longer exists.

1.3 In most cases, the determination of component or system operability will be self evident to the shift manager. This will either be because a system, structure or component (SSC) has obviously failed, or because the concern noted can readily be assured as not affecting the ability of the SSC to perform its licensing basis function. In some cases however, concerns may be identified that are not as clear. In order to ensure proper dispositioning of emergent issues, the Prompt Operability Screening flowchart is provided as Figure 2. This process is not required to be documented but is a tool to assist licensed operators in making operability decisions.

Appendix A
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1.4 Key elements of the Prompt Operability Screening include the following:

Step 1: Identify the specific SSC affected.

Step 2: Identify the potentially degraded or nonconforming condition associated with the SSC.

Step 3: Determine the licensing and design basis requirements associated with the applicable SSC.

Step 4: Based on the SSC associated with Steps 1, 2 and 3, determine whether the issue affects operability. In this step it is important to distinguish between an actual affect and a potential affect on operability. Questions may be identified that have no current impact on operability e.g. the issue does not indicate a failure to meet design or license basis requirements, though additional investigation may indicate additional operability concerns.

Step 5: Based on concerns that are identified, current activities or information that confirm operability are identified. Determination of Operability is a continuous process. At any given time operability is assured based on testing, maintenance, inspection and plant operation. Those aspects of the continuous operability process applicable to the condition and SSC are identified by the Shift Manager in order to confirm a reasonable assurance of operability exists.

Step 6: Review of the SSC and potential concerns in the above steps may identify a requirement not being met. If so, this could provide a basis for the determination that the SSC is inoperable. At the same time, it is likely that the concern identified will not lead to a determination that a licensing or design basis requirement is not being met. In that case the SSC is operable. If at this point the Shift Manager determines that the SSC is Operable as described in this procedure but additional documentation is required to support that determination an Operability Request (OPR) **SHALL** be initiated to document additional assessment of operability. An entry **SHALL** be made in the Station Log noting that the Operability Determination was initiated and the basis for Operability pending completion of the OPR.

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Step 7: If evaluation of the condition results in a determination that the SSC is full Operable but degraded or nonconforming, the Operability Recommendation may recommend compensatory measure to provide further assurance to maintain Operability. In most cases, these compensatory measures will be implemented through temporary procedure changes or temporary modifications to the plant. Compensatory measures may also include additional operator monitoring or mode change restrictions.

Step 8: Once the Operability state of the SSC has been determined, this is documented in Section 2 of the Corrective Action Program (CAP) Action Request (AR). Operability state is only to be assigned for SSC's in the plant's licensing basis. SSC's not part of the licensing basis (e.g. not required for accident mitigation or response) **SHALL** not be dispositioned with regard to Operability.

Step 9: The basis used by the Shift Manager to determine Operability **SHALL** be documented in the CAP "Basis for Operability." This summary description assists others in understanding the decision process in the absence of the Shift Manager. The information entered into Operability Basis must provide sufficient information to support the determination of operability from the prior steps.

Step 10: If equipment is determined to be Inoperable, notify the Operations Manager in accordance with Operations Department expectations. Notification is not required when determination is made that equipment is Operable.

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Additional Requirements

2.0 DOCUMENTATION OF OPERABILITY RECOMMENDATIONS (OPR)

2.1 Use of the Operability Recommendation Form

2.1.1 Operability Recommendations will normally be documented on the form PINGP 1478. In some cases it may be desirable to document the OPR in a format other than the PINGP form. In these cases all elements of the form PINGP 1478 **SHALL** be met.

2.1.2 Operability Recommendations **SHALL** be completed by a person formally qualified to perform them. The completed OPR **SHALL** be reviewed by an appropriately qualified reviewer. The completed OPR **SHALL** also be approved by an Engineering Manager or designee who may also be the Reviewer.

2.1.3 All compensatory measures implemented as the result of an Operability Recommendation (OPR) **SHALL** be reviewed in accordance with 10 CFR 50.59. Normally, compensatory measures required to establish or assure operability will be implemented through a temporary modification or temporary procedure change, in which case the 50.59 process is specifically entered. In cases where compensatory measures are not implemented through a process where 10 CFR 50.59 is required, either consideration for 50.59 will be specifically discussed in the OPR or a t-track AR will be initiated to address impact of the compensatory measure(s) on other equipment.

2.1.4 Completed OPR's (PINGP 1478's) **SHALL** be reviewed and signed by the Shift Manager, in addition to the electronically completed record. If the OPR results in a conclusion that the SSC is Operable but Degraded or Nonconforming the form **SHALL** be retained in the Shift Manager's Office until the degraded or nonconforming condition is resolved. PINGP 1478's no longer required to be retained in the Shift Manager's office **SHALL** be sent to Records with a transmittal sheet for permanent retention.

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2.2 Use of Preliminary or Draft Calculations in Determining Operability

In some cases, it may be necessary to perform preliminary or draft calculations to support a determination of Operability. This is acceptable as long as the inputs and conclusions of the preliminary calculation are included in the text of the Operability Recommendation. In addition, an action **SHALL** be created for any CAP involving preliminary or draft calculations to finalize the calculation to assure full documentation, review and approval of the calculation in accordance with site procedures.

2.3 Revisions of Operability Recommendations

On occasion, additional information related to an open Operability Recommendation (unresolved Operable but Degraded or Nonconforming condition) may be identified. If the information identified causes additional questions for the basis of the original Operability Determination, a new CAP **SHALL** be initiated to ensure proper Shift Manager and Screening Committee review. If the new information merely provides clarification or amplification of the original determination, then a revision **SHALL** be documented, reviewed and approved with the notation that it is a revision. The revised OPR **SHALL** be electronically attached to the original OPR in t-Track and retained in the Shift Manager's office until the condition is resolved.

3.0 SUPPORT SYSTEM OPERABILITY

3.1 T.S. LCO 3.0.6 states that when a supported system LCO is not met solely due to a support system LCO not being met, the SUPPORTED system is inoperable, however the associated Conditions and Required Actions of the supported system(s) are not required to be entered if LCO 3.0.6 is invoked. When a support system is declared inoperable and LCO 3.0.6 is invoked, an evaluation **SHALL** be performed in accordance with Technical Specification 5.5.13, "Safety Function Determination Program (SFDP)."

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3.2 When a support system's LCO Required Action directs a supported system to be declared inoperable or directs entry into Conditions and Required Actions for a supported system, the applicable Conditions and Required Actions **SHALL** be entered in accordance with T.S. LCO 3.0.2.

3.3 For some support systems, there are specific Completion Times specified in the Tech Specs. When a second inoperability in the same train occurs, a maximum out of service time for the SSC can be determined. The maximum out of service time is allowed when no loss of safety function exists and as determined by the Safety Function Determination Program. The Safety Function Determination Program is invoked as a function of implementing LCO 3.0.6 for support systems.

3.4 In all cases, the most important safety concern is to ensure that the capability to perform a specified safety function is not lost as a result of more than one train of a support or supported system being inoperable. Therefore,

- When any SSC is declared inoperable, the Safety Function Determination Program procedures **SHALL** be implemented. (Refer to 5AWI 3.15.8, Safety Function Determination Program) This will ensure that all SSC inoperable configurations are evaluated.

- When multiple LCO CONDITIONS are active, all inoperable SSC **SHALL** be evaluated in accordance with 5AWI 3.15.8, Safety Function Determination Program.

- If a loss of safety function is determined to exist due to multiple system inoperabilities, then the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists **SHALL** be entered.

T.S. LCO 3.0.8 provides an exemption to LCO 3.0.2 and states that when a Technical Specification supported system LCO is not met solely due to the inoperability of a listed non-Technical Specification support system, the Technical Specification supported system LCO is considered to be met unless the associated delay time of the non-Technical Specification support system has expired. LCO 3.0.8 allows a delay time of 72 hours for snubbers.

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Additional Requirements

4.0 ADDITIONAL CONSIDERATIONS RELATIVE TO FLAW EVALUATIONS

4.1 Code Class MC components containing flaws or areas of degradation characterized or determined to be within the acceptance standards in Table IWE-2500-1 (ASME Section XI, 1992 Edition), **SHALL** be considered acceptable for continued service. Although no determination of operability is necessary, reporting of the examination must be in accordance with regulatory requirements.

4.2 For Code Class MC components which are not exempt from Subsection IWE requirements, upon discovery of a flaw or area of degradation exceeding the acceptance standards in Table IWE-2500-1, the IWE program responsible engineer should promptly determine operability. The flaw or area of degradation may be considered acceptable for continued service following repair, replacement, or evaluation per the requirements of ASME Section XI Subsection IWE, 1992 Edition with 1992 Addenda, and 10CFR50.55a.

5.0 OPERATIONAL LEAKAGE

T.S. LCO 3.4.14, RCS Operational Leakage, prescribes allowed leakage in Modes 1, 2, 3 and 4. If leakage develops in the reactor coolant system, there are additional requirements. LCO 3.4.14 specifies zero pressure boundary leakage. The Required Action for the associated Condition must be taken upon discovery of pressure boundary leakage; therefore, an operability determination is not appropriate.

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6.0 RESOLUTION OF DEGRADED AND NONCONFORMING CONDITIONS

6.1 Conditions identified as Operable but Degraded or Nonconforming **SHALL** be resolved in accordance with Generic Letter 91-18 revision 1 (Appendix C). The resolution will be documented in the Corrective Action Process.

6.2 Use of Operator Action as a Compensatory Measure

As stated in Appendix B, it is unlikely that a determination of Operability will be successful for manual action in place of automatic action. There are times however, when manual action may enhance operability or may appropriately be used to assure operability when automatic action is not a concern. Whenever an Operability Determination relies on operator action, the following items must also be addressed:

6.2.1 The specific operator action(s) must be clearly stated in the OPR.

6.2.2 The procedure number, revision and step(s) **SHALL** be clearly identified.

6.2.3 The timing of operator action must be discussed, with a clear demonstration that adequate time exists to perform the actions.

6.2.4 The procedure being relied upon must reference the OPR and/or OBD number crediting the operator action. For EOP's, this may be in the basis of the procedure.

6.3 Tracking of Operable but Degraded or Nonconforming Issues

During review of AR's by the Screening Committee, an Operable but Degraded (OBD) action will be initiated for any condition found to be Operable but Degraded or Nonconforming. This action will identify the condition required to be attained or corrected, and will remain open until the SSC is returned to a fully Operable state.

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OPERABLE/OPERABILITY: ENSURING THE FUNCTIONAL CAPABILITY OF A SYSTEM OR COMPONENT

1.0 PURPOSE AND SCOPE

To provide guidance to NRC inspectors for the review of licensee operability determinations affecting the following systems, structures, or components (SSCs):

(i) Safety-related SSCs, which are those relied upon to remain functional during and following design basis events (A) to ensure the integrity of the reactor coolant pressure boundary, (B)to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition, or (C) to ensure the capability to prevent or mitigate the consequences of accidents that could result in potential offsite consequences comparable to the 10 CFR Part 100 guidelines. Design basis events are defined the same as in 10 CFR 50.49(b)(1).

(ii) All SSCs whose failure could prevent satisfactory accomplishment of any of the required functions identified in (i) A, B, and C.

(iii) All SSCs relied on in the safety analyses or plant evaluations that are a part of the plant's current licensing basis. Such analyses and evaluations include those submitted to support license amendment requests, exemption requests, or relief requests, and those submitted to demonstrate compliance with the Commission's regulations such as fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).

(iv) Any SSCs subject to 10 CFR Part 50, Appendix B.

(v) Any SSCs subject to 10 CFR Part 50, Appendix A, Criterion 1.

(vi) Any SSCs explicitly subject to facility Technical Specifications (TS).

(vii) Any SSCs subject to facility TS through the definition of operability (i.e., support SSCs outside TS).

(viii) Any SSCs described in the FSAR.

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This guidance is directed toward NRC inspectors that are reviewing actions of licensees that hold an operating license. Although this guidance generally reflects existing staff practices, application on specific plants may constitute a backfit. Consequently, significant differences in licensee practices should be discussed with NRC management to ensure that the guidance is applied in a reasonable and consistent manner for all licensees.

2.0 DEFINITIONS:

2.1 Current Licensing Basis

Current licensing basis (CLB) is the set of NRC requirements applicable to a specific plant, and a licensee's written commitments for assuring compliance with and operation within applicable NRC requirements and the plant-specific design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and in effect. The CLB includes the NRC regulations contained in 10 CFR Parts 2, 19, 20, 21, 30, 40, 50, 51, 55, 72, 73, 100 and appendices thereto; orders; license conditions; exemptions, and Technical Specifications (TS). It also includes the plant-specific design basis information defined in 10 CFR 50.2 as documented in the most recent Final Safety Analysis Report (FSAR) as required by 10 CFR 50.71 and the licensee's commitments remaining in effect that were made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.

2.2 Design Basis

Design basis is that body of plant-specific design bases information defined by 10 CFR 50.2.

2.3 Degraded Condition

A condition of an SSC in which there has been any loss of quality or functional capability.

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2.4 Nonconforming Condition

A condition of an SSC in which there is failure to meet requirements or licensee commitments. Some examples of nonconforming conditions include the following:

1. There is failure to conform to one or more applicable codes or standards specified in the FSAR.

2. As-built equipment, or as-modified equipment, does not meet FSAR design requirements.

3. Operating experience or engineering reviews demonstrate a design inadequacy.

4. Documentation required by NRC requirements such as 10 CFR 50.49 is not available or deficient.

2.5 Full Qualification

Full qualification constitutes conforming to all aspects of the current licensing basis, including codes and standards, design criteria, and commitments.

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3.0 STANDARD TECHNICAL SPECIFICATIONS OPERABILITY DEFINITION AND DISCUSSION

3.1 Operability Definition

The Standard Technical Specifications (STS) define operable or operability as follows:

"A system, subsystem, train, component, or device **SHALL** be OPERABLE or have OPERABILITY when it is capable of performing its specified functions, and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s)."

3.2 Variations of Operability Definition in Plant Specific TS

There are several variations in existing plant specific TS of the above basic definition. Therefore, some judgment is required in application of this guidance on operability. Word differences that exist are not viewed by the NRC to imply any significant overall difference in application of the plant specific TS. Any problems that result from existing inconsistencies between a plant specific definition of operability and this guidance should be discussed with regional management, who should discuss the issues with NRR if deemed necessary. In all cases, a licensee's plant-specific definition is governing.

3.3 Specified Function(s)

The definition of operability refers to capability to perform the "specified functions." The specified function(s) of the system, subsystem, train, component, or device (hereafter referred to as system) is that specified safety function(s) in the current licensing basis for the facility.

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In addition to providing the specified safety function, a system is expected to perform as designed, tested and maintained. When system capability is degraded to a point where it cannot perform with reasonable assurance or reliability, the system should be judged inoperable, even if at this instantaneous point in time the system could provide the specified safety function. See Section 6.11,which discusses ASME Section XI, for an example.

3.4 Support System Operability - Understanding System Interrelationships

The definition of operability embodies a principle that a system can perform its specified safety function(s) only when all its necessary support systems are capable of performing their related support functions. Therefore, an NRC inspector should expect that each licensee understands which support systems are necessary to ensure the operability of main systems and components that perform specified safety functions. Such an understanding is mandatory. Otherwise the licensee will not be able to implement the definition of operability.

4.0 BACKGROUND

The purpose of the Technical Specifications is to ensure that the plant is operated within its design basis and to preserve the validity of the safety analyses, which are concerned with both the prevention and mitigation of accidents. Because both prevention of accidents and the ability to mitigate them must be continuously ensured, the process of ensuring OPERABILITY for safety or safety support systems is ongoing and continuous. The focus of operability is foremost on the capability to ensure safety.

The process of ensuring operability is continuous and consists of the verification of operability by surveillances and formal determinations of operability whenever a verification or other indication calls into question the system's or component's ability to perform its specified function.

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Verification of operability is supplemented by continuous and ongoing processes such as:

- Day-to-day operation of the facility
- Implementation of programs such as inservice testing and inspection
- Plant walkdowns or tours
- Observations from the control room
- Quality assurance activities such as audits and reviews
- Engineering design reviews including design basis reconstitution.

Without any information to the contrary, once a component or system is established as operable, it is reasonable to assume that the component or system should continue to remain operable, and the previously stated verifications should provide that assurance. However, whenever the ability of a system or structure to perform its specified function is called into question, operability must be determined from a detailed examination of the deficiency.

The determination of operability for systems is to be made promptly, with a timeliness that is commensurate with the potential safety significance of the issue. If the licensee chooses initially not to declare a system inoperable, the licensee must have a reasonable expectation that the system is operable and that the prompt determination process will support that expectation. Otherwise, the licensee should immediately declare the system or structure inoperable. Where there is reason to suspect that the determination process is not, or was not prompt, the Region may discuss with the licensee, with NRR consultation as appropriate, the reasoning for the perceived delay.

The TS establish operability requirements on systems required for safe operation and include surveillance requirements to demonstrate periodically that these systems are operable. Performance of the surveillance requirement is usually considered to be sufficient to demonstrate operability provided that there is reasonable assurance that the system continues to conform to all appropriate criteria in the current licensing basis (CLB). Whenever conformance to the appropriate criteria in the CLB is called into question, performance of the surveillance requirement alone is usually not sufficient to determine operability.

When operability verification or other processes indicate a potential deficiency or loss of quality, licensees should make a prompt determination of operability and act on the results of that determination. The licensee should also restore the quality of the system in accordance with 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action.

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5.0 ADDITIONAL GUIDANCE FOR OPERABILITY DETERMINATIONS

In the course of review activities or through normal plant operation, a licensee may become aware of degraded or nonconforming conditions affecting the SSCs defined in Section 1. These activities include, but are not limited to, the following:

- Review of operational events
- Design modifications to facilities
- Examinations of records
- Additions to facilities
- Vendor reviews or inspections
- Plant system walkdowns.

These and other paths for identifying degraded or nonconforming conditions, including reports from industry and other utilities, should result in the prompt identification and correction of the deficiency by the licensee. Licensees should make an operability determination and take follow-on corrective action in the following circumstances:

- Discovery of degraded conditions of equipment where performance is called into question

- Discovery of nonconforming conditions where the qualification of equipment (such as conformance to codes and standards) is called into question

- Discovery of an existing but previously unanalyzed condition or accident. NOTE: For a previously unanalyzed condition or accident that is considered a significant safety concern, but is not part of the design basis, the licensee may subsequently be required to take additional action after consideration of backfit issues (See 10 CFR 50.109 (a)(5)).

The following guidance for dealing with issues that are closely associated with operability determinations has been derived from the NRC regulations and from previous guidance issued to licensees.

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5.1 Focus on Safety

The immediate and primary attention must be directed to safety concerns. Reporting and procedural requirements should not interfere with ensuring the health and safety of the public. To continue operation while an operability determination is being made, the licensee must have a reasonable expectation that the system is operable and that the determination process will support that expectation.

5.2 Full Qualification

Full qualification constitutes conforming to all aspects of the current licensing basis, including codes and standards, design criteria, and commitments.

The SSCs defined in section 1 are designed and operated, as described in the current licensing basis (CLB), to include design margins and engineering margins of safety to ensure, among other things, that some loss of quality does not mean immediate failure. The CLB includes commitments to specific codes and standards, design criteria, and some regulations that also dictate margins. Many licensees add conservatism so that a partial loss of quality does not affect their commitments to the margins. The loss of conservatism not taken credit for in the safety analyses and not committed to by the licensee to satisfy licensing requirements does not require a system to be declared inoperable. All other losses of quality or margins are subject to an operability determination and corrective action.

5.3 Deal with Operability and Restoration of Qualification Separately

Operability and qualification are closely related concepts. However, the fact that a system is not fully qualified does not, in all cases, render that system unable to perform its specified function if called upon. According to the definition of operability, a safety or safety support system or structure must be capable of performing its specified function(s) of prevention or mitigation as described in the current licensing basis, particularly the TS bases or FSAR.

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The prompt determination of operability will result in decisions or actions pertaining to continued plant operation, while qualification or requalification becomes a corrective action goal. Qualification concerns, whether it is a lack of required quality or loss of quality because of degradation, can and should be promptly considered to determine the effect of the concern on the operability of the system.

If operability is assured based on this prompt determination, plant operation can continue while an appropriate corrective action program is implemented to restore full qualification. This is consistent with the plant TS being the controlling document for making decisions about plant operations, while 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, is the requirement document for dealing with restoring equipment qualification.

The principle of treating the related concepts of operability and restoration of qualification separately is to ensure that the operability determination is focused on safety and is not delayed by decisions or actions necessary to plan or implement the corrective action, i.e., restoring full qualification.

