FORM EG&G-1844
(Rev. 5-77)

(1) OPER. NO.

DOCUMENT REVISION REQUEST

PAGE 1 OF 2

(2) REQUESTER	(3) DRR DATE	(4) DRR NO.
P JORDAN	10/9/80	L-4472

(5) DOCUMENT NO. (IF APPLICABLE) | DOCUMENT TITLE | DOCUMENT ISSUE DATE

LOFT Exp. Oper. Spec. Non-LOCE Baseline Test Series L6 — 10/3/80

(6) CHECK APPLICABLE BLANK: PERMANENT CHANGE X — TEMPORARY CHANGE — BULLETIN

(7) MANAGER APPROVAL: CW Selby — DATE: 10/9/80

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1.	6	1	change 2000 seconds to 3600 seconds OR
2.	6	3	change "(except L6-5 and possibly L6-1)" to "(except L6-5, L6-3, and possibly L6-1)" OR
3.	7	2	Revise as per attached copy OR
4.	8	1	Omit item (1), renumber items (2) and (3) OR.
5.	17	5.3.1	Revise as per attached copy OR

SEE PAGE 2 FOR Continuation.

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NEXT ANTICIPATED NEED FOR DOCUMENT WITH THIS REVISION INCORPORATED: DATE/EVENT

(10) JUSTIFICATION: (REASON FOR CHANGE — NUMBER TO CORRESPOND TO ITEM NO. ABOVE)

1. To improve consistency with section 6.1
2. To improve consistency with the EP
3. To accurately reflect the EP
4. To accurately reflect the EP
5. To clarify the EP results

(11) OTHER DOCUMENTATION AFFECTED

DOC. NO.	DRR NO.	DATE COMPLETED
L6-1,2,3 EOP		

(12) ORIGINATING DRR NO.

(13) REVIEW

NAME/SIGNATURE	ORG.	DATE	NAME/SIGNATURE	ORG.	DATE	NAME/SIGNATURE	(14) REVIEW CODE	ORG.	DATE
CW Selby	6400	10/9/80	[signature]	LFO	10/9/80	[signature]		QUALITY DIV	10-9
[illegible]	LPD	10/8/80	E.R. Hermann	6400	10/9/80	[signature]		SAFETY DIV	10-9
[illegible]	LTSD	10/9/80	[signature]	LPD	10/9/80	JE Solecki		[illegible]	10/9/80

(15) COMMENTS

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(16) ADDITIONAL DRRS IN THIS DOCUMENT REVISION

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(Rev. 5-77)

DOCUMENT REVISION REQUEST

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(5) DOCUMENT NO. (IF APPLICABLE) | DOCUMENT TITLE: LOFT Exp. Oper. Spec. Non-LOCE Baseline Test Series L6 | DOCUMENT ISSUE DATE: 10/3/80

(6) CHECK APPLICABLE BLANK — PERMANENT CHANGE X — TEMPORARY CHANGE ____ — BULLETIN ____

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6.	2C	2	Revise as per attached copy. OR
7.	23	5.4.4	Revise as per attached copy. OR per revision
8.	27	2	Delete the following: OK. T_o+12 sec Reactor scram on high total power (52 MW_t) T_o+14 sec Control Rods bottom Insert the following: T_o+8.5 sec Steam valve completely open T_o+17 sec Core power peaks (44.5 MW_t)
9.	[illegible]		

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6. To accurately reflect the EP
7. Clarification for EOP and operators
8. To accurately reflect the EP.
9. [illegible]

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DOC. NO.	DRR NO.	DATE COMPLETED
[illegible]		
	L6-3 EOP	

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C.W. Solberg	6400	10/9/80						~~QUALITY ORG~~	
		See page 1 for Approval signatures						~~SAFETY ORG~~	
								~~DRAP~~	

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DRR-L-4472
Page 1

(17) DOCUMENT CONTROLLER: COCS

(18) RELEASE DATE: [signature] 10/9/80

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ITEM 3:

Original Copy:

Test L6-3 is an excessive load increase incident. The steam flow control valve will be opened at its maximum rate. PCS temperature will start decreasing adding positive reactivity until a reactor scram occurs either on high power (approximately 51.5 MW) or low PCS pressure. This test will simulate an excessive rapid power demand incident at an LPWR.

Revised Copy:

Test L6-3 is an excessive load increase indicent. The steam flow control valve will be opened at its maximum rate. PCS temperature will start decreasing thus increasing the power level and decreasing the PCS pressure. The transient is predicted to reach PCS/SCS stabilization without a reactor scram. This test will simulate an excessive rapid power demand indicent at an LPWR.

ITEM 5:

Original Copy:

5.3.1 Operating History. For the anticipated transient test series, a reactor scarm is expected to occur thus terminating the significant energy generation. It should be noted that only in test L6-1 is the probability of scram ambiguous. Therefore, a representative level of decay heat should be obtained by power operation prior to test initiation. Consequently, with the concurrence of the LOFT Test and Data Branch, and the Reactor Systems Branch, the following requirements are to be met prior to test initiation:

1. Test L6-1 and L6-3 will achieve a power level and operating time sufficient to produce at least 250 kW at a time of 4000 seconds after scram.

2. Test L6-2 will achieve a power level and operating time sufficient to produce at least 277 kW at a time of 4000 seconds after scram.

Revised Copy:

5.3.1 Operating History. For the anticipated transient test series except L6-3, a reactor scram is expected to occur thus terminating the significant energy generation. Therefore, a representative level of decay heat should be obtained by power operation prior to test initiation. Consequently, with the concurrence of the LOFT Test and Data Branch, and the Reactor Systems Branch, the following requirements are to be met prior to test initiation:

1. Test L6-1 and L6-3 will achieve a power level and operating time sufficient to produce at least 250 kW at a time of 4000 seconds after scram.

2. Test L6-2 will achieve a power level and operating time sufficient to produce at least 277 kW at a time of 4000 seconds after scram.

ITEM 6:

Original Copy:

L6-3 Excessive Load Increase

Test initiation will be the opening of the main steam flow control valve at maximum rate to the full open position. Feedwater flow control will be left on automatic to ensure a proper steam flow/feedwater flow match. Both primary system temperature and pressure will begin decreasing and reactor power will increase until either a scram on high power or low pressure occurs. Should temperature and pressure in the hot leg decrease sufficiently rapid enough, a low hot leg pressure scram will occur, possibly prior to a high power scram. Operator intervention should not be required throughout the transient until the PCS conditions have stabilized. At that time, steps should be taken to place the plant in a hot standby mode. Monitoring of the reactor power level, hot leg pressure and temperature, and secondary conditions will be required.

