FOR INFORMATION ONLY

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

FOR INFORMATION ONLY

NUCLEAR OPERATIONS

COPY NO. 1

GENERAL TEST PROCEDURE

GTP-301

INSERVICE TESTING OF PUMPS
SECOND TEN YEAR INTERVAL

REVISION 6

SAFETY RELATED

Gerald O Lorjan Jr. 12/29/93
DISCIPLINE SUPERVISOR DATE

Gerald O Lorjan Jr. 12/30/93
APPROVAL AUTHORITY DATE

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE
A	P	2-9-94					
B	P	3-24-94					

INFORMATION USE

Procedure May Be Performed from Memory.
User Retains Accountability for Proper Performance.

PROCEDURE DEVELOPMENT FORM - A

I. DATE: 2-23-94 PROC. # STP-301 REV. # 6 CHG. 8 COMM. # _____

TITLE: INSERVICE TESTING OF PUMPS SECOND TEN YEAR INTERVAL

NEW PROC ___ CHANGE X PERMANENT X SAFETY RELATED X

REVISION ___ RESTRICTED ___ FROM _____ TO _____ QUALITY RELATED ___

NON-SAFETY RELATED ___

II. DESCRIPTION: ① Pgs 7+8, corrected text alignment. ② Pg 9, added step 5.4.5 for the EFW Pumps ③ Exclosure 7.1 pg 2 of 3, added STP-220.008 for XPP0021A, XPP0021B and XPP0008. ④ Attachment I, changed TEST COORDINATOR to TEST SUPERVISOR.

REASON FOR CHANGE:
① Correct Typing ② To document the requirement to perform SUBSTANTIAL FLOW TESTING of the EFW Pumps per Generic Letter 89-04. ③ To document the additional pump test procedure (Refueling Interval). ④ To address change in Responsibilities within the Test Unit.

Affected pages: TOC, Text Pgs 1-12, Exclosure 7.1 pg 2 of 3, Attachment I.

Robert B McGowen
Originator

III. WILL THIS REVISION/CHANGE/NEW PROCEDURE:

	* YES	NO	N/A
1. Result in significant increased personnel radiation exposure? (ALARA review)	___	✓	
2. Result in a release of effluents to the Environment?	___	✓	
3. Degrade the effectiveness of the Radiation Emergency Plan?	___	✓	
4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans?	___	✓	___
	___	✓	___

* If any question 1 through 4 is answered "YES", refer to appropriate section of procedure for direction.

REQUIRED REVIEW AND COMMENT:

☒ OPS	☒ NL&OE	( ) CHS	( ) GMNPO	( ) _____	
☒ MNTS	( ) PRS	( ) HPS	( ) GMES	( ) _____	
☒ QA	( ) NPS	( ) MNT	( ) GMNSF	( ) _____	
☒ QC	( ) TS	( ) GMSS	☒ QR (D. Stone)	( ) _____	

Discipline Supervisor 3/3/94 Date

IV. 10CFR50.59 SCREENING REVIEW/SAFETY EVALUATION

☒ REQUIRED ☐ EXEMPT ☐ PSRC SUPPORTING DOCUMENT: _____

Discipline Supervisor concurrence 3/28/94

V. TEMPORARY APPROVAL:

QUALIFIED REVIEWER _____ DATE _____

TELECON BY _____

SHIFT SUPERVISOR _____ DATE _____

QA REVIEW _____ DATE _____

TELECON BY _____

FINAL APPROVAL REQUIRED BY: DATE _____

VI. DISCIPLINE SUPERVISOR FINAL REVIEW:

TRAINING REQUIRED? YES ___ NO ✓

IF YES, PRIOR TO PROCEDURE IMPLEMENTATION? YES ___ NO ___

P/CAP AFFECTED? YES ___ NO ✓

COMMENTS RESOLVED: Discipline Supervisor 3/28/94 Date

VII. P/CAP ACCEPTABLE?

C YES ___ NO ___ _____ / _____
NL&OE Date

N YES ___ NO ___ _____ / _____
RESP. MGR. Date

VIII. FINAL QA REVIEW (As Applicable)

Wm U Pearson 3-29-94
QA Concurrence Date

IX. APPROVAL AUTHORITY:

Approval/Concurrence 3/28/94 Date

X. PSRC REVIEW:

A. REVIEWED BY:

_____ / _____
PSRC Chairman Date

COMMENTS: YES ___ NO ___

B. PSRC COMMENTS RESOLVED:

_____ / _____
Responsible Manager Date

_____ / _____
PSRC Chairman Date

NUCLEAR OPERATIONS

COPY NO. _____

PROCEDURE DEVELOPMENT FORM - A

I. DATE: 1-25-94 PROC # GTP-301 REV # 6 CHG A COMM. # _____

TITLE: INSERVICE TESTING of PUMPS SECOND TEN YEAR INTERVAL

NEW PROC ___ CHANGE ✓ PERMANENT ✓ SAFETY RELATED ✓

REVISION ___ RESTRICTED ___ FROM _____ TO _____ QUALITY RELATED ___

NON-SAFETY RELATED ___

II. DESCRIPTION: REVISED ENCLOSURE 7.5, PAGE 3 of 3, IST PUMP TEST RELIEF REQUEST B.1, REVISION 0, AS FOLLOWS: CHANGED "CLASS" for ALL IST PUMPS FROM "3" to "2 AND 3".

REASON FOR CHANGE:

ALL IST Pumps are either classified as ASME Code Class 2 or 3, AS STATED in Enclosure 7.6.

Robert B. McGowen
Originator

III. WILL THIS REVISION/CHANGE/NEW PROCEDURE:

	* YES	NO	N/A
1. Result in significant increased personnel radiation exposure? (ALARA review)	___	✓	
2. Result in a release of effluents to the Environment?	___	✓	
3. Degrade the effectiveness of the Radiation Emergency Plan?	___	✓	___
4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans?	___	✓	___

* If any question 1 through 4 is answered "YES", refer to appropriate section of procedure for direction.