5.4 Determining Operability and Plant Safety is a Continuous Decision-Making Process

Licensees are obligated to ensure the continued operability of SSCs as specified by TS, or to take the remedial actions addressed in the TS. For other SSCs which may be in a degraded or nonconforming condition, it must be determined whether a condition adverse to quality exists and whether corrective actions are needed. Operability is verified, as discussed above, by day-to-day operation, plant tours, observations from the control room, surveillances, test programs, and other similar activities. Deficiencies in the design basis or safety analysis or problems identified by the operability verification lead to the operability determination process by which the specific deficiency and overall capability of the component or system are examined. The process, in one form or another, is ongoing and continuous. As a practical matter, decision making requires good information and takes time. However, the process used by licensees should call for prompt and continuous attention to deficiencies and potential system inoperabilities. In addition, the licensee's process should call for immediately declaring equipment inoperable when reasonable expectation of operability does not exist or mounting evidence suggests that the final analysis will conclude that the equipment cannot perform its specified safety function(s).

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5.5 Timeliness of Operability Determinations

Timeliness of operability determinations should be commensurate with the safety significance of the issue. Once the deficiency has been identified and the specific component or system has been identified, the determination can be made regarding the capability to perform the specified function(s). There is not an explicit requirement in the regulations for the timing of the decision. As discussed further in Section 6.0, timeliness is important and is determined by the safety significance of the issue. The Allowed Outage Times (AOTs) contained in TS generally provide reasonable guidelines for safety significance.

5.6 Timeliness of Corrective Action

Timeliness of corrective action (i.e., the requirements in 10 CFR Part 50, Appendix B, Criterion XVI, for "prompt" corrective action) should be commensurate with the safety significance of the corrective action.

The determination of operability establishes a basis for plant operation while the corrective action establishes or re-establishes the design basis/qualification of the safety or safety support system. As in Section 5.5 above, there is no explicit requirement in the regulations for timeliness of these corrective actions, except that 10 CFR Part 50, Appendix B, Criterion XVI requires it to be "prompt." Again, timeliness is determined by the safety significance of the issue.

5.7 Justification for Continued Operation

See the NRC Inspection Manual, Part 9900, Technical Guidance, "Resolution of Degraded and Nonconforming Conditions," for guidance on JCOs.

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6.0 DETAILED DISCUSSION OF SPECIFIC OPERABILITY ISSUES

6.1 Scope and Timing of Operability Determinations

Determining system, structure, or component (SSC) operability is a continuous process that cannot be avoided. Action is required any time an SSC that is required by TS or NRC requirement to be operable is found to be inoperable. If an immediate threat to public health and safety is identified, action to place the plant in a safe condition should begin as soon as this circumstance is known and should be completed expeditiously.

Once a degraded or nonconforming condition of specific SSCs is identified, an operability determination should be made as soon as possible consistent with the safety importance of the SSC affected. In most cases, it is expected that the decision can be made immediately (e.g., loss of motive power, etc.). In other cases it is expected the decision can be made within approximately 24 hours of discovery even though complete information may not be available. Some few exceptional cases may take longer. For SSCs in TS, the Allowed Outage Times (AOTs) contained in TS generally provide reasonable guidelines for safety significance. For SSCs outside TS, engineering judgment must be used to determine safety significance. The decision should be based on the best information available and must be predicated on the licensee's reasonable expectation that the SSC is operable and that the prompt determination process will support that expectation. When reasonable expectation does not exist, the SSC should be declared inoperable and the safe course of action should be taken.

The licensee should examine the full scope of the current licensing basis, including the TS and FSAR commitments, to establish the conditions and performance requirements to be met for determining operability. The operability decision may be based on analysis, a test or partial test, experience with operating events, engineering judgment, or a combination of these factors taking into consideration equipment functional requirements. An initial determination regarding operability should be revised, as appropriate, as new or additional information becomes available.

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The scope of an operability determination needs to be sufficient to address the capability of the equipment to perform its safety function(s). Operability determinations should therefore include the following actions:

- Determine what equipment is degraded or potentially nonconforming.
- Determine the safety function(s) performed by the equipment.
- Determine the circumstances of the potential nonconformance, including the possible failure mechanism.
- Determine the requirement or commitment established for the equipment, and why the requirement or commitment may not be met.
- Determine by what means and when the potentially nonconforming equipment was first discovered.
- Determine safest plant configuration including the effect of transitional action.
- Determine the basis for declaring the affected system operable, through:
  a. analysis
  b. test or partial test,
  c. operating experience, and
  d. engineering judgment.

If an NRC-approved action (such as provided in an LCO action statement) is immediately taken to compensate for failed equipment (e.g., placing one channel of reactor protection in the tripped condition upon failure of the channel such that the specified safety function can be maintained), continued operation of the facility is permitted.

However, continued operation with an inoperable channel in the tripped condition is not advisable because a subsequent failure will result in a plant trip that will challenge plant safety systems. It is also not advisable from the standpoint of plant availability.

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6.2 Treatment of Single Failures in Operability Determinations

6.2.1 Definition of Single Failure

10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," defines a single failure as:

> "A single failure means an occurrence which results in the loss of capability of a component to perform its intended safety functions. Multiple failures resulting from a single occurrence are considered to be a single failure."

6.2.2 Capability to Withstand a Single Failure is a Design Consideration

Appendix A contains general design criteria (GDC) for SSCs that perform major safety functions. Many of the GDC contain a statement similar to the following:

> "Suitable redundancy in components and features and suitable interconnections, leak detection, isolation and containment capabilities **SHALL** be provided to assure that for onsite electrical power system operation (assuming offsite power in not available) and for offsite electrical power system operation (assuming onsite power is not available) the system safety function can be accomplished assuming a single failure."

See, for example, GDC 17, 34, 35, 38, 41, 44. Therefore, capability to withstand a single failure in fluid or electrical systems is a plant-specific design consideration, which ensures that a single failure does not result in a loss of the capability of the system to perform its safety functions.

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6.2.3 Discovery of a Design Deficiency in Which Capability to Withstand a Single Failure is Lost

A design deficiency in which capability to withstand a single failure is lost, should be evaluated and treated as a degraded and nonconforming condition. As with any degraded or nonconforming condition, a prompt determination of operability is required.

For any design deficiency in which the capability to withstand a single failure is lost, the licensee must address the quality aspects and if the design deficiency affects the design basis requirements for the particular plant, promptly correct the deficiency in accordance with 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action.

6.3 Treatment of Consequential Failures in Operability Determinations

6.3.1 Definition of Consequential Failure

A consequential failure is a failure of an SSC caused by a postulated accident within the design basis. For example, if during a loss of coolant accident (LOCA) (a design basis event), the broken pipe could whip and incapacitate a nearby pump, then the pump would not be able to function. Such a pump failure is called a consequential failure because the pump failed as a result of the design basis event itself. In general, facility design takes any such consequential failures that are deemed credible into consideration. In this case, that would mean that the broken pump was not one that the safety analysis would take credit for to mitigate the LOCA.

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6.3.2 Consequential Failures and Operability Determinations

Operability determinations should be performed for those potential consequential failures (i.e., an SSC failure that would be a direct consequence of a design basis event) for which the SSC in question needs to function. Where consequential failures would cause a loss of function needed for limiting or mitigating the effects of the event, the affected SSC is inoperable because it cannot perform all of its specified functions. Such situations are most likely discovered during design basis reconstitution studies, or when new credible failure modes are identified.

6.3.3 Consequential Failures and Appendix B

With any consequential failure, the licensee must address the quality aspects and if the failure affects the design basis requirements for the particular plant, promptly correct the deficiency in accordance with 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action.

6.4 Operability During TS Surveillances and Preventive Maintenance

During preventive maintenance (PM), equipment may be removed from service and rendered incapable of performing the function(s) specified for safety. This equipment is clearly inoperable. For equipment subject to the Technical Specifications (TS), the PM activity and any other action that may be required by the Limiting Conditions for Operation (LCOs), is expected to be completed within the Allowed Outage Time (AOT). For safety equipment not subject to the TS either explicitly by direct inclusion in the TS or implicitly through the definition of operability, the licensee's PM activities should be consistent with the importance of the equipment to safety and the function(s) of the equipment and a reasonable time goal should be set to complete the PM.

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In all cases, care should be exercised in removing equipment from service for PM to avoid accumulating long out-of-service times of safety trains. The licensee should reestablish operability before the equipment is returned to service. The licensee also may need to reestablish operability for systems or components, in whole or in part, that are actively dependent upon the equipment undergoing the PM activity. The need for testing to reestablish operability should be based on a reasonable judgment about how the inoperable equipment may have been affected. If retesting to reestablish operability is not possible or practicable because of safety concerns, analysis or other means should be used to demonstrate operability.

If TS surveillances require that safety equipment be removed from service and rendered incapable of performing its safety function, the equipment is inoperable. The LCO action statement **SHALL** be entered unless the TS explicitly direct otherwise. Upon completion of the surveillance, the licensee should verify restoration to operable status of at least those portions of the equipment or system features that were altered to accomplish the surveillance.

NOTE: With regard to surveillances or other similar activities (such as inservice testing) that render systems inoperable for extended periods (i.e., those that may exceed the Allowed Outage Time (AOT)), licensees must have prior NRC approval by license amendment for the surveillance requirement or redefine the tests. It is not the intent of surveillances or other similar program requirements to cause unwarranted plant shutdowns or to unnecessarily challenge other safety systems.

See "Maintenance - Voluntary Entry into Limiting Conditions for Operation Action Statements to Perform Preventive Maintenance," NRC Inspection Manual, Part 9900, Technical Guidance.

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6.5 Surveillance and Operability Testing in Safety Configuration

Many systems are designed to perform both normal operational and safety functions. It is preferable that both the Technical Specification (TS) surveillance requirement testing and any other operability testing be performed in the same configuration as would be required to perform the safety function, i.e., safety mode. However, testing in the normal configuration or mode of operation may be required for systems if testing in the safety mode will result in unwarranted safety concerns or transients. The mode of operation for the TS surveillance requirements test is usually prescribed and the acceptance criteria are established on that basis.

If a system should fail while it is being tested in the safety mode of operation, the system is to be declared inoperable. For ongoing periodic testing that must be performed during normal mode operation, the licensee should establish normal mode operational acceptance criteria that are based on a direct relationship to the safety mode requirements. Operability verification is then provided by acceptable normal mode operational test results.

Test failures should be examined to determine the root cause and correct the problem before resumption of testing. Repetitive testing to achieve acceptable test results without identifying the root cause or correction of any problem in a previous test is not acceptable as a means to establish or verify operability.

6.6 Missed Technical Specification Surveillance

The Standard Technical Specifications (STS) contain Surveillance Requirement 4.0.3 which states:

> "Failure to perform a Surveillance Requirement within the specified time interval **SHALL** constitute a failure to meet the OPERABILITY requirements for a Limiting Condition for Operation. Exceptions to these requirements are stated in the individual specifications. Surveillance Requirements do not have to be performed on inoperable equipment."

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Plant-specific Technical Specification (TS) variations of this statement may exist, in which case the plant-specific TS govern.

The Allowed Outage Time (AOT) in the action requirements specifies a time interval that permits corrective action to be taken to satisfy the LCO. If such a time interval is specified in the action requirements or if the licensee has adopted by license amendment, the 24-hour provision of amended Surveillance Requirement 4.0.3 as discussed in Generic Letter (GL) 87-09, the completion of a missed surveillance within these time intervals meets the requirements. As with systems discovered to be inoperable, the time interval begins upon discovery of the missed surveillance. Failure to perform a TS requirement within the specified time interval is considered a condition prohibited by the TS and is reportable at least under 10 CFR Part 50.73; it also may be subject to enforcement action.

Generic Letter 87-09 and other documents provide extensive guidance on surveillance extension, applicability, and success criteria. The above discussion involves only the operability issues.

6.7 Use of Manual Action in Place of Automatic Action

Automatic action is frequently provided as a design feature specific to each safety system to ensure that the specified functions of the system will be accomplished. Limiting safety system settings for nuclear reactors are defined in 10 CFR Part 50.36, "Technical Specifications," as settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. Accordingly, it is not appropriate to take credit for manual action in place of automatic action for protection of safety limits to consider equipment operable. This does not preclude operator action to put the plant in a safe condition, but operator action cannot be a substitute for automatic safety limit protection.

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The licensing of specific plant designs includes consideration of automatic and manual action. While approvals have been granted for either or both type actions, not every combination of circumstances has been reviewed from an operability standpoint. Although it is possible, it is not expected that many determinations of operability will be successful for manual action in place of automatic action. Credit for manual initiation to mitigate the consequences of design basis accidents should have been established as part of the licensing review of a plant.

For any other situation in which substitution of manual action for automatic action may be acceptable, the licensee's determination of operability with regard to the use of manual action must focus on the physical differences between automatic and manual action and the ability of the manual action to accomplish the specified function. The physical differences to be considered include, but are not limited to, the ability to recognize input signals for action, ready access to or recognition of setpoints, design nuances that may complicate subsequent manual operation such as auto-reset, repositioning on temperature or pressure, timing required for automatic action, etc., minimum manning requirements, and emergency operation procedures written for the automatic mode of operation. The licensee should have written procedures in place and training accomplished on those procedures before substitution of any manual action for the loss of an automatic action.

The assignment of a dedicated operator for manual action is not acceptable without written procedures and a full consideration of all pertinent differences. The consideration of manual action in remote areas also must include the ability and timing in getting to the area, training of personnel to accomplish the task, and occupational hazards to be incurred such as radiation, temperature, chemical, sound, or visibility hazards. One reasonable test of the reliability and effectiveness of manual action may be the approval of manual action for the same function at a similar plant. Nevertheless, this is expected to be a temporary condition until the automatic action can be promptly corrected in accordance with 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action.

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6.8 "Indeterminate" State of Operability

An SSC is operable when it is capable of performing its specified function(s) and when all necessary support SSCs are also capable of performing their related support functions. See operability definition and discussion in Section 3.0. Otherwise, the SSC is inoperable. When a licensee has cause to question the operability of an SSC, the operability determination is to be prompt; the timeliness must be commensurate with the potential safety significance of the issue. The determination process during this time; however, must be predicated on the licensee's reasonable expectation that the SSC is operable and that the prompt determination process will support that expectation.

In the absence of reasonable expectation that the SSC is operable, the SSC is to be declared inoperable immediately. Subsequent evaluation may conclude that an SSC declared inoperable is in fact operable. The licensee's actions subsequent to declaring an SSC inoperable are guided by the regulations, TS, plant procedures, and so forth. In addition, the licensee should determine when and under what circumstances the system became inoperable so that reporting requirements may be met and NRC followup actions may properly reflect the circumstances and the licensee's efforts to correct and prevent recurrences. In summary, an SSC is either operable or inoperable at all time. "Indeterminate" is not a recognized state of operability.

6.9 Use of Probabilistic Risk Assessment in Operability Decisions

Probabilistic risk assessment (PRA) is a valuable tool for the relative evaluation of accident scenarios while considering, among other things, the probabilities of occurrence of accidents or external events. The definition of operability states; however, that the SSC must be capable of performing its specified function(s). The inherent assumption is that the occurrence conditions or event exists and that the safety function can be performed. The use of PRA or probabilities of the occurrence of accidents or external events is not acceptable for making operability decisions.

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However, PRA may provide valid and useful supportive information for a licensee amendment. The PRA is also useful for determining the safety significance of SSCs. The safety significance, whether determined by PRA or other analyses, is a necessary factor in decisions on the appropriate "timeliness" of operability determinations. Specific guidance on the timeliness of determinations is presented in Section 5.5.

6.10 Environmental Qualification

When the NRC or licensee identifies a potential deficiency in the environmental qualification of equipment (i.e., a licensee does not have an adequate basis to establish qualification), the licensee is expected to make a prompt determination of operability, to take immediate steps to establish a plan with a reasonable schedule to correct the deficiency, and to write a Justification for Continued Operation (JCO) (See Note below), which will be available for NRC review. The licensee may be able to make a finding of operability using analysis and partial test data to provide reasonable assurance that the equipment will perform its safety function(s) in its accident environment when called upon to do so. The licensee should also show that subsequent failure of the equipment will not result in significant degradation of any safety function or provide misleading information to the operator.

NOTE: The JCO referred to in questions of equipment qualification is specifically addressed by Generic Letter 88-07 dated April 7, 1988. This environmental qualification "JCO" includes an operability determination. It also states that the licensee should evaluate whether the findings are reportable under 10 CFR 50.72, 10 CFR 50.73, 10 CFR Part 21, the Technical Specifications, or any other pertinent reporting requirements, including 10 CFR 50.9.

The following actions should be taken if a licensee is unable to demonstrate equipment operability:

- For inoperable equipment in a system subject to the TS, the licensee **SHALL** follow the appropriate action statements. This could require that the plant be shutdown or remain shut down.

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- For inoperable equipment in a system not subject to the TS, the licensee may continue reactor operation if the safety function can be accomplished by other designated equipment that is qualified, or if limited administrative controls can be used to ensure the safety function is performed.

6.11 Technical Specification Operability vs. ASME Code, Section XI Operative Criteria

The Technical Specifications (TS) normally apply to overall system performance but sometimes contain limiting values for certain component performance, which are specified to ensure that the design basis and safety analysis is satisfied. The values (e.g., pump flow rate, valve closure time, valve leakage rate, safety/relief valve set point pressure) are operability verification criteria. If these values are not met at any time, the applicable LCO **SHALL** be entered.

The ASME Section XI inservice testing plans required under 10 CFR 50.55(a) for pumps and valves may contain the same or different limits and additional component performance acceptance values which, if not met, will indicate that the pump or valve has seriously degraded so that corrective action would be required to ensure or restore the operability and operational readiness of the pump or valve. The ASME Section XI acceptance criteria include "required action ranges" or limiting values for certain component performance parameters. These required action ranges or limiting values as defined by the code as component performance parameters, may be less conservative than the TS values which are safety analysis limits. However, action must be taken when the TS requirements are not met.

Generic Letter 89-04 Attachment 1, Position 8, defines the starting point for the Allowed Outage Time (AOT) in TS action statements for ASME Section XI pumps and valves. When performance data fall in the required action range, regardless of whether the limit is equal to or more conservative than the TS limit, the pump or valve must be declared inoperable immediately (the term "inoperative" is used in the text of ASME Section XI; the pump or valve is both "inoperative" and inoperable) and the TS action statement for the associated system must be entered.

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In cases where the required action range limit is more conservative than its corresponding TS limit, the corrective action may not be limited to replacement or repair; it may be an analysis to demonstrate that the specific performance degradation does not impair operability and that the pump or valve will still fulfill its function, such as delivering the required flow. A new required action range may be established after such analysis which would then allow a new determination of operability.

The durations specified by the Code for analyzing test results have not been accepted by the NRC for postponing entering a TS action statement. As soon as data are recognized as being within the required action range for pumps or as exceeding the limiting value of full-stroke time for valves, the associated component must be declared inoperable and, if subject to the TS, the AOT specified in the action statement must be started at the time the component was declared inoperable. For inoperable pumps and valves considered by ASME Section XI but not subject to the TS, the action should be consistent with the safety significance of the issue and the functions served by the affected system(s).

Recalibrating test instruments and then repeating pump or valve tests is an acceptable alternative to the corrective action of repair or replacement, but is not an action that can be taken before declaring the pump or valve inoperable. However, if during a test it is obvious that a test instrument is malfunctioning, the test may be halted and the instruments promptly recalibrated or replaced. During a test, anomalous data with no clear indication of the cause must be attributed to the pump or valve under test. For this occurrence, a prompt determination of operability is appropriate with follow-on corrective action as necessary.

Note: In the above discussion, "required action range" and "inoperative" are ASME Section XI terms.

6.12 Support System Operability

The definition of operability embodies the principle that a system can perform its function(s) only if all necessary support systems are capable of performing their related support functions. It is incumbent upon each licensee to understand which support systems are necessary to ensure operability of systems and components that perform specified safety functions.

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When a support system is determined to be inoperable, all systems for which that support system is required for systems operability should be declared inoperable and the LCOs for those systems entered. Any appropriate remedial actions specified by a supported system LCO action statement (to compensate for the inoperable supported system) should be taken.

When a support system is determined to be inoperable, the licensee should employ the same operability determination process for the supported systems, as the licensee would for any other degraded system. In particular, the scope and timing of such operability decisions should follow the guidance in Section 6.1.

There are cases where judgment on the part of a licensee is appropriate in determining whether a support system is or is not required. One example is the case of a ventilation system. A ventilation system may be required to ensure that other safety-related equipment can perform its safety function in the summer, but may not be required in the winter. Similarly, the electrical power supply for heat tracing may be required in the winter to ensure that a safety-related system equipment can perform its safety function, but may not be required in the summer. The need for judgment in reviewing what individual licensees do in specific cases should be recognized. If a licensee determines that a Technical Specification (TS) system TS capable of performing its specified function(s) with an inoperable support system that is not in the TS, then no additional action outside of restoring the inoperable support systems is needed. Furthermore, the licensee may modify the support function like any other change to the facility by use of the 10 CFR 50.59 process and FSAR update.