Revised Copy:

L6-3 Excessive Load Increase

Test initiation will be the opening of the main steam flow control valve at maximum rate to the full open position. Feedwater flow control will be left on automatic to ensure a proper steam flow/feedwater flow match. Both primary system temperature and pressure will begin decreasing and reactor power will increase until either a scram on high power or low pressure could possibly occur. Should the PPS scram setpoints not be reached, operator intervention should not be required throughout the transient until the PCS conditions have stabilized. At that time, steps should be taken to place the plant in a hot standby mode. Monitoring of the reactor power level, hot leg pressure and temperature, and secondary conditions will be required.

ITEM 7:

Original Copy:

5.4.4 Test Termination. The test shall not be terminated, except in case of emergency, nor shall data acquisition be stopped until the following termination criteria, inclusive, are met.

a. Pressurizer level has been recovered to the normal band

b. Positive operator control of pressurizer pressure on heaters and spray hase been restored consistent with the MPT curve

c. Steam flow control valve, CV-P4-10, is no longer cycling

d. Steam generator pressure in equilibrium, within 50 psig, with hot leg temperature, or SCS and PCS in controlled cooldown, and

e. Steam generator narrow range level indication has been recovered and level is increasing.

There are no programmatic experimental requirements for operator actions after the data recording has been stopped.

Table V-1 identifies the sequence of events expected to occur during the tests in the series. The table is presented to provide an understanding of the events taking place.

Revised Copy:

5.4.4 Test Termination. The test shall not be terminated, except in case of emergency, nor shall data acquisition be stopped, nor shall plant recovery procedures be initiated until the following programmatic termination criteria, inclusive, are met.

ITEM 7: (Continued)

Revised Copy: (Continued)

a. Pressurizer level has been recovered to the normal band

b. Positive operator control of pressurizer pressure on heaters and spray has been restored consistent with the MPT curve

c. Steam flow control valve, CV-P4-10, is no longer cycling

d. Steam generator pressure in equilibrium, within 50 psig, with hot leg temperature, or SCS and PCS in controlled cooldown,* and

e. Steam generator level has recovered and is stabilized within the narrow range level indication.

There are no programmatic experimental requirements for operator actions after the data recording has been stopped.

Table V-1 identifies the sequence of events expected to occur during the tests in the series. The table is presented to provide an understanding of the events taking place.

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*May be removed if a reactor scram does not occur.

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DOCUMENT REVISION REQUEST

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(2) REQUESTER: RPJORDAN
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(4) DRR NO: L-4471

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1	15	—	Remove the Steam/Feedwater Flow Mismatch Manual Scram.

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1. Change required by potential instrument malfunction.

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EOP(L6-1)		

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CWSolbrig/[illegible]	LPD	10/8/80	WA Spencer/[illegible]	LTSD	10/8/80	JH Linebarger/[illegible]*	10/8/80	~~QUALITY DIV~~	10/8/80
EAHarvego/[illegible]	LPPB	10/8/80	[illegible]	LFD	10/8/80	NCKaufman/10/8/80	RPJ	~~SAFETY DIV~~	10/8/80
DJHanson/[illegible]	LMC	10/8/80	TRCharlton/RPJ	CAP	10/8/80	JE Solecki/10/8/80	RPJ	~~PRAC~~	10/8/80

(15) COMMENTS

* per CWSolbrig telecon

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(16) ADDITIONAL DRRS IN THIS DOCUMENT REVISION

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NE L6 Series
EOS
Rev. 1

LOFT EXPERIMENT OPERATING SPECIFICATION
NON-LOCE BASELINE TEST SERIES L6

September 5, 1980

Prepared By

R. P. Jordan

Prepared For The U.S. Nuclear
Regulatory Commission And
Department of Energy
Idaho Operations Office
Under Contract No. DE-AC07-76ID01570

NE L6 Series
EOS
REV. 1

LOFT EXPERIMENT OPERATING SPECIFICATION
ANTICIPATED TRANSIENT TEST SERIES L6

Approved By:

E. A. Harvego — E. A. Harvego
Manager, LOFT Program Planning Branch

J. H. Linebarger — J. H. Linebarger
Mgr, LOFT Experiment Evaluation Branch

Charles W. Solbrig — C. W. Solbrig
Manager, LOFT Program Division

N. C. Kaufman — N. C. Kaufman
Director, LOFT

Technical Concurrence:

T F Pointer as per telecon. R Jordan 9/5/80 — T. F. Pointer
Manager, LOFT Facility Division

W. A. Spencer — W. A. Spencer
Manager, LOFT Technical Support Division

D J Hanson — D. J. Hanson
Manager, LOFT Measurement Division

T R Charlton — T. R. Charlton
Manager, Code Assessment Program

See Incorporated DRR-L-4466.

Authorized for Release:

for 10/3/80 — B. L. Freed
Configuration Document Control and Services

DOE/ID Approval Letter (Tests L6-1, L6-2, L6-3, and L6-5* only)
From: J. E. Solecki
To: N. C. Kaufman, October 2, 1980
* Test performed May 29, 1980.

CONTENTS

ABBREVIATIONS

ATWS	Anticipated Transient Without Scram
BWST	Borated Water Storage Tank
BST	Blowdown Suppression Tank
CHF	Critical Heat Flux
DAVDS	Data Acquisition and Visual Display System
DBR	LOFT Design Basis Report
DOE	Department of Energy
ECC(S)	Emergency Core Cooling (System)
EOP	Experiment Operating Procedure
EOS	Experiment Operating Specification
ESA	Experiment Safety Analysis
ESF	Engineered Safety Feature
FTM	Facility Temperature Monitor
HPIS	High-Pressure Injection System
JEG	Joint Experiment Group
LOCA	Loss-of-Coolant Accident
LOCE	Loss-of-Coolant Experiment
LOFT	Loss-of-Fluid Test
LPIS	Low-Pressure Injection System
LPPB	LOFT Program Planning Branch
LPWR	Large Pressurized Water Reactor
MLHGR	Maximum Linear Heat Generation Rate
MRD-1	Measurement Requirements Document