REQUIRED REVIEW AND COMMENT:

(✓) OPS (✓) NL&OE ( ) CHS ( ) GMNPO ( ) _____
( ) MNTS ( ) PRS ( ) HPS ( ) GMES ( ) _____
( ) QA ( ) NPS ( ) MNT ( ) GMNSF ( ) _____
(✓) QC ( ) TS ( ) GMSS (✓) QR Emergency ( ) _____

Discipline Supervisor 1/25/94 Date

IV. 10CFR50.59 SCREENING REVIEW/SAFETY EVALUATION

☒ REQUIRED ☐ EXEMPT ☐ PSRC SUPPORTING DOCUMENT: _____

Discipline Supervisor concurrence 2/8/94

V. TEMPORARY APPROVAL:

QUALIFIED REVIEWER _____ DATE _____
TELECON BY _____
SHIFT SUPERVISOR _____ DATE _____

QA REVIEW _____ DATE _____
TELECON BY _____
FINAL APPROVAL REQUIRED BY: DATE _____

VI. DISCIPLINE SUPERVISOR FINAL REVIEW:

TRAINING REQUIRED? YES ___ NO ✓

IF YES, PRIOR TO PROCEDURE IMPLEMENTATION? YES ___ NO ___

P/CAP AFFECTED? YES ___ NO ✓

COMMENTS RESOLVED: Discipline Supervisor 2/8/94 Date

VII. P/CAP ACCEPTABLE?

C YES ___ NO ___ _____ NL&OE Date

N YES ___ NO ___ _____ RESP. MGR. Date

VIII. FINAL QA REVIEW (As Applicable) 2/9/94

QA Concurrence 2/9/94 Date

IX. APPROVAL AUTHORITY:

Approval/Concurrence 2/9/94 Date

X. PSRC REVIEW:

A. REVIEWED BY:

_____ PSRC Chairman Date

COMMENTS: YES ___ NO ___

B. PSRC COMMENTS RESOLVED:

_____ Responsible Manager Date

_____ PSRC Chairman Date

TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure defines the general rules and requirements for Inservice Testing of ASME Section XI Code Class pumps.

1.2 The requirements of this procedure may be applied partly or in whole to the testing of other plant pumps.

2.0 SCOPE

2.1 The pumps listed in Enclosure 7.1 are required to be tested in accordance with the conditions of this procedure.

2.2 This procedure applies to all plant personnel who perform Inservice Testing on ASME Sect XI Code Class pumps.

3.0 REFERENCES AND GLOSSARY

3.1 References

3.1.1 Virgil C. Summer Nuclear Station Technical Specifications

3.1.2 ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition

3.1.3 ASME/ANSI OM Part 6, 1987 Edition, 1988 Addenda, Inservice Testing of Pumps in Light-Water Reactor Power Plants

3.1.4 SAP-134, Control of Station Surveillance Test Activities

3.1.5 SAP-139, Procedure Development, Review, Approval and Control

3.1.6 SAP-145, Inservice Testing Second Ten Year Interval

3.1.7 GMP-103.003, Pump and Valve Trending

3.1.8 NRC Safety Evaluation Report for Inservice Testing Program for Pumps and Valves and Associated Reliefs for Virgil C. Summer Nuclear Station Unit No. 1, dated 10/18/91

3.1.9 NRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

3.1.10 GMP-100.022, Control of Process Instruments Used for Surveillance Testing

3.1.11 GTP-240, Generic Pump Performance Test

3.2 Glossary

3.2.1 ICP - Instrument Calibration Procedure

3.2.2 Instrument Accuracy - The allowable inaccuracy of an instrument loop based on the square root of the sum of the squares of the inaccuracies of each instrument or component in the loop.

3.2.3 Instrument Loop - Two or more instruments or components working together to provide a single output (e.g. a vibration probe and its associated signal conditioning and readout devices).

3.2.4 Inservice Test (IST) - A test to determine the operational readiness of a pump.

3.2.5 Operational Readiness - The capability of the pump to fulfill its intended function.

3.2.6 Pump - A mechanical device used to move liquid.

3.2.7 Reference Values - One or more values of test parameters measured or determined when the equipment is known to be operating acceptably.

3.2.9 Routine Servicing - The performance of planned preventive maintenance (e.g., changing oil, flushing the cooling system, adjusting packing, adding packing rings, or mechanical seal maintenance or replacement).

3.2.10 STP - Surveillance Test Procedure

3.2.11 System Resistance - The hydraulic resistance to flow in a system.

3.2.12 Symbols - The various symbols used in this procedure to define pump parameters are listed in Enclosure 7.3.

3.2.13 Test Parameters - Those pump parameters that are used in determining a pumps operational readiness in the performance of an Inservice Test. Test Parameters for each pump required to be tested are listed in Enclosure 7.2.

4.0 RESPONSIBILITIES

4.1 The Test Unit is responsible for the performance of ASME Section XI evaluations per Section 5.5 of this procedure and the initiation of corrective action for those pumps having unacceptable test results.

4.2 The Shift Supervisor or Shift Engineer may review, analyze and sign completed pump test data when qualified Test Unit personnel are not on-site.

4.3 Other responsibilities for implementation of this procedure are delineated in SAP-145, "Inservice Testing Second Ten Year Interval".

5.0 PROCEDURE

5.1 Testing Requirements

5.1.1 Attachment III of this procedure discusses the basis of all safety-related pumps either included in or excluded from the Inservice Test Program.

5.1.2 The performance of Inservice Testing shall be in addition to any other specified surveillance requirements.

5.1.3 The more restrictive requirements of the Technical Specifications take precedence over ASME Section XI Code requirements.

5.2 Reference Values

5.2.1 General Requirements

A. Reference values shall be at points of operation readily duplicated during subsequent tests.

B. All subsequent test results shall be compared to the initial reference values or to new reference values established in accordance with Steps 5.2.2 and/or 5.2.3.

C. Reference values shall only be established when the pump is known to be operating acceptably.

D. If the particular parameter being measured or determined can be significantly influenced by other related conditions, then these conditions shall be analyzed.

5.2.2 Effect of Pump Replacement, Repair, and Maintenance on Reference Values

A. When a reference value or set of reference values may have been affected by repair, replacement, or routine servicing of a pump, a new reference value or set of values shall be determined or the previous value reconfirmed by an Inservice Test run prior to declaring the pump operable.

B. Deviations between the previous and new set of reference values shall be identified, and verification that the new values represent acceptable pump operation shall be placed in the record of tests.