For some support systems, there are specific Allowed Outage Times (AOTs) specified in the TS. Ideally, the AOT contained in the TS for a support system should be equal to or less than the AOT for any system for which that support system is required for system operability. Problems where inconsistencies exist between an AOT for a support system and the AOT for a system for which that support system is required should be discussed with regional management who should discuss the issue with NRR if deemed necessary. While such inconsistencies are being resolved, the more restrictive AOT should be used. In some cases an amendment to the TS may be necessary.

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In all cases, the following principles should be used:

a. The most important safety concern is to ensure that the capability to perform a specified safety function is not lost as a result of more than one train of a support or supported system being declared inoperable. When a support or supported system is declared inoperable in one train, the corresponding independent support or supported systems and all other associated support systems in the opposite train(s) should be ensured to be operable; i.e., the complete capability to perform the specified safety function has not been lost. The term "ensure" as used here, allows for an administrative check by examining logs or other information to determine if required features are out-of-service for maintenance or other reasons. These actions are not to be used in lieu of required TS actions.

b. Upon determining that a loss of functional capability condition exists, actions specified in the support and supported system LCOs should be taken to mitigate the loss of functional capability.

6.13 Piping and Pipe Support Requirements

All piping and pipe supports found to be degraded or nonconforming should be subjected to an operability determination. To assist licensees in the determinations, operability guidance has been provided specific to various components. These components include the piping, supports, support plates, and anchor bolts. IE Bulletin No. 79-14 addressed the seismic analysis for as-build safety-related piping systems. The supplement to IE Bulletin 79-14 dated August 15, 1979 and Supplement 2 to IE Bulletin 79-14 dated September 7, 1979 provide additional guidance. Concrete anchor bolts and pipe supports are addressed with specific operability criteria in Supplement 1 to Revision 1 of IE Bulletin 79-02. The criteria for evaluating operability of seismic design piping supports and anchor bolts relating to Bulletins 79-02 and 79-14 are detailed in the E. Jordan memo to the Regions dated July 1979, and the V. Noonan memo dated August 7, 1979. Upon discovery of a nonconformance with piping and pipe supports, licensees may use the criteria in Appendix F of Section III of the ASME Code for operability determinations. These criteria and use of Appendix F are valid until the next refueling outage when the support(s) are to be restored to the FSAR criteria.

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For systems determined to be otherwise operable but which do not meet the above criteria, licensees should treat the systems or components as if inoperable until NRC approval is obtained for any additional criteria or evaluation methods used to determine operability. Where a piping support is determined to be inoperable, a determination of operability should be performed on the associated piping system.

6.14 Flaw Evaluation

Regulation 10 CFR 50.55a(g) and Standard Technical Specification (STS) 3.4.10 (the section number may vary with plant specific TS) require that the structural integrity of ASME Code Class 1, 2, and 3 components be maintained according to Section XI of the ASME Code. In the conduct of inservice inspection, maintenance activities, or during plant operation, flaws in components will be discovered. The operability of such systems containing flaws may depend on the flaw characterization or evaluation performed by the licensee and the acceptability of continued service of the component. Since the characterization and/or evaluation is vital to the determination of operability, the licensee's efforts following flaw detection must be prompt.

Components containing flaws characterized or determined to be within the acceptance standards in IWB-3500 (IC-3500 for Class 2 components) of Section XI are acceptable for continued service and, although no determination of operability is necessary, reporting must be in accordance with regulatory requirements.

Upon discovery of a flaw exceeding the acceptance standards in IWB-3500 (IWC-3500 for Class 2 components), the licensee should promptly determine operability. The evaluation and acceptance criteria of IWB-3600 may be used in the determination. For Class 3 moderate energy piping, i.e., Class 3 piping with a maximum operating temperature below 200 _F and a maximum operating pressure below 275 psig, the evaluation and acceptance criteria in Generic Letter 90-05 may be used.

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The licensee may treat the system containing the flaw(s), evaluated and found to meet the acceptance criteria in IWB-3600, as operable until NRC approval in accordance with IWB-3600 is obtained. For Class 3 moderate energy piping, the licensee may treat the system containing the flaw(s), evaluated and found to meet the acceptance criteria in Generic Letter 90-05, as operable until relief is obtained from the NRC. The licensee must promptly submit its evaluation for either case to the NRC for review and approval.

Alternative evaluation procedures and/or acceptance criteria may also be used for flaws exceeding IWB-3600 or Generic Letter 90-05. When alternative evaluation procedures and/or acceptance criteria are used as a basis for acceptable continued service, the licensee must treat the system containing the flaw(s) as inoperable until NRC approval of procedures and criteria is obtained. Prior to the approval, the plant must be placed in a safe condition or for systems in the TS, the plant must enter the corresponding Limiting Condition for Operation.

6.15 Operational Leakage

If leakage develops in the reactor coolant system, there are additional requirements. The Technical Specifications (TS) do not permit any pressure boundary leakage. The Operational Leakage Limiting Condition for Operation (LCO) must be entered upon discovery of pressure boundary leakage; therefore, an operability determination is not appropriate.

Article NB-2121 of Section III of the ASME Code excludes code requirements from materials not associated with the pressure retaining function of a component, such as packing and gaskets. However, leakage from the reactor coolant system is limited to specified values in the TS depending on whether the leakage is from identified, unidentified, or specific sources such as the steam generator tubes or reactor coolant system pressure isolation valves. If the leakage exceeds the TS limits, the LCO must be entered.

For reactor coolant system leakage within the limits of the TS, the licensee should determine operability for the degraded component and include in the determination the effects of the leakage onto other components and materials.

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Furthermore, the regulations and TS require that the structural integrity of ASME Code Class 1, 2, and 3 components be maintained according to Section XI of the ASME Code. If a leak is discovered in a Class 1, 2, or 3 component in the conduct of inservice inspections, maintenance activities, or during plant operation, IWA-5250 of Section XI requires corrective measures be taken based on repair or replacement in accordance with Section XI. In addition, a through-wall flaw does not meet the acceptance criteria in IWB-3600.

Upon discovery of leakage from a Class 1, 2, or 3 component pressure boundary (i.e., pipe wall, valve body, pump casing, etc.) the licensee should declare the component inoperable. The only exception is for Class 3 moderate energy piping as discussed in Generic Letter 90-05. For Class 3 moderate energy piping, the licensee may treat the system containing the through-wall flaw(s), evaluated and found to meet the acceptance criteria in Generic Letter 90-05, as operable until relief is obtained from the NRC.

6.16 Structural Requirements

Category I structures and supports (referred to herein as structures) which are subject to periodic surveillance and inspection in accordance with the requirements of Technical Specifications (TS) **SHALL** be considered operable if the limits stipulated in the TS are met. If these limits are not met, the Limiting Condition for Operations (LCOs) are to be entered for the affected structure.

If the degradation affects the ability of the structure to provide the required design support for systems attached to the structure, an operability determination must be performed for these systems as well.

Degradation affecting Category I structures include, for example, concrete cracking and spalling, excessive deflection or deformation, water leakage, rebar corrosion, missing or bent anchor bolts, etc. If these degradations are identified in Category I structures which are not subject to periodic surveillance and inspection, they should be assessed by the licensee to determine the capability of these structures to perform their specified function. As long as the identified degradation does not result in the exceedance of acceptance limits specified in applicable design codes and standards, referenced in the design basis document, the affected structures are operable.

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Significant degradations resulting in the exceedance of the acceptance limits must be promptly reported in accordance with the requirements in 10 CFR 50.72 and evaluated by the licensee for determination of operability. These evaluations should include the criteria used for the operability determination and the rationale for continued plant operation in a degraded condition outside of the design basis. The licensee's evaluations should also include the plan for corrective action, as required by Criterion XVI of Appendix B to 10 CFR Part 50, to restore degraded structures to their original design requirements. As stated above, any system which depends upon the degraded structure for required support should also be examined for operability if the degradation or nonconformance calls into question the performance of the system. NRC inspectors, with possible support from headquarters, should review licensees' evaluations of structural degradations to determine their technical adequacy and conformance to licensing and regulatory requirements.

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RESOLUTION OF DEGRADED AND NONCONFORMING CONDITIONS

1.0 PURPOSE AND SCOPE

To provide guidance to NRC inspectors on resolution of degraded and nonconforming conditions affecting the following systems, structures, or components (SSCs):

(i) Safety-related SSCs, which are those relied upon to remain functional during and following design basis events (A) to ensure the integrity of the reactor coolant pressure boundary, (B) to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition, or (C) to ensure the capability to prevent or mitigate the consequences of accidents that could result in potential offsite consequences comparable to the 10 CFR Part 100 guidelines. Design basis events are defined the same as in 10 CFR 50.49(b)(1).

(ii) All SSCs whose failure could prevent satisfactory accomplishment of any of the required functions identified in (i) A, B, and C.

(iii) All SSCs relied on in the safety analyses or plant evaluations that are a part of the plant's current licensing basis. Such analyses and evaluations include those submitted to support license amendment requests, exemption requests, or relief requests, and those submitted to demonstrate compliance with the Commission's regulations such as fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).

(iv) Any SSCs subject to 10 CFR Part 50, Appendix B.

(v) Any SSCs subject to 10 CFR Part 50, Appendix A, Criterion 1.

(vi) Any SSCs explicitly subject to facility Technical Specifications (TS).

(vii) Any SSCs subject to facility TS through the definition of operability (i.e., support SSCs outside TS).

(viii) Any SSCs described in the FSAR.

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This guidance is directed toward NRC inspectors that are reviewing actions of licensees that hold an operating license. Although this guidance generally reflects existing staff practices, application on specific plants may constitute a backfit. Consequently, significant differences in licensee practices should be discussed with NRC management to ensure that the guidance is applied in a reasonable and consistent manner for all licensees.

2.0 DEFINITIONS

2.1 Current Licensing Basis

Current licensing basis (CLB) is the set of NRC requirements applicable to a specific plant, and a licensee's written commitments for assuring compliance with and operation within applicable NRC requirements and the plant-specific design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and in effect. The CLB includes the NRC regulations contained in 10 CFR Parts 2, 19, 20, 21, 30, 40, 50, 51, 55, 72, 73, 100 and appendices thereto; orders; license conditions; exemptions, and Technical Specifications (TS). It also includes the plant-specific design basis information defined in 10 CFR 50.2 as documented in the most recent Final Safety Analysis Report (FSAR) as required by 10 CFR 50.71 and the licensee's commitments remaining in effect that were made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.

2.2 Design Basis

Design basis is that body of plant-specific design bases information defined by 10 CFR 50.2.

2.3 Degraded Condition

A condition of an SSC in which there has been any loss of quality or functional capability.

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2.4 Nonconforming Condition

A condition of an SSC in which there is failure to meet requirements or licensee commitments. Some examples of nonconforming conditions include the following:

1. There is failure to conform to one or more applicable codes or standards specified in the FSAR.

2. As-built equipment, or as-modified equipment, does not meet FSAR descriptions.

3. Operating experience or engineering reviews demonstrate a design inadequacy.

4. Documentation required by NRC requirements such as 10 CFR 50.49 is not available or deficient.

2.5 Full Qualification

Full qualification constitutes conforming to all aspects of the current licensing basis, including codes and standards, design criteria, and commitments.

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3.0 BACKGROUND

A nuclear power plant's SSCs are designed to meet NRC requirements, satisfy the current licensing basis, and conform to specified codes and standards. For degraded or nonconforming conditions of these SSCs, the licensee may be required to take actions required by the Technical Specifications (TS). The provisions of Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criteria XVI, may apply requiring the licensee to identify promptly and correct conditions adverse to safety or quality. Reporting may be required in accordance with Sections 50.72, 50.73, and 50.9(b) of 10 CFR Part 50, 10 CFR Part 21, and the Technical Specifications (TS). Collectively, these requirements may be viewed as a process for licensees to develop a basis to continue operation or to place the plant in a safe condition, and to take prompt corrective action. Changes to the facility in accordance with 10 CFR 50.59 may be made as part of the corrective action required by Appendix B. The process displayed by means of the attached chart titled, "Resolution of Degraded and Nonconforming Conditions," recognizes these and other provisions that a licensee may follow to restore or establish acceptable conditions. These provisions are success paths that enable licensees to continue safe operation of their facilities.

4.0 DISCUSSION OF NOTABLE PROVISIONS

4.1 Public Health and Safety

All success paths, whether specifically stated or not, are first directed to ensuring public health and safety and second to restoring the systems, structures, or components (SSCs) to the current licensing basis of the plant as an acceptable level of safety. Identification of a degraded or nonconforming condition that may pose an immediate threat to the public health and safety requires the plant to be placed in a safe condition. Technical Specifications (TS) address the safety systems and provide Limiting Conditions for Operation (LCOs) and Allowed Outage Times (AOTs) required to ensure public health and safety.

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4.2 Operability Determinations

For guidance on operability see the Inspection Manual, Part 9900, "OPERABLE/OPERABILITY: ENSURING THE FUNCTIONAL CAPABILITY OF A SYSTEM OR COMPONENT," and see the Inspection Manual, Part 9900, "STANDARD TECHNICAL SPECIFICATIONS STS SECTION 1, OPERABILITY."

4.3 The Current Licensing Basis and 10 CFR 50, Appendix B

The design and operation of a nuclear plant is to be consistent with the current licensing basis. Whenever degraded or nonconforming conditions of SSCs subject to Appendix B are identified, Appendix B requires prompt corrective action to correct or resolve the condition. The licensee must establish a time frame for completion of corrective action. The timeliness of this corrective action should be commensurate with the safety significance of the issue.

The time frame governing corrective action begins with the discovery of the condition, not with the time when it is reported to the NRC. In determining whether the licensee is making reasonable efforts to complete corrective action promptly, NRC will consider whether corrective action was taken at the first opportunity, as determined by safety significance (effects on operability, significance of degradation) and by what is necessary to implement the corrective action. Factors that might be included are the amount of time required for design, review, approval, or procurement of the repair/modification; availability of specialized equipment to perform the repair; or the need to be in a hot or cold shutdown to implement the actions. The NRC expects time frames longer than the next refueling outage to be explicitly justified by the licensee as part of the deficiency tracking documentation. If the licensee does not resolve the degraded or nonconforming condition at the first available opportunity or does not appropriately justify a longer completion schedule, the staff would conclude that corrective action has not been timely and would consider taking enforcement action.

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4.4 Discovery of an Existing But Previously Unanalyzed Condition or Accident

In the course of its activities, the licensee may discover a previously unanalyzed condition or accident. Upon discovery of an existing but previously unanalyzed condition that significantly compromises plant safety, the licensee **SHALL** report that condition in accordance with 10 CFR 50.72 and 50.73, and put the plant in a safe condition.

For a previously unanalyzed condition or accident that is considered a significant safety concern, but is not part of the design basis, the licensee may subsequently be required to take additional action after consideration of backfit issues (see Section 50.109(a)(5)).

4.5 Justification for Continued Operation (JCO)

4.5.1 Background

The license authorizes the licensee to operate the plant in accordance with the regulations, license conditions and the TS. If an SSC is degraded or nonconforming but operable, the license establishes an acceptable basis to continue to operate and the licensee does not need to take any further actions. The licensee must, however, promptly identify and correct the condition adverse to safety or quality in accordance with 10 CFR Part 50, Appendix B, Criterion XVI.

The basis for this authority to continue to operate arises because the TS contain the specific characteristics and conditions of operation necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to public health and safety. Thus, if the TS are satisfied, and required equipment is operable, and the licensee is correcting the degraded or nonconforming condition in a timely manner, continued plant operation does not pose an undue risk to public health and safety.

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Under certain defined and limited circumstances, the licensee may find that strict compliance with the TS would cause an unnecessary plant action not in the best interest of public health and safety. NRC review and action is required prior to the licensee taking actions that are contrary to compliance with the license conditions or TS unless an emergency situation is present such that 10 CFR 50.54(x) and (y) is applied. A JCO, as defined herein for general NRC purposes, is the licensee's technical basis for requesting NRC responses to such action.

4.5.2 JCO Definition

A Justification for Continued Operation[1] (JCO) is the licensee's technical basis for requesting authorization to operate in a manner that is prohibited (e.g., outside TS or license) absent such authorization. The preparation of JCOs does not constitute authorization to continue operation.

4.5.3 Items for Consideration in a JCO

Some items which are appropriate for consideration in a licensee's development of a JCO include:

- Availability of redundant or backup equipment
- Compensatory measures including limited administrative controls
- Safety function and events protected against
- Conservatism and margins, and
- Probability of needing the safety function.
- PRA or Individual Plant Evaluation (IPE) results that determine how operating the facility in the manner proposed in the JCO will impact the core damage frequency.

[1] Regulations, generic letters, and bulletins may provide direction on specific issue JCOs, which do not require that they be submitted. Licensees may also use the JCO for situations other than for operating in a prohibited manner. The JCO term has been used in Generic Letters 88-07 on Environmental Qualifications of Electrical Equipment and 87-02 on Seismic Adequacy. Licensees should continue to follow earlier guidance regarding the preparation of JCOs on specific issues.

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4.5.4 Discussion of Industry-Type JCOs

Currently, some licensees refer to two other documents or processes as JCOs that are not equivalent to and do not perform the same function as the NRC-recognized JCO (as defined in 4.5.2). This is an acceptable industry practice and to the extent the industry JCO fulfills other NRC requirements, the JCOs will be selectively reviewed and audited accordingly.

In the first industry-type JCO, the licensee may consider the entire process depicted in the attached chart as a single JCO that includes such things as the basis for operability, PRA, corrective action elements, and alternative operations.

In the second industry-type JCO, the licensee may consider the documentation that is developed to support facility operation after the operability decision has been made as a JCO. This documentation can cover any or all of the items listed under "Interim Operation" on the attached chart.

Although the "JCO" is used differently by some licensees, the NRC concern is that the operability decision is correct, documentation of licensee's actions are appropriate, and submittals to the NRC are complete. The licensee's documentation of the JCO's is normally proceduralized through the existing plant record system, which is auditable.

4.6 Reasonable Assurance of Safety

For SSCs that are not expressly subject to TS and that are determined to be inoperable, the licensee should assess the reasonable assurance of safety. If the assessment is successful, then the facility may continue to operate while prompt corrective action is taken. Items to be considered for such an assessment include the following:

- Availability of redundant or backup equipment
- Compensatory measures including limited administrative controls
- Safety function and events protected against
- Conservatism and margins, and
- Probability of needing the safety function.

- PRA or Individual Plant Evaluation (IPE) results that determine how operating the facility in the manner proposed in the JCO will impact the core damage frequency.

4.7 Evaluation of Compensatory Measures

In its evaluation of the impact of a degraded or nonconforming condition on plant operation and on operability of SSCs, a licensee may decide to implement a compensatory measure as an interim step to restore operability or to otherwise enhance the capability of SSCs until the final corrective action is complete. Reliance on a compensatory measure for operability should be an important consideration in establishing the "reasonable time frame" to complete the corrective action process. NRC would normally expect that conditions that require interim compensatory measures to demonstrate operability would be resolved more promptly than conditions that are not dependent on compensatory measures to show operability, because such reliance suggests a greater degree of degradation. Similarly, if an operability determination is based upon operator action, NRC would expect the nonconforming condition to be resolved expeditiously.

On July 21, 1997, the Nuclear Energy Institute (NEI) submitted to the NRC a guidance document, NEI 96-07 [Final Draft], "Guidelines for 10 CFR 50.59 Safety Evaluations." Part of this guidance relates to applicability of 10 CFR 50.59 to degraded and nonconforming conditions. With respect to the use of compensatory measures, the guidance states:

- If an interim compensatory action is taken to address the condition and involves a procedure change or temporary modification, a 10 CFR 50.59 review should be conducted and may result in a safety evaluation. The intent is to determine whether the compensatory action itself (not the degraded condition) impacts other aspects of the facility described in the SAR.

The staff concludes that this is an acceptable approach for dealing with compensatory actions within the context of a corrective action process.

In considering whether a compensatory measure may affect other aspects of the facility, a licensee should pay particular attention to ancillary aspects of the compensatory measure that may result from actions taken to directly compensate for the degraded condition.

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As an example, suppose a licensee plans to close a valve to isolate a leak. Although that action would temporarily resolve the leak, it has the potential to affect flow distribution to other components or systems, may complicate required operator responses, or could have other effects that should be evaluated before the compensatory measures are implemented. In accordance with 10 CFR 50.59, should the evaluation determine that implementation of the compensatory action itself would involve a TS change or an unreviewed safety question (USQ), NRC approval, in accordance with 10 CFR 50.90 and 50.92, is required prior to implementation of the compensatory action.