MTA	Mobile Test Assembly
NE	Nuclear Experiment
NRC	Nuclear Regulatory Commission
ODDS	Operational Diagnostic and Display System
P&ID	Piping and Instrument Diagram
PCCS	Primary Component Cooling System
PCP	Primary Coolant Pump
PCS	Primary Coolant System
POM	Plant Operating Manual
PORV	Power Operated Relief Valve
PPS	Plant Protection System
PSMG	Primary System Motor-Generator (Sets)
QOBV	Quick-Opening Blowdown Valves
SCS	Secondary Coolant System
SDD	System Design Description
SG	Steam Generator
SPGR	Specific Gravity
T_{av}	Average of T_h and T_c
T_h	Hot leg primary coolant bulk temperature, reactor vessel exit bulk temperature
T_c	Cold leg primary coolant bulk temperature, reactor vessel inlet bulk temperature
TBS	To Be Supplied
TIP	Traversing In-core Probe
$\Delta\rho$	Percent reactivity change $= \frac{K_2 - K_1}{K_1 \ K_2} \times 100$

where K_1 = effective multiplication constant at the initial condition

K_2 = effective multiplication constant at the final condition

I. INTRODUCTION

This Experiment Operating Specification (EOS) provides the plant configuration, initial conditions, operator actions and measurement requirements that have programmatic significance for the first 6 tests (L6-1 through L6-6) in the L6 non-LOCE test series. The EOS is used to develop the detailed operating procedures specified in the Experiment Operating Procedure (EOP) prepared by the LOFT Facility Division. In addition the LOFT Program Planning Branch uses the requirements specified in the EOS to develop an Experiment Prediction (EP) document which is used to ensure the test objectives will be met and the measurements are correctly ranged and have an adequate response.

The L6 test series is being developed to study transients in which a disturbance to plant equilibrium occurs, resulting in a reactor scram when the first safety system setpoint is reached.

The objectives of the L6 test series are:

(1) To provide data required for evaluation of the plant and control systems performance during each of the anticipated transient tests.

(2) To determine the important thermal, hydraulic, operational, and neutronic phenomena during an anticipated transient at the LOFT facility. Identify any unexpected behavior or response.

(3) Provide data to evaluate reactor transient analysis techniques used to analyze anomalous transients.

(4) Provide data to assist in analyzing the relationship between LOFT and LPWR behavior during anticipated transients.

(5) To determine the effectiveness of instruments normally provided in LPWRs for identifying anticipated transients and monitoring the resulting plant response.

(6) To determine what additional information and/or measurements would assist a plant operator in his diagnosis and/or control of an anticipated transient.

(7) To continue development and testing of the Operational Diagnostic and Display System (ODDS) by operation of the ODDS during each test.

The six tests described in this EOS will be baseline tests for the anticipated transient test series. Data from the tests will be utilized in evaluating the computer codes used to predict anticipated transients and to check out LOFT as a test facility for performing anticipated transients. The tests were developed so they could be run in conjunction with the more severe loss-of-coolant experiments (LOCE) with little schedule impact.

The first six tests were developed to contribute to each of the test series objectives and to meet the following test specific objectives:

(1) Test L6-1 is designed to:

(a) Investigate plant response to a transient in which the heat removal capabilities of the secondary system is significantly reduced;

(b) Evaluate the automatic recovery methods in bringing the plant to a hot standby condition;

(c) Provide data to evaluate computer code capabilities to predict secondary system initiated events.

(2) Test L6-2 is designed to:

(a) Investigate plant response to a transient in which forced reactor coolant flow is lost;

(b) Obtain additional data on the natural circulation mode of cooling;

(c) Evaluate the automatic recovery methods in bringing the plant to a hot standby condition, without the reactor coolant pumps;

(d) Provide data to assess computer code capabilities to predict primary system initiated events.

(3) Test L6-3 is designed to:

(a) Investigate plant response to a transient in which the heat removal capability of the secondary system is significantly increased;

(b) Provide continued evaluation on automatic recovery methods;

(c) Provide data to evaluate code capabilities for secondary system initiated events.

(4) Test L6-4 is designed to:

(a) Investigate plant response to a transient caused by the withdrawal of a control rod bank;

(b) Provide continued evaluation of the plant automatic recovery methods;

(c) Provide data to evaluate code capabilities for primary system initiated events.

(5) Test L6-5 is designed to:

(a) Investigate plant response to a transient in which the feedwater flow to the secondary system is stopped.

(b) Provide continued evaluation on automatic recovery methods.

(c) Provide data for assessment of code capabilities to predict secondary system initiated events.

(6) Test L6-6 is designed to:

(a) Investigate plant response to a transient in which the boron concentration in the primary coolant is lowered a significant amount causing a reactivity insertion.

(b) Evaluate the automatic recovery methods to mitigate the boron dilution effects and bring the plant to a hot standby condition.

(c) Provide data to evaluate code capabilities to predict a primary system event initiated by a change in coolant chemistry.

II. GENERAL TEST DESCRIPTION

Of the tests described in this EOS, three are anticipated transients initiated by a disturbance in the primary system and three are initiated by a disturbance in the secondary system. It is expected that all tests will display the same trends as expected in an LPWR but the magnitudes and response times will be slightly different because of scaling considerations. Piping resistance and total thermal losses are higher for LOFT than for an LPWR (scaled). Valve actuation times for feedwater and steam control are slower for LOFT, and only a single steam generator is used, making SCS initiated events in LOFT similar to LPWRs only when uniform disturbances in all LPWR steam generators are assumed to occur.

Because of this, anticipated transient testing in LOFT will not serve as demonstration tests for LPWRs; however, the codes used to predict transient response can be assessed using LOFT data with a suitable LOFT analytical model. Also, significant LOFT deviations can be identified, evaluated and modifications made if the deviations appear to cause undesireable behavior preventing extrapolation to LPWR behavior.

All tests will be initiated from operating conditions and plant configurations simulating the conditions expected at a typical 4x4 loop LPWR should it undergo an anticipated transient. An important assumption made is that commercial power is not lost during the transient, so all reactor support systems are available.

All tests will be initiated from the same conditions:

Initial total power of 37.5 MW_t
PCS flow of 3.8×10^6 lbm/hr (478.8 Kg/sec)
Vessel inlet temperature of 535°F (552.6 K).

Normal system responses should be allowed to occur with minimal operator actions. Normal ECC linups will be used since there are no test requirements for the ECC systems. Data will be recorded until primary and secondary parameters stop rapidly changing indicating plant recovery is in progress. The parameters changing and the duration of the changes will be different for each test, due to the different types of transients. Recording times will vary from 1800 to 2000 seconds, depending on the transient.

Prior to each test, the necessary hardware configurations will be established and the plant heated to normal operating temperature using pump heat. During the heatup instrument calibrations and checks will be performed. Anomalous measurements will be identified and corrections made.