5.2.3 Establishing an Additional Set of Reference Values

A. If it is necessary or desirable, for some reason other than stated in Step 5.2.2, to establish an additional set of reference values, an Inservice Test shall first be run at the conditions of the existing set of reference values and the results analyzed.

B. If the Inservice Test discussed above is satisfactory, a second Inservice Test run at the new reference conditions shall be performed as soon as practical.

C. The results of the Inservice Test run at the new reference conditions shall establish the additional set of reference values.

D. Whenever an additional set of reference values is established, the reasons for doing so shall be justified and documented on Attachment I, "Pump Reference Value Change Justification". Additionally, the requirements of Step 5.2.1 apply.

5.3 Instrumentation

5.3.1 General Requirements

A. Accuracy - All instruments used for Inservice Tests may have nominal errors within the following limits:

1. Pressure - ± 2%

2. Differential Pressure - ± 2%

3. Flowrate - ± 2%

4. Speed - ± 2%

5. Vibration - ± 5%

6. The values listed above represent percent of full scale for full scale analog instruments, percent of total loop accuracy for a combination of instruments, or over the calibrated range for digital instruments.

B. Range - The following range requirements apply to instruments used for Inservice Testing:

1. The full-scale range of each analog instrument shall not exceed (3) three times the reference value.

2. Digital instruments shall be selected such that the reference value shall not exceed 70% of the calibrated range of the instrument.

3. Vibration instruments are excluded from range requirements.

C. Instrument Location - The following requirements apply to the location of instruments used for Inservice Testing:

1. The sensor location shall be established and documented in the plant records and shall be appropriate for the parameter being measured.

2. The same sensor location shall be used for subsequent tests.

3. Instruments that are position sensitive shall be either permanently mounted or provision shall be made to duplicate their position during each test.

D. Calibration - All instruments (together with their transmitters, if required), excluding flow orifices, used in measuring Inservice Test quantities shall be calibrated in accordance with the appropriate calibration STPs or ICPs.

E. Fluctuations - The following methods may be used to reduce instrument fluctuations:

1. Symmetrical damping devices or averaging techniques may be used to reduce instrument fluctuations.

2. Hydraulic instruments may be damped by using gauge snubbers or by throttling small valves in instrument lines.

F. Frequency Response Range - The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump shaft rotational speed to at least 1000 Hz.

5.3.2 Pressure Measurement

A. Gage Lines - If the presence or absence of liquid in a gage line could produce a difference of more than 0.25% in the indicated value of the measured pressure, means shall be provided to assure or determine the presence or absence of liquid as required for the static correction used.

B. Differential Pressure - The following methods may be used to determine differential pressure across a pump:

1. A differential pressure gauge.

2. A differential pressure transmitter that provides direct measurement of pressure difference.

3. The difference between the pressure at a point in the inlet pipe and the pressure at a point in the discharge pipe.

5.3.3 Rotational Speed Measurements - Rotational speed measurements of variable speed pumps shall be taken by a method which meets the requirements of Section 5.3.1.

5.3.4 Vibration Measurements

A. Centrifugal Pumps - Measurements shall be taken in a plane approximately perpendicular to the rotating shaft in two orthogonal directions on each accessible pump bearing housing. Measurements also shall be taken in the axial direction on each accessible pump thrust bearing housing.

B. Vertical Line Shaft Pumps - Measurements shall be taken on the upper motor bearing housing in three orthogonal directions, one of which is the axial direction.

C. Rotary Screw Pumps - The measurement shall be taken on the inboard bearing housing approximately perpendicular to the pump shaft.

D. If a portable vibration indicator is used, the reference points must be clearly identified on the pump to permit subsequent duplication in both location and plane.

5.3.5 Flow Rate Measurement

A. Flow rate shall be measured using a rate or quantity meter installed in the pump test circuit.

B. Where the meter does not indicate the flow rate directly, the test record shall include the method to reduce the data.

5.4 Test method

5.4.1 General Requirements

A. Generic Test Requirements

1. An Inservice Test shall be conducted with the pump operating at specified test reference conditions.

2. The Inservice Test Parameters listed in Enclosure 7.2 for each pump tested shall be determined and recorded.

3. The test shall be conducted as follows:

a. The pump shall be operated at nominal motor speed for constant speed drives and at a speed adjusted to the reference speed for variable speed drives.

b. The resistance of the system shall be varied until the flow rate equals the reference value. The pressure shall than determined and compared to its reference value.

c. Alternatively, the flow rate can be varied until the pressure equals the reference value and the flow rate shall be determined and compared to the reference flow rate value.

d. Where system resistance cannot be varied, flow rate and pressure shall be determined and compared to their respective reference values. Those reference values may be obtained from pump curves developed per Section 5.4.1.C.

e. The following parameters shall be determined and compared with corresponding reference values:

1) Pressure

2) Flow rate B

3) Vibration (displacement or velocity)

f. All deviations from the reference values shall be compared with the limits given in Enclosure 7.4 and corrective action taken as specified in Section 5.5.3.

g. Vibration measurements are to be broad band (unfiltered). If velocity measurements are used, they shall be peak. If displacement amplitudes are used, they shall be peak-to-peak.

B. The detailed steps necessary for the Inservice Testing of those pumps listed in Enclosure 7.1 are contained in separate Surveillance Test Procedures. Enclosure 7.1 lists the Surveillance Test Procedure that are applicable to each Code Class pump.

C. Development of Pump Curves

1. Curves will be developed, or manufacturers pump curves will be validated when the pumps are known to be operating acceptably.

2. The reference points used to develop or validate the curve will be measured using instruments meeting or exceeding the requirements of Section 5.3.

3. Curves will be based on an adequate number of points, with a minimum of three points within the expected operating range, which includes or is as close as practicable to design basis flow rates.

4. Acceptance criteria based on the curves should not conflict with Technical Specifications or Final Safety Analysis Report operability criteria for flow rate and differential pressure for the affected pump.

5. Vibration levels shall be validated on at least three points within the expected operating range. If vibration levels vary significantly over the range of pump conditions, a method for assigning appropriate vibration acceptance criteria shall be developed for those regions of the pump curve. This may include the establishment of additional points where variation in vibration exists. B

6. When the reference pump curve may have been affected by repair, replacement, or routine servicing, a new reference pump curve shall be developed or the previous curve validated by an Inservice Test prior to declaring the pump operable.