4.8 Final Corrective Action

The responsibility for corrective action rests squarely on the licensee. A licensee's range of corrective action could include (1) full restoration to the SAR-described condition, (2) NRC approval for a change to its licensing basis to accept the as-found condition as is, or (3) some modification of the facility other than restoration to the original FSAR condition. If corrective action is taken so that the degraded or nonconforming condition is restored to its original configuration, no 10 CFR 50.59 evaluation is required. The 10 CFR 50.59 process is entered when the final resolution to the degraded or nonconforming condition is to be different than the established FSAR requirement. At this point, the licensee is planning (in a prospective sense) to make a change to the facility or procedures as described in the SAR. The proposed change is now subject to the evaluation process established by 10 CFR 50.59. A change can be safe, but can still require NRC approval. The proposed final resolution can be under staff review and not affect the continued operation of the plant, because interim operation is being governed by the processes of the operability determination and corrective action of Appendix B.

In two situations, the identification of a final resolution or final corrective action would trigger a 10 CFR 50.59 evaluation, unless another regulation applies (i.e., 10 CFR 50.55a): (1) when a licensee decides to change its facility or procedures to something other than full restoration to the FSAR-described condition, as the final corrective action, or (2) when a licensee decides to change its licensing basis as described in the SAR to accept the degraded or nonconforming condition as its revised licensing basis. This guidance is consistent with the July 21, 1997, revision of NEI 96-07.

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Change to Facility or Procedures

The first circumstance is if the licensee plans for its final resolution of the degraded or nonconforming condition to include other change(s) to the facility or procedures in order to cope with the (uncorrected, including only partially corrected) nonconforming condition. Rather than fully correcting the nonconforming condition, the licensee decides to restore capability or margin by another change. In this case, the licensee needs to evaluate the change from the SAR-described condition to the final condition in which the licensee proposes to operate its facility. If the 10 CFR 50.59 evaluation concludes that a change to the TS or a USQ is involved, a license amendment must be requested, and the corrective action process is not complete until the approval is received, or other resolution occurs.

Change to Current Licensing Basis

The other situation is a final resolution in which the licensee proposes to change the current licensing basis to accept the as-found nonconforming condition. In this case, the 10 CFR 50.59 evaluation is of the change from the SAR-described condition to the existing condition in which the licensee plans to remain (i.e., the licensee will exit the corrective action process by revising its licensing basis to document acceptance of the condition). If the 10 CFR 50.59 evaluation concludes that a change to the TS or a USQ is involved, a license amendment must be requested, and the corrective action process is not complete until the approval is received, or other resolution occurs. In order to resolve the degraded or nonconforming condition without restoring the affected equipment to its original design, a licensee may need to obtain an exemption from 10 CFR Part 50 in accordance with 10 CFR 50.12, or relief from a design code in accordance with 10 CFR 50.55a. The use of 10 CFR 50.59, 50.12, or 50.55a in fulfillment of Appendix B corrective action requirements does not relieve the licensee of the responsibility to determine the root cause, to examine other affected systems, or to report the original condition, as appropriate.

In both of these situations, the need to obtain NRC approval for a change (e.g., because it involves a USQ) does not affect the licensee's authority to operate the plant. The licensee may make mode changes, restart from outages, etc., provided that necessary equipment is operable and the degraded condition is not in conflict with the TS or the license. The basis for this position was previously discussed in Section 4.5.1.

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ENFORCEMENT

If the licensee, without good cause, does not correct the nonconformance at the first available opportunity, the staff concludes that the licensee has failed to take prompt corrective action and, thus, is in violation of 10 CFR Part 50 Appendix B (Criterion XVI).[2] When the NRC concludes that corrective action to implement the final resolution of the degraded or nonconforming condition is not prompt, or that the operability determination is not valid, enforcement action (Notice of Violation, orders) will be taken. Enforcement action may include restrictions on continued operation.

Implementation of complete corrective action within a reasonable time frame does not mitigate the potential for taking enforcement action for the root causes that initially created the degraded or nonconforming condition or for violations of other regulatory requirements. The nonconforming condition may have resulted from (1) earlier changes performed without a 10 CFR 50.59 evaluation or (2) inadequate reviews; or may be a *de facto* change for which the facility never met the SAR description. The staff may determine that the "change" from the FSAR-described condition to the discovered nonconforming condition involved a USQ (or a TS change), and that enforcement action is appropriate for the time frame up to time of discovery.

5.0 REFERENCE

See attached charts titled, "Resolution of Degraded and Nonconforming Conditions."

END

[2] Since Appendix B is only applicable to safety-related SSCs, this approach could not be used if the delay in resolution of a nonconforming condition from the SAR involved only nonsafety-related SSCs and did not affect any safety-related SSCs. However, NRC expects licensees to take corrective action for nonconformances with the SAR consistent with Criterion XVI in a time frame commensurate with safety.

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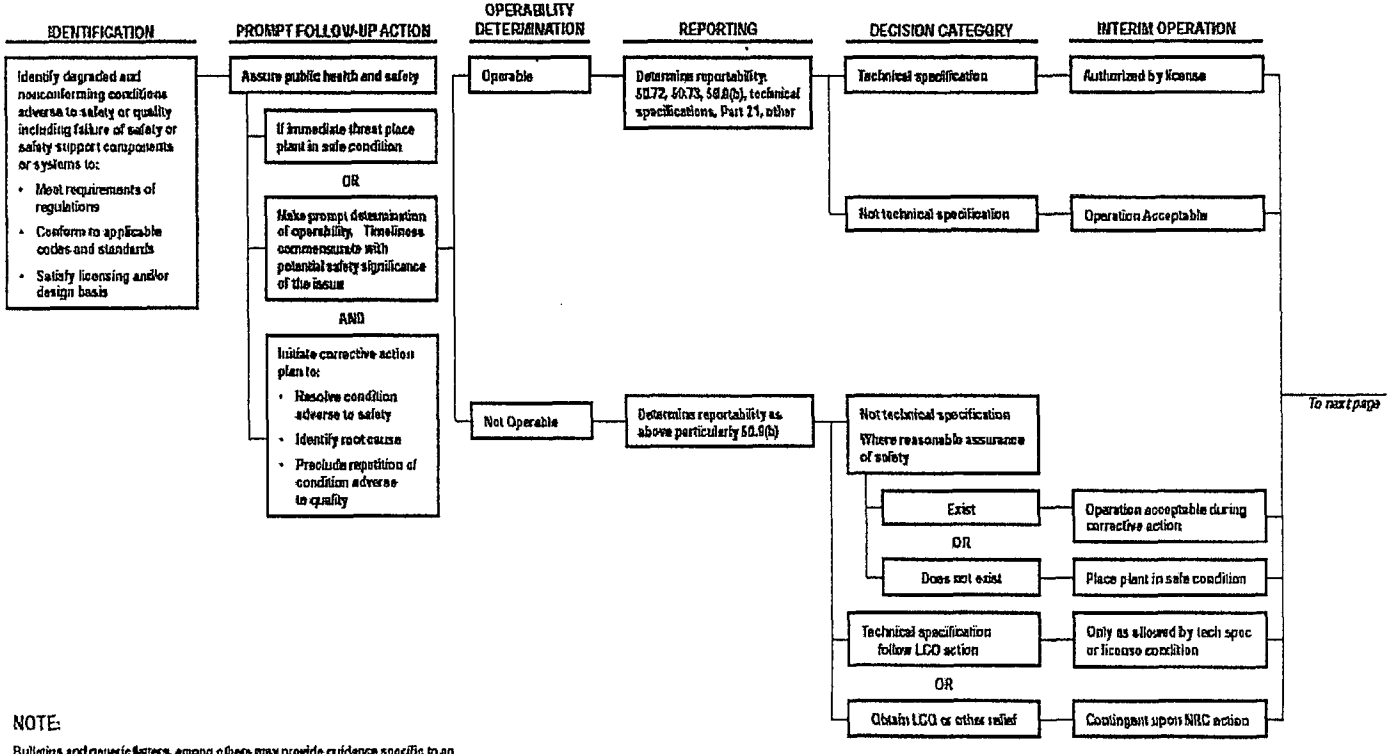
RESOLUTION OF DEGRADED AND NONCONFORMING CONDITIONS



NOTE:

Bulletins and generic letters, among others may provide guidance specific to an issue but counter to the generally accepted approach herein. Examples of deviations from the above approach include generic letter 88-87 on environmental qualification of electrical equipment and generic letter 87-02 on seismic adequacy (See use of JCO)

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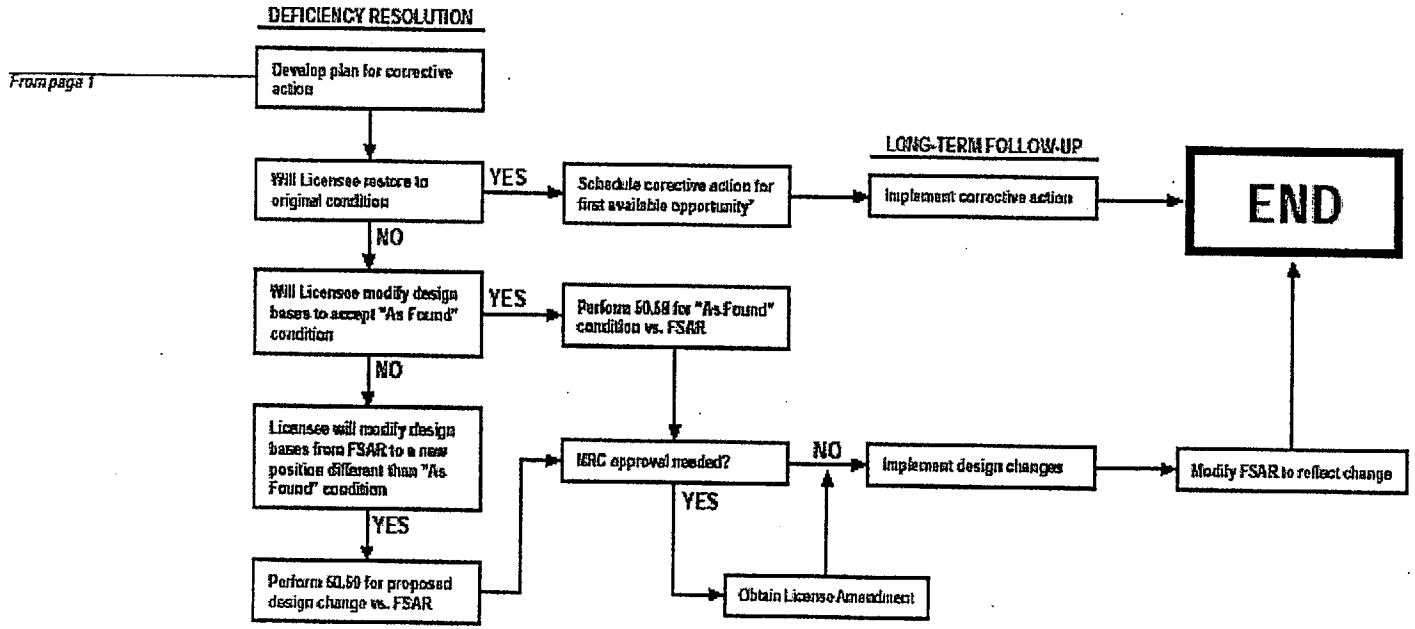
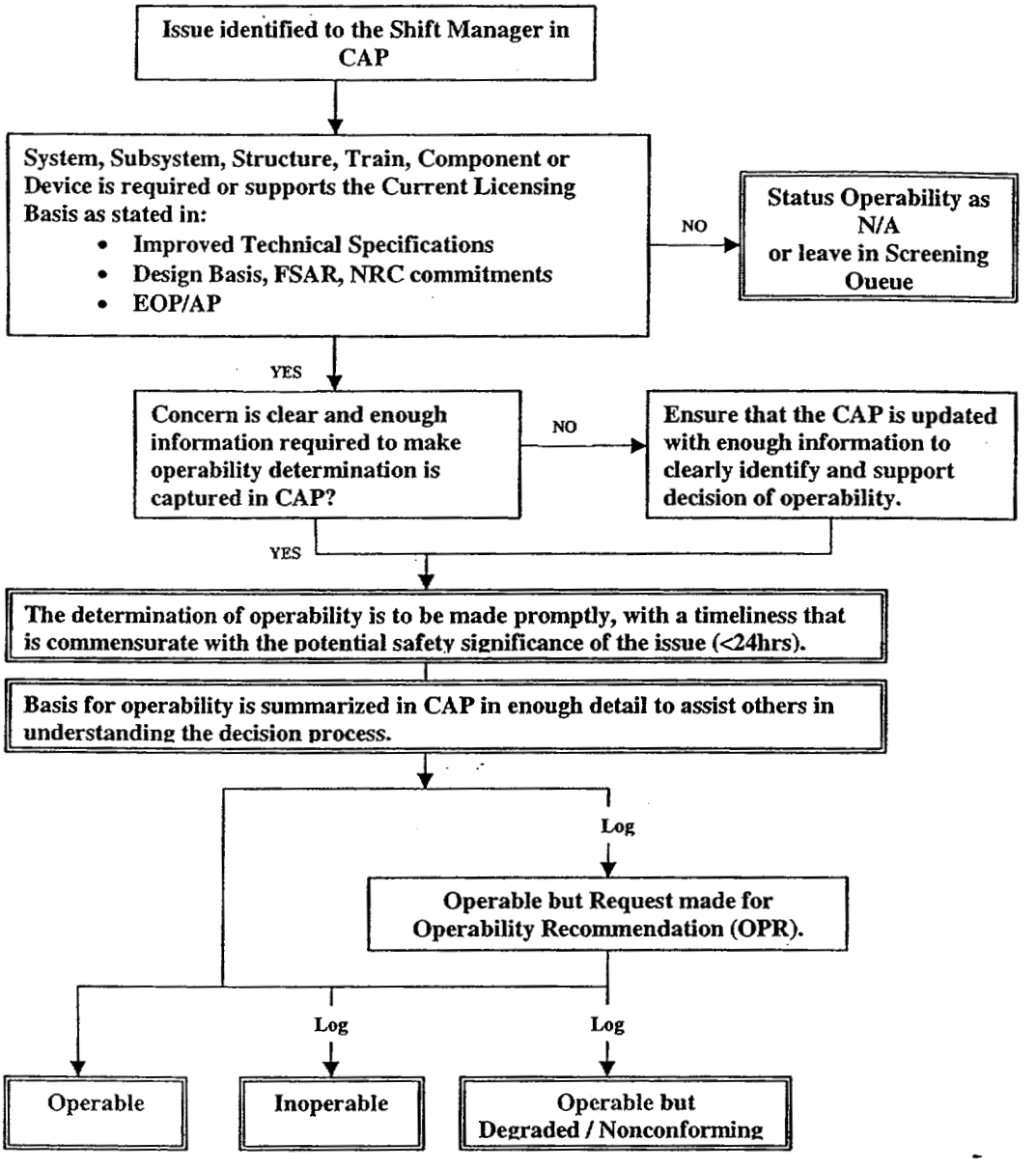
RESOLUTION OF DEGRADED AND NONCONFORMING CONDITIONS



* See section 4.3

Figure 1 Shift Manager CAP Action Request Review Expectations



June 9, 2003

Figure 1 Shift Manager CAP Action Request Review Expectations

Status Operability as N/A or leave in Screening Oueue

A person other than the shift managers may screen items that are not related to plant equipment / operation, involves an external agency or is an immediate treat to personnel safety.

Ensure that the CAP is updated with enough information to clearly identify and support decision of operability.

If the CAP does not have enough information, contact someone who can answer your questions. Consider having the experts update the CAP.

The determination of operability is to be made promptly, with a timeliness that is commensurate with the potential safety significance of the issue (<24 hrs).

Basis for operability is summarized in CAP in enough detail to assist others in understanding the decision process.

Operability determinations should be prompt but must be accurate as well. It is acceptable to invest time, based on the potential impact on safety, for a complete and accurate evaluation. I would prefer an item remain in the SRO queue an extra shift in an effort to allow engineering time to answer the concerns vs. forward the CAP with inadequate documentation of evaluation.

LOG

Cap is referenced in Unit Log entry documenting Operability determination.

Figure 2 Prompt Operability Screening Process

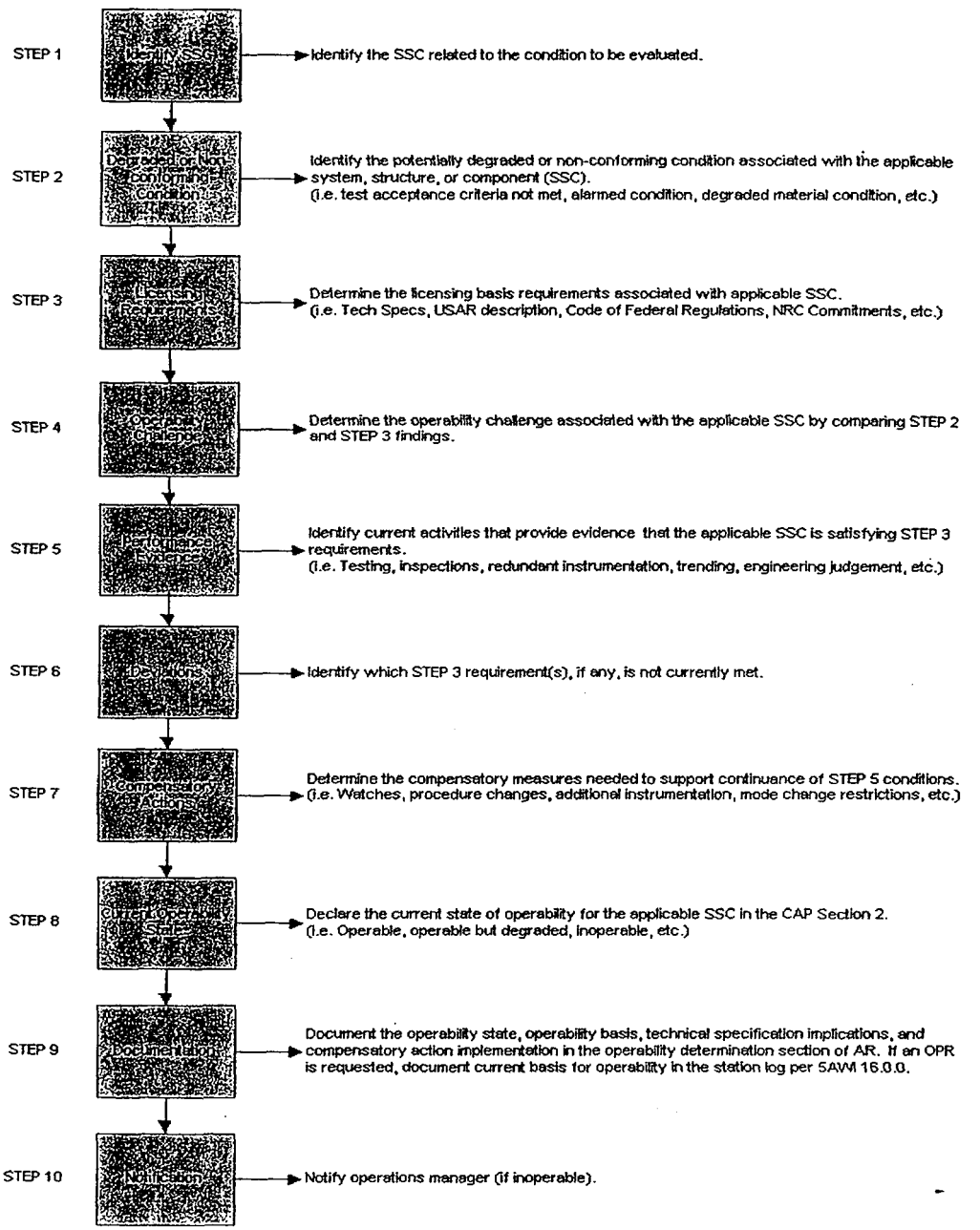


Table 1 Source Document Index

This Instruction stems from Request No. 569 (N0001173). The AWI is based on NRC technical guidance on "Operable/Operability: Ensuring the Functional Capability of a System or Component" and "Resolution of Degraded and Nonconforming Conditions."

Table 2 Significant Changes From the Previous Revision

Section	Change
Various	Removed many previous sections based on the content equivalent content being present in NMC Procedure FP-OP-OL-01, "Operability Determination."
6.6, 6.7, 6.8	Sections in operability in conjunction with surveillance testing moved to G-1, "Surveillance Testing Program."
Various	Remaining body of previous revision retained as Appendix A, "Additional Considerations for Operability Determination."
	Removed sections of procedure based on NRC Inspection Manual Part 9900 and added as Appendix for the entire Inspection Manual.