The reactor will be brought critical and power raised to the required power level (approximately 75% power) and held there until all initial conditions are established and stabilized. The reactor will then be held at this power level for a specified time to ensure a representative decay heat buildup. The test will then be initiated by performing the specified initiating event. The Plant Protection System (PPS) is expected to cause a reactor scram to occur in each test (except L6-5 and possibly L6-1). Manual scrams, other than those specified for the particular tests, should occur only in the event that a PPS channel fails to scram the reactor. PPS channels and safety actions should be monitored during the tests to ensure the tests are progressing satisfactorily.

Test L6-1 is a loss-of-steam load incident. The steam flow control valve on the steam generator will be closed at its maximum rate (5% stem movement/sec) which will stop heat removal in the SCS causing PCS temperature and pressure to increase until a scram is expected to occur. Certain secondary manual scram setpoints have been

included in the system to help ensure a reactor scram and enhance LPWR typicality. This test will simulate a turbine trip with loss of condenser vacuum in an LPWR.

Test L6-2 is a loss of PCS flow incident. The test will be initiated by tripping power to the primary coolant pump motor generator sets, allowing the pumps to coast down under the influence of the installed flywheel system. Reactor scram will occur on low PCS flow. The steam flow control valve and feedwater system after scram logic will control the secondary system. This test will simulate a loss of all forced flow in an LPWR.

Test L6-3 is an excessive load increase incident. The steam flow control valve will be opened at its maximum rate. PCS temperature will start decreasing adding positive reactivity until a reactor scram occurs either on high power (approximately 51.5 MW) or low PCS pressure. This test will simulate an excessive rapid power demand incident at an LPWR.

Test L6-4 will simulate an unintentional rod bank withdrawal at power. The control rods will be withdrawn at normal rod speed with no adjustments to steam/feedwater flow. Reactor scram should occur on high temperature.

Test L6-5 will simulate a loss-of-feedwater incident. The test will be initiated by tripping the feedwater pump and closing the feedwater regulating valve. Since LOFT does not have a low steam generator water level trip, the reactor will be manually scrammed when the level reaches -5 inches (0.13 m) (111 inches (2.82 m) above the top of the tube sheet).

Test L6-6 will simulate an uncontrolled boron dilution incident. The test will be initiated by injecting demineralized water into the primary system. Pressurizer level will be initially low to allow for

the maximum fluid inventory increase. Steam or feedwater flow in the secondary should not be altered during the test. The reactor will scram on either high PCS temperature or pressure.

The tests will be considered complete when the following occur:

(1) The reactor has scrammed;
(2) The SCS temperature and pressure has stopped increasing;
(3) The PCS reactor vessel inlet and outlet temperatures have stabilized.

The plant will then be in a normal hot standby condition from which the system could be cooled down to cold shutdown or restarted using normal POM procedures.

For all tests, the broken loop will be installed and configured for a cold leg break; however, blowdown and isolation valves will not be opened. The BST will not be required for the tests.

Data will be recorded from approximately 300 instruments during each test. The measurements will provide pressures, temperatures, and flows from key points throughout the primary and secondary system and necessary associated systems. After each test DAVDS calibrations and performance checks will be performed.

The data will be collected and formally reviewed by the Data Integrity Review Committee (DIRC). Selected data will be published in the Quick Look Report (QLR) and Experiment Data Report (EDR).

Series and test objectives will be addressed in the QLR and topical reports.

III. PREREQUISITES

The following prerequisites must be completed prior to initiating each test in the series.

3.1 Complete an experiment safety analysis (ESA) and incorporate all required EOS changes.

3.2 Complete the test prediction and review for logic and credibility. This review will be completed by LPPB and the LOFT Data Systems Branch and will include an evaluation of instrument ranges and response frequencies.

3.3 The DAVDS software shall be checked out using pre-defined functional and configuration tests.

3.4 The instruments identified in Table III-1 shall be evaluated within 30 days prior to the test.

3.5 The location and orientation of accessible experimental instrument transducers shall be verified. If this has been already performed within 30 days for the previous LOCE, it does not need to be redone for the anticipated transient test.

3.6 Early in the pre-test power run, compare a DAVDS LDA with the control room instruments and resolve any discrepancies. As a minimum compare those instruments identified in Table III-1.

3.7 The Operational Diagnostic and Display System (ODDS) shall be checked out and operational for each test.

TABLE III-1

INSTRUMENTS REQUIRING EVALUATION PRIOR TO EACH L6 SERIES TEST*

Instrument	Parameter Measured
FT-P4-12	Steam flow
FT-P4-72A	Feedwater flow
FT-P4-72-2	Feedwater flow
FT-P141-22	PCC flow
LT-P4-8A	Steam generator liquid level - narrow range
LT-P4-8B	Steam generator liquid level - wide range
LT-P139-7	Pressurizer liquid level
PT-P139-2	PCS hot leg pressure
FT-P139-27-1	PCS flow venturi ΔP
FT-P139-27-2	PCS flow venturi ΔP
FT-P139-27-3	PCS flow venturi ΔP
PT-P4-10A	Steam generator pressure
TE-P138-170	Broken loop cold leg temperature
TE-P138-171	Broken loop hot leg temperature
TE-P141-94	PCC temperature - downstream
TE-P141-95	PCC temperature - upstream
TT-P4-4	Feedwater temperature
TT-P139-32	Hot leg temperature
TE-P139-28-2	Cold leg temperature
PT-P139-5	Pressurizer pressure
TE-P139-19	Pressurizer temperature (liquid)
TE-P139-20	Pressurizer temperature (vapor)

*Evaluation of the instrumentation response shall be performed by the LOFT Data Analysis Branch subsequent to receiving the 540°F calibration data. The Branch will determine if further information or calibration of specific instruments will be necessary.

IV. ANALYTICAL DATA

This section is intended primarily for code users. It contains the initial conditions and configurations necessary for input into the computer models used for calculating anticipated transient response. Requirements for plant operation and equipment are identified in Section V. A detailed plant physical description can be found in Reference 1.

4.1 Primary Coolant System

The reactor will be at the conditions identified in Table IV-1 prior to initiating the test.

The reactor trip and PPS setpoints to be monitored during the tests are shown in Table IV-2.

The intact loop pressure drops and resistance coefficients are shown in Table IV-3.

The control rods will be 54 inches (1.37 m) withdrawn (except for L6-4) and the boron concentration will be as required to maintain plant temperature prior to initiating the test.

4.2 Special Conditions (PCS)

Primary coolant pump injection flow will not be used during the L6 test series.

The pressurizer heaters/spray flow control system will be allowed to function normally with cycling actuation from pressure signals.

The purification system will remain operational for all tests in the series.

The broken loop warm-up lines will remain open to minimize any contributions of colder water from the blowdown legs to the system.