5.4.2 Frequency of Inservice Tests

A. Normally - All quantities specified in the applicable Surveillance Test Procedure for each pump shall be measured or observed and recorded every 92 days during normal plant operation unless a more restrictive frequency is specified by Technical Specifications.

B. Plant Shutdown - The following requirements apply to pump testing frequency when the plant is shutdown:

1. Quarterly test frequency shall be maintained, if possible, during plant shutdown to minimize accumulation of additional tests.

2. For a pump in a system declared inoperable or not required to be operable and testing is undesirable, the pump shall be tested within three (3) months prior to placing the system in an operable status and the test schedule followed.

3. Pumps which can only be tested during plant operation shall be tested within one week following plant startup.

C. Pumps in Regular Use

1. Pumps which are normally operated more frequently than every 3 months may be tested during normal operation without stopping the pump.

2. The Pump Data Sheets must show that each pump was operated at acceptable reference values in the required flow path and that the required quantities specified in the STP were measured or observed, recorded, and analyzed on the applicable Pump Data Sheets.

5.4.3 Duration of Tests - After pump conditions are as stable as the system permits, each pump shall be run for at least two minutes. At the end of that period at least one measurement or observation of the quantities specified in the STP shall be made and recorded on the Pump Data Sheets provided in the appropriate STP.

5.4.4 Charging/SI Pumps - The Charging/SI Pumps (XPP0043A, XPP0043B, and XPP0043C) are tested in accordance with NRC Generic Letter 89-04, Position 9. This position allows the use of non-instrumented minimum flowpaths for quarterly testing when a full flow instrumented test circuit can only be established during Cold Shutdowns or Refueling Outages. Quarterly testing on minimum flow in conjunction with full flow testing during refueling outages provides adequate assurance that these pumps are capable of performing their design safety function upon demand.

5.4.5 Emergency Feedwater Pumps - The Emergency Feedwater Pumps (XPP0008, XPP0021A and XPP0021B) are tested in accordance with NRC Generic Letter 89-04, Position 9. This position allows the use of an instrumented minimum flow path for quarterly testing with a test performed at substantial flow conditions during Cold Shutdowns or Refueling Outages. Quarterly testing on minimum flow in conjunction with testing at substantial flow conditions during Refueling Outages provides adequate assurance that these pumps are capable of performing their design safety function upon demand. B

5.5 Analyses and Evaluation

5.5.1 All test data must be analyzed within 96 hours of test completion.

5.5.2 Acceptance Criteria

A. The Acceptable, Alert, and Required Action Ranges of Inservice Test Parameters are tabulated on Enclosure 7.4.

B. The ranges are expressed as a percentage of the reference values, with the exception of vibration ranges which are multiples of the reference values.

5.5.3 Corrective Action - If the Inservice Test Parameters deviate from the Acceptable Range, the following corrective action shall be initiated immediately:

A. If deviations fall within the Alert Range, the frequency of testing shall be doubled until the cause of the deviation is determined and the condition corrected. The pump is still considered operable.

B. If the deviations fall within the Required Action Range, the pump shall be declared inoperable until the cause of the deviation has been determined, the cause corrected, and a satisfactory Inservice Test has been conducted.

C. When a test shows deviations outside of the Acceptable Range, the instruments involved may be recalibrated and the test rerun.

D. When a test shows deviations outside of the Acceptable Range, Attachment II must be completed, showing a summary of the corrective actions taken, and attached to the Re-test STTS.

E. If the Inservice Test Parameters are in the Required Action Range, a Non-Conformance Notice (NCN) shall be generated to obtain analysis by Engineering Services of pump safety function capability.

6.0 RECORDS AND DOCUMENTS

6.1 Pump Records - Records will be maintained for each pump included in the IST Program. This will include the following items and must be retained for the lifetime of the component:

6.1.1 Manufacturer's information, including:

A. Manufacturer

B. Manufacturer's model and serial or other identification number

6.1.2 A copy of summary of the manufacturer's acceptance test report, if available.

6.1.3 A copy of the pump manufacturer's operating limits.

6.2 Inservice Test Plans - A record of test plans and procedures shall be maintained which shall include the following:

6.2.1 The hydraulic circuit to be used.

6.2.2 The location and type of measurement for the required test parameters.

6.2.3 The reference values.

6.2.4 The method of determining reference values which are not directly measured by instrumentation.

6.3 Record of Tests - A record of each test shall be maintained which shall include the following:

6.3.1 Pump identification.

6.3.2 Date of test.

6.3.3 Reason for test (e.g., post-maintenance, routine inservice test, establishing reference values).

6.3.4 Values of measured parameters.

6.3.5 Identification of instruments used.

6.3.6 Comparisons with allowable ranges of test values and analysis of deviations.

6.3.7 Requirement for corrective action, if any.

6.3.8 Evaluation and justification for changes to reference values.

6.3.9 Signature of the person or persons responsible for conducting and analyzing the test.

6.4 Record of Corrective Action - Records of corrective action shall be maintained which shall include the following:

6.4.1 A summary of the corrections made, using Attachment II "Correction Measures Summary".

6.4.2 The subsequent Inservice Test and confirmation of operational adequacy.

6.4.3 The signature of the individual(s) responsible for corrective action and verification of results.

6.5 Record of Relief Requests

6.5.1 Relief requests, if any, shall be referenced on Enclosure 7.2.

6.5.2 Current relief request are included in Enclosure 7.5.

6.5.3 Relief request history may be recalled from records through the record title "Pump Test Relief Request", reference DTI, (0003 entry code).

