H009-M-808

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U.S. DEPARTMENT OF ENERGY

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DOE/SF/10499-T138 (STMPO 593)	DE-AC03-79SF10499	UC 62, 62c, 62d

4. Title
Receiver "Cold Flow" (Controls) Preoperational Test Procedure 1010, Rev.

5. Type of Document ("x" one)
- [X] a. Scientific and technical report
- [ ] b. Conference paper: Title of conference _____
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P.O. Box 366, Daggett, CA 92327 (619) 254-2672

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H009-M-808

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SAN FRANCISCO OPERATIONS OFFICE

CONTRACTOR REQUEST FOR PATENT CLEARANCE
FOR RELEASE OF UNCLASSIFIED DOCUMENT

Prime Contract No. DE-AC03-79SF10499
Subcontract No. (N/A)
Report No. (STMPO 593) DOE/SF/10499-T138
Date of Report
Name & Phone No. of DOE Technical Representative S.D. Elliott, Jr. (619) 254-2672

TO: Roger S. Gaither, Asst. Chief for Prosecution
Office of Patent Counsel/Livermore Office
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FROM:
McDonnell Douglas Corporation
3855 Lakewood Blvd.
Long Beach, CA 90846

1. Document Title: Receiver "Cold Flow" (Controls) Preoperational Test Procedure 1010, Revision 0

2. Type of Document: X ☐ Technical Report, ☐ Conference Paper, ☐ Journal Article, ☐ Abstract or Summary, ☐ Copy of Oral Presentation, ☐ Other (please specify): _____

3. In order to meet a publication schedule or submission deadline, patent clearance by (Routine) would be desired.

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Title Asst. Chief Patent Counsel, MDC (MS 122-23)
Signature _____ Date 26 Sep 84

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DOE/SF/10499-T138
(STMPO-593)

RECEIVER "COLD FLOW" (CONTROLS)
PREOPERATIONAL TEST
PROCEDURE 1010
REVISION 0

UNITED STATES DEPARTMENT OF ENERGY/
SOUTHERN CALIFORNIA EDISON COMPANY

10 MWe SOLAR PILOT PLANT
DAGGETT, CALIFORNIA

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
HUNTINGTON BEACH, CALIFORNIA

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RECEIVER "COLD FLOW" (CONTROLS)
PREOPERATIONAL TEST (1010)

TABLE OF CONTENTS

INTRODUCTION

The purposes of the 1000 series preoperational tests are to:

(1) Verify the "process" operation of solar specific portions of the plant.

(2) Develop the control functions and/or field tune the individual plant controllers.

(3) Verify selected portions of the Plant Operating Procedures (Ref. RADL 2-36, Plant Operating/Training Manual)

As a result in addition to satisfying the stated Acceptance Criteria (Section 2.0), portions of this procedure are designed to gather data required to develop and refine the basic control functions. Also, the actual procedures themselves (step-by-step activities) will be evaluated against currently published operating procedures. In the event selected steps of the procedure do not produce the desired condition or better ways of achieving the desired conditions are identified, the operating and test procedures will be revised (red lined in the field) to support subsequent testing.

In the event stated test objectives or acceptance criteria are not fully satisfied due to technical, cost, or schedule considerations, a field decision will be made by the members of the Test Working Group to move forward through the test procedure or to retest (with possible equipment modification) until satisfactory results are acheived. From a program cost and schedule standpoint, it is intended to move forward through the procedure unless issues of equipment or personnel safety are involved. Problem areas will be so noted and serve as detailed test objectives for subsequent "in depth" test activities to be carried out as part of the Operational Test Program.

Preoperational test 1010 involves cold flow through the receiver and includes the following major activities:

(1) Receiver and flash tank GN_2 pressurization

(2) Bypass flow to the flash tank, circulation, and condensate cleanup.

(3) Receiver fill
(4) Receiver panel circulation
(5) Flash tank pressure/leak check*
(6) Receiver pressure/leak check*
(7) Receiver drain and GN_2 backfill
(8) Shutdown and Inspection

Major process elements to be investigated during this test are shown schematically in Figure 1.

*May be deleted if flash tank and receiver hydrostatic tests were conducted following the chemical cleaning and steam blow and the system was completely (mechanically) restored.

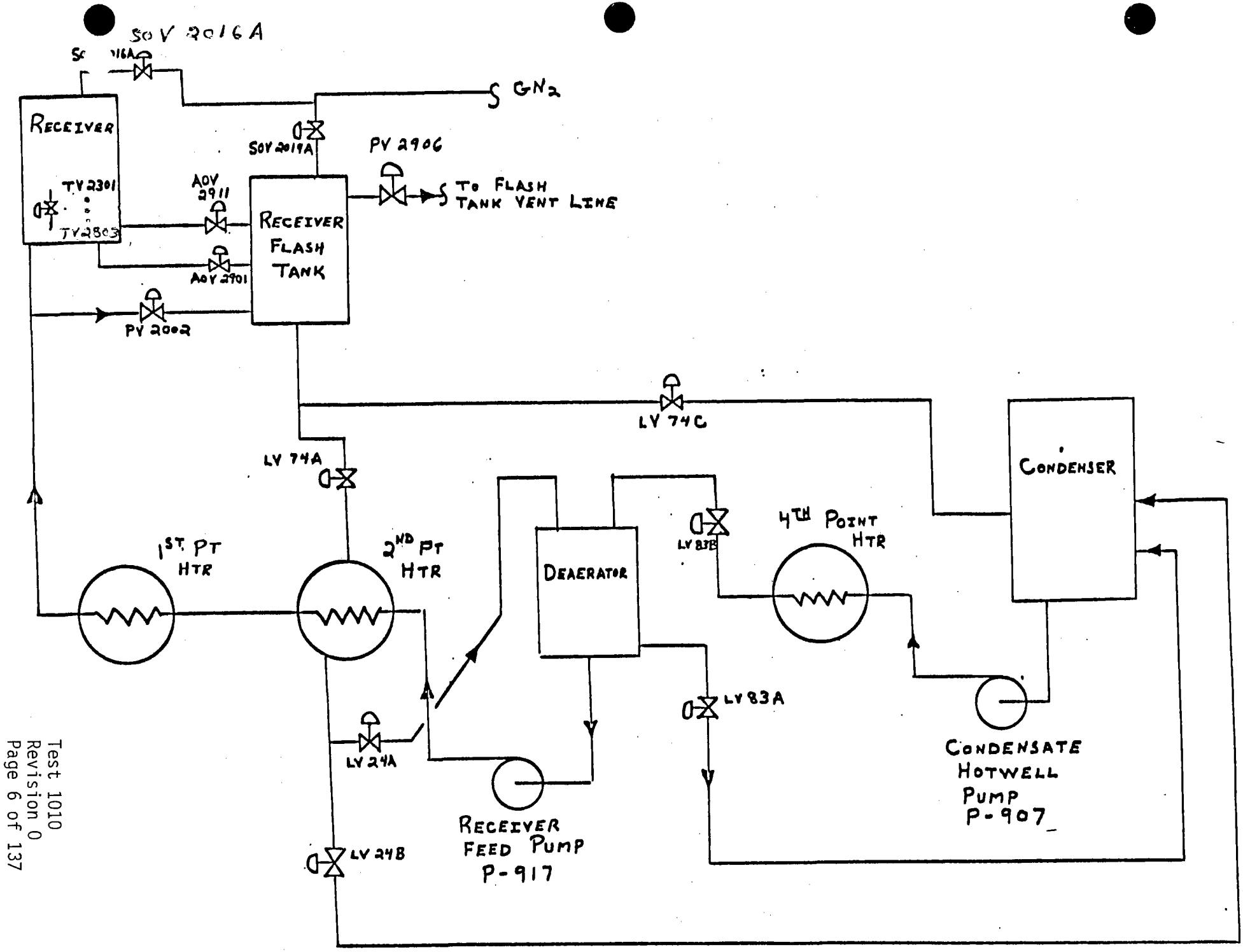


Figure 1. Preoperational Test 1010 Principal Flow Paths

1.0 OBJECTIVES

General: Demonstrate satisfactory operation of all applicable instrumentation systems from sensor to data recording, display, and transmission to the MDAC computer at Huntington Beach.