4.3 Secondary Coolant System

The steam generator will be steaming with the water level in the normal programmed band (123.5 inches or 3.137 m) above the top of the tube sheet.

Upon receipt of the reactor trip signal, the feed pump will trip off and the main feedwater isolation valve (CV-P4-73) will shut. The steam flow control valve (CV-P4-10) position will then depend on steam generator pressure. At 920 psig (6.24 MPa) the valve will start to close, at 1020 psig (7.03 MPa) the valve will start to open.

During plant recovery, operator action may be required to return the steam generator to the operating level.

4.4 Emergency Core Coolant Systems

There are no specific requirements for the ECC systems during any anticipated transient test except test L6-6 where HPIS Pump A will be controlled to deliver 25 GPM of demineralized water to the intact loop cold leg during the test.

All other ECC parameters will be as needed for compliance with the Technical Specifications and for ease in performing the subsequent LOCE to minimize test turnaround.

4.5 Blowdown System

4.5.1 Loop Configuration. For Tests L6-1 through L6-6 there are no program requirements for the broken loop configuration.

The QOBVs are not planned to be opened during this test series, but the final decision is dependent upon the Experiment Safety Analysis.

4.5.2 Blowdown Suppression Tank. The blowdown suppression tank (BST) will not be used during the L6 test series and may be controlled as desired by LOFT Facility personnel, consistent with POM requirements for power operation.

TABLE IV-1

INITIAL OPERATING CONDITIONS

Experiment Number	System Pressure	PCS Flow	Reactor Power	Vessel Inlet Temp	Pressurizer Vol Stm	Pressurizer Vol Liq
L6-1	2156 PSIG (14.95 MPa)	3.8×10^6 lbm/hr (479.8 Kg/s)	37.5 MWt	$535^{\circ}F$ (552.6 K)	11.3 ft^3 (0.32 m^3)	21.6 ft^3 (0.61 m^3)
L6-2	2156 PSIG (14.95 MPa)	3.8×10^6 lbm/hr (479.8 Kg/s)	37.5 MWt	$535^{\circ}F$ (552.6 K)	11.3 ft^3 (0.32 m^3)	21.6 ft^3 (0.61 m^3)
L6-3	2156 PSIG (14.95 MPa)	3.8×10^6 lbm/hr (479.8 Kg/s)	37.5 MWt	$535^{\circ}F$ (552.6 K)	11.3 ft^3 (0.32 m^3)	21.6 ft^3 (0.61 m^3)
L6-4	2156 PSIG (14.95 MPa)	3.8×10^6 lbm/hr (479.8 Kg/s)	37.5 MWt	$535^{\circ}F$ (552.6 K)	11.3 ft^3 (0.32 m^3)	21.6 ft^3 (0.61 m^3)
L6-5	2156 PSIG (14.95 MPa)	3.8×10^6 lbm/hr (479.8 Kg/s)	37.5 MWt	$535^{\circ}F$ (552.6 K)	11.3 ft^3 (0.32 m^3)	21.6 ft^3 (0.61 m^3)
L6-6	2156 PSIG (14.95 MPa)	3.8×10^6 lbm/hr (479.8 Kg/s)	37.5 MWt	$535^{\circ}F$ (552.6 K)	15.16 ft^3 (0.429 m^3)	18.84 ft^3 (0.533 m^3)

Note: Tolerances on initial conditions are given in Table V-2.

TABLE IV-2

LOFT REACTOR TRIP AND PPS ACTUATION SETPOINTS

Signal	Nominal Setpoint
Low Hot Leg Pressure Scram	2046 psig (14.19 MPa)
High Hot Leg Temperature Scram	590° F (583 K)
Low PCS Flow Scram	3.43×10^6 lbm/hr (433.08 Kg/sec)
High Total Reactor Power Scram	51.5 MWt
High Hot Leg Pressure Scram	2269 psig (15.73 MPa)
Low Steam Generator Water Level Scram (manual)*	-32 inches (-0.81 m)
Steam/Feedwater Flow Mismatch (manual)*	Steam flow greater than feedwater flow by 35% of nominal flow rate
Post-Scram Steam Control Valve Cycling Valve Closure	920 psig (6.42 MPa)
Valve Opening	1020 psig (7.12 MPa)
PRZ. Power Relief Valve Opens	2410 psig (16.7 MPa)
PRZ. Power Relief Valve Closes	2390 psig (16.56 MPa)
S. G. Main Feedwater Pump Trip	Indirect Trip on Scram
PRZ HTR ON	2141 psig (14.85 MPa)
PRZ HTR OFF	2171 psig (15.05 MPa)
PRZ BACKUP HTR OFF	2151 psig (14.92 MPa)
PRZ BACKUP HTR ON	2136 psig (14.81 MPa)
PRZ Spray ON	2210 psig (15.32 MPa)
PRZ Spray OFF	2186 psig (15.16 MPa)

*To be used in Test L6-1 only.

TABLE IV-3

INTACT LOOP PRESSURE DROP

Location	Instrument	ΔP psid (Kpa)	K
RV_{out} to SG_{in}	PdE-PC-3	3.70 (25.51)	0.6524
SG_{in} to $Pump_{in}$	PdE-PC-2	35.33 (243.60)	6.3968
$Pump_{out}$ to RV_{in}	Pde-PC-5	3.03 (20.89)	0.5605
RV_{in} to RV_{out}	PdT-P139-30	25.50 (175.82)	4.6171
Pump (Total ΔP)	PdE-PC-1	67.56 (465.83)	12.2403

ΔP values are based on a PCS flow of 3.8×10^6 lbm/hr (478.8 Kg/sec) and system temperature distribution of $535^{\circ}F$ (552.6 K) vessel inlet, $570^{\circ}F$ (572 K) vessel outlet, and vessel (and SG) Tave of $552.5^{\circ}F$ (562.3 K).

$K = 2g_c \rho A^2 \Delta P/m^2$ and is based on a flow area of 0.6827 ft^2.

V. TEST REQUIREMENTS

This section is intended for facility and operating personnel's use. It provides the system configuration and the initial conditions that must be established prior to test initiation.

All systems shall be operated per the Technical Specifications. Deviations from the Plant Operating Manual (POM) may occur and are covered by the Experiment Operating Procedure (EOP).

5.1 Configuration Control

No modifications or alterations should be made to LOFT systems or data acquisition and instrumentation systems after an experiment has been completed until approval of the Joint Experiment Group (JEG) is obtained. This is to allow evaluation of a system or component, should unexpected experimental results be obtained.