7.0 ENCLOSURES

7.1 IST Program Pump List

7.2 Inservice Test Parameter Matrix

7.3 Test Parameter Symbols

7.4 Ranges of Inservice Test Parameters

7.5 IST Pump Test Relief Request

7.6 Pump Selection Basis

8.0 REVISION SUMMARY

8.1 Procedure updated to incorporate the requirements of ASME Section XI, 1989.

8.2 Format was updated to reflect the requirements of SAP-139 and TSAG-100.1.

IST PROGRAM PUMP LIST

SYSTEM	PUMP ID NUMBER	PUMP NAME (DESCRIPTION)	DRAWING LOCATION	APPLICABLE STP
CC	XPP0001A	COMPONENT COOLING PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-611 G-8	STP-222.002
CC	XPP0001B	COMPONENT COOLING PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-611 G-4	STP-222.002
CC	XPP0001C	COMPONENT COOLING PUMP C (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-611 H-6	STP-222.002
CS	XPP0013A	BORIC ACID TRANSFER PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-677 F-10	STP-204.005
CS	XPP0013B	BORIC ACID TRANSFER PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-677 H-10	STP-204.005
CS	XPP0043A	CHARGING/SI PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-675 F-10	STP-205.003 STP-230.006
CS	XPP0043B	CHARGING/SI PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-675 H-10	STP-205.003 STP-230.006
CS	XPP0043C	CHARGING/SI PUMP C (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-675 G-10	STP-205.003 STP-230.006
DG	XPP0004A	DG FUEL OIL TRANSFER PUMP 4A (MOTOR DRIVEN ROTARY SCREW PUMP)	302-351 G-12	STP-225.001A
DG	XPP0004B	DG FUEL OIL TRANSFER PUMP 4B (MOTOR DRIVEN ROTARY SCREW PUMP)	302-351 G-3	STP-225.001A
DG	XPP0141A	DG FUEL OIL TRANSFER PUMP 141A (MOTOR DRIVEN ROTARY SCREW PUMP)	302-351 G-14	STP-225.001A
DG	XPP0141B	DG FUEL OIL TRANSFER PUMP 141B (MOTOR DRIVEN ROTARY SCREW PUMP)	302-351 G-2	STP-225.001A

IST PROGRAM PUMP LIST

SYSTEM	PUMP ID NUMBER	PUMP NAME (DESCRIPTION)	DRAWING LOCATION	APPLICABLE STP	
EF	XPP0008	EMERG FEEDWATER TURBINE DRIVEN PUMP (VARIABLE SPEED CENTRIFUGAL PUMP)	302-085 H-6	STP-220.002 STP-220.008	B
EF	XPP0021A	EMERGENCY FEEDWATER PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-085 D-7	STP-220.001A STP-220.008	B
EF	XPP0021B	EMERGENCY FEEDWATER PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-085 F-6	STP-220.001A STP-220.008	B
RH	XPP0031A	RESIDUAL HEAT REMOVAL PUMP A (MOTOR DRIVEN VERTICAL LINE SHAFT PUMP)	302-641 C-7	STP-205.004	
RH	XPP0031B	RESIDUAL HEAT REMOVAL PUMP B (MOTOR DRIVEN VERTICAL LINE SHAFT PUMP)	302-641 E-7	STP-205.004	
SP	XPP0038A	REACTOR BUILDING SPRAY PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-661 D-6	STP-212.002	
SP	XPP0038B	REACTOR BUILDING SPRAY PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-661 E-6	STP-212.002	
SW	XPP0039A	SERVICE WATER PUMP A (MOTOR DRIVEN VERTICAL LINE SHAFT PUMP)	302-221 C-2	STP-223.002A	
SW	XPP0039B	SERVICE WATER PUMP B (MOTOR DRIVEN VERTICAL LINE SHAFT PUMP)	302-221 C-10	STP-223.002A	
SW	XPP0039C	SERVICE WATER PUMP C (MOTOR DRIVEN VERTICAL LINE SHAFT PUMP)	302-221 C-6	STP-223.002A	
SW	XPP0045A	SERVICE WATER BOOSTER PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-222 C-6	STP-223.002A	
SW	XPP0045B	SERVICE WATER BOOSTER PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-222 G-6	STP-223.002A	

IST PROGRAM PUMP LIST

SYSTEM	PUMP ID NUMBER	PUMP NAME (DESCRIPTION)	DRAWING LOCATION	APPLICABLE STP
VU	XPP0048A	CHILLED WATER PUMP A (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-841 E-10	STP-229.001
VU	XPP0048B	CHILLED WATER PUMP B (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-841 E-5	STP-229.001
VU	XPP0048C	CHILLED WATER PUMP C (MOTOR DRIVEN CENTRIFUGAL PUMP)	302-841 E-8	STP-229.001

INSERVICE TEST PARAMETER MATRIX

PUMP ID NUMBER	Q	Pi (1)	Pd (2)	dP	V	N	APPLICABLE RELIEF REQUEST NUMBER
XPP0001A	YES	YES	YES	YES	YES	N/A	NONE
XPP0001B	YES	YES	YES	YES	YES	N/A	NONE
XPP0001C	YES	YES	YES	YES	YES	N/A	NONE
XPP0004A	YES	N/A	NO	N/A	YES	N/A	A.1
XPP0004B	YES	N/A	NO	N/A	YES	N/A	A.1
XPP0008	YES	YES	YES	YES	YES	YES	NONE
XPP0013A	YES	YES	YES	YES	YES	N/A	NONE
XPP0013B	YES	YES	YES	YES	YES	N/A	NONE
XPP0021A	YES	YES	YES	YES	YES	N/A	NONE
XPP0021B	YES	YES	YES	YES	YES	N/A	NONE
XPP0031A	YES	YES	YES	YES	YES	N/A	NONE
XPP0031B	YES	YES	YES	YES	YES	N/A	NONE
XPP0038A	YES	YES	YES	YES	YES	N/A	NONE
XPP0038B	YES	YES	YES	YES	YES	N/A	NONE

(1) INLET PRESSURE REQUIRED ONLY WHEN DETERMINING DIFFERENTIAL PRESSURE ON CENTRIFUGAL PUMPS.
(2) DISCHARGE PRESSURE NOT REQUIRED FOR CENTRIFUGAL PUMPS UNLESS USED TO DETERMINE DIFFERENTIAL PRESSURE.