1.1 Receiver and Flash Tank GN_2 Pressurization

1.1.1 Demonstrate that the receiver can be pressurized to 10 psig with low pressure GN_2.

1.1.2 Demonstrate that the receiver flash tank can be pressurized to 400 psig with high pressure GN_2 and determine the time required to carryout the pressurization process.

1.1.3 Demonstrate that the high pressure GN_2 contained in the flash tank does not leak back into the receiver or into the downstream piping.

1.2 Receiver Bypass Flow to the Flash Tank and Condensate Cleanup

1.2.1 Demonstrate that initial feedwater circulation can be established to the receiver flash tank.

1.2.2 Demonstrate satisfactory low flow closed loop operation of the flash tank level control valves (LV-74A and LV-74C) using control loops LC 74A and LC 74C. Tune control loops.

1.2.3 Obtain process control open loop data required for control tuning of feed pump P-917 controller PC 1105. (Pressure/flow response to pump speed command).

1.2.4 Demonstrate satisfactory closed loop operation of the receiver feed pump while under pressure control.

1.2.5 Verify that the feedwater chemistry can be established to within acceptable limits.

1.3 Receiver Fill

1.3.1 Demonstrate that the receiver can be filled.

1.3.2 Develop an estimate of the fill time required.

1.4 Receiver Panel Circulation

1.4.1 Demonstrate that panel flow can be passed to the receiver flash tank.

1.4.2 Verify that a uniform flow distribution exists between the three parallel preheat panel passes.

1.4.3 Demonstrate satisfactory closed loop operation of the flash tank level control valves (LV 74A and LV 74C) using control loops LC 74A and LC 74C. Tune control loops.

1.4.4 Obtain panel flow data (all panels) and control valve flow coefficient data-CV-(appropriate panels) under steady flow conditions at value strokes of 0, 5, 10, 20, 50, 70, 80, 90, and 100%.

1.4.5 Obtain process control open loop data required for tuning of receiver panel flow control loops for a high and low panel (panels No. 10 and 4).

1.4.6 Demonstrate satisfactory closed loop operation (and tune if required) of the receiver panel flow control loops for TC 2301 (panel 4) and TC 2501 (panel 10) while in flow control mode at both low and high flows.

1.4.7 Demonstrate satisfactory closed loop flow control on all panels (TC 2301 --- TC 2803) simultaneously at maximum allowable flash tank flow rates.

1.4.8 Obtain process control open loop data required for control tuning of the receiver feedwater pump control loop PC 1105 over the flow range of 12,000 - 40,000 lb/hr (net receiver flow rate).

1.4.9 Demonstrate satisfactory switch over of receiver feedwater pump controller PC 1105 from pressure to valve control.

1.4.10 Demonstrate satisfactory control of the receiver feedwater pump loop PC 1105 while under valve control.

1.4.11 Field tune the second point heater drain valve controllers (LIC 83A and LIC 83B) as required.

1.4.12 Field tune the deaerator level controllers LIC 83A and LIC 83B as required.

1.5 Flash Tank Pressure/Leak Check

1.5.1 Verify that the flash tank circuit including all restored components are leak free.

1.5.2 Verify the proper operation of the high pressure flash tank alarm function (PAH 2906).

1.6 Receiver Pressure/Leak Check

1.6.1 Verify that the receiver boiler circuits including all restored components are leak free.

1.6.2 Verify the proper operation of the high pressure alarm function (PAHL 2902).

1.6.3 Verify that the receiver preheater circuit including all restored components are leak free.

1.6.4 Verify the proper operation of the high pressure alarm function (PAH 2002).

1.7 Receiver Drain and GN_2 Backfill

1.7.1 Demonstrate that the receiver can be drained and backfilled with low pressure GN_2.

1.7.2 Demonstrate the AOV 2901 "Enable"/"Disable" function.

1.8 Shutdown and Inspection

1.8.1 Verify satisfactory operation of the receiver filter and orifices.

2.0 ACCEPTANCE CRITERIA	Verification Paragraph	Objective
General Criteria: Proper data is being gathered, displayed, recorded, and transmitted to MDAC at Huntington Beach.		
2.1 Receiver and Flash Tank GN_2 Pressurization		
2.1.1 A receiver pressure of 10 psig can be maintained by the nitrogen system with the vents, drains, flash tank inlet, and downcomer valves in their closed positions.	8.1.3 8.1.5	1.1.1
2.1.2 A receiver flash tank pressure of 400 psig can be established and maintained (with the inlet nitrogen supply shut off) with the flash tank inlet valves closed and the discharge control valves closed or in their normal control positions.	8.1.8 8.1.9	1.1.2 1.1.3
2.2 Receiver Bypass Flow to the Flash Tank, Tuning of Level Control Valves, and Condensate Cleanup		
2.2.1 A satisfactory procedure has been carried out for establishing feedwater circulation to the flash tank.	8.2.1 8.2.10	1.2.1
2.2.2 Closed loop test acceptance criteria applied to LV 74A and LV 74C. Closed loop response is stable and well behaved in the presence of set point changes and process disturbances.	8.2.11 8.2.14	1.2.2

		Verification Paragraph	Objective
2.2.2	Mode switching transients do not significantly degrade plant operation or cause conditions to exceed design requirements. All alarms and limits are acceptable for safe, controlled operation. Control logic for initialization, mode transfers, and shutdown is satisfactory. Monitored, displayed, and recorded data is satisfactory for evaluating the closed loop test performance. Adequate control loop stability margins are maintained and verified for the full range of operation.		
2.2.3	Open loop test acceptance criteria applied to PC 1105. Monitored and recorded data are valid and meet the evaluation requirements (parameters, scan rate, calibration, measurable output) over the specified range of test conditions.	8.2.15 8.2.17	1.2.3
2.2.4	Closed loop test acceptance criteria applied to PC 1105 while operating under pressure control. (See acceptance criteria 2.2.2)	8.2.18	1.2.4
2.2.5	Feedwater chemistry alarms have all cleared.	8.2.19	1.2.5

		Verification Paragraph	Objective
2.3	Receiver Fill		
2.3.1	A satisfactory procedure has been carried out for filling the receiver panels.	8.3.2 8.3.9	1.3.1
2.3.2	A measure of the required fill time has been made.	8.3.8 8.3.9	1.3.2
2.4	Receiver Panel Circulation		
2.4.1	A satisfactory procedure has been carried out for establishing flow to the flash tank through the receiver panels.	8.4.1 8.4.4	1.4.1
2.4.2	Feedwater flow is evenly divided between the three parallel pre-heater flow paths.	8.4.5	1.4.2
2.4.3	Closed loop test acceptance criteria applied to LC 74A and LC 74C. (Same as criteria listed in Section 2.2.2)	8.4.10 8.4.12 8.4.15	1.4.3
2.4.4	Satisfactory panel flow and control valve flow coefficient (CV) data has been obtained for each of the indicated panels at the required valve positions.	8.4.16	1.4.4

		Verification Paragraph	Objective
2.4.5	Open loop test acceptance criteria applied to panels 4 and 10. (Same as criteria listed in Section 2.2.3).	8.4.17	1.4.5
2.4.6	Closed loop test acceptance criteria applied to TC 2301 (panel 4) and TC 2501 (panel 10) operating in flow control mode. (Same as criteria listed in Section 2.2.2).	8.4.18	1.4.6
2.4.7	Closed loop test acceptance criteria applied to all 18 panel controllers simultaneously while operating in flow control mode. (Same as criteria listed in Section 2.2.2).	8.4.19	1.4.7
2.4.8	Open loop test acceptance criteria to PC 1105. (Same as criteria listed in Section 2.2.3).	8.4.20	1.4.8
2.4.9	Feed pump operation remains stable and controlled when controller PC 1105 is switched from pressure to valve control.	8.4.21.4 8.4.21.12	1.4.9