NMC Committed to Nuclear Excellence	Operations Fleet Procedure
	FP-OP-OL-01 Revision: 0
Corporate Office Quality Procedures	Effective Date: 12/19/2002

Title: OPERABILITY DETERMINATION

Approval:

Vice President Fleet Operations

Note: This procedure has been issued as an NMC Fleet Procedure; individual sites must authorize its use at their site via their site specific review and approval process.

1.0 PURPOSE

This procedure details the process for prompt determination of OPERABILITY of safety-related equipment, systems, structures, and components (SSCs) included in Technical Specifications (directly or indirectly by the definition of OPERABILITY), and equipment important to safety. The process is composed of an initial determination of OPERABILITY decision by the Shift Manager (OPERABILITY Determination) and supporting documentation by Engineering, when requested (OPERABILITY Recommendation). The performance of an OPERABILITY Determination / Recommendation to resolve Conditions Adverse to Quality are directed by the NMC Action Request (AR) Process.

NOTE: Throughout this procedure the terms OPERABLE, OPERABILITY, operable, and operability are used. The terms OPERABLE / OPERABILITY are used to denote specified safety function or Technical Specification requirements for SSCs within the scope of this procedure. The terms operable / operability are used to denote other functional requirements for other SSCs from the unit's licensing basis.

2.0 APPLICABILITY

This instruction applies to all site personnel and owner controlled property operated by Nuclear Management Company (NMC).

3.0 RESPONSIBILITIES

The following positions have responsibilities in the this procedure:

3.1 Plant Personnel: Initiate an Action Request when a Condition Adverse to Quality (CAQ) exists.

3.2 Shift Manager: Make OPERABILITY determinations for all conditions that involve an equipment or programmatic issue related to the ability of a safety, or safety support, SSC to perform its specified function.

3.3 Responsible Individual: When assigned to perform an OPERABILITY Recommendation, follow the guidelines contained in this procedure and attachments.

4.0 DEFINITIONS

4.1 **Aggregate Review:** The activity of identifying related issues by review of active Action Requests (ARs) / OPERABILITY Determinations (ODs) for the same system including, as applicable, their compensatory measures. Historical ARs / ODs can also be included in this review at the discretion of the Engineer. The review of the active ARs / ODs, and their compensatory measures, is intended to ensure there is no conflict between the related conditions, i.e., conflicting assumptions or compensatory measures. Additional documents that may help clarify

current conditions are temporary changes, temporary modifications, planned modifications or design changes, open work orders, and recently performed Inservice Testing.

4.2 **Compensatory Measure**: An action, either physical or administrative, taken as an interim step to restore OPERABILITY/operability or to otherwise enhance the capability of SSCs until the final corrective action is complete. Compensatory measures may include alternate system alignment, installation of temporary equipment, periodic patrols, remote stationing of personnel, special surveillances, temporary procedure changes, imposition of more stringent requirements on redundant/diverse equipment, or special training.

NOTE: In accordance with Generic Letter 91-18, Compensatory Measures require screening/evaluation pursuant to the requirements of 10 CFR §50.59 on the potential effects of the proposed Compensatory Measures on SSCs other than degraded/non-conforming SSC.

4.3 **Condition Adverse to Quality (CAQ):** Failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances that have potential to affect nuclear safety, radiological safety, operability of safety related or augmented quality SSCs, or any programmatic or operational aspects associated with nuclear or radiological safety which reduces the ability of the SSC to perform its specified function.

4.4 **Degraded**: A condition of an SSC, potentially affecting OPERABILITY or operability, in which quality or functional capability has been reduced by mechanisms such as aging, erosion, corrosion, or improper operation or maintenance.

4.5 **Design Basis Event:** Design basis events are defined in 10 CFR 50.49(b)(1) as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (A) through (C) of definition 4.15.

4.6 **Engineering Judgment:** (for the purpose of assessing OPERABILITY) – An assessment substantiated by the application of engineering principles and operational experiences based on available data.

4.7 **Qualification/Full Qualification:** Conformance to and with all aspects of the licensing basis, including codes and standards, design criteria, safety analysis, and commitments.

4.8 **Licensing Basis:** The set of NRC requirements applicable to a specific unit and the licensee's written commitments for assuring compliance with, and operation within, applicable NRC requirements and the plant-specific

design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and in effect.

4.9 **Nonconforming Condition:** A condition of an SSC in which there is failure to meet requirements or license commitments. The following are examples of nonconforming conditions:

- A condition fails to conform to one or more applicable codes or standards specified in the UFSAR.
- As-built, or as-modified, equipment does not meet UFSAR descriptions.
- Operating experience or engineering review demonstrates a design inadequacy.
- Documentation required by NRC requirements is unavailable or deficient.

4.10 **OPERABLE / OPERABILITY:** See Technical Specifications for site-specific definition.

4.11 **OPERABILITY Determination:** A decision making process intended to determine the ability of plant equipment to perform their specified function upon identification of a condition which may impact OPERABILITY.

4.12 **OPERABILITY Recommendation:** A written evaluation of a degraded or nonconforming condition to determine the impact of the condition on the OPERABILITY of SSCs.

4.13 **Operable But Degraded:** A SSC maintains its ability to fulfill its safety, or safety support, function while failing to meet any of the following:

- Licensing Basis or Design Basis
- NRC Requirements or Regulations
- Applicable Codes or Standards
- UFSAR Descriptions

4.14 **Reasonable Assurance of Safety:** For SSCs that are not expressly subject to TS and are determined to be inoperable, an assessment of safety considering the following criteria.

- availability, reliability, and operability of redundant or backup equipment
- compensatory measures, including limited reliance on administrative controls
- safety function and events protected
- conservatism and margins, and probability of needing the safety function.

- probabilistic risk assessment (PRA) or individual plant evaluation (IPE) results that determine how operating the facility in the proposed manner will impact the core damage frequency, or conditional core damage probability

- plant specific and industry experience, testing, and research.

If reasonable assurance of safety exists, then the facility may continue to operate while prompt corrective action is taken.

4.15 **Specified Function(s)** [***specified safety function, safety function***];The specified safety function for an SSC as defined in the licensing basis for the facility. SSCs subject to this procedure are those relied upon to remain functional during and following design basis events (A) to ensure the integrity of the reactor coolant pressure boundary, (B) to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition, or (C) to ensure the capability to prevent or mitigate the consequences of accidents that could result in potential offsite consequences comparable to the 10 CFR Part 100 guidelines. In addition to providing the specified safety function, a system is expected to perform as designed, tested and maintained. When system capability is degraded to a point where it cannot perform with reasonable assurance or reliability, the system should be judged inoperable, even if at the instantaneous point in time the system could provide the specified safety function.

4.16 **Transitional Action:** Action required by the unit's TS ACTION when a LIMITING CONDITION FOR OPERATION (LCO) is not met that results in the unit being placed in a MODE or other specified condition in which the LCO is not applicable.

5.0 REQUIREMENTS

5.1 Discussion

The purpose of Technical Specifications is to ensure the plant is operated within its design basis and to preserve the validity of the safety analyses, which are concerned with both the prevention and mitigation of accidents. Because the prevention of design basis accidents and the ability to mitigate them must be continuously ensured, the process of ensuring OPERABILITY for safety and safety support systems is continuous. The focus of OPERABILITY is foremost on the capability to ensure safety.

In the course of normal activities, potential deficiencies or a reduction in quality of safety, or safety support, SSCs may be identified. This procedure provides guidance regarding a process that may be used when SSCs might be:

- Degraded such that performance or OPERABILITY is called into question.

- Nonconforming because qualification is called into question (full qualification constitutes conforming to all aspects of the design bases, including codes and standards, design criteria, regulations/regulatory requirements).

An SSC is OPERABLE when it meets the definition of OPERABLE /OPERABILITY in the unit's Technical Specifications. Otherwise, the SSC is inoperable.

The Technical Specifications establish OPERABILITY requirements on SSCs required for safe operation and include surveillance requirements to confirm periodically that these SSCs are OPERABLE. Performance of the surveillance requirement is usually considered to be sufficient to demonstrate OPERABILITY provided that there is reasonable assurance that the SSC continues to conform to all appropriate OPERABILITY criteria in the Licensing Basis. Whenever conformance to OPERABILITY criteria in the Licensing Basis is called into question, performance of the surveillance requirement alone is usually not sufficient to demonstrate OPERABILITY.

Additionally, verification of OPERABILITY is supplemented by continuous and ongoing processes such as:

- Day-to-day operation of the facility
- Implementation of programs such as in-service testing and inspection
- Plant walk downs or tours
- Observations from the control room
- Quality assurance activities such as audits and reviews
- Engineering design reviews including design basis reconstitution.

Absent information to the contrary, once a SSC is established as OPERABLE, it is reasonable to assume that the SSC remains OPERABLE and the previously stated verifications should provide that assurance. However, whenever the ability of a SSC to perform its specified function is called into question, OPERABILITY must be established by a documented examination of the deficiency.

> **NOTE: IT IS IMPORTANT TO NOTE THAT AN SSC IS EITHER OPERABLE OR INOPERABLE AT ALL TIMES. "INDETERMINATE" IS NOT A RECOGNIZED STATE OF OPERABILITY.**

In addressing the timeliness of OPERABILITY Determinations, NRC Generic Letter 91-18 provides that "in most cases it is expected that the decision (of OPERABILITY) can be made within 24 hours of discovery

even though complete information may not be available. Some few exceptional cases may take longer. For SSCs in TS, the Allowed Outage Times (AOTs) contained in TS generally provide reasonable guidelines for safety significance. For SSCs outside TS, engineering judgment must be used to determine safety significance. The decision should be based on the best information available and must be predicated on the licensee's reasonable expectation that the SSC is operable and that the prompt determination process will support that expectation. When reasonable expectation does not exist, the SSC should be declared inoperable and the safe course of action should be taken. "

An essential element in the NMC OPERABILITY philosophy is that SSCs are OPERABLE while the evaluations are on going. If reasonable assurance of OPERABILITY cannot be demonstrated, the SSC shall be declared inoperable and the appropriate actions taken. The focus shall be on safety.

5.2 OPERABILITY and Restoration of Full Qualification

OPERABILITY and qualification are closely related concepts. However, the fact that a system is not fully qualified (i.e., Degraded or Nonconforming) does not, in all cases, render that system unable to perform its specified function if called upon. According to the definition of OPERABILITY, a safety or safety support system or structure must be capable of performing its specified function(s) of prevention or mitigation as described in the Licensing Basis, particularly the Technical Specification (TS) BASES or Final Safety Analysis Report (FSAR).

The prompt determination of OPERABILITY will result in decisions or actions pertaining to continued plant operation, while qualification or restoration of qualification becomes a corrective action process activity. Qualification concerns, whether due to a lack of required quality or loss of quality because of degradation, can and should be promptly considered to determine the effect of the concern on the OPERABILITY of the system.

If OPERABILITY is confirmed based on this prompt determination, plant operation can continue while corrective action is taken to restore full qualification. This is consistent with the plant TS being the controlling document for making decisions about plant operations, while 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, is the requirement document for dealing with restoring equipment qualification.

The principle of treating the related concepts of OPERABILITY and restoration of qualification separately is to ensure that the OPERABILITY determination is focused on safety and is not delayed by decisions or actions necessary to plan or implement the corrective action, i.e., restoring full qualification.

5.3 Scope

NOTE: ONLY THE SHIFT MANAGER CAN MAKE A DETERMINATION OF OPERABILITY. FOR DEGRADED OR NON-CONFORMING CONDITIONS, THE SHIFT MANAGER MAY DETERMINE THE ASSOCIATED SSC IS OPERABLE, WITH FOLLOW-UP EVALUATIONS OF DEGRADED OR NON-CONFORMING CONDITIONS DIRECTED BY THE CORRECTIVE ACTION PROCESS' "ACTION REQUEST SCREENING TEAM", AS APPROPRIATE.

5.3.1 This procedure requires determination of OPERABILITY for systems, structures, and components (SSCs) found in

- Degraded conditions where performance is called into question
- Nonconforming conditions where qualification (such as conformance to codes and standards) is called into question
- An existing but previously unanalyzed condition or accident.

To determine if the as-found condition affects:

- Safety-related SSCs, which are those relied upon to remain functional during and following design basis events (A) to ensure the integrity of the reactor coolant pressure boundary, (B) to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition, or (C) to ensure the capability to prevent or mitigate the consequences of accidents that could result in potential offsite consequences comparable to the 10 CFR Part 100 guidelines. Design basis events are defined the same as in 10 CFR 50.49(b)(1) [*safety related electric equipment, or Class 1E*].
- SSCs whose failure could prevent satisfactory accomplishment of any of the required functions of safety-related SSCs.
- All SSCs relied on in the safety analyses, or plant evaluations, that are a part of the plant's Licensing Basis as a requirement of OPERABILITY. Such analyses and evaluations may include those submitted to support license amendment requests, exemption requests, or relief requests, and those submitted to demonstrate compliance with the Commission's regulations such as fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).
- Any SSCs explicitly subject to facility Technical Specifications (TS).

- Any SSCs subject to facility TS through the definition of OPERABILITY (i.e., support SSCs outside TS).

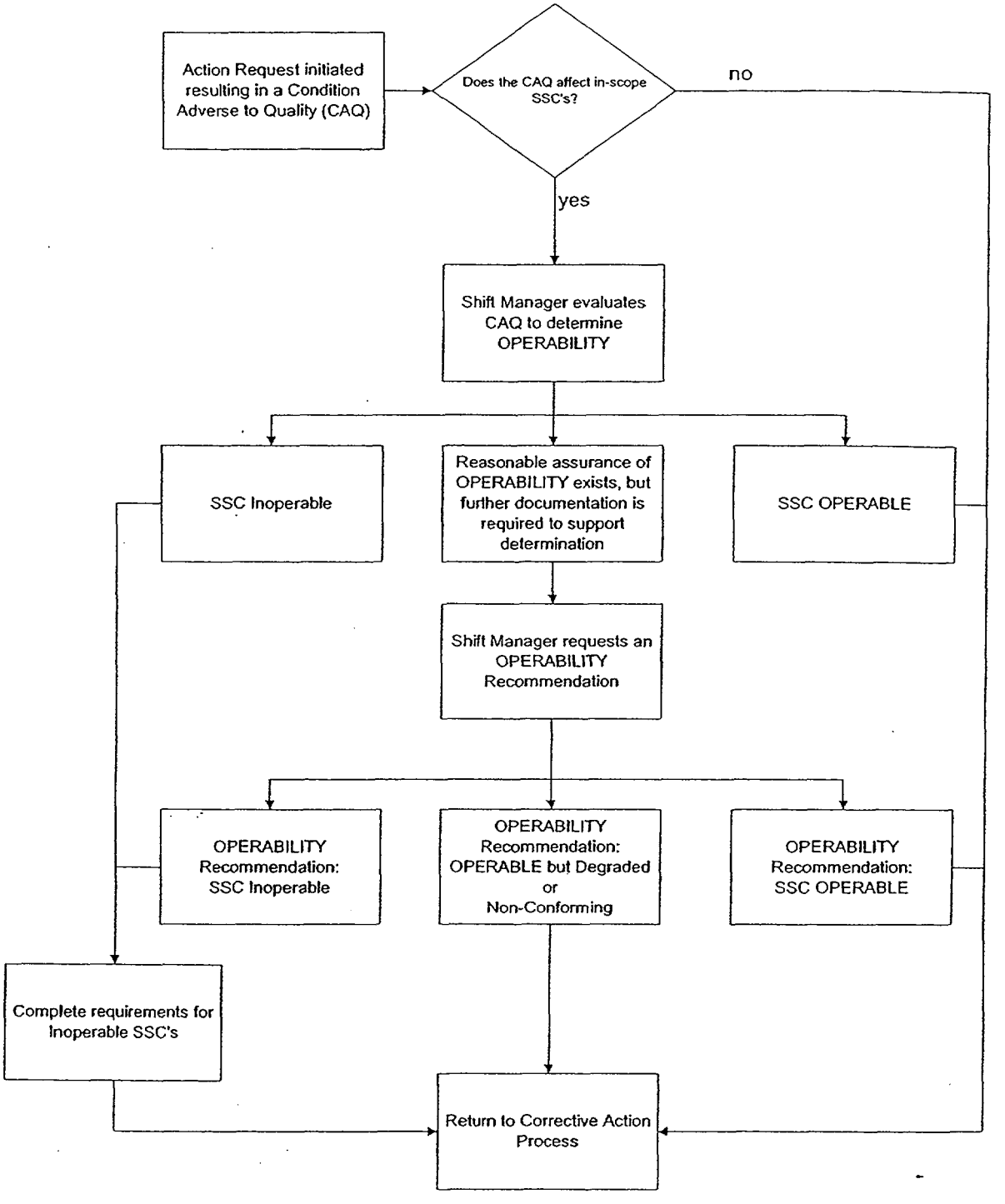
5.3.2 An OPERABILITY Determination / Recommendation, as applicable, needs to address the capability of the equipment to perform its specified safety function(s). OPERABILITY Determinations / Recommendations should include the following:

- What SSC is degraded or potentially nonconforming;
- The safety function performed by the SSC;
- By what means, and when, the potentially nonconforming SSC was discovered;
- The requirement or commitment established for the SSC and why the commitment or requirement may not be met; and,
- The safest plant configuration including the effect of Transitional Action.

5.3.3 While the scope of this procedure covers SSCs described above, SSCs meeting the following criteria found in a degraded or potentially nonconforming condition are to be evaluated in accordance with the Corrective Action Program (CAP):

- Any SSCs subject to 10 CFR Part 50, Appendix B [*Quality Assurance Criteria*].
- Any SSCs subject to 10 CFR Part 50, Appendix A, Criterion 1 [*Quality Standards and Records*].

5.4 Operability Determination Process Flowchart



Does the CAQ affect in-scope SSC's?	The Shift Manager shall determine if the condition affects in-scope SSCs as defined in section 5.3.1.
Shift Manager evaluates CAQ to determine OPERABILITY	The Shift Manager or Designee determines if a condition exists that could call into question the ability of an SSC to perform its specified safety function. Examples of conditions include: • a valve closing slower than anticipated, • a loose piping support, • an error in an analysis involving plant equipment, • and those items that meet the definition of a degraded or nonconforming condition. The Shift Manager should utilize any and all resources to promptly determine SSC status. These include, but are not limited to: • Engineering Support Personnel • Maintenance Rule Scoping Document • Past OPERABILITY Recommendations / Determinations • 'Q' List An OPERABILITY Recommendation is not required if the Shift Manager can determine SSC OPERABILITY using the resources described above, or if adequate information exists in the Action Request. If the CAQ does not affect the SSCs ability to perform its specified safety function, then the Shift Manager has reasonable assurance of OPERABILITY. Degraded and Non-Conforming condition evaluations will be assigned by the Action Request Review Team, as deemed appropriate.
SSC Inoperable	If the SSC is inoperable, then: • Determine and implement any Technical Specification, or other Licensing Basis, Required Actions; • Determine any Immediate Reportability requirements;

	• Determine if any Compensatory Actions are required and implement as necessary. Document determination in Section 2 of Action Request. NOTE: AN INOPERABLE SSC CAN ONLY BE RETURNED TO OPERABLE STATUS BY A DECLARATION OF OPERABLE / OPERABILITY BY THE SHIFT MANAGER. THE COMPLETION AND CLOSURE OF ACTION (E.G., COMPLETED WORK ORDER) THAT RETURNS AN SSC TO OPERABLE STATUS MUST BE REVIEWED AND APPROVED BY THE SHIFT MANAGER AND DOCUMENTED WITHIN THE CAP.
SSC OPERABLE	Document determination in Section 2 of Action Request. Include as a minimum: • SSC of concern and associated specified safety function • Basis for determination (quantitative or qualitative assessment) NOTE: AN INOPERABLE SSC CAN ONLY BE RETURNED TO OPERABLE STATUS BY A DECLARATION OF OPERABLE / OPERABILITY BY THE SHIFT MANAGER. THE COMPLETION AND CLOSURE OF ACTION (E.G., COMPLETED WORK ORDER) THAT RETURNS AN SSC TO OPERABLE STATUS MUST BE REVIEWED AND APPROVED BY THE SHIFT MANAGER AND DOCUMENTED WITHIN THE CAP.
Reasonable assurance of OPERABILITY exists, but further documentation is required to support determination	If there is reasonable assurance that the SSC is OPERABLE, but clarifying documentation is required to support the OPERABILITY Determination, then • The SSC remains OPERABLE. • Document rationale for determination of OPERABILITY in Section 2 of the Action Request.
Shift Manager requests an OPERABILITY Recommendation	The Shift Manager requests an OPERABILITY Recommendation on the Action Request in TeamTrack, and notifies the appropriate Manager/Supervisor. • The individual assigned to perform the OPERABILITY Recommendation, as documented on Attachment 1 "OPERABILITY Recommendation", should refer to the Licensing Basis, to determine functions and performance requirements, as well as NRC Generic Letter 91-18, revision 1, section 6 for detailed discussion of specific OPERABILITY issues. • If the SSC is unable to meet a minimum acceptable level of performance, i.e. inoperable, then notify the Shift Manger immediately. • When the OPERABILITY Recommendation is complete, the Shift Manager shall be notified for

	review and approval. • The Shift Manager shall review the OPERABILITY Recommendation and determine if the SSC is OPERABLE based on the information provided to support the initial prompt determination of OPERABILITY.
OPERABILITY Recommendation: SSC Inoperable	If the Shift Manager concurs with and approves the OPERABILITY Recommendation of inoperability, then document on Attachment 1, **AND** • Determine and implement any Technical Specification, or other Licensing Basis, Required Actions; • Determine any Immediate Reportability requirements; • Determine if any Compensatory Actions are required and implement as necessary.
OPERABILITY Recommendation: SSC OPERABLE	If the Shift Manager concurs with and approves the OPERABILITY Recommendation of OPERABLE, document on Attachment 1.
OPERABILITY Recommendation: OPERABLE but Degraded or Non-Conforming	If the Shift Manager concurs with and approves the OPERABILITY Recommendation of OPERABLE but Degraded or Non-Conforming, document on Attachment 1, **AND** • Implement any Compensatory Actions as necessary; • Close out OPERABILITY Recommendation required action in CAP.
Return to Corrective Action Process	Exit this procedure.