INSERVICE TEST PARAMETER MATRIX

PUMP ID NUMBER	Q	Pi (1)	Pd (2)	dP	V	N	APPLICABLE RELIEF REQUEST NUMBER
XPP0039A	YES	YES	YES	YES	YES	N/A	B.1
XPP0039B	YES	YES	YES	YES	YES	N/A	B.1
XPP0039C	YES	YES	YES	YES	YES	N/A	B.1
XPP0043A	YES	YES	YES	YES	YES	N/A	(3)
XPP0043B	YES	YES	YES	YES	YES	N/A	(3)
XPP0043C	YES	YES	YES	YES	YES	N/A	(3)
XPP0045A	YES	YES	YES	YES	YES	N/A	NONE
XPP0045B	YES	YES	YES	YES	YES	N/A	NONE
XPP0048A	YES	YES	YES	YES	YES	N/A	B.1
XPP0048B	YES	YES	YES	YES	YES	N/A	B.1
XPP0048C	YES	YES	YES	YES	YES	N/A	B.1
XPP0141A	YES	N/A	NO	N/A	YES	N/A	A.1
XPP0141B	YES	N/A	NO	N/A	YES	N/A	A.1

(1) INLET PRESSURE REQUIRED ONLY WHEN DETERMINING DIFFERENTIAL PRESSURE ON CENTRIFUGAL PUMPS.
(2) DISCHARGE PRESSURE NOT REQUIRED FOR CENTRIFUGAL PUMPS UNLESS USED TO DETERMINE DIFFERENTIAL PRESSURE.
(3) THESE PUMPS ARE TESTED PER NRC GL 89-04, POSITION 9.

TEST PARAMETER SYMBOLS

SYMBOL	QUANTITY	UNIT	UNIT ABBREVIATION
Q	Flow Rate	Gallons Per Minute	GPM
Pi	Inlet Pressure	Pounds Per Square Inch Gage	PSIG
Pd	Discharge Pressure	Pounds Per Square Inch Gage	PSIG
dP	Differential Pressure	Pounds Per Square Inch Differential	PSID
V	Vibration (Velocity or Displacement)	Inches Per Second Thousandths of an Inch	IN/SEC MILS
N	Rotative Speed	Revolutions Per Minute	RPM
r	Subscript Denotes Reference Quantity	N/A	N/A

RANGES OF INSERVICE TEST PARAMETERS

PRESSURE AND FLOW

TEST PARAMETER	ACCEPTABLE RANGE	ALERT RANGE		REQUIRED ACTION RANGE	
		LOW	HIGH	LOW	HIGH
Pd (Positive Displacement Pumps)	0.93 - 1.10 Pd_r	0.90 - < .93 Pd_r	N/A	< 0.90 Pd_r	> 1.10 Pd_r
dP (Vertical Line Shaft Pumps)	0.95 - 1.10 dP_r	0.93 - < .95 dP_r	N/A	< 0.93 dP_r	> 1.10 dP_r
Q (Positive Displacement, Vertical Line Shaft Pumps)	0.95 - 1.10 Q_r	0.93 - < .95 Q_r	N/A	< 0.93 Q_r	> 1.10 Q_r
dP (Centrifugal Pumps)	0.90 - 1.10 dP_r	N/A	N/A	< 0.90 dP_r	> 1.10 dP_r
Q (Centrifugal Pumps)	0.90 - 1.10 Q_r	N/A	N/A	< 0.90 Q_r	> 1.10 Q_r

VIBRATIONS

PUMP TYPE	PUMP SPEED	TEST PARAMETER	ACCEPTABLE RANGE	ALERT RANGE (1)	REQUIRED ACTION RANGE (1)
Centrifugal and Vertical Line Shaft Pumps	< 600 RPM	Vd or Vv	≤ 2.5 V_r	> 2.5 V_r - 6.0 V_r or >10.5 mils	> 6 V_r or > 22 mils
Centrifugal and Vertical Line Shaft Pumps	≥ 600 RPM	Vv or Vd	≤ 2.5 V_r	>2.5 V_r - 6.0 V_r or >0.325 in/sec	> 6.0 V_r or > 0.70 in/sec
Positive Displacement	N/A	Vd or Vv	≤ 2.5 V_r	>2.5 V_r - 6.0 V_r	> 6.0 V_r

(1) NOTE: Use whichever value is smaller.

IST PUMP TEST RELIEF REQUEST

A.1 REVISION 0

System: Diesel Generators (DG)

Pumps: XPP-4A, XPP-4B, XPP-141A, and XPP-141B

Class: 3

Function: To transfer diesel fuel oil from the storage tank to the day tank.

Test Requirement:

1) When measuring flow rate, use a rate or quantity meter installed in the pump test circuit. (OM-6, 4.6.5)

2) Pressure (discharge) shall be determined and compared with corresponding reference values. (OM-6, 5.2 (d) and Table 2)

3) After pump conditions are as stable as the system permits, each pump shall be run at least 2 minutes prior to measuring required test parameters. (OM-6, 5.6)

Basis for Relief: Flowmeters are not provided within the pump test circuits. The modifications required to install flowmeters would be very costly and would not provide a significant enhancement of the monitoring capability for pump degradation over the monitoring capability provided by measuring the level change in the tank per unit time.

These positive displacement pumps discharge into a vented tank with no means provided to vary discharge pressure. The discharge pressure of a positive displacement pump is directly proportional to the pressure of the system into which it is pumping. The system pressure in this instance is provided by the head of the oil above the tank inlet. Therefore, the pump discharge pressure is low and virtually constant during pump operation and, in this case, is not a significant performance indicator.

The amount of space available in each D. G. Day Tank is limited which, in turn, limits the amount of time these pumps can be run without overflowing the tank. Also, since the flow rate is determined by measuring the level change in the tank per unit time and rotary screw positive displacement pumps are not subject to the same flow oscillations as centrifugal pumps, observing the two minute hold time prior to taking pump data would not provide any benefit and would actually decrease the accuracy of the flowrate determination by limiting the sampling time for the data.

IST PUMP TEST RELIEF REQUEST

Alternate Test: The flow rate will be determined by measuring the rate of level increase in the fuel oil day tank using appropriate level instrumentation. This rate of level increase shall then be converted to flow rate via calculations. The level instrument and calculation accuracy shall meet the requirements of Table 1 (± 2 %). This, in conjunction with vibration measurement, shall be performed at least once every 92 days prior to or subsequent to engine operation. The data will be taken independent of the two minute hold time.