		Verification Paragraph	Objective
2.4.10	Closed loop test acceptance criteria applied to PC 1105 while operating under valve position control. (Same as criteria listed in Section 2.2.2).	8.4.21	1.4.10
2.4.11	Closed loop test acceptance criteria applied to controller LIC 24A. (Same as criteria listed in Section 2.2.2).	8.4.10.2	1.4.11
2.4.12	Closed loop test acceptance criteria applied to controllers LIC 83A and LIC 83B. (Same as criteria listed in Section 2.2.2).	8.4.10.3 8.4.10.4	1.4.12
2.5	Flash Tank Pressure/Leak Check		
2.5.1	Flash tank system including all restored components has been verified to be leak free.	8.5.5	1.5.1
2.5.2	Alarm PAH 2906 is activated at the desired alarm value.	8.5.3 8.5.4	1.5.2
2.6	Receiver Pressure/Leak Check		
2.6.1	The receiver (boiler) system including all restored components has been verified to be leak free.	8.6.8	1.6.1

		Verification Paragraph	Objective
2.6.2	Alarm PAHL 2006 is activated at the desired alarm value.	8.6.3 8.6.4	1.6.2
2.6.3	The receiver (preheater) system including restored components has been verified to be leak free.	8.6.8	1.6.3
2.6.4	Alarm PAH 2002 is activated at the alarm value.	8.6.6 8.6.7	1.6.4
2.7	Receiver Drain and GN_2 Backfill		
2.7.1	A satisfactory procedure has been carried out for draining and backfilling the receiver.	8.7.3 8.7.5	1.7.1
2.7.2	Moisture accumulator level valve can be enabled and disabled through the dedicated button in the control room.	8.7.8	1.7.2
2.7.3	The moisture accumulator level control valve can maintain the level at the desired value.	8.7.8	1.7.3
2.8	Shutdown and Inspection		
2.8.1	Receiver filters and panel orifices have been inspected and problem areas (if any) have been identified.	8.8.1 8.8.3	1.8.1

3.0 REFERENCES

3.1 Pilot Plant System Documentation

3.1.1 Pilot Plant System Description, Dec. 1980

3.1.2 Pilot Plant Startup and Acceptance Test Plan, Dec. 1980

3.1.3 Plant Operating/Training Manual
Book 1 - Operating Instructions, July 1981

3.2 Logic Diagrams

3.2.1 Controller Logic Diagrams, Issued May 1981.

3.2.2 Digital Logic Diagrams (I5)

3.2.3 Solar One Digital Logic Design Criteria

3.2.4 Receiver Red Line Unit Logic Diagrams

3.3 Line Schedules

40P7002133104 Rev. 4 March 20, 1981

a) Condensate (CO)
b) Feedwater (FW)
c) Nitrogen (N)
d) Instrument Air (NA)
e) Vents (VT)

3.4 Single Line Diagrams

a) 40E700 5133351, Main One Line Diagram
b) 40E700 5133353-1,4160 Volt System
c) 40E700 5133354, 480 V. Switchgear "B01"

3.5 Piping and Instrumentation Diagrams

a) P3-1201, Receiver Preheat Panel Feedwater
b) P3-1202, Receiver Boiler Panels RB-204 through RB-206
c) P3-1203, Receiver Boiler Panels RB-207 through RB-209
d) P3-1204, Receiver Boiler Panels RB-210 through RB-212
e) P3-1205, Receiver Boiler Panels RB-213 through RB-215
f) P3-1206, Receiver Boiler Panels RB-216 through RB-218
g) P3-1207, Receiver Boiler Panels RB-219 through RB-221
h) P3-1208, Main Steam Manifold, GN_2, and Drain System
i) P3-1901, Steam System
j) P3-1903, Feedwater and condensate

3.6 Electrical Loop Diagrams

a) 9033/4 SK-EL1, TV-2301 Sheets 1-3
b) 9033/4 SK-EL2, TV-2302 Sheets 1-3
c) 9033/4 SK-EL3, TV-2303 Sheets 1-3
d) 9033/4 SK-EL4, TV-2401 Sheets 1-3
e) 9033/4 SK-EL5, TV-2402 Sheets 1-3
f) 9033/4 SK-EL6, TV-2403 Sheets 1-3
g) 9033/4 SK-EL7, TV-2501 Sheets 1-3
h) 9033/4 SK-EL8, TV-2502 Sheets 1-3
i) 9033/4 SK-EL9, TV-2503 Sheets 1-3
j) 9033/4 SK-EL10, TV-2601 Sheets 1-3
k) 9033/4 SK-EL11, TV-2602 Sheets 1-3
l) 9033/4 SK-EL12, TV-2603 Sheets 1-3
m) 9033/4 SK-EL13, TV-2701 Sheets 1-3
n) 9033/4 SK-EL14, TV-2702 Sheets 1-3
o) 9033/4 SK-EL15, TV-2703 Sheets 1-3
p) 9033/4 SK-EL16, TV-2801 Sheets 1-3
q) 9033/4 SK-EL17, TV-2802 Sheets 1-3
r) 9033/4 SK-EL18, TV-2803 Sheets 1-3
s) 9033/4 SK-EL19, TV-2906 Sheet 1
t) 9033/4 SK-EL20, TV-2002 Sheet 1
u) 9033/4 SK-EL56, FY-2233 Sheets 1-2
v) 9033/4 SK-EL58, Flow Meter Power Sheet 1
w) 9033/4 SK-EL62, RS Pressure Switch to Mux
x) 9033/4 SK-EL65, RS XMTR and RTD to MUX
y) 9033/4 SK-EL91, RS Diff. Press. XTMR to Darm
z) 9033/4 SK-EL59, RS SOV to ILS
aa) 9033/4 SK-EL61, RS POS SW to MUX
bb) 9033/4 SK-EL60, RS POS SW to ILS and Darm

3.7 Instrument Index

3.7.1 Master Equipment List (MEL)

3.7.2 Measurements List

3.7.3 Measurement User File (MUF)

3.8 Material Requisition and/or Specification

N/A

3.9 Vendor Data

N/A

3.10 Standards

N/A

3.11 Startup Schedule

3.11.1 "Best Effort" Working Startup Schedule October 20, 1981

	Initial	Date
4.0 PREREQUISITES		
4.1 Turnover of the system to SCE is complete and in accordance with Section 5.4 of the SCE Startup Manual.		
4.2 Referenced material has been reviewed and later revision (if any) will not affect this test.		
4.3 The Master Tracking System has been reviewed and outstanding items (if any) will not affect this test. A summary list of outstanding items is attached on Appendix 10A.		
4.4 The Abnormal Equipment and Circuitry Log has been reviewed, is current, and is satisfactory for this test. A summary list is attached on Appendix 10B.		
4.5 The system has been walked through and verified complete to the extent required to conduct this test.		
4.6 Related prerequisite and preoperational tests (Test Numbers 000-980) have been completed to the extent required to demonstrate the operability of the plant systems required for this test.		
4.7 All test equipment as per Section 6.0, is available, calibrated and in working order.		

Initial	Date

4.8 A pretest coordination meeting has been held to familiarize test and operations personnel with the requirements of this test.

Initial	Date

5.0 LIMITS AND PRECAUTIONS

5.1 Portions of this test involve or could involve the discharge of preheated feedwater from receiver vents and relief valves. Operating personnel should avoid being in the vicinity of the receiver (above the BCS Target level) during the conduct of this test except during specified inspection periods. In particular, extreme caution against possible receiver discharges should be exercised during the following periods:

a) Test Section 8.3 - Receiver Fill
b) Test Section 8.5 - Flash Tank Pressure/Leak Check
c) Test Section 8.6 - Receiver Pressure/Leak Check

5.2 Opening the system for final inspection (Section 8.8) should be done only after the internal system pressure and temperature are reduced to ambient conditions and proper clearances have been received.

6.0 TEST EQUIPMENT

NOTE: Test equipment equivalent to that specified may be used. Equipment serial number will be recorded prior to start of test and calibration shall be verified for expected test time period.