6.0 Records

None

7.0 REFERENCES

7.1 NRC Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions."

7.2 NRC Generic Letter 91-18, Revision 1, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions."

7.3 NRC Inspection Manual, Part 9900, "Operable/Operability: Ensuring the Functional Capability of a System or Component."

7.4 IE Notice 97-78, "Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions Including Response Times."

8.0 Attachments

8.1 Attachment 1, OPERABILITY Recommendation Form

9.0 Revision Summary

None (new procedure)

Submit comments

Attachment 1
Operability Recommendation Form
(example)

NMC	OPERABILITY RECOMMENDATION FORM

SSC affected by condition:

Identify the overall scope of the condition that calls OPERABILITY into question.

Describe the specified safety, or safety support, function(s) of the SSC. Identify the Licensing Basis functions and performance requirements, including Technical Specifications, FSAR, NRC Commitments, or other appropriate information (*reference SCOPE section 5.3*).

Evaluate the effects of the condition, including potential failure modes, on the ability of the SSC to perform its specified safety, or safety support, function(s)

Is the SSC in its present condition capable of performing its safety or safety support function(s)? Explain basis.

(Use engineering analysis or engineering judgment to determine whether the design function can be provided given the existence of the deficiency. When using engineering judgment, provide supporting information from sources such as field walkdowns, industry experience, proven system/component performance under similar service conditions, etc.)

Attachment 1

Operability Recommendation Form

(continued)

NMC	OPERABILITY RECOMMENDATION FORM

If the SSC is not fully capable (*Full Qualification*) of performing its safety or safety support function(s), then determine if Compensatory Measures are required to maintain OPERABILITY.

(Describe the Compensatory Measures, basis for which the Compensatory Measures maintain OPERABILITY, implementation mechanism (procedure, temp mod, etc.), and under what conditions the Compensatory Measures may be terminated.)

_____
_____
_____
_____
_____
_____

If the SSC is not capable of performing its safety or safety support function(s), then provide an Aggregate Review of the condition. Identify related Action Requests (CAP numbers).

_____
_____
_____
_____
_____
_____
_____

Equipment recommended to be:

Operable **Operable, But Degraded** **Nonconforming** **Inoperable ***

Engineering Management Approval Required *** Notify Shift Manager immediately**

Responsible Engineer: _____ Date:_____ Ext: _____

Verifier: _____ Date:_____ Ext: _____

Cognizant Engineering Supervisor:_____ Date:_____ Ext: _____

Approval Recommendation

Cognizant Engineering Manager: _____

Date:_____ N/A

Shift Manager Concurrence and Approval: _____

Date and Time: _____

Attachment 1

Operability Recommendation Form

(continued)

NMC	OPERABILITY RECOMMENDATION FORM

Identify references used. (Reference Name and Section (s))

Continuation.

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources-Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two paths between the offsite transmission grid and the onsite 4 kV Safeguards Distribution System; and

b. Two diesel generators (DGs) capable of supplying the onsite 4 kV Safeguards Distribution System.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One path inoperable.	A.1 Perform SR 3.8.1.1 for the OPERABLE path. AND A.2 Restore path to OPERABLE status.	1 hour AND Once per 8 hours thereafter 7 days AND 14 days from discovery of failure to meet LCO

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for the paths.	1 hour AND Once per 8 hours thereafter
	AND	
	B.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	
	B.3.1 Determine OPERABLE DG is not inoperable due to common cause failure. OR	24 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.2 Perform SR 3.8.1.2 for OPERABLE DG. AND B.4 Restore DG to OPERABLE status.	24 hours 7 days AND 14 days from discovery of failure to meet LCO
C. Two paths inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. AND C.2 Restore one path to OPERABLE status.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features 24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One path inoperable. AND One DG inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems-Operating," when Condition D is entered with no AC power source to either train. ---------- D.1 Restore path to OPERABLE status. OR D.2 Restore DG to OPERABLE status.	 12 hours 12 hours
E. Two DGs inoperable.	E.1 Restore one DG to OPERABLE status.	2 hours
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Two DGs inoperable and one or more paths inoperable. OR One DG inoperable and two paths inoperable.	G.1 Enter LCO 3.0.3.	Immediately

Table 2.2 Radioactive Liquid Effluent Monitoring Instrumentation

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. Gross Radioactivity Monitors Providing Automatic Termination of Release			
a. Liquid Radwaste Effluent Line	1	During releases	1
b. Steam Generator Blowdown Effluent Line	1/Unit	During releases	2
2. Flow Rate Measurement Devices			
a. Liquid RadwasteEffluent Line	1	During releases requiring throttling of flow	4
b. Steam Generator Blowdown Flow	1/Gen	During releases	4
3. Continuous Composite Samplers			
a. Each Turbine Building Sump Effluent Line	1/Unit	During releases	3
4. Discharge Canal Monitor	1	At all times	6
5. Tank Level Monitor			
a. Condensate Storage Tanks	1/Unit	When tanks are in use	5
b. Temporary Outdoor Tanks Holding Radioactive Liquid	1/Tank	When tanks are in use	5
6. Discharge Canal Flow System (Daily determination and following changes in flow)	NA	At all times	

Table 2.2 Radioactive Liquid Effluent Monitoring Instrumentation

Table Notations

ACTION 1 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases may continue for up to 14 days provided that prior to each release:

a. At least two independent samples are analyzed in accordance with Specification 2.2.1, and

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge line valving.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 2 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided grab samples are analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least 10^{-7} μCi/gram:

1. At least once per 12 hours when the specific activity of the secondary coolant is ≥0.01 μCi/gram DOSE EQUIVALENT I-131, or
2. At least once per 24 hours when the specific activity of the secondary coolant is <0.01 μCi/gram DOSE EQUIVALENT I-131.

ACTION 3 With the numbers of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided that, at least once per 12 hours, grab samples are collected and saved for weekly composition and analysis in accordance with Table 2.1.

ACTION 4 With the number of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours during actual releases. Pump curves may be used to estimate flow.

ACTION 5 With the number of channels Operable less than required by the Minimum Channels Operable requirement, liquid additions to the tank may continue for up to 30 days provided the tank liquid level is estimated during all liquid additions.

ACTION 6 With the numbers of channels Operable less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue for up to 30 days provided that, at least once per 12 hours, grab samples are collected and analyzed for gamma emitters.


PRZR RELIEF VLV
CV-31231 (1PCV431C)
CLOSE AUTO OPEN
PRZR RELIEF VLV
CV-31232 (1PCV430)
CLOSE AUTO OPEN
PRZR PORV AND
SAFETY FLOW
PUSH TO RESET
1XL443 1117BKR10
49
PRZR RELIEF ISOL
MV-32195 (1-8000A)
CLOSE OPEN
46263 1LA1-B3
49
PRZR RELIEF ISOL
MV-32196 (1-8000B)
CLOSE OPEN
PRZR RELIEF TNK
NITROGEN SPLY ISOL
CV-31221 (1-8028)
CLOSE AUTO OPEN
46269

SAFETY INJECTION

	A	B	C	D	E
1	8816A RH TO SI OPEN	8816B RH TO SI OPEN	8807A SI SUCT CLOSED	8807B SI SUCT CLOSED	
2	11 SI PUMP NOT READY	12 SI PUMP NOT READY		8800A ACC DISCH CLOSED	8800B ACC DISCH CLOSED
3	8806A LP ISOL CLOSED	8806B RV ISOL CLOSED	8801A LP A CLOSED	8801B LP B CLOSED	
4	8826A SI RECIRC CLOSED	8826B SI RECIRC CLOSED	8802A SI TO RV OPEN	8802B SI TO RV OPEN	
5	8804A SUMP/RH OPEN	8805A SUMP/RH OPEN	8810A RWST/RH CLOSED	8808A RWST TO SI CLOSED	8808B RWST TO SI CLOSED
6	8804A SUMP/RH OPEN	8805B SUMP/RH OPEN	8810B RWST/RH CLOSED	11 RHR PUMP NOT READY	12 RHR PUMP NOT READY
7	HCV-624 RH HX OUT CLOSED	HCV-625 RH HX OUT CLOSED	FCV-626 RH HX BP OPEN	D1 NOT READY	D2 NOT READY
8	11 AFW PUMP NOT READY	12 AFW PUMP NOT READY	11 AFW SUCT VLVS CLOSED	12 AFW SUCT VLVS CLOSED	12 CL PUMP NOT READY
9	11 AFW DSCH VLV CLOSED	12 AFW DSCH VLV CLOSED	11 CC PUMP NOT READY	12 CC PUMP NOT READY	22 CL PUMP NOT READY
10	11 CS PUMP NOT READY	12 CS PUMP NOT READY	11 AFW STM SPLY CLOSED	11 SHIELD BLDG VENT NOT READY	12 SHIELD BLDG VENT NOT READY
11	121 AX BD SPEC VENT NOT READY	122 AX BD SPEC VENT NOT READY	CL X-OVER RET VLV A OPEN	11 AX BD CL RET CLOSED	CL DUMP VLV OPEN
12	11 H2 CONT VENT VLVS OPEN	12 H2 CONT VENT VLVS OPEN	11 H2 CONT SPLY VLVS OPEN	12 H2 CONT SPLY VLVS OPEN	

SI NOT READY

44102

	A	B	C	D	E
1	11 SI PUMP RUNNING	12 SI PUMP RUNNING			
2	D1 RUNNING	D2 RUNNING	11 AFW PUMP RUNNING	12 AFW PUMP RUNNING	
3	11 RHR PUMP RUNNING	12 RHR PUMP RUNNING	RH TO RV 8803A OPEN	RH TO RV 8803B OPEN	
4	AFW TO 11 SG ISOL V.V OPEN	AFW TO 12 SG ISOL V.V OPEN	11 CC PUMP RUNNING	12 CC PUMP RUNNING	12 CL PUMP RUNNING
5	11 CNTNMT FAN COIL RUNNING	12 CNTNMT FAN COIL RUNNING	13 CNTNMT FAN COIL RUNNING	14 CNTNMT FAN COIL RUNNING	22 CLG PUMP RUNNING
6	121 CL HDR VLV C CLOSED	121 CL HDR VLV D CLOSED	11/13 FOU CL WTR ORF B-P OPEN	12/14 FOU CL WTR ORF B-P OPEN	
7	CL X OVER VLV A CLOSED	CL X OVER VLV B CLOSED			
8	11 CNTNMT SPRAY SYS RUNNING	12 CNTNMT SPRAY SYS RUNNING	CA TO CS 31941 OPEN	CA TO CS 31938 OPEN	
9	CLG WTR TO 11 CC HX OPEN	CLG WTR TO 12 CC HX OPEN	11 CC DSCH VLV CLOSED	12 CC DSCH VLV CLOSED	
10	121 AX BD SPEC VENT RUNNING	122 AX BD SPEC VENT RUNNING			
11	11 SHIELD BLDG VENT RUNNING	12 SHIEL BLDG VENT RUNNING			
12			NOT USED		NOT USED

SI ACTIVE

44103

NOTE: HIGHLIGHTED INDICATORS ARE LIT.

WASTE DISP CNTMT ISOL

	A	B	C	D	E
1	PRT TO GA 8025 CLOSED	PRT TO GA 8026 CLOSED	N2 TO PRT 8028 CLOSED	RM TO CNTMT 1-8029 CLOSED	
2	LTDN ORIF 8140A CLOSED	LTDN ORIF 8140B CLOSED	LTDN ORIF 8141 CLOSED	LTDN ISOL 8147 CLOSED	
3	EX LTDN 8100A CLOSED	EX LTDN 8100B CLOSED			N2 TO ACC 8820 CLOSED
4	RCDT GA 9158A CLOSED	RCDT GA 9158B CLOSED	RCDT VENT 9160A CLOSED	RCDT VENT 9160B CLOSED	
5	RCDTP DIS 9170A CLOSED	RCDT DIS 9170B CLOSED	SMP A DIS 9182A CLOSED	SMP A DIS 9182B CLOSED	
6	1 REAC BD INSTR AIR CLOSED	11 SGB DR HDR VLV CLOSED	12SGB DR HDR VLV CLOSED	11 SGB ISOL VLV CLOSED	12 SGB ISOL VLV CLOSED
7	11 CONTMT VAC BKR CLOSED	12 CONTMT VAC BKR CLOSED	FW TO 11 SG ISOL V CLOSED	FW TO 12 SG ISOL V CLOSED	
8	11 PR STM SMPL/ISOL V CLOSED	11 PR LIQ SMPL/ISOL V CLOSED	11 RC HOT LEG/SMPL V CLOSED	11 SG SMPL/ISOL V CLOSED	12 SG SMPL/ISOL V CLOSED
9	CC TO EXC LTDN HX 1 V CLOSED		1 IN-SERV PRGE VLVS CLOSED		
10	1R11/1R12 SPLY VLS CLOSED	1R11/1R12 RET VLS CLOSED			
11	PERSONNEL OUTR AIR LK OPEN	PERSONNEL INER AIR LK OPEN	MAINT OUTR AIR LK OPEN	MAINT INER AIR LK OPEN	
12					
13					
14					
15	AFW TO11 SG ISOL V CLOSED	AFW TO 12 SG ISOL V CLOSED		SMP A DSCH AER SMP TK CLOSED	ANN DSCH 10 CNT SMP OPEN

CONTAINMENT ISOLATION WASTE DISPOSAL

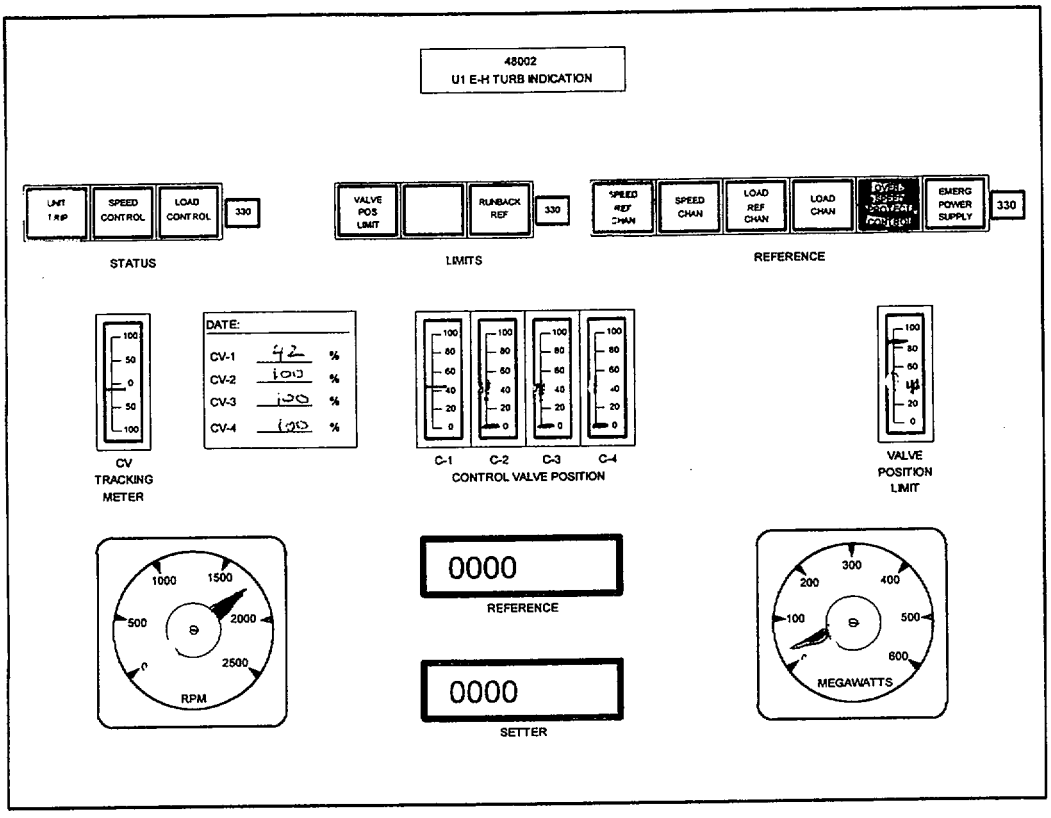
44104

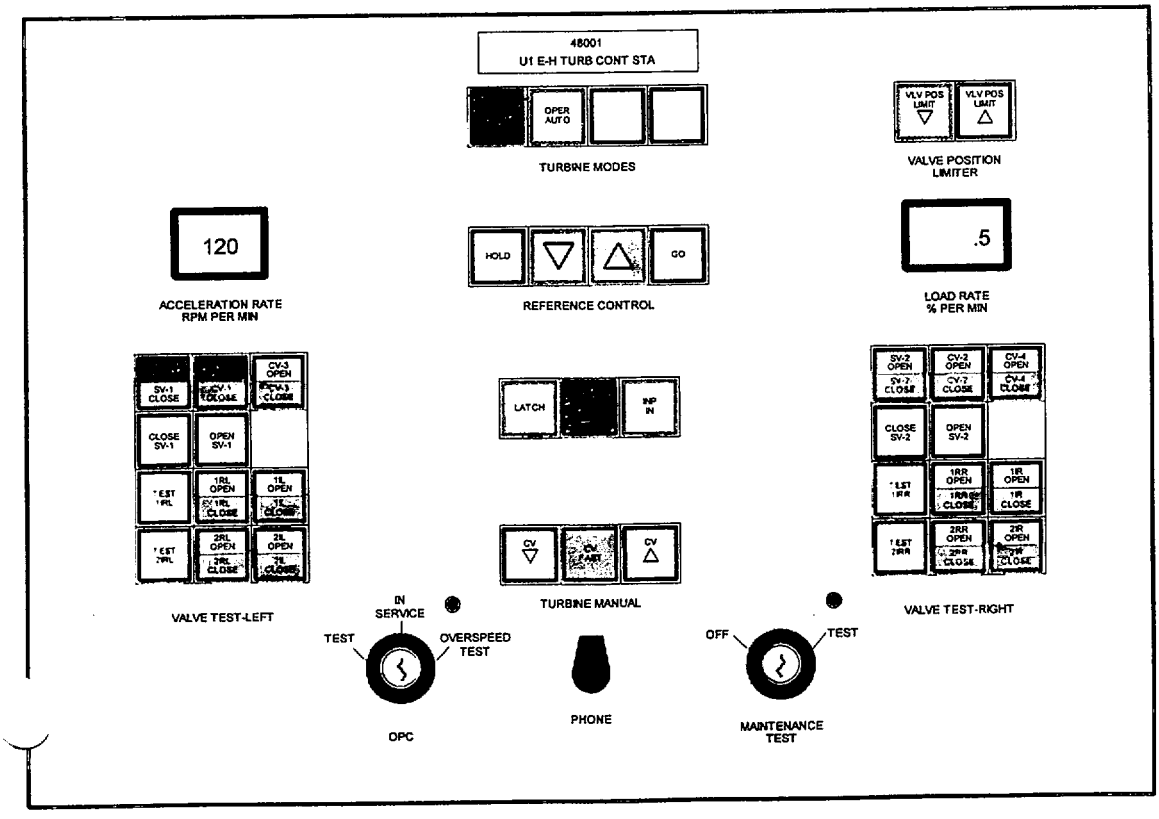
NOTE: HIGHLIGHTED INDICATORS ARE LIT.