IST PUMP TEST RELIEF REQUEST

B.1 REVISION 0

System:	All Code Class Systems
Pumps:	All IST Pumps
Class:	2 and 3
Function:	N/A
Test Requirement:	The resistance of the system shall be varied until the flow rate equals the reference value. The pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the pressure equals the reference value and the flow rate shall be determined and compared to the reference flow rate value. (OM-6, 5.2(b))
Basis for Relief:	Adjusting either the resistance of the system or the flow rate to achieve a single point reference value necessitates changing normal system configurations to achieve arbitrary test conditions which may not reflect actual normal operating conditions. The use of individual pump curves will allow testing to occur at the point where the pump normally operates, also reducing the number of perturbations on the system.
Alternate Test:	Individual pump curves, developed in accordance with Section 5.4.1.C and containing minimum and maximum ΔP Alert and Required Action Ranges, will be used to determine pump operability. The flow rate will be recorded and the ΔP will be verified to be within the acceptance limits for that flow rate. If necessary, curves will be developed for vibration using the Alert and Required Action Ranges specified in OM-6, Table 3a.

A

PUMP SELECTION BASIS

This attachment includes discussion pertaining to the reasoning, and provides justification for both inclusion or exclusion of pumps applicable to the requirements of GTP-301, "Inservice Testing of Pumps Second Ten Year Interval". The intent of the pump selection basis is to provide a documented reference for responding to questions and concerns regarding the selection of components or lack thereof. The bases contained in this attachment will not completely avoid all inquiries, but by documenting the logic for decisions made, should minimize the amount of time and effort required to respond to those questions.

The basis also provides a means of documenting certain SCE&G positions where the code may be unclear and increase consistency of the testing performed. This attachment should be used in conjunction with the FSAR, Design Basis Documents, Technical Specifications and other design documents when additional clarification is required.

BASIS

System: Component Cooling Water System (CC)

Pumps: XPP-1A, XPP-1B and XPP-1C

Class: 3

Function and Design Safety Requirements:

These pumps are required to operate after a design basis accident to remove residual and sensible heat from the reactor coolant system via residual heat removal heat exchangers. The switchgear serving the component cooling pump motor is safety class 1E. The required function of the component cooling water system following a safety injection signal is to provide cooling water to the Engineered Safety Features (ESF). They receive an automatic start signal from the ESF loading sequencer. Initially, the only components involved are the RHR pumps. In subsequent phases, removal of heat from the RHR heat exchanger may be necessary, depending upon the accident or event resulting in the SI signal. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Chemical Volume and Control System (CS) - Boric Acid Transfer

Pumps: XPP-13A and XPP-13B

Class: 3

Function and Design Safety Requirements:

These pumps are provided with electrical power from separate Class 1E electrical power sources to ensure safe shutdown boration of the RCS with an assumed single failure. The pumps must be capable of providing boron solution to the suction of the charging pumps for injection into the reactor core. This emergency boration capability is a means of achieving negative reactivity in the core during an accident condition thereby providing a safe shutdown.

Additionally, emergency boration via the CVCS provides a backup to the rod control system for reactivity control without initiating an SI signal. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Emergency Diesel Generation (DG) - FUEL OIL TRANSFER

Pumps: XPP-4A, XPP-4B, XPP-141A and XPP-141B

Class: 3

Function and Design Safety Requirements:

These pumps are required to perform a safety function by transferring fuel oil from the storage tank to the day tank under the combined loading conditions listed in the design specification (DSP-607). The pump motors are powered by a safety class 1E supply. These pumps are not required to operate during a seismic event , but shall be capable of operating at full capacity and pressure after a seismic event. The FUEL OIL TRANSFER pumps receive a start/stop signal from the day tank level switches. The day tank capacity is 550 gallons which is sufficient for 90 minutes of engine operation. The fuel oil transfer pumps provide long term supply of fuel oil (7-days) to the engines, under full load conditions.

ASME/ANSI OM Part 6 1988a requires vibration, flowrate, and discharge pressure to be measured and recorded. Relief has been requested from acquiring discharge pressure and also addresses calculating flow rate by time versus level change during pump testing independent of the two minute hold time. Pump tests shall be performed at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Emergency Feedwater System (EF)

Pumps: XPP-8, XPP-21A and XPP-21B

Class: 3

Function and Design Safety Requirements:

The motor driven EF pumps, XPP-21A and XPP-21B, are provided with electrical power from separate 1E electrical power sources. These pumps must have automatic start capabilities upon receipt of the lo-lo level signal from 2 out of 3 steam generators, SI signal, or safeguard sequencer, or loss of all main feedwater pumps. The turbine driven EF pump, XPP-8, is driven by steam supplied by either "B" or "C" steam generators. These pumps perform a safety function by providing emergency feedwater to the steam generators after an event which results in insufficient or loss of main feedwater. The EF pumps operate until RCS pressure is reduced to the point where the RHR system can be placed in operation. Sufficient emergency feedwater is available during plant emergency conditions to bring the plant to a safe shutdown condition. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Residual Heat Removal System (RH)

Pumps: XPP-31A and XPP-31B

Class: 2

Function and Design Safety Requirements:

The RHR pumps are provided with electrical power from separate class 1E power sources. These pumps must be capable of automatic starting upon receipt of an "S" signal thereby delivering low head safety injection flow when RCS pressure has decreased to below the shutoff head. This low head flow of borated water from the RWST to the RCS during the injection phase provides assurance that the minimum reflooding rate of the core assumed in the accident analysis is maintained.

These pumps must be capable of recirculation of spilled water from the containment sump through the the RHR heat exchangers and back to the RCS during both cold and hot leg recirculation. These pumps must be capable of continuous operation during the recirculation phase in order to provide a suction source for the Charging/SI pumps. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Reactor Makeup Water System (RMW)

Pumps: XPP-40A and XPP-40B

Class: 3

Function and Design Safety Requirements:

These pumps are provided with electrical power from a class 1E electrical power source. The system was originally designed as safety related for the purpose of providing makeup to the spent fuel pool. By plant design, three seismic category I makeup supplies are provided for the spent fuel pool as compared to the required single category I source. Credit is not taken in the accident analysis relying upon the RMW system for accident mitigation. The class 2, seismic category I RWST satisfies makeup requirements to the spent fuel pool. Additionally, RMW system operation is not required for ANS 18.2 Condition III and IV events. The RMW pumps shall not be included in the ASME Section XI, Testing Program. Their class 1E power supply is considered for convenience only as recognized by OM-Part 6, paragraph 1.2(b).