6.1 Indicating Instruments

None required

6.2 Sensors and Transducers

None required

6.3 Recording Equipment

6.3.1 Strip Chart Recorders

Make: Gould
Model: Brush 260
Number Required: 2

6.4 Others

6.4.1 Control Test Unit

Serial Number: MDAC Supplied
Number Required: 2

6.4.2 Transfer Function Analyzer

Make: EMR
Number Required: 1

6.4.3 Function (Wave) Generator

Make: Hewlett Packard Function Generator
Model: 3310A
Number Required: 1

6.4.4 Stop Watch

		Initial	Date
7.0	INITIAL CONDITIONS		
7.1	Environmental Conditions		
7.1.1	Testing during subfreezing periods should be avoided. In the event of a freezing condition, the receiver should be drained in accordance with the steps listed in Section 8.7.		
7.2	Temporary Installations		
7.2.1	The Frequency Generator and Control Test Unit are installed as required between the MVCU and the valve or pump during respective open loop control tests.		
7.3	Support Systems/Plant Operating Status		
7.3.1	This test requires the operation of all plant systems excluding: . Collector system . Thermal Storage System . Beam characterization system . Operational control system (OCS) and all related power, instrumentation, and control equipment.		
7.3.2	Auxiliary steam should be available to the deaerator and turbine seal steam regulator in sufficient quantities to properly deaerate the condensate and maintain a turbine/condenser vacuum.		

	Initial	Date
7.3.3 Turbine shall be on turning gear with the lube oil system operating.		
7.3.4 All aspects of the Data Acquisition System as it involves SDPC, DARMS, and SHIMMS information shall be operational including data transmission to and recording at MDAC Huntington Beach. In the event the data transmission link to Huntington Beach becomes inoperable, testing may continue at the discretion of the lead Startup Engineer.		
7.4 Process Conditions The following process and SDPC controller conditions should exist for the respective portions of this test: (Note that in carrying out the indicated Section 8 steps, controllers and hand switches are manipulated in accordance with the procedure. "Initial condition" tabulations referenced in this section refer to those specific controllers or handswitches which must be reintialized prior to proceeding to the next portion of Section 8. Those items that are unchanged from a previous initialization table or do not require further manipulation beyond its previous status are not listed in the initialization table).		
7.4.1 Applies to Test Section 8.1.		
7.4.1.1 The receiver and flash tank shall be in an unfilled condition.		

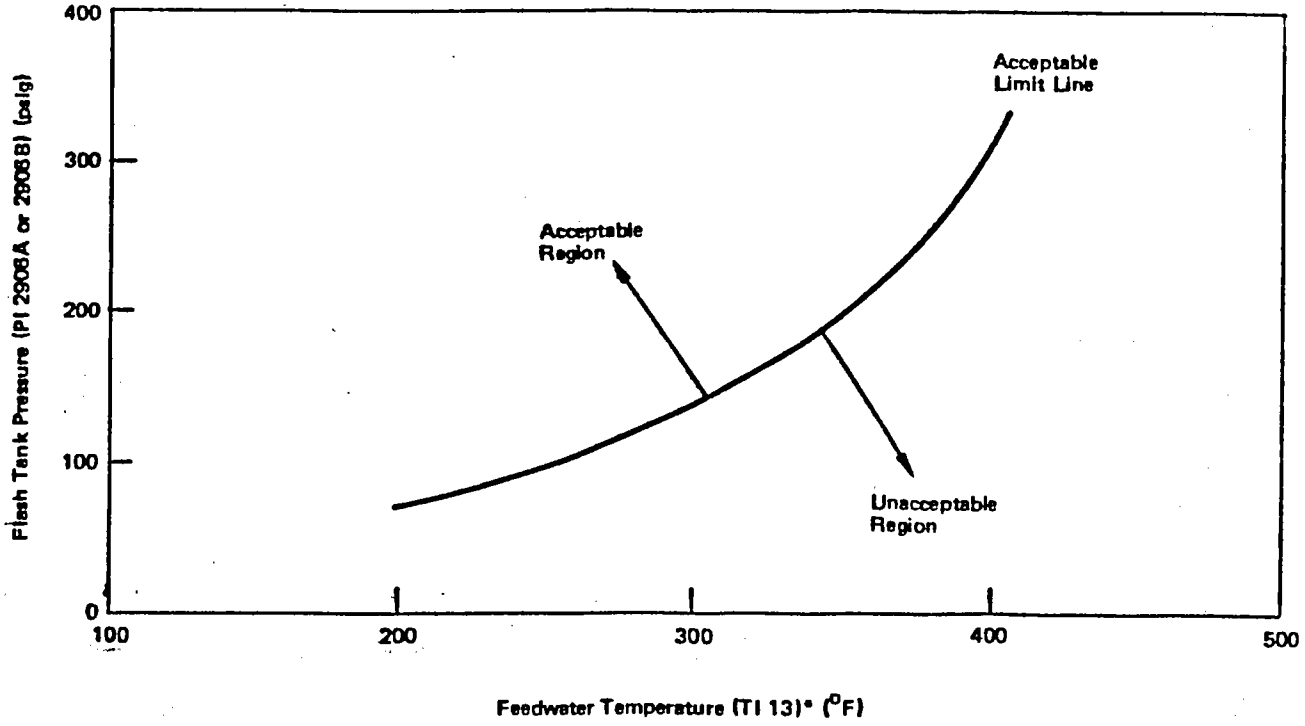
		Initial	Date
7.4.1.2	Controllers and handswitches shall be in the status identified in Table 10C-1.		
7.4.2	Applies to Test Section 8.2		
7.4.2.1	Condensate and feedwater flow shall be initiated through the feedwater heaters and bypassed through the water cleanup recirculation line (MOV 110). Circulation shall be maintained until acceptable water chemistry is established. Auxiliary steam shall be supplied to the deaerator and the receiver feed pump shall be operated in the manual (speed) control mode. (Reference: Plant Operating/Training Manual, Book 1, Instruction T-1).		
7.4.2.2	Controllers and hand switches shall be in the status identified in Table 10C-2.		
7.4.2.3	Condenser vacuum and circulating water systems shall be started and operating.		

		Initial	Date
8.0	PROCEDURE AND DATA COLLECTION		
8.1	Receiver and Flash Tank GN_2 Pressurization		
8.1.1	Verify that the initial conditions have been established as required in Section 7.4.1.		
8.1.2	Open SOV 2016A and allow the low pressure GN_2 to flow to the receiver panels (Receiver SDPC command, HS 2016 (open). Start a stop watch and measure the fill time.		
8.1.3	Allow the GN_2 pressure to reach steady state and record the value indicated on PI 2014. Measured _____ Design 10 psig Time _____		
8.1.4	Open receiver vent valves AOV 2007 and AOV 2902 (Receiver SDPC commands HS 2007 and HS 2902 (open) for 15 sec. or until the GN_2 pressure reading at PI 2014 drops to 5 psig. Then close the vent valves.		
8.1.5	Allow the GN_2 pressure to again reach steady state and record the value indicated on PI 2014. Measured _____ Design 10 psig Time _____		

		Initial	Date
8.1.6	Verify that all flash tank inlet and discharge remote valves (water and steam) are closed. Modulating valves should be in their "normal" automatic control mode with proper set points to ensure that they are closed.		
8.1.7	Open SOV 2019A (Receiver SDPC command, HS 2019 (open) and allow GN_2 to flow into the flash tank. Start a stop watch and measure the fill time.		
8.1.8	Monitor flash tank SDPC pressure indicators PI 2906A and PI 2906B. Stop the flash tank fill, HS 2019 (closed) when the pressure reaches 400 psig or equilibrium with the supply pressure (local gauge PI 2011). Measured (PI 2906 A or B) Design 400 psig Time _____		
8.1.9	Hold the flash tank in a pressurized condition for 15 minutes. Monitor flash tank pressure for indications of leakage to the rest of the plant. Record the following SDPC parameters: Parameters / Time = 0 / Time = 15 Min. PI 2906A _____ _____ PIT 1000 _____ _____ Flash tank pressure dorp due to valve leakage should be less than 50 psi following 15 minute hold period.		

	Initial	Date
8.1.10 Vent the flash tank nitrogen to the deaerator until the flash tank pressure falls below 100 psig. Venting is accomplished by opening flash tank discharge valve PV 2906 and passing the flow through PV 647B to the deaerator. The high pressure override function for PC 647B must be in the automatic control mode and have a set point of $\leq$35 psig. Since this is the first time controller PC 647B has been operated in a normal manner, deaerator pressure should be closely monitored. Actual deaerator venting is accomplished by opening vent valve FV 659 with a commanded output of HC 659 through the EPGS SDPC. The initial valve position should be $\sim$70%. Modulate the valve as required to maintain the deaerator pressure in the range of 5 to 35 psig. Avoid rapid deaerator pressure reductions.		