PANEL OVERVIEW

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Safeguard Component Alignment:	
	a. "SI NOT READY" lights - NOT LIT	a. Manually or locally align components, as necessary. Note any exceptions:
	b. "SI ACTIVE" lights - LIT FOR PLANT CONDITIONS	b. Manually or locally align components, as necessary. Note any exceptions:
	c. "CONTAINMENT ISOLATION" lights - LIT FOR PLANT CONDITIONS	c. Manually or locally align components, as necessary. Refer to ATTACHMENT G for outside CTMT isolation valve locations. Note any exceptions:
	d. Category I doors - CLOSED	d. Locally close doors.
	e. Check Category I Special Vent Zone Report- NO OPENINGS REQUIRING CLOSURE WITHIN 6 MINUTES	e. Locally close openings.
	f. CLOSE MV-32115, 122 SFP HX INLT HDR MV B	
	g. Check Loop A and Loop B Cooling Water Pressures, - GREATER THAN 65 PSIG	g. Restore cooling water pressure per C35 AOP1, LOSS OF PUMPING CAPACITY OR SUPPLY HEADER WITH SI.

QUESTION #9





NOTE: HIGHLIGHTED/COLORED IN LIGHTS ON, WHITE BACKGROUND LIGHTS OFF

Attachment A Record of Failed 12 Battery Charger Indications

On 12 Battery Charger:

Output DC Voltmeter:	0	Volts DC
Output DC Ammeter:	0	Amps DC
"AC ON" Amber light:	ON	(ON or OFF)
"LO-VOLTAGE" Red light:	ON	(ON or OFF)
"HI-VOLTAGE" Red light:	OFF	(ON or OFF)
"NCAR" Red light:	ON	(ON or OFF)
AC Input Circuit Breaker:	ON	(ON, Tripped, OFF)
DC Output Circuit Breaker:	ON	(ON, Tripped, OFF)

On MCC 1AC2:

Cell A6, "12 Battery Charger:"	ON	(ON, Tripped, OFF)

Inside 12 Battery Charger DC Transfer Switch:

12 Battery Charger Isolation Breaker:	ON	(ON, Tripped, OFF)
Portable Battery Charger Isolation Breaker:	OFF	(ON, Tripped, OFF)

On DC Panel 22:

12 Battery Ammeter:	0	Amps DC (Charge or Discharge)
12 DC Panel Voltmeter:	0	Volts DC

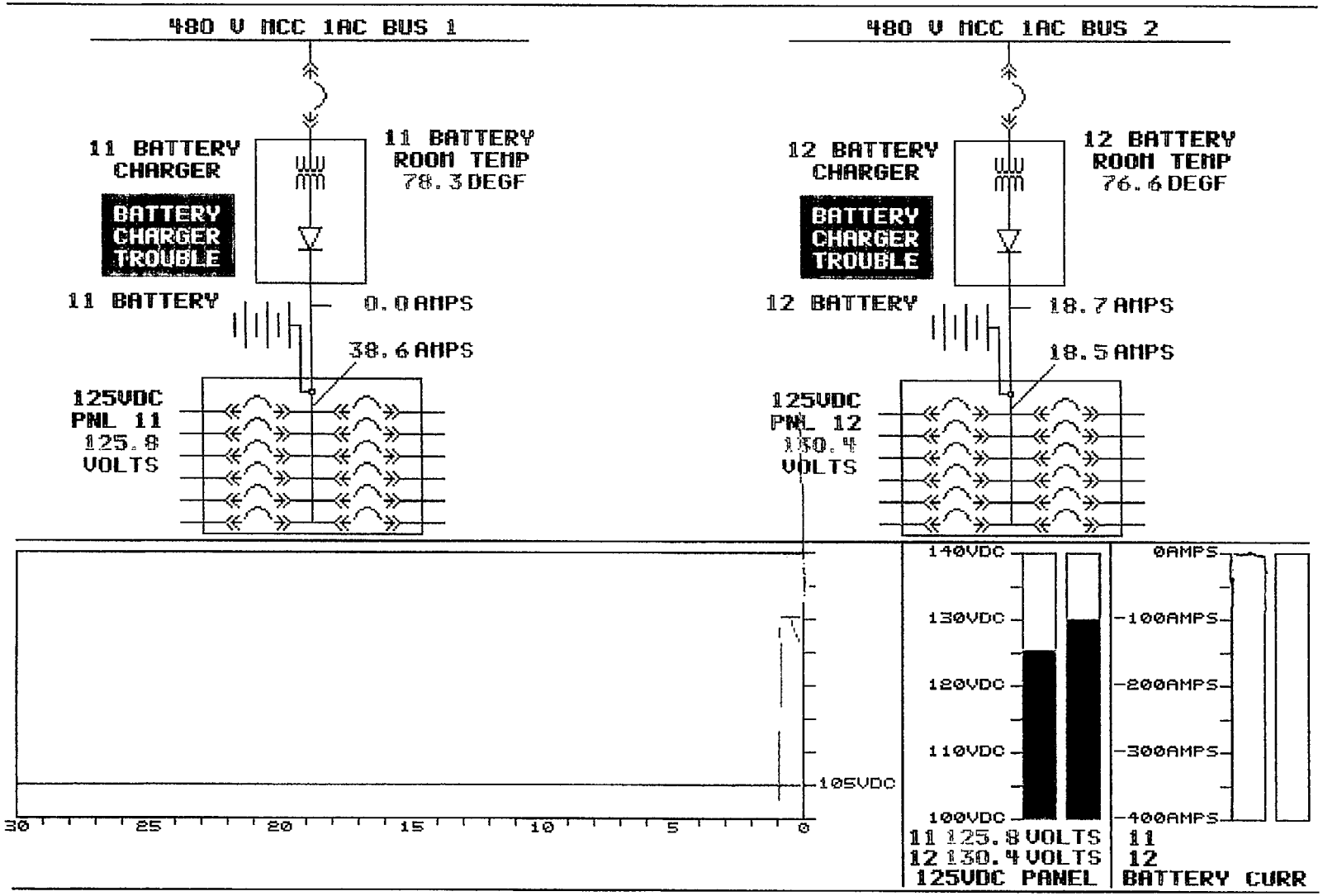
On ERCS Display DC1:

12 DC Panel Voltage:	0	Volts DC
12 Battery Amps:	0	Amps DC (Charge or Discharge)
12 Battery Charger Amps:	0	Amps DC

SELECT FUNC. KEY OR TURN-ON CODE

DEC 08, 2003
15:09:03

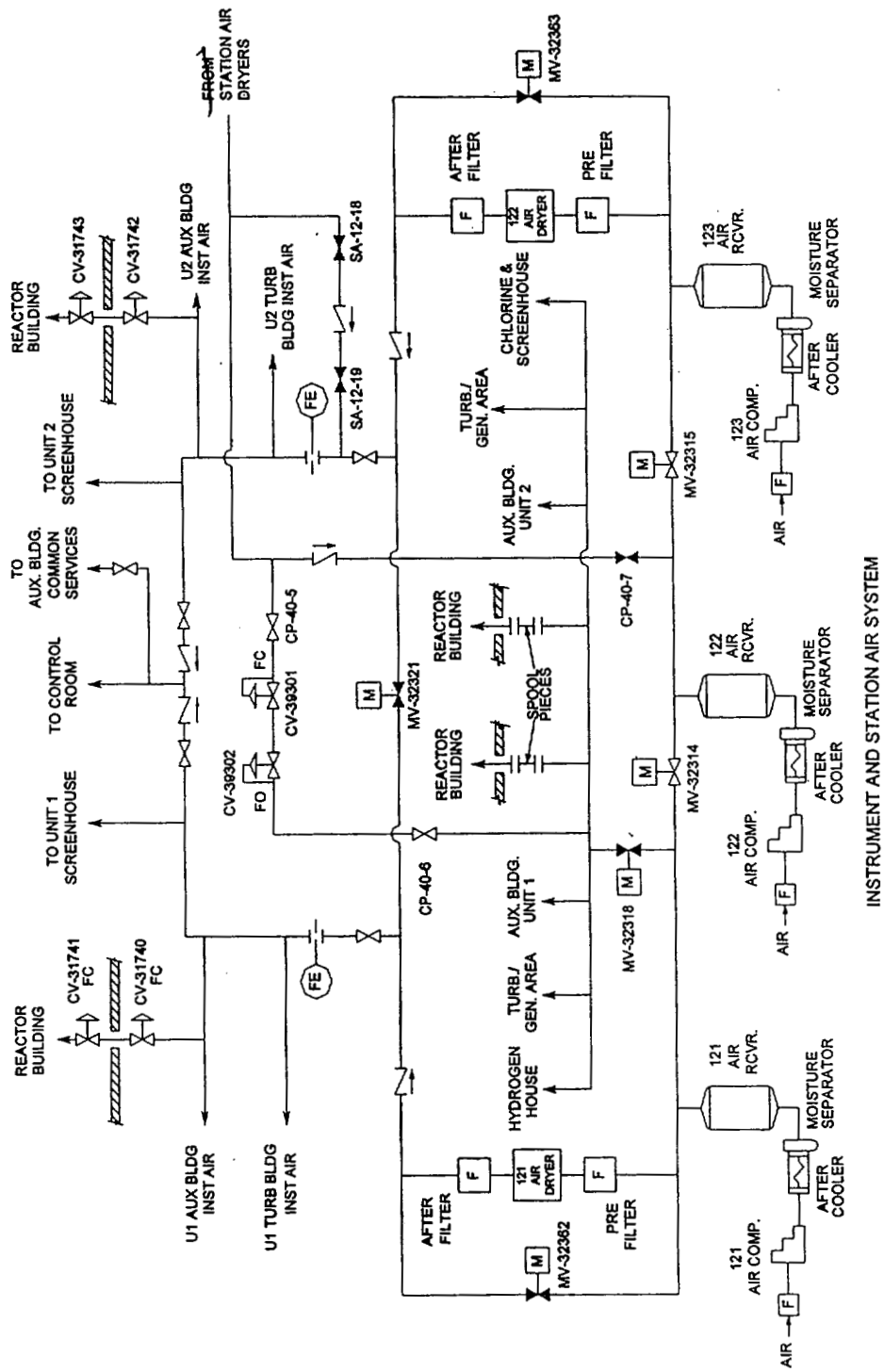
DC1 - BATTERY MONITORING DISPLAY PAGE 1 OF 1

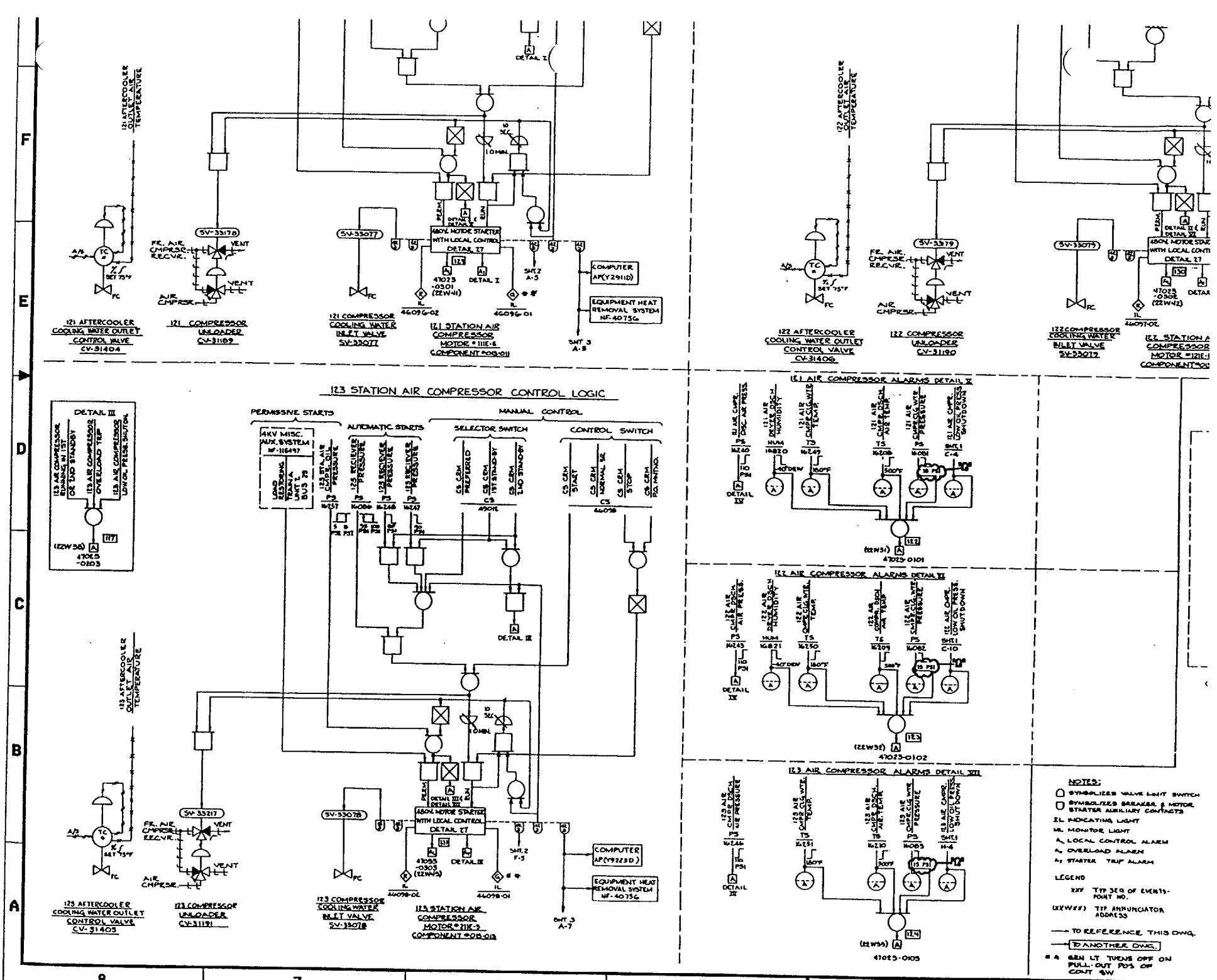


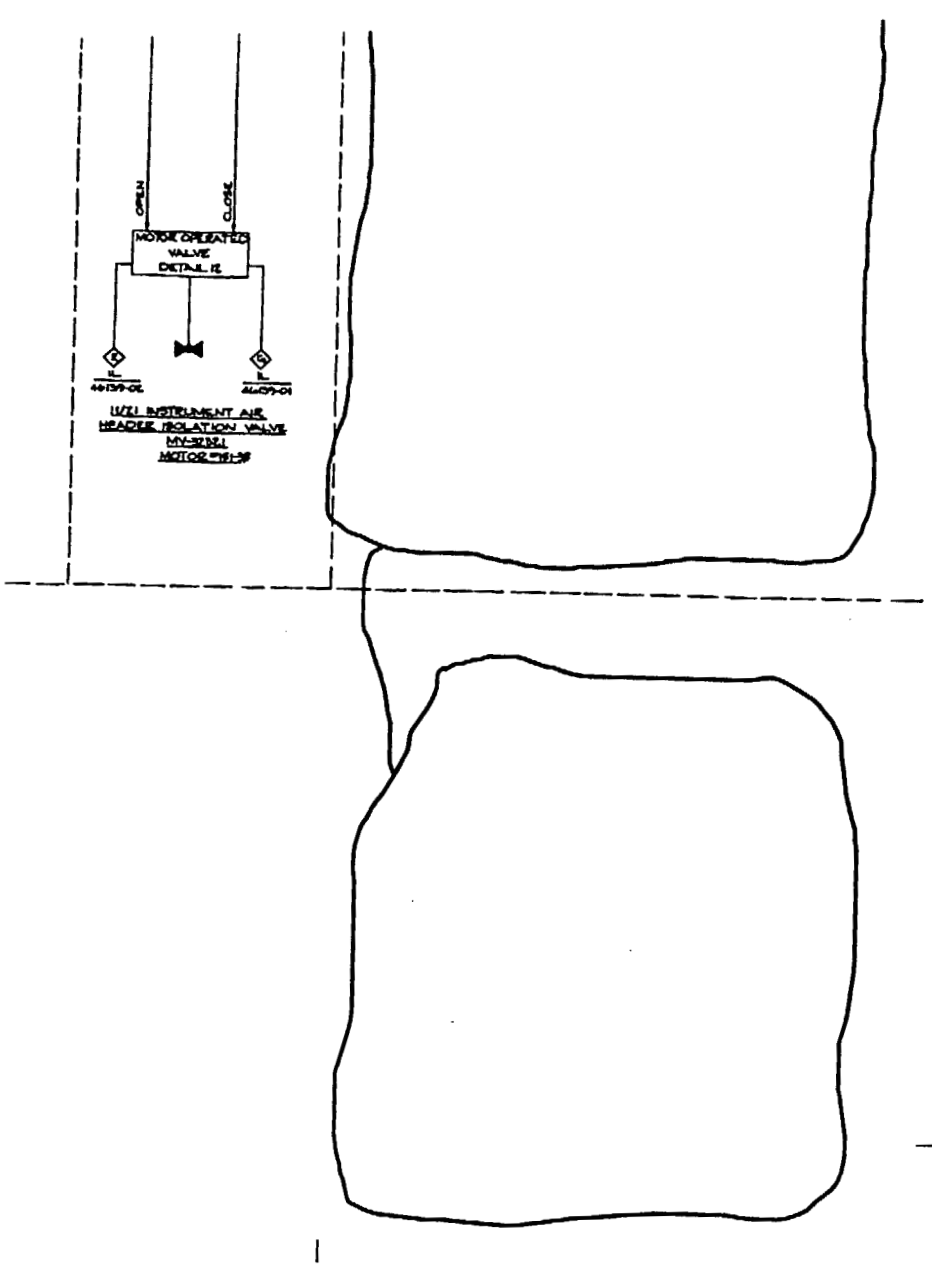
F1= F2= F3= F4= F5= F6=

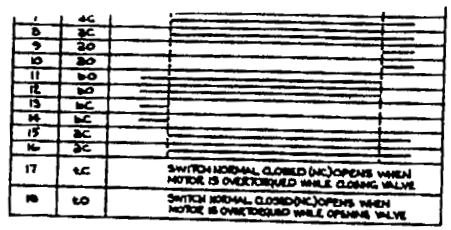
KBD= NORMAL ANODE= FULL POWER S1-A*

FIGURE B34-1 - INSTRUMENT AND STATION AIR SYSTEM

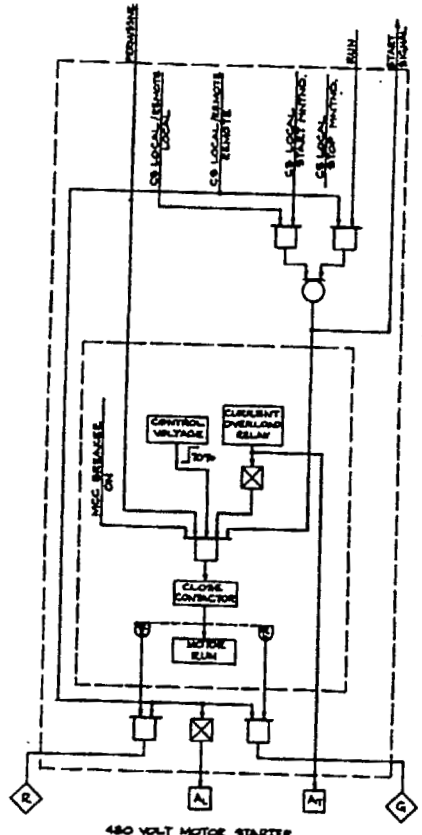



123 STATION AIR COMPRESSOR CONTROL LOGIC
PERMISSIVE STARTS
AUTOMATIC STARTS
MANUAL CONTROL
SELECTOR SWITCH
CONTROL SWITCH
4KV MISC. AUX. SYSTEM NF-116497
LOAD RESTORING TRAIN A UNIT 2 BUS 29
123 AIR COMPRESSOR RUNNING IN TEST OR LAG STANDBY
123 AIR COMPRESSOR OVERLOAD TRIP
123 AIR COMPRESSOR LOW OIL PRESS. SHUTDOWN
123 AFTERCOOLER OUTLET AIR PRESSURE
123 RECEIVER PRESSURE
CS CRM PREFERRED
CS CRM 1ST STAND-BY
CS CRM 2ND STAND-BY
CS CRM START
CS CRM NORMAL S/C
CS CRM STOP
CS CRM P.G. MAINTAIN
DETAIL III
123 AFTERCOOLER OUTLET AIR TEMPERATURE
480V MOTOR STARTER WITH LOCAL CONTROL DETAIL ZT
SV-33217
SV-33078
123 AFTERCOOLER COOLING WATER OUTLET CONTROL VALVE CV-31405
123 COMPRESSOR UNLOADER CV-31191
123 COMPRESSOR COOLING WATER INLET VALVE SV-33078
123 STATION AIR COMPRESSOR MOTOR #21K-3 COMPONENT #08-013
COMPUTER AP(Y9223D)
EQUIPMENT HEAT REMOVAL SYSTEM NF-40756
121 AIR COMPRESSOR ALARMS DETAIL XI
122 AIR COMPRESSOR ALARMS DETAIL XII
123 AIR COMPRESSOR ALARMS DETAIL XIII
NOTES:
SYMBOLIZES VALVE LIMIT SWITCH
SYMBOLIZES BREAKER & MOTOR STARTER AUXILIARY CONTACTS
IL INDICATING LIGHT
ML MONITOR LIGHT
AL LOCAL CONTROL ALARM
AO OVERLOAD ALARM
AT STARTER TRIP ALARM
LEGEND
XXY TYP SEQ OF EVENTS-POINT NO.
(XXWYY) TYP ANNUNCIATOR ADDRESS
TO REFERENCE THIS DWG.
TO ANOTHER DWG.
A 480 LT TURNS OFF ON FULL-OUT POS OF CONT SW
NF-40313-1





17	LC	SWITCH NORMAL CLOSED (NC) OPENS WHEN MOTOR IS OVERTORQUED WHILE CLOSING VALVE
18	LO	SWITCH NORMAL CLOSED (NC) OPENS WHEN MOTOR IS OVERTORQUED WHILE OPENING VALVE



480 VOLT MOTOR STARTER WITH LOCAL CONTROL DETAIL 'L'

NOTES
1. FOR *121 AND *122 AIR DRYER CONTROL LOGIC SEE NF-48313-4 & NF-48313-5.
2. SEE SHT. 1 FOR NOTES AND ADDL. DETAILS.