5.2 System Configuration

5.2.1 Emergency Core Coolant Systems. Test L6-6 requires the use of HPIS Pump A at 25 gpm delivering demineralized water to the intact loop cold leg. All other ECC system parameters for all L6 series tests will be as required for normal power operation.

5.3 Initial Conditions

Prior to initiating any anticipated transient, the following initial conditions must be established.

5.3.1 Operating History. For the anticipated transient test series, a reactor scram is expected to occur thus terminating the significant energy generation. It should be noted that only in test

L6-1 is the probability of scram ambiguous. Therefore, a representative level of decay heat should be obtained by power operation prior to test initiation. Consequently, with the concurrence of the LOFT Test and Data Branch, and the Reactor Systems Branch, the following requirements are to be met prior to test initiation:

1. Test L6-1 and L6-3 will achieve a power level and operating time sufficient to produce at least 250 kW at a time of 4000 seconds after scram.

2. Test L6-2 will achieve a power level and operating time sufficient to produce at least 277 kW at a time of 4000 seconds after scram.

5.3.2 System Conditions. The initial conditions identified in Table V-2 shall be established prior to initiating the test. Systems or controllable parameters not identified in the table or this section have no programmatic importance and will be operated per Plant Operating Manual requirements.

5.3.2.1 Pressurizer Heaters. The pressurizer heaters will be allowed to cycle on pressure in the normal operating mode.

5.3.2.2 Blowdown Recirculation Lines. Blowdown leg recirculation flows will be used during the tests.

5.3.2.3 Broken Loop Hot Leg Heaters. Power to the broken loop hot leg heat tracing shall be continued during the tests. Prior to test initiation, the heat tracing shall be used as required to obtain the specified hot leg temperature. Heaters can be turned off at the completion of each experiment.

5.4 Actions Required For Testing

Manual operator action is required to initiate each test in the series. Monitoring of PPS parameters during each test to ensure that the reactor scrams at the proper value is also required.

5.4.1 Specific Actions for Each Test.

L6-1 Loss of Steam Load

The test will be initiated by manually closing the main steam flow control valve. With the corresponding increase in both PCS and SCS pressure and temperature, reactor power will decrease. The reactor is expected to scram on either the PCS hot leg temperature or pressure trip setpoints. Should selected setpoints on the secondary side be exceeded, the reactor will be manually scrammed. If the reactor conditions do not violate any automatic or manual setpoints, active operator intervention will not be required until the PCS pressure and temperature have stabilized. If the reactor has not scrammed, the plant will then be stabilized in Mode 6. Should the scram occur, the plant will be returned to the hot shutdown mode, following stabilization of the PCS. Operator intervention will be required for the monitoring of selected measurements. The channels needing surveillance are the hot leg pressure and temperature, and steam generator secondary pressure and level. Manual opening of the main steam flow control valve may be required if the SCS pressure approaches the safety valve setpoint of 1100 psia.

L6-2 Loss of Forced PCS Flow With PCP Coastdown

The experiment is initiated by manually tripping the power to the prime mover motors on the primary coolant pump motor generator set. The reactor is expected to scram on the low PCS flow setpoint followed by a subsequent PCS pressure/temperature decrease and SCS pressure/temperature increase. The steam flow control valve and feedwater system after scram logic will control the secondary system. PCS stabilization is expected to occur at 150 seconds and 2170 psia. Stabilization of the SCS is expected shortly thereafter. Specific operator intervention is not required until this time when the system should be brought to a hot standby condition. Monitoring the PCS flowrate in conjunction with the rod bottom lights will be required to ensure reactor scram.

L6-3 Excessive Load Increase

Test initiation will be the opening of the main steam flow control valve at maximum rate to the full open position. Feedwater flow control will be left on automatic to ensure a proper steam flow/feedwater flow match. Both primary system temperature and pressure will begin decreasing and reactor power will increase until either a scram on high power or low pressure occurs. Should temperature and pressure in the hot leg decrease sufficiently rapid enough, a low hot leg pressure scram will occur, possibly prior to a high power scram. Operator intervention should not be required throughout the transient until the PCS conditions have stabilized. At that time, steps should be taken to

place the plant in a hot standby mode. Monitoring of the reactor power level, hot leg pressure and temperature, and secondary conditions will be required.

L6-4 Inadvertent Rod Bank Withdrawal at Power

All control rods will be withdrawn from an initial rod position of 50 inches with the reactor at 37.5 MWt. Reactor power, pressure, and temperature will start to increase with similar increases in SCS temperature/pressure. Depending on the rod worth for a withdrawal from 50 inches, the scram setpoint may or may not be reached. All PPS channels should be monitored to ensure that setpoints for scram are complied with.

L6-5 Loss of Steam Generator Feedwater

The main feedwater pump supplying fluid to the steam generator will be stopped and the feedwater flow control valve will be closed to start this test. As heat removal decreases, the PCS temperature and pressure will start to increase, decreasing reactor power. The reactor will be manually scrammed when the indicated steam generator water level reaches -5 inches (zero reference is 116 inches above the tube sheet). There is presently no automatic scram on low steam generator water level so manual operator action is required. If the manual scram is not accomplished, the reactor will scram later on high PCS hot leg temperature. The additional time will allow the steam generator water level to decrease to about 8 inches above the top of the tube sheet before the scram occurs causing an unacceptable dryout of the tube bundle. PPS

channels that should be monitored are PCS temperature and pressure. SCS pressure and level should also be observed, although they are not PPS channels.

L6-6 Inadvertent Boron Dilution

Pressurizer level will be lowered to the bottom of the control band and HPIS flow at 25 gpm using demineralized water will be initiated to start this test. Reactor power will start to increase as the net boron concentration in the PCS decreases. PCS and SCS temperatures and pressures will start to increase, causing negative reactivity input to the reactor. The scram will probably occur on high PCS temperature or pressure. This transient will take more time than the others due to the combination of positive reactivity addition from boron concentration decrease and negative reactivity addition from increasing PCS temperature. All PPS channels and SCS pressure and steam generator level should be monitored. If a high pressurizer level (53.0 inches) is encountered prior to automatic scram, manually scram the reactor to avoid a solid pressurizer. This could occur as early as 298 seconds.

5.4.2 Core Monitoring. During all tests monitor vessel inlet and outlet temperatures and upper and lower end box temperatures for evidence of natural circulation or upper end box temperatures greater than 100°F above saturation (L6-2 only). See Section 5.5 "Abnormal Conditions", for any required corrective actions.