		Initial	Date
8.2	Receiver Bypass Flow to the Flash Tank, Tuning of Level Control Valves, and Condensate Cleanup (Reference Plant Operating/Training Manual (RADL 2-36), Section T-1, Steps 67-76 excluding Step 70)		
8.2.1	Verify that the initial conditions have been established as required in Section 7.4.2.		
8.2.2	Set LC 74A to auto and verify level set point of 8.5 in.		
8.2.3	Set LC 74C to auto and verify level set point of 25.0 in.		
	Steps 8.2.4 - 8.2.6 are required to provide a means of venting excess GN_2 in the event an abnormally high pressure condition is created.		
8.2.4	Set PC 2906 to auto and verify set point of 485 psig.		
8.2.5	Set PC 1000 to auto and verify set point of 500 psig.		
8.2.6	Set PC 647B to manual and closed. This diverts any excess GN_2 to the condenser.		
8.2.7	Open SOV 2019 (Receiver SDPC command, HS 2019 (open)) and allow GN_2 to pressurize the flash tank to the "Acceptable Limit Line" shown in Figure 2. Monitor receiver pressure indicators PI 2906A and PI 2906B. Close SOV 2019A when desired pressure is reached.		



*Last Remote Indication Upstream of Feedwater Recirculation Line to the Condenser

Figure 2. Flash Tank Nitrogen Pressurization Curve

		Initial	Date
8.2.8	Adjust pump speed until the receiver inlet pressure, PI 2002 (Receiver CRT) is 50 psi greater than the flash tank pressure as measured by PI 2906A or PI 2906B. (Receiver feed pump under manual control.)		
8.2.9	Slowly open receiver bypass valve PV 2002 by inputting successively larger position commands into HC 2002 starting with 5%. (Monitor valve position indicator ZI 2002.)		
8.2.10	Adjust pump speed until sufficient flash tank level is reached to activate LC 74A and pass a flow of 12,000 lb/hr through LV 74A to the second point heater. Verify operation of level control. • Monitor ZI 74A for valve position • Monitor LC 74A for process variable • Monitor AM 74A for command • Monitor FI 35A for flow		
8.2.11	Tune LC 74A - flash tank low level controller by carrying out the following steps: A) Set receiver console to configure mode. B) Decrease level set point of LC 74A by 10% and observe the response on the strip chart.		

Initial	Date

C) Increase level set point of LC 74A to the nominal value and observe the response on the strip chart.

D) Increase/decrease proportional gain, K1 (C4-4, AL 6).*

E) Repeat steps B -- D as required until response is satisfactory.

F) Decrease level set point 10% and observe LC 74A response.

G) Increase level set point to nominal value and observe LC 74A response.

H) Increase/decrease reset gain, K2 (C4-4, AL 6)* in the ± 30% increments.

I) Repeat steps F -- H as required until response is satisfactory.

J) Establish preliminary LC 74A controller gains and record.

8.2.12 Place LC 74A in manual and slowly close. Watch for activation and operation of LV 74C. Verify operation of level control.

- Monitor ZI 74C for valve position
- Monitor LCM 74C for process variable and commanded output.

*MVCU 4-4, Analog Line 6

Initial	Date

8.2.13 Tune LC 74C - flash tank high level controller by carrying out the following steps:

A) Set receiver console to configure mode.

B) Decrease level set point of LC 74C by 10% and observe the response on the strip chart.

C) Increase level set point of LC 74C nominal value and observe the response on the strip chart.

D) Increase/decrease proportional gain, K1 (C4-4, AL 11).*

E) Repeat steps B -- D as required until response is satisfactory.

F) Decrease level set point of 10% and observe LC 74C response.

G) Increase level set point to nominal value and observe LC 74C response.

H) Increase/decrease reset gain, K2 (C4-4, AL 11)* in the ± 30% increments.

I) Repeat steps F -- H as required until response is satisfactory.

J) Establish preliminary LC 74C controller gains and record.

*MVCU 4-4, Analog Line 6

Initial	Date

8.2.14 Receiver feed pump open loop test --- (net flow to the receiver). Verify that a nominal feedwater flow of 12,000 lb/hr and quasi steady state condition exist. Suppress external disturbances to the maximum extent possible.

8.2.15 Perform the pump open loop control test by carrying out the following steps:

A) Decrease the receiver feed pump speed settings from nominal to minimum speed in approximately 20% step increments using AM 1105.

B) Increase the receiver feed pump speed setting from minimum to nominal speed in approximately 20% step increments using AM 1105.

Allow the system to reach steady state at each condition before proceeding to the next set point.

Monitor

FI 35A	AM 1105
PI 2002	JT 44
PI 2906A	LC 74A
LC 74C	FI 37
SI 1105	

8.2.16 Receiver feed pump control threshold -- Set the pump speed to reestablish receiver feedwater flow at 12,000 lb/hr.

Initial	Date

8.2.17 Apply ± 1%, 2%,... 10% input changes in commanded pump speed via AM 1105 until the threshold in the combined pump/speed controller is defined.

Monitor

SI 1105	AM 1105
PI 2002	FI 35A
FI 37	JT 44

8.2.18 Obtain process control closed loop data for tuning the receiver feed pump controller PC 1105 when operating the pressure configuration. Establish steady state pressure control from the receiver feed pump through the bypass path into the receiver flash tank. Carry out the following steps:

A) Adjust pump speed to produce a flow of ∿12,000 lb/hr.

B) Adjust the pressure control set point for PC 1105 to the current value indicated by PI 2002.

C) Place AM 1105 into auto and verify stable pressure control.

D) Increase pressure set point for PC 1105 by 10%.

E) Field tune as required.

Initial	Date

F) Decrease pressure set point of PC 1105 to the nominal value.

8.2.19 Continue feedwater circulation through the receiver bypass and on to the condenser until water chemistry alarms have cleared. (Note: during this period, flash tank level should be controlled by LC 74C while LC 74A is in manual and closed. In this way, all flow is diverted to the condenser and subsequently passes through the inline demineralizer.)

The following high and low water chemistry alarm points are provided for reference information:

Alarm ID	Measurement	Alarm Values (High)	Alarm Values (Low)
AAHL-706, AAHL-716, AAHL-719	pH	9.60	9.45
AAHL-729	pH	7.50	6.50
CAH-708, CAH-726, CAH-736	Conductivity	10 μ mhos	—
CAH-728	Conductivity	0.5 μ mhos	—
CAH-717, CAH-718, CAH-720, CAH-727	Cation Conductivity	0.15 μ mhos	—
AAHL-707, AAH-725	Hydrazine	30 ppb	10 ppb

Initial	Date

Alarm ID	Measurement	Alarm Values (High)	(Low)
AAH-735	Dissolved Oxygen	5 ppb	—
AAH-733	Sodium	2 ppb	—

Initial	Date

8.3 Receiver Fill (Reference Plant Operating/ Training Manual (RADL 2-36)) (Section T-2, Steps 1-8)

8.3.1 Verify that the initial conditions have been established as required in Section 8.2.18.

8.3.2 Place all (18) receiver panel control valves into flow control. Activate digital switches (9) and monitor valve action from corresponding indications (all valves should open since all controllers will sense zero flow).