INTERLOCK LOGIC DIAGRAM
STATION AIR UNIT 1 & 2

NF-48313-2

5 6 7 8 9 10 11 12

C D E F H

FIGURE B18C-6 - TRAIN A SAFETY INJECTION ACTUATION CIRCUITRY

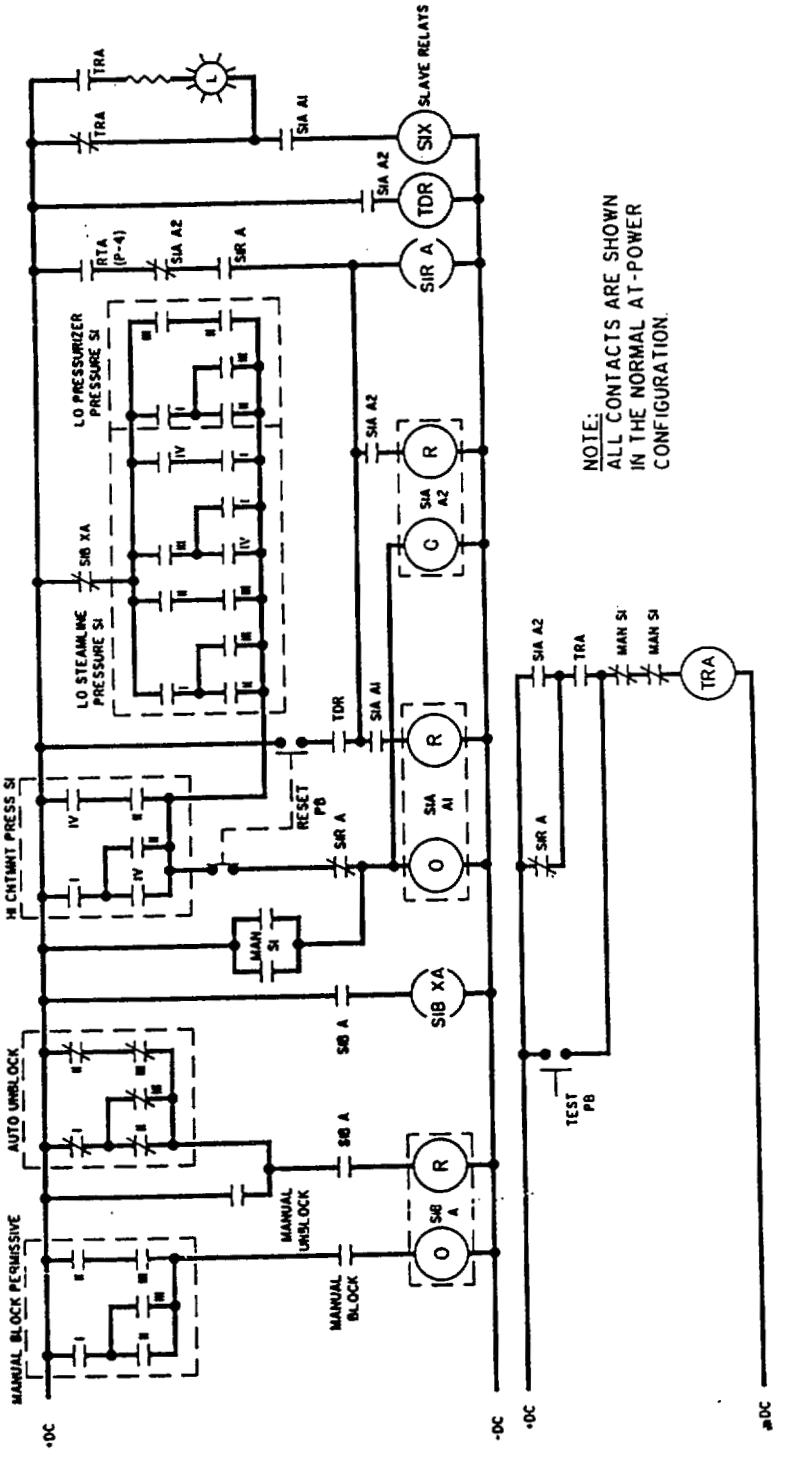
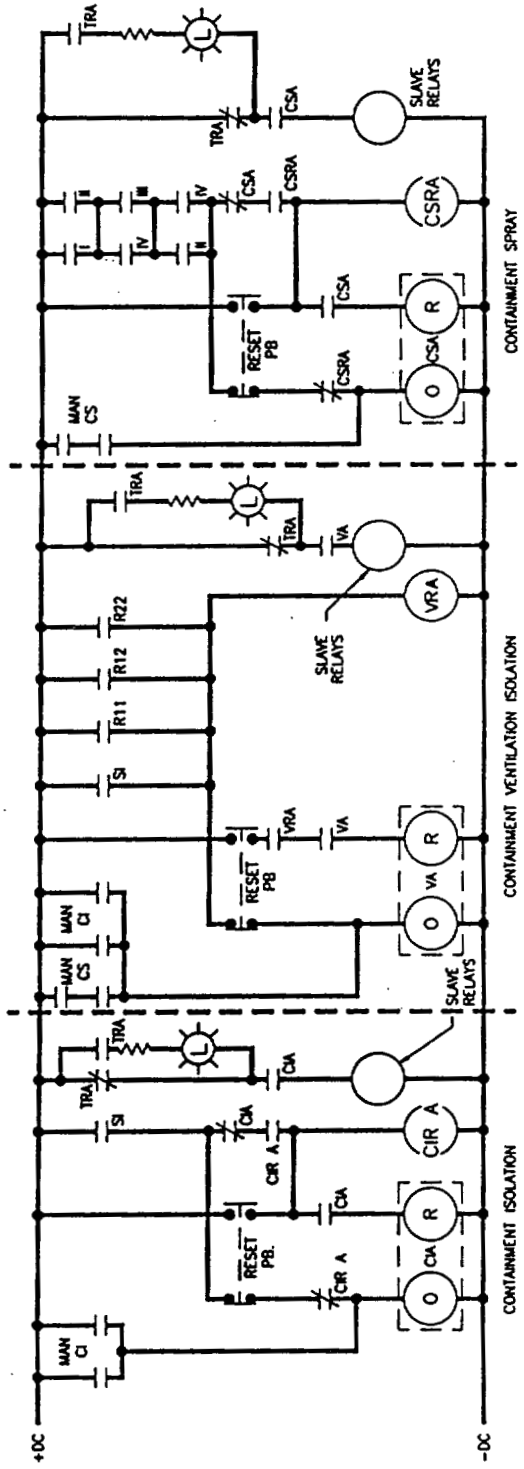
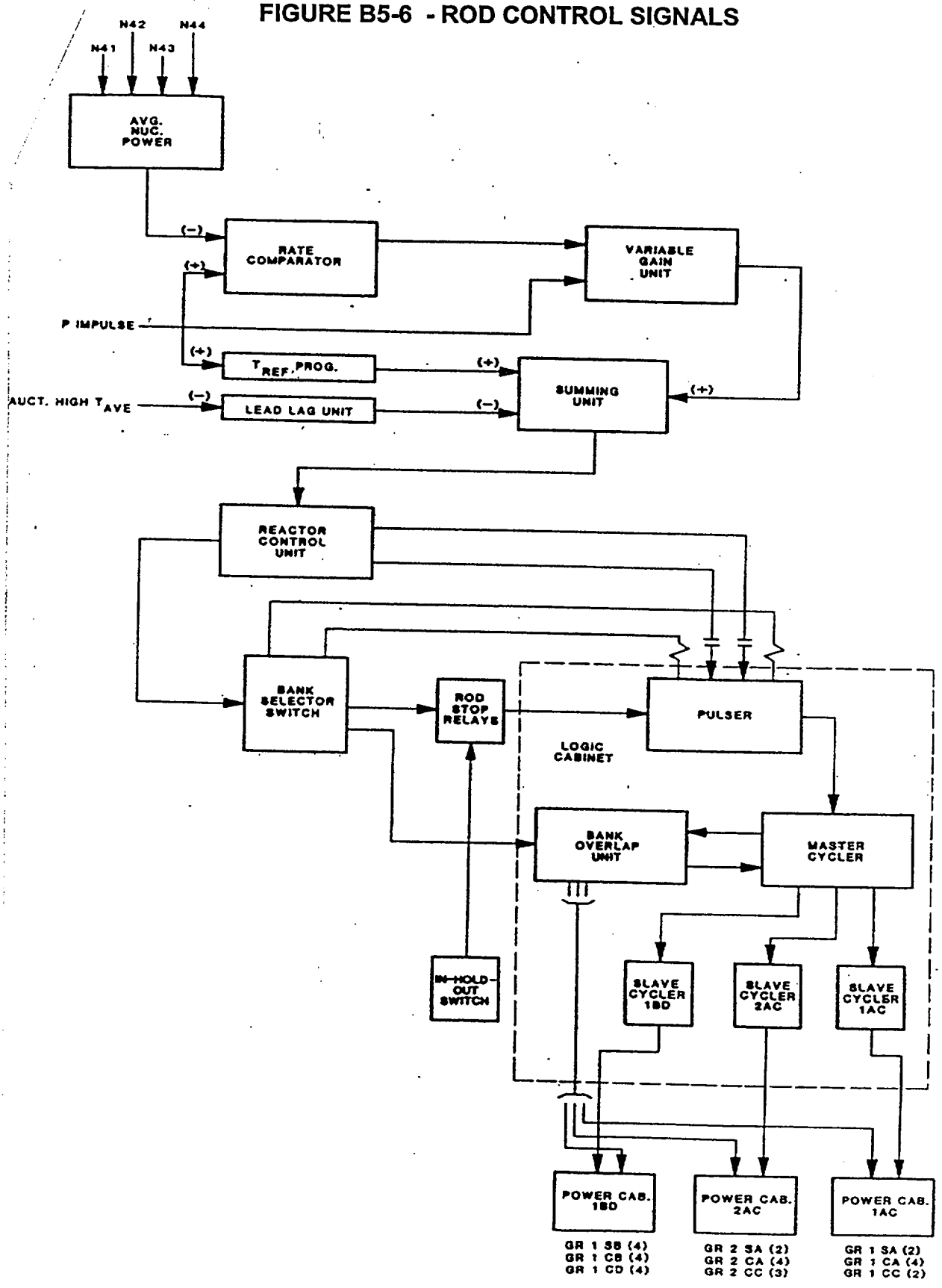


FIGURE B18C-7 - TRAIN A C1 SIGNAL, 'P' SIGNAL AND VENT ISOLATION



NOTE:
ALL CONTACTS ARE SHOWN IN THE NORMAL AT-POWER CONFIGURATION.

FIGURE B5-6 - ROD CONTROL SIGNALS



Appendix B Turbine Loading Calculation

1. Determine the time to accelerate to synch from Figure C1-2A:

   time = _____ minutes

2. Calculate the maximum recommended acceleration rate:

   1800rpm/_____ minutes = _____rpm/min

♥ 3. Determine the recommended time to hold at approximately 15% reactor power from Figure C1-2A:

   Hold for _____minutes

4. Determine the time to increase load to 100% from Figure C1-2A:

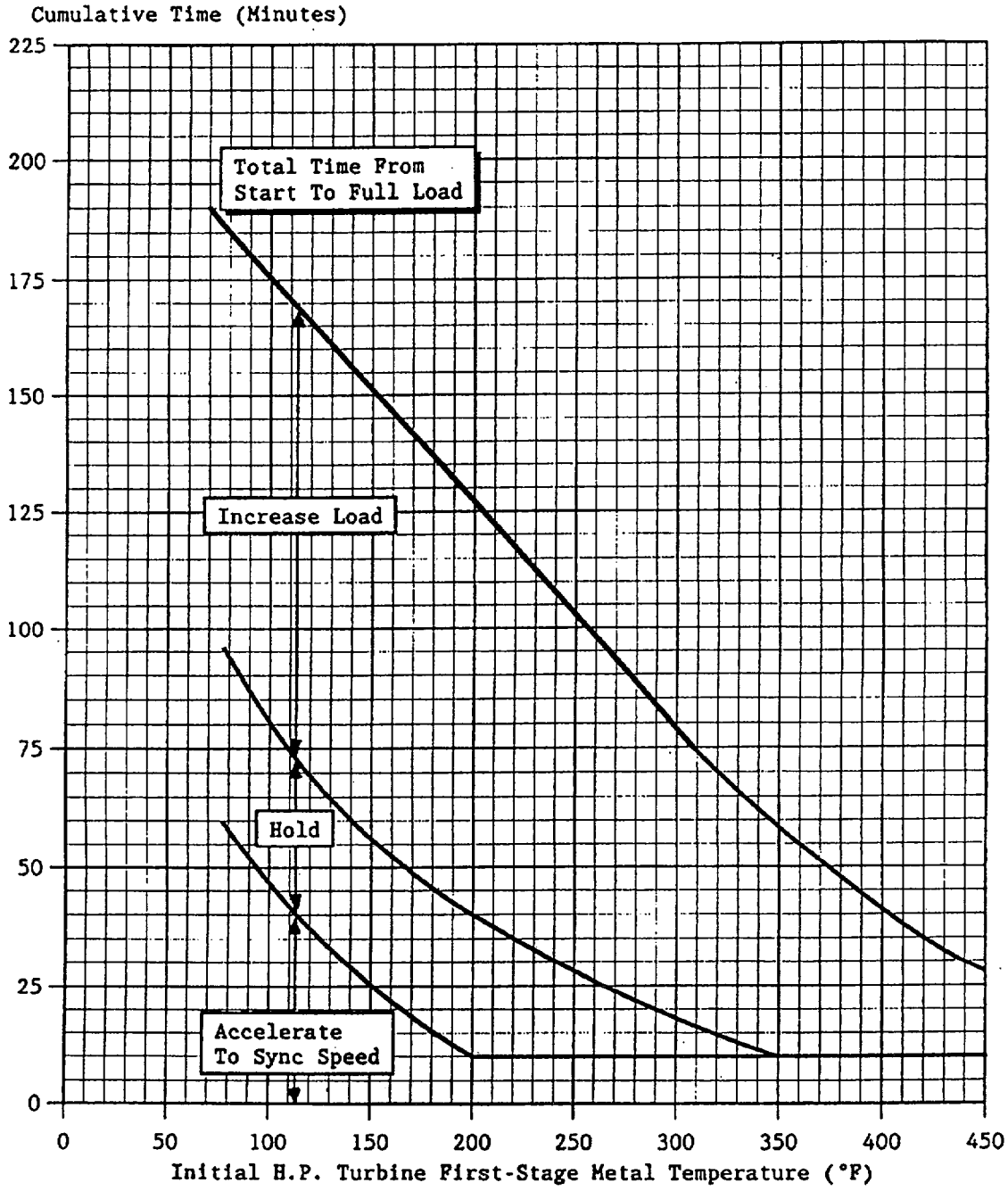
   load increase in _____ minutes

5. Determine the maximum recommended loading rate:

   85%/ _____ minutes = _____%/min

♥ Westinghouse recommends 5% load, but due to thermal stresses on the SG nozzles, the soak occurs at approximately 15% reactor power (**see** Precaution 3.7).

C Section	TITLE: RECOMMENDED STARTUP AND LOADING TIMES	NUMBER: FIG C1-2A
		REV: 2
		Page 1 of 1



O.C. REVIEW DATE: NR	REVIEWED BY: M E Hall	DATE: 5-6-98
	APPROVED BY: TC Hall	DATE: 5/6/98

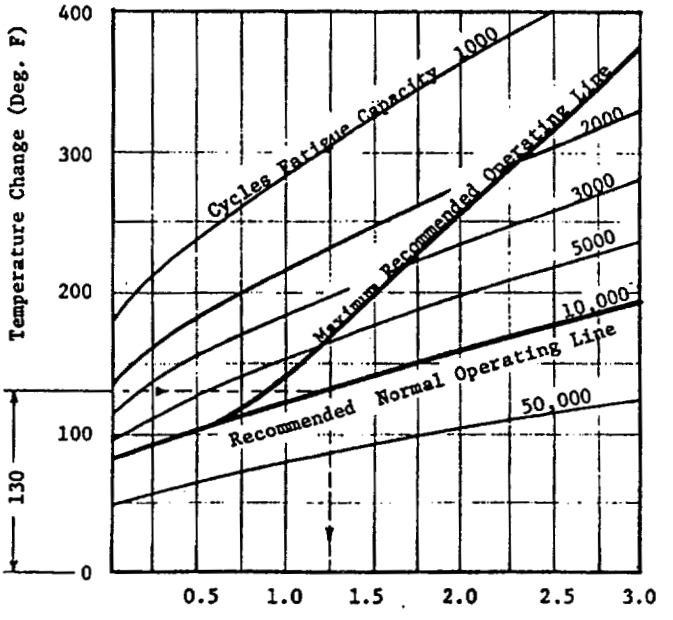
C Section

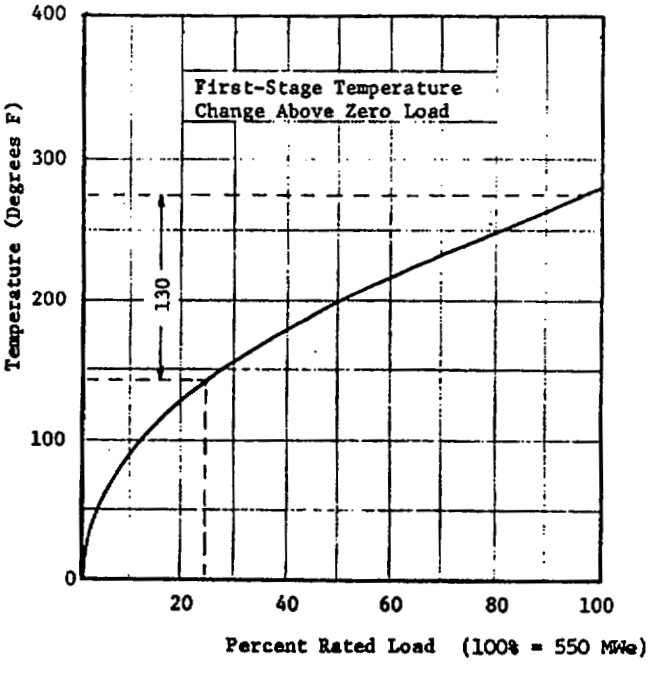
TITLE

LOAD CHANGING RECOMMENDATIONS

NUMBER: FIG C1-2B

REV: 2





O.C. REVIEW DATE: NR	REVIEWED BY: M. E. Hall	DATE: 5-6-98
	APPROVED BY: T C Kelly	DATE: 5-6-98