5.4.3 Steam Generator Safety Valve Discharge Line Temperature. On five minute intervals from test initiation to end of test and on indications of safety valve lifting, obtain a printout from the FTM of

the temperatures indicated by TE-P4-135 and TE-P4-136. Transmit the data sheet to LOFT Program Planning after test completion. This is applicable to all tests except L6-3.

5.4.4 Test Termination. The test shall not be terminated, except in case of emergency, nor shall data acquisition be stopped until the following termination criteria, inclusive, are met.

a. Pressurizer level has been recovered to the normal band

b. Positive operator control of pressurizer pressure on heaters and spray has been restored consistent with the MPT curve

c. Steam flow control valve, CV-P4-10, is no longer cycling

d. Steam generator pressure in equilibrium, within 50 psig, with hot leg temperature, or SCS and PCS in controlled cooldown, and

e. Steam generator narrow range level indication has been recovered and level is increasing.

There are no programmatic experimental requirements for operator actions after the data recording has been stopped.

Table V-1 identifies the sequence of events expected to occur during the tests in the series. The table is presented to provide an understanding of the events taking place.

5.4.5 Plant Recovery Criteria. Operator intervention to recover the plant shall be delayed until at least the time specified in Table V-1 and JEG concurrence has been obtained. Recovery shall be in accordance with applicable POM procedures.

5.5 Abnormal Conditions

This section covers system failures and accidents that could take place prior to and during a test.

5.5.1 Unplanned Events Prior to Test Initiation.

5.5.1.1 DAVDS Recording Failure. If a DAVDS recording system or tape deck fails prior to initiating the experiment, the test should be placed in "Hold" until the system is repaired or until a coordinated decision by the JEG is reached to proceed with the experiment.

5.5.1.2 Reactor and Associated Systems Abnormalities. There are no LOFT Program experimental requirements for operator actions taken to mitigate any abnormal condition occurring prior to initiating a test. Should an unplanned event and recovery take place, the initial conditions of this EOS shall be reestablished prior to initiating the test.

Test initiation is defined as the time when the specific intentional disturbance to equilibrium reactor operation is initiated. These disturbances are different for each test in the L6 series.

5.5.2 Unplanned Events After Test Initiation.

5.5.2.1 DAVDS Recording Failure. Since the experiments are expected to last 1800 to 3600 seconds, the experiment should continue until it is determined that the DAVDS cannot be repaired unless experimental measurements required for test monitoring are lost. In that case the plant should be manually scrammed and Plant Operating Manual Procedures should be used for recovery.

5.5.2.2 Reactor and Associated Systems Abnormalities. The test should be terminated if any condition occurs that causes loss of control of the experiment. Loss of control shall be considered as loss of instruments used to monitor test progression; loss of control shall also be defined as the loss of effective operator actions to control or guide the plant during system recovery. If any cladding temperature determination exceeds 680^{O}F at any time, terminate the test.

TABLE V-1

GENERAL TEST SEQUENCE[a]

Time	Function
Prior to initiating the test.	Complete instrument calibrations per Section 6.3, and establish accumulator, BST, and BWST conditions
	Bring reactor critical
	Approach to specified power and intermediate power plateau testing
	Take PCS and SCS water samples Perform data integrity checks
	Start DAVDS
TEST L6-1	
T_o	Close main steam flow control valve on steam generator
T_o + 50 sec	Reactor scram from high PCS temperature or pressure
T_o + 100 sec	PCS temperature stablized, SCS temperature/pressure no longer increasing
T_o + 105 sec	Recovery begins

a. The general test sequence prior to T_o is applicable to the first anticipated transient only. The timing of events in this table are to be considered as estimates only and therefore may not represent the true behavior of the experiment.

TABLE V-1 (Cont'd)

Time	Function
TEST L6-2	
T_o	Primary coolant pump prime mover motors de-energized
T_o + 4 sec	Reactor scram from low PCS coolant flow
T_o + 6 sec	Control rods bottom
T_o + 20 sec	Pump rpm coastdown to 750 rpm. Pump generator field breakers trip
T_o + 150 sec	PCS temperatures stabilized and converging on a constant core ΔT
T_o + 200 sec	SCS pressure stops increasing
T_o + 210 sec	Recovery begins
TEST L6-3	
T_o	Open main steam flow control valve on steam generator
T_o + 12 sec	Reactor scram on high total power (52 MWt)
T_o + 14 sec	Control rods bottom
T_o + 40 sec	PCS temperatures stabilized and converging on a T_{ave} value
T_o + 100 sec	SCS pressure stops increasing
T_o + 110 sec	Recovery begins

TABLE 4-1 (Cont'd)

Time	Function
TEST L6-4	
T_0 - [illegible] hour	Control rods adjusted to 50 inches withdrawn at 37.5 MW by boron adjustment
T_0	All rods withdrawn to 54 inches
T_0 + 420 sec	Reactor power increased to 47 MWt
T_0 + 450 sec	PCS and SCS temperatures/pressures stabilized at equilibrium values
T_0 + 500 sec	Manual scram
T_0 + 510 sec	Recovery begins
TEST L6-5	
T_0	Main feedwater pump de-energized and feedwater flow control value closure initiated
T_0 + 20 sec	Steam generator level reaches -5 inches (111 inches above tubesheet) Manual Reactor Scram
T_0 + 80 sec	PCS temperatures stabilized and converging on T_{ave} value
T_0 + 120 sec	SCS pressure stops increasing
T_0 + 125 sec	Recovery begins

TABLE V-1 (Cont'd)

Time	Function
TEST L6-6	
T_o - 60 sec	Pressurizer level adjusted to low level alarm (slightly greater than 18 inches)
T_o	HPIS flow at 25 gpm using demineralized water initiated to cold leg of intact loop
T_o + 298 sec	High pressurizer level. Manual reactor scram
T_o + 320 sec	PCS temperatures stabilized and converging to T_{ave} value
T_o + 340 sec	SCS pressure stops increasing
T_o + 350 sec	Recovery begins

TABLE V-2

INITIAL CONDITIONS[a]

Primary Coolant System	Operating Band	Test L6-1	L6-2	L6-3	L6-4	L6-5	L6-6
Power Level (MW)	± 1	37.5	37.5	37.5	37.5	37.5	37.5
Flowrate ($\times 10^6$ lbm/hr)	±0.05	3.8	3.8	3.8	3.8	3.8	3.8
Pressure (psig)	± 15	2156	2156	2156	2156	2156	2156
Pzr Level (in.)	± 7	44.5	44.5	44.5	44.5	44.5	20.0
Control Rod Posn (in.)	±0.5	54	54	54	50	54	54
RV Inlet Temp (^{0}F)	± 2	535	535	535	535	535	535

EMERGENCY CORE COOLANT SYSTEM

Accumulator	Operating Band	Test
Liquid Level (in.)		As Required For Plant Operation
Pressure (psig)		
Temperature (^{0}F)		
HPIS[b]		
Flowrate (gpm)	±2	As Required For Plant Operation 25
Initiation (psig)	±27	2156
LPIS		
Initiation (psig)		As Required For Plant Operation

a. Values shown are indicated values.

b. Operating bands applicable to Test L6-6 only.