Switch	Controller Output	Valve Position
TC 2301	FCM 2301	ZI 2301
TC 2301	FCM 2302	ZI 2302
TC 2303	FCM 2303	ZI 2303
TC 2303	FCM 2401	ZI 2401
TC 2402	FCM 2402	ZI 2402
TC 2402	FCM 2403	ZI 2403
TC 2501	FCM 2501	ZI 2501
TC 2501	FCM 2502	ZI 2502
TC 2503	FCM 2503	ZI 2503
TC 2503	FCM 2601	ZI 2601
TC 2602	FCM 2602	ZI 2602
TC 2602	FCM 2603	ZI 2603
TC 2701	FCM 2701	ZI 2701
TC 2701	FCM 2702	ZI 2702
TC 2703	FCM 2703	ZI 2703
TC 2703	FCM 2801	ZI 2801
TC 2802	FCM 2802	ZI 2802
TC 2802	FCM 2803	ZI 2803

		Initial	Date
8.3.3	Disable the receiver moisture accumulator drain function through the dedicated function key on the receiver console. Verify drain valve AOV 2901 is closed based on indication ZI 2901.		
8.3.4	Verify that the main steam downcomer valve UV-2905 is closed.		
8.3.5	Open the receiver inlet valve (AOV 2004) and allow the filling process to begin through the preheat panels using receiver SDPC command HS 2004 (open). Monitor valve position indicator ZI 2004. Start timing the fill process.		
8.3.6	Open the receiver power vent valves for the preheater and boiler sections (AOV 2007 and 2903) using receiver SDPC commands HS 2007 and HS 2903 (open) respectively. Monitor valve position indicators ZI 2007 and ZI 2903.		
8.3.7	Close off the low pressure nitrogen source by commanding SOV 2016A closed using HS 2016.		
8.3.8	Allow filling process to continue until water is initially released through the preheat vent valve (AOV 2007). Command the preheat vent valve closed through hand switch HS 2007 and monitor valve response through ZI 2007. Record the elapsed time since filling was initiated. Elaped Time _____ Note: An outside visual observer is required to "see" water flowing from the vent valve.		

		Initial	Date
	The observer should be at ground level and no personnel should be in the receiver or on top of the BCS targets since the water will be hot or boiling as it leaves the vent valve. Due to uncertainty in the nature of the discharge from the receiver during the filling operation, the observer may see anywhere from 1 to 3 more or less distinct variations in receiver flow.		
8.3.9	Allow filling process to continue until water is again released through the remaining receiver vent valve (AOV 2903). Command the boiler vent valve closed through hand switch HS 2903 and monitor valve response through ZI 2903. Record the total elapsed time since filling was initiated. Total elapsed time _____ See Note for step 8.3.8		
8.3.10	Command the receiver bypass valve PV 2002 closed through controller HC 2002. Verify valve closes by monitoring valve position indicator ZI 2002.		
	Continue on immediately to Section 8.4.		

		Initial	Date
8.4	Receiver Panel Circulation		
8.4.1	Adjust the temperature set point for each of the 18 boiler panel temperature controllers to 585°F. Note that all panel controllers respond to a common receiver SDPC command TSP 2929.		
8.4.2	Verify that the flash tank pressure still meets or exceeds the "Acceptable Limit Line" as defined in Figure 2 by monitoring PI 2906A or PI 2906B. If additional pressure is required, pressurize to the "Acceptable Limit Line" per the procedure described in Step 8.2.7.		
8.4.3	Open flash tank inlet valve AOV 2911 with hand-switch HS 2911 and allow flow to discharge from the panels into the flash tank. Confirm valve position ZI 2911.		
8.4.4	Verify that all receiver panels are indicating flow. Preheat panel flows FI 2230 - 2232 Boiler panel flows FCM 2301 - 2803		
8.4.5	Verify that equal flow distributions exist between the three parallel preheat paths. Record the following: FI 2230 _____ FI 2231 _____ FI 2232 _____		

	Initial	Date
8.4.6 Verify that flash tank level valve controllers LC 74A and LC 74C are in the automatic control mode with the nominal control set points and configuration constants as determined in the tuning steps 8.2.11 and 8.2.13.		
8.4.7 Call up the individual flow control loops FCM 2301, FCM 2302,...FCM 2803 for all of the boiler panels and adjust the respective set points to the current indicated flow value (FI 2301, FI 2302,...FI 2803). This step will result in a bumpless transfer when the controllers are transferred to "Console" during the next step.		
8.4.8 Switch each of the controllers from "Cascade" to "Console" and input the appropriate set point listed below. This will result in a total receiver flow of ∿25,000 lb/hr.		

	Set Point
FCM 2301 and FCM 2803	738 lb/hr
FCM 2302 and FCM 2802	911
FCM 2303 and FCM 2801	1112
FCM 2401 and FCM 2703	1350
FCM 2402 and FCM 2702	1537
FCM 2403 and FCM 2701	1674
FCM 2501 and FCM 2603	1750
FCM 2502 and FCM 2602	1750
FCM 2503 and FCM 2601	1674

	Initial	Date
8.4.9 Place AM 1105 into manual and adjust pump speed so that all valves are open 30 - 70%.		

8.4.10 Field Tuning of Level Controllers LC 74A, LIC 24, LC 83A, and LC 83B

8.4.10.1 Tune LC 74A - flash tank low level controller at its maximum operating flow by carrying out the following steps:

1) Decrease level set point of LC 74A by 10% and observe the response on the strip chart.

2) Increase level set point of LC 74A to nominal value and observe the response on the strip chart.

3) Increase/decrease proportional gain, K1 (C4-4, A1 6).

4) Repeat steps 1 -- 3 as required until response is satisfactory.

5) Decrease level set point to 10% and observe LC 74A response.

6) Increase level set point to nominal value and observe LC 74A response..

7) Increase/decrease reset gain, K2 (C4-4, A1 6) in ± 30% increments.

Initial	Date

8) Repeat steps 5 -- 7 as required until response is satisfactory.

9) Establish preliminarv LC 74A controller gains and record.

8.4.10.2 Tune LIC 24 second point heater drain controller by carrying out the following steps:

1) Verifv that the level set point for LIC 24 is adjusted to 2-1/2 inches of water.

2) Verify that the control bias for LV 24A is adjusted to 50%.

3) Verify that the control bias for LV 24B is adjusted to 45%.

4) Verify that the deaerator high pressure override function from deaerator controller PC 647A is set for 35 psig.

5) With condensate passing through the No. 2 heater shell, decrease level set point for LIC 24 by 10% and observe the level response on the DAS strip chart.

6) Increase level set point of LIC 24 to the nominal value and observe the response on the strip chart.

7) Increase/decrease proportional gain, K1 (C4-1, AL 2).

Initial	Date

8) Repeat steps 5 --7 as required until response is satisfactory.

9) Decrease level set point 10% and observe LIC 24 response.

10) Decrease level set point to nominal value and observe LIC 24 response.

11) Increase/decrease reset gain K2 (C4-1, AL 2) in ± 30% increments.

12) Repeat steps 9 --11 as required until response is satisfactory.

13) Reduce the deaerator high pressure override set point from controller PC 647A to 0 psig. (This will cause LV 24A to close and flow will be diverted to the condenser through LV 24C.)

14) Decrease level set point for LIC 24 by 10% and observe the level response on the DAS strip chart.

15) Increase level set point for LIC 24 to the nominal value and observe the response on the strip chart.

16) Increase/decrease proportional gain, K1 (C4-1, AL 5).

17) Repeat steps 14 --16 as required until response is satisfactory.

Initial	Date

18) Decrease level set point 10% and observe LIC 24 response.

19) Increase level set point to nominal value and observe LIC 24 response.

20) Increase/decrease reset gain K2 (C4-1, AL 5) in ± 30% increments.

21) Repeat steps 18 --20 as required until response is satisfactory.

22) Establish preliminary LIC 24 controller gains and record.

23) Adjust the deaerator high pressure override set point 35 psig (nominal control value).

8.4.10.3 Tune LIC 83A - deaerator high level overflow controller by carrying out the following steps:

1) Verify that the overflow level set point for LIC 83A is set for 60 in (nominal control point).

2) Adjust the level set point for controller LIC 83B to a value ∿ 15% greater than the nominal set point value for LIC 83A used in step 1) above. This will result in the condensate flowing through the overflow and into the condenser.

Initial	Date

3) Place controller LIC 83B in manual with a commanded output equal to the value that existed in step 2).

4) Decrease level set point of LIC 83A by 10% and observe the response on the strip chart.

5) Increase level set point of LIC 83A to the nominal value and observe the response on the strip chart.

6) Increase/decrease proportional gain, K1, (C4-1, AL 10).

7) Repeat steps 4 --6 as required until response is satisfactory.

8) Decrease level set point 10% and observe LIC 83A response.

9) Increase level set point to nominal value and observe LIC 83A.

10) Increase/decrease reset gain, K2 (C4-1, AL 10) in ± 30% increments.

11) Repeat steps 8 --10 as required until response is satisfactory.

12) Establish preliminary LIC 83A controller gains and record.