BASIS

System: Spent Fuel Cooling (SF)

Pumps: XPP-32A and XPP-32B

Class: 3

Function and Design Safety Requirements:

XPP-32A is in the spent fuel cooling loop and is used solely for cooling of the spent fuel pool. XPP-32B is in the spent fuel cooling and transfer loop and serves as an alternate or supplement to the SF cooling pumps. XPP-32B is required to function for transfer of water between the several storage volumes associated with the fuel handling and storage systems, including the RWST, fuel transfer canal and refueling cavity, and the cask loading area.

The SF pumps motors were originally required to be classified as IEEE Class 1E safety related. ECN2165 changed this classification to non-safety related as allowed by the Standard Review Plan, NUREG-0800 part 9.1.3. The spent fuel cooling pumps shall not be included in the ASME Section XI, Testing Program. They are not relied upon for accident mitigation or safe shutdown. Their emergency power supply is considered as an operating convenience as recognized by OM-Part 6, Paragraph 1.2(b).

BASIS

System: Safety Injection System (SI)

Pumps: XPP-43A, XPP 43B and XPP-43C

Class: 2

Function and Design Safety Requirements:

The Charging/SI pumps are provided with electrical power from separate class 1E power sources. These pumps must be capable of an automatic start upon receipt of an "S" signal. During accident conditions they provide the high head safety injection flow from the RWST to the RCS loops and, backed up by the RHR pumps, provide the post accident recirculation of coolant from the containment to the RCS. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5. This testing shall utilize the non-instrumented minimum flow line as discussed in Generic Letter 89-04, Position 9. Full flow pump testing shall be performed during refueling outages.

BASIS

System: Reactor Building Spray System (SP)

Pumps: XPP-38A and XPP-38B

Class: 2

Function and Design Safety Requirements:

These pumps are provided with electrical power from separate class 1E electrical power sources. The spray pumps have automatic start capabilities upon receipt of a containment spray actuation signal. The pumps perform a safety function by removal of thermal energy released to containment by a LOCA at a rate sufficient to limit the resulting overpressurization to a level below the design limit, thereby maintaining structural integrity of the containment, and minimizing the potential of leakage from containment. This is accomplished by spraying water into the containment atmosphere. Additionally, the spray system serves to reduce the concentration of soluble iodine in the containment atmosphere. This further minimizes the potential for leakage of radioactive material from containment. Iodine is effectively removed from the atmosphere by the addition of sodium hydroxide to the spray pump suction. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Service Water System (SW)

Pumps: XPP-39A, XPP-39B and XPP-39C

Class: 3

Function and Design Safety Requirements:

SW pumps XPP-39A and XPP-39B are provided with electrical power from separate class 1E electrical power sources. XPP-39C has the capability of being aligned with with class 1E electrical power sources. These pumps must be capable of automatically starting upon receipt of an automatic start signal via the Engineered Safety Features Loading Sequencer (EFSLS) during a safety injection. Also, an auto start signal is provided for the service water pump in the non-running loop when low EF suction transfer is initiated. These pumps perform a safety function by providing post accident cooling to various components important to safety. Additionally, these pumps provide the motive force for the service water which allow crediting this system as an alternate supply to the component cooling and emergency feedwater systems. The service water pond and associated systems are considered the ultimate heat sink for V.C.S. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5. During testing system flow is dependent on cooling demands and ambient temperature therefore, pump testing shall utilize a reference curve for the purpose of monitoring for pump degradation.

BASIS

System: Service Water System (SW) - SW BOOSTER PUMPS

Pumps: XPP-45A and XPP-45B

Class: 3

Function and Design Safety Requirements:

These pumps are provided with electrical power from separate class 1E power sources. The pumps are required to automatically start via the Engineered Safety Features Loading Sequencer (EFSLS) in the event of a safety injection signal or a loss of offsite power. These pumps perform a safety function by providing cooling flow to the reactor building cooling units during post accident conditions. The Service Water Booster Pumps ensure adequate containment heat removal with system pressure greater than containment. Additionally, "B" service water booster pump is required to provide service water to the "B" reactor building cooling units during a 10CFR50 Appendix R, Fire Emergency Shutdown condition which results in Control Room Evacuation. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5.

BASIS

System: Chilled Water System (VU)

Pumps: XPP-48A, XPP-48B and XPP-48C

Class: 3

Function and Design Safety Requirements:

Chilled water pumps, XPP-48A and XPP-48B are provided with separate class 1E electrical power sources, while pump XPP-48C has the capability of being aligned to either class 1E electrical source. These pumps must be capable of automatically starting upon receipt of a safety injection signal. Additionally, following the occurrence of a 1E bus undervoltage signal, the pump and chiller served by that bus are tripped and are automatically loaded by the ESFLS. The safety function of these pumps is to provide sufficient flow to the chilled water system for heat removal from components and room/area cooling coils associated with equipment required to function during post accident conditions. These pumps shall be tested at least once every 92 days pursuant to Technical Specification 4.0.5. However, system flow is dependent upon cooling demands which may vary during normal plant operation. Therefore, pump testing shall utilize a reference curve for the purpose of monitoring for pump degradation.

PUMP REFERENCE VALUE CHANGE JUSTIFICATION

I. Prerequisites For Changing Reference Values (only one (1) prerequisite is required)

1) ☐ Repair/ Rework, or

2) ☐ Replacement, or

3) ☐ Modification, or

4) ☐ Other

Note: When changing reference values for any of the above reasons the guidelines of paragraphs 5.2.2 and 5.2.3 of this procedure must be followed.

II. Pump Name _____ Pump Number _____

Last Test Date _____ Remarks: _____

New Reference Value Test Date _____ _____

STTS No. _____ PTP No. _____

STP No. _____ Other _____
(MWR, NCN, etc.)

III. Justification : [write justification for (1), (2), (3) or (4)]

_____

_____

_____

_____

_____

_____

PREPARED BY: _____
TEST SPECIALIST/TEST SUPERVISOR

APPROVED BY: _____
TEST UNIT SUPERVISOR

SHEET ___ OF ___

PUMP NO._____
STP-_____

TYPICAL CORRECTION MEASURES SUMMARY

STTS	MWR/NCN	SUMMARY -ACTION TAKEN-	INITIALS/DATE
		....	
		....	
		....	

_____ / _____
TEST UNIT SUPERVISOR DATE