TABLE V-2 (Cont'd)

Primary Coolant System	Operating Band	Test L6-1	L6-2	L6-3	L6-4	L6-5	L6-6
BST							
Liquid Level Liquid Temperature Pressure		As Required For Plant Operation					
Broken Legs							
Cold Leg Temp. (°F) Indicated by TE-P138-170	±25	535	535	535	535	535	535
Hot Leg Temp (°F) Indicated by TE-P138-171	±25	535	535	535	535	535	535
Secondary Coolant System							
Steam Generator Liquid Level (in.)	±2	7.5	7.5	7.5	7.5	7.5	7.5

VI. MEASUREMENT REQUIREMENTS

6.1 Normal Measurement Requirements

Measurements required for the L6 series of experiments are identified on the Data Acquisition Requirements Lists (DARL) to be publisned prior to each test.

The DDAPS and analog systems will be used for long term data recording and the DDAS will be used for short term recording (-30 to 200 seconds).

DDAPS and analog recording will be required from -30 seconds until the plant is stable. Approximate times for each test are as follows:

L6-1	1800 seconds
L6-2	1800 seconds
L6-3	1800 seconds
L6-4	3600 seconds
L6-5	1800 seconds
L6-6	3600 seconds

No later than 2 weeks prior to the scheduled test, LOFT Program will transmit, by letter, the updated measurement requirements to the LOFT Facility Division. A copy of these requirements will be sent to DOE/NRC.

6.2 Minimum Measurement Requirements

Measurements that fail prior to test initiation should be repaired if possible. If a failed instrument(s) cannot be repaired, the JEG shall determine the course of action.

To assist the JEG with determining their course of action the following critical measurements list is provided. The list identifies measurements which are considered important for each experiment:

Critical Measurements List

(1) Steam generator fluid conditions

Pressure	PT-P004-10A
Level	LT-P004-008B
	LT-P004-008A

(2) Pressurizer fluid conditions

Temperature		TE-P139-19
	or	TE-P139-20
Pressure		PT-P139-005
	or	PE-PC-004
Level		LT-P139-006
	or	LT-P139-007
	or	LT-P139-008

(3) Upper plenum pressure PE-1UP-1A

(4) At least 1 upper end box thermocouple from each instrumented fuel module

TE-1UP-1
TE-2UP-1 or 3
TE-3UP-1
TE-4UP-1 or 3
TE-5UP-1 through 8 (Any 1 of)
TE-6UP-1 or 3

(5) Lower plenum pressure
PE-1ST-1A or PE-2ST-1A

(6) At least 1 lower end box thermocouple from each instrumented fuel module
TE-1LP-1
TE-2LP-1 or 3
TE-3LP-1
TE-4LP-1 or 3
TE-5LP-2 or 4
TE-6LP-1 or 3

(7) Cladding thermocouples monitored to ensure test safety

(8) Feedwater fluid conditions

Flow	FT-P004-72A
Pressure	PT-P004-034
Temperature	TT-P004-004

(9) Steam flowrate FT-P004-012

(10) Cold leg temperature TE-P139-28-2

(11) Hot leg temperature TE-P139-32-2

6.3 DAVDS Calibration Requirements

The DAVDS calibration and data recording should be performed for these tests in the normal manner. The reduced and zero flow measurements must be made prior to plant criticality. (See LOFT Technical Specifications.) The following paragraphs are organized and data requirements listed for each temperature.

(1) Ambient Temperature (~230°F or ~383 K)[a]

(a) With system pressure at 500 psig (3.45 MPa) run a DAVDS calibration check.

(b) Record 20 sec of data at 200, 500, 1000, 1500, 2000, and 2250 psig (1.38, 3.45, 6.89, 10.3, 13.8, and 15.5 MPa) and no flow in both increasing and decreasing directions (11 points).

(c) Start the pumps and take 20 seconds of data at 15, 20, 30, 40, 50 and 60 Hz (pressure as specified by LOFT Facility) in both increasing and decreasing directions (11 points).

(2) Raise primary system temperature to 300° ± 5°F (422 ± 3 K).[b] When the temperature has stabilized within the error bands and pressure is that specified by LOFT Facility:

(a) Record 20 seconds of data at the steady state flow and temperature.

(3) Raise primary system temperature to 420 ± 5°F (489 ± 3 K).[b] When the temperature has stablized within the error bands and pressure is that specified by LOFT Facility:

(a) Take 20 seconds of data at the steady state temperature and then shut the pumps off, recording coastdown data.

(b) Take 20 seconds of data at the no flow condition.

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a. Test L6-2 only.

b. May be omitted with the concurrence of the LOFT Data Analysis Branch.

(4) Raise primary system temperature to 540 ± 2°F (555.4 ± 1 K).[a] When temperature has stabilized within the error bands and pressure is that specified by the LOFT Facility Division:

(a) Take 20 seconds of data at the steady state temperature and then shut the pumps off, recording coastdown data.

(b) Take 20 seconds of data at the no flow condition.

(c) With the pumps off vary system pressure and take 20 seconds of data at 2250, 2000, 1800, 1600, and 1400 psig (15.5, 13.78, 12.4, 11, and 9.65 MPa) in both increasing and decreasing directions (9 points).

(d) Start the pumps and record 20 seconds of data at 15, 20, 30, 40, 50, and 60 Hz in both increasing and decreasing directions (11 points).

(e) With system pressure at 2250 psig (15.5 MPa) and 540°F (555.4) run a DAVDS calibration check.

(5) If the primary system temperature is at 540 ± 2°F as a result of performing a previous experiment:[b]

(a) Take 20 seconds of data at the steady state temperature and then shut the pumps off, recording coastdown data.

(b) Take 20 seconds of data at the no flow condition.

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a. Test only.

b. Tests L6-1 and L6-3 only.

(c) Vent and check instrumentaton lines on measurements PE-PC-5 and PE-PC-6.

(6) At approximately 2 hours prior to T_0 run a DAVDS calibration check.

REFERENCES

1. D. L. Reeder, LOFT System of Test Description (5.5 ft Nuclear Core 1 LOCES), NUREG/CR-0247, TREE-1208, (July 1978).