Initial	Date

13) Adjust the level set point for controller LIC 83B to 36 in (nominal control point) and return to automatic mode.

8.4.10.4 Tune LIC 83B - deaerator level controller by carrying out the following steps:

1) Reduce the deaerator high pressure override set point for controller PC 647A to 0 psig. (This will cause a "zero flow" signal from FIT 113B.)

2) Adjust level set point for controller LC 83A to value at least 15% greater than the nominal starting level set point for LC 83B. This will prevent the deaerator overflow from activating during subquent steps of this test.

3) Decrease level set point of LC 83B by 10% and observe response on the strip chart.

4) Increase level set point of LC 83B to the nominal value and observe the response on the strip chart.

5) Increase/decrease proportional gain, K1 (C4-1, AL 29).

6) Repeat steps 3 --5 as required until response is satisfactory.

7) Decrease level set point by 10% and observe LC 83B response.

	Initial	Date

8) Increase level set point to nominal value and observe LC 83B response.

9) Increase/decrease reset gain, K2 (C4-1, AL 29) in ± 30% increments.

10) Repeat steps 7 --9 as required until response is satisfactory.

11) Establish preliminary LC 83B controller gains and record.

12) Return the level set point for controller LC 83A to its normal control value.

13) Return the deaerator high pressure override set point for controller PC 647A to 35 psig.

8.4.11 Place LC 74A in manual and close valve LC 74A. Watch for activation and operation of LV 74C. Verify operation of level control.

- Monitor ZI 74C for valve position
- Monitor LCM 74C for process variable and commanded output.

8.4.12 Tune LC 74C - flash tank high level controller at moderate flow by carrying out the following steps:

1) Decrease level set point of LC 74C by 10% and observe the response on the strip chart.

Initial	Date

2) Increase level set point of LC 74C to the nominal value and observe the response on the strip chart.

3) Increase/decrease proportional gain, K1 (C4-4, AL 6).

4) Repeat steps 1 -- 3 as required until response is satisfactory.

5) Decrease level set point 10% and observe LC 74A response.

6) Increase level set point to nominal value and observe LC 74C response.

7) Increase/decrease reset gain, K2 (C4-4, AL 6) in ± 30% increments.

8) Repeat steps 5 -- 7 as required until response is satisfactory.

9) Establish preliminary LC 74C controller gains and record.

8.4.13 Adjust the panel controller set points to the appropriate set points listed below. This will result in a total receiver flow of 40,000 lb/hr.

Initial	Date

Controllers	Panels	Set Point lb/hr
FCM 2301 and FCM 2803	(204 and 221)	1181
FCM 2302 and FCM 2802	(205 and 220)	1462
FCM 2303 and FCM 2801	(206 and 219)	1778
FCM 2401 and FCM 2703	(207 and 218)	2160
FCM 2402 and FCM 2702	(208 and 217)	2469
FCM 2403 and FCM 2701	(209 and 216)	2678
FCM 2501 and FCM 2603	(210 and 215)	2801
FCM 2502 and FCM 2602	(211 and 214)	2801
FCM 2503 and FCM 2601	(212 and 213)	2678

8.4.14 Adjust receiver feed pump speed (AM 1105) so that all valves are open 30-70%.

8.4.15 Tune LC 74C - flash tank high level controller at high flow by carrying out steps A - I of Section 8.4.12.

8.4.16 Gather panel flow data for all panels and verify panel control valve flow coefficient data for selected panels by carrying out the following steps. In addition, obtain threshold data for flow meter operation.

8.4.16.1 Establish nominal panel flow conditions of 35,000 lb/hr (total receiver flow) by opening all control valves to 10% open (adjust controller outputs to 90%) and adjust receiver feed pump speed to produce the desired flow.

Initial	Date

8.4.16.2 Perform Cv calibration test on panel 204 by carrying out the following sequence:

1) Select FCM 2301

2) Verify controller FCM 2301 set in manual mode

3) Adjust output to 0% (full open valve) and allow flow and pressure to achieve steady state condition.

4) Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2301	_____
Control valve pressure drop	PDTX 2330	_____
Valve position	ZI 2301	_____

5) Repeat steps 3) and 4) for the following values of commanded output 10%, 20%, 30%, 50%, 80%, 90%, 92%,* 94%,* 96,* 98%,* 100%*

6) Return the valve to its original 10% open position (adjust controller output to 90%).

*2% increments used to determine operational threshold for panel flow meter FE 2301.

Initial	Date

8.4.16.3 Repeat Cv calibration test steps 1 -- 6 of 9.4.16.2 using controller FCM 2303 (panel 206). Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2303	_____
Control valve pressure drop	PDTX 2332	_____
Valve Position	ZI 2303	_____

8.4.16.4 Repeat Cv calibration test steps 1 --6 of 8.4.16.2 using controller FCM 2402 (panel 208). Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2402	_____
Control valve pressure drop	PDTX 2431	_____
Valve Position	ZI 2402	_____

8.4.16.5 Repeat CV calibration test steps 1 -- 6 of 8.4.16.2 using controller FCM 2501 (panel 210). Record the following parameters on the DAS system:

		Measured Value	Initial	Date
Inlet Temperature	TI 2005			
Inlet Pressure	PI 2006			
Panel Flow	FI 2501			
Control valve pressure drop	PDTX 2530			
Valve Position	ZI 2501			

8.4.16.6 Repeat Cv calibration test steps 1 -- 6 of 8.4.16.2 using controller FCM 2503 (panel 212). Record the following parameters of the DAS system:

		Measured Value	Initial	Date
Inlet Temperature	TI 2005			
Inlet Pressure	PI 2006			
Panel Flow	FI 2503			
Control valve pressure drop	PDTX 2532			
Valve Position	ZI 2503			

8.4.16.7 Gather panel flow data for panel 205 by carrying out the following sequence:

1) Select FCM 2302

2) Verify controller is set in manual mode

3) Adjust output to 0% (full open valve) and allow flow and pressure to achieve steady state conditions.

Initial	Date

4) Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2302	_____
Valve Position	ZI 2302	_____

5) Repeat steps 3 and 4 for the following values of commanded output: 10%, 20%, 30%, 50%, 80%, 90%, 92%,* 94%,* 96%,* 98%,* and 100%*

6) Return the value to its original 10% open position (adjust controller output to 90%) _____

8.4.16.8 Repeat panel flow test steps 1 -- 6 of 8.4.16.7 using controller FCM 2401 (panel 207). Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2401	_____
Valve Position	ZI 2401	_____

*2% increments are used to determine operational threshold for Panel Flowmeter FE2302.

	Initial	Date

8.4.16.9 Repeat panel flow test steps 1 -- 6 of 8.4.16.7 using controller FCM 2403 (panel 209). Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2402	_____
Valve Position	ZI 2402	_____

8.4.16.10 Repeat panel flow test steps 1 -- 6 of 8.4.16.7 using controller FCM 2502 (panel 211). Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2502	_____
Valve Position	ZI 2502	_____

8.4.16.11 Gather panel flow data for panel 213 by carrying out the following sequence:

1) Select FCM 2601

2) Verify controller is set in manual mode

3) Adjust output to 0% (full open valve) and allow flow and pressure to achieve steady state conditions

Initial	Date

4) Record the following parameters on the DAS system:

		Measured Value
Inlet Temperature	TI 2005	_____
Inlet Pressure	PI 2006	_____
Panel Flow	FI 2601	_____
Valve Position	ZI 2601	_____

8.4.16.12 Repeat Step 8.4.16.11 for the following panels and related controllers. Record the appropriate inlet temperature, inlet pressure, panel flow, and control valve position.

Panel	Controller
214	TC 2602
215	TC 2603
216	TC 2701
217	TC 2702
218	TC 2703
219	TC 2801
220	TC 2802
221	TC 2803

8.4.17 Obtain open loop process control data required for control tuning of the receiver panel flow control loops or panels 204 (low Cv) and 210 (high Cv).

Initial	Date

8.4.17.1 Establish a total receiver flow of 35,000 lb/hr by carrying out the following steps:

1) Set FCM 2301 --- FCM 2803 to manual mode

2) Adjust output command for each valve to 90% (10% open).

3) Adjust the feed pump pressure control set point to the pressure currently indicated by PI 2002.

4) Place the receiver feed pump controller into the pressure control mode.

5) Adjust control pressure until a flow of 35,000 lb/hr is established.

8.4.17.2 Perform step response tests on valve TV 2301 by carrying out the following steps:

1) Verify FCM 2301 is in manual control mode.

2) Step FCM 2301 output to 80% (20% open valve).

3) Monitor ZI 2301, FI 2301, FCM 2301, PDTX 2330, and PI 2006 on DAS strip charts and allow to reach steady state.

4) Step FCM 2301 output to 50% and monitor the parameters listed in 3.

Initial	Date

5) Step FCM 2301 output to 90% and monitor the parameters listed in 3.

6) Step FCM 2301 output to 50% and monitor the parameters listed in 3.

7) Step FCM 2301 output to 20% and monitor the parameters listed in 3.

8) Step FCM 2301 output to the nominal value (90%) and monitor the parameters listed in 3.

8.4.17.3 Perform step response tests on valve TV 2501 by carrying out the following steps:

1) Verify FCM 2501 is in manual control mode.

2) Step FCM 2501 output to 80% (20% open valve).

3) Monitor ZI 2501, FI 2501, FCM 2501, PDTX 2530, and PI 2006 on DAS strip charts and allow to reach steady state.

4) Step FCM 2501 output to 50% and monitor the parameters listed in 3.

5) Step FCM 2501 output to 90% and monitor the parameters listed in 3.

6) Step FCM 2501 output to 50% and monitor the parameters listed in 3.

Initial	Date

7) Step FCM 2501 output to 20% and monitor the parameters listed in 3.

8) Step FCM 2501 output to the nominal value (90%) and monitor the parameters listed in 3.

8.4.17.4 Perform frequency response test on valve TV 2301 by carrying out the following steps (pump on pressure control, total receiver flow of 35,000 lb/hr, and all valves with commanded outputs of 90%):

1) Insert the controls test unit (CTU) on the drive to TV 2301.

2) Adjust FCM 2301 output until FI 2301 reads 3,000 lb/hr.

3) Using the transfer function analyzer (TFA) insert a 0.1 Hz sin wave into the CTU and adjust the TFA output such that a ± 1500 lb/hr peak-to-peak response is achieved on FI 2301.

4) Set the TFA to 0.02 Hz and allow the system to reach steady state (3-4 cycles).

5) Repeat 4 at a frequency of 0.05 Hz

6) Repeat 4 at a frequency of 0.07 Hz

7) Repeat 4 at a frequency of 0.1 Hz

	Initial	Date
8) Repeat 4 at a frequency of 0.2 Hz		
9) Repeat 4 at a frequency of 0.5 Hz		
10) Repeat 4 at a frequency of 0.7 Hz		
11) Repeat 4 at a frequency of 1 Hz		
12) Repeat 4 at a frequency of 2 Hz		
13) Repeat 4 at a frequency of 5 Hz		

8.4.17.5 If the open loop step responses (8.4.17.2) indicate non-linear response with flow magnitude, adjust TV 2301 to achieve 6000 lb/hr and repeat steps 8.4.17.4 3 --- 13. Check one of the following:

linear open loop step response _____
non-linear open loop step response _____

8.4.17.6 Perform frequency response test on valve TV 2501 by carrying out the following steps (pump on pressure control, total receiver flow of 35,000 lb/hr, and all valves with commanded outputs of 90%):

1) Insert the controls test unit (CTU) on the drive to TV 2501.

2) Adjust FCM 2501 output until FI 2501 reads 3000 lb/hr.

Initial	Date

3) Using the transfer function analyzer (TFA) insert a 0.1 Hz sin wave into the CTU and adjust the TFA output such that a ± 1500 lb/hr peak-to-peak response is achieved on FI 2501.

4) Set the TFA to 0.02 Hz and allow the system to reach steady-state (3-4 cycles).

5) Repeat 4 at a frequency of 0.05 Hz

6) Repeat 4 at a frequency of 0.07 Hz

7) Repeat 4 at a frequency of 0.1 Hz

8) Repeat 4 at a frequency of 0.2 Hz

9) Repeat 4 at a frequency of 0.5 Hz

10) Repeat 4 at a frequency of 0.7 Hz

11) Repeat 4 at a frequency of 1 Hz

12) Repeat 4 at a frequency of 2 Hz

13) Repeat 4 at a frequency of 5 Hz

8.4.17.7 If the open loop step responses (8.4.17.6) indicate non-linear response with flow magnitude adjust TV 2301 to achieve 6000 lb/hr and

		Initial	Date
	repeat steps 8.4.20.6 3 --- 13. Check one of the following: linear open loop step response _____ non-linear open loop step response _____		
8.4.18	Demonstrate satisfactory closed loop flow control on loops TC 2301 and TC 2501 at both low and high flowrates. Tune loops if required.		
8.4.18.1	Establish a total receiver flow of 35,000 lb/hr with the valves (TV 2301 - TV 2803) positioned to 10% open (commanded output = 90%) and close the flow control loop by carrying out the following steps: 1) Set FCM 2301 --- FCM 2803 to manual mode. 2) Adjust output command for all valves to 90% (10% open). 3) Adjust the receiver feed pump pressure to achieve a net flow of 35,000 lb/hr (PC 1105). 4) Set FCM 2301 to console mode. 5) Adjust flow set point to 20%. 6) Set FCM 2301 to auto mode and observe response.		

Initial	Date

8.4.18.2 Perform closed loop control test on TC 2301 in the flow control mode by carrying out the following steps:

1) Step flow set point on FCM 2301 to 30% and observe responses on DAS strip chart for FI 2301, FCM 2301, ZI 2301, PDTX 2330, and PI 2006. Allow system to reach steady state conditions.

2) Step flow set point to 10% and allow to reach steady state. Record strip chart data during transient.

3) Step flow set point to 20% and allow to reach steady state. Record strip chart data during transient.

4) Tune loop gains if required.

5) Step flow set point from 20% to 80% to establish high flow conditions.

6) Step flow set point to 95% and allow to reach steady state. Record strip chart data during transient.

7) Step flow set point to 70% and allow to reach steady state. Record strip chart data during transient.

8) Step flow set point to 80% and allow to reach steady state. Record strip chart data during transient.

Initial	Date

9) Tune for final loop gains if required.

10) Ramp set point to 20% in 30 seconds and hold.

8.4.18.3 Perform closed loop control test on TC 2501 in the flow control mode by carrying out the following steps:

1) Set FCM 2501 to console mode.

2) Adjust flow set point to 20%.

3) Set FCM 2501 to auto mode and observe response.

4) Step flow set point (FCM 2501) to 30% and observe response on DAS strip charts for FI 2501, FCM 2501, ZI 2501, PDTX 2530, and PI 2006. Allow system to reach steady state conditions.

5) Step flow set point to 10% and allow to reach steady state. Record strip chart data during transient.

6) Step flow set point to 20% and allow to reach steady state. Record strip chart data during transient.

7) Tune loop gains if required.

	Initial	Date

8) Step flow set point from 20% to 80% to establish high flow conditions.

9) Step flow set point to 95% and allow to reach steady state. Record strip chart data during transient.

10) Step flow set point to 70% and allow to reach steady state. Record strip chart data during transient.

11) Step flow set point to 80% and allow to reach steady state. Record strip chart data.

12) Tune for final loop gains if required.

13) Ramp set point to 20% in 30 sec. and hold.

8.4.19 Demonstrate closed loop flow control on all receiver control loops (TC 2301 --- TC 2803) through sequential activation of the control loops at the maximum allowable flash tank flow.

8.4.19.1 Perform closed loop flow control test on TC 2302 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2302.

8.4.19.2 Perform closed loop flow control test on TC 2303 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2303.

		Initial	Date
8.4.19.3	Perform closed loop flow control test on TC 2401 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2401.		
8.4.19.4	Perform closed loop flow control test on TC 2402 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2402.		
8.4.19.5	Perform closed loop flow control test on TC 2403 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2403.		
8.4.19.6	Perform closed loop flow control test on TC 2502 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2502.		
8.4.19.7	Perform closed loop flow control test on TC 2503 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2503.		
8.4.19.8	Perform closed loop flow control test on TC 2601 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2601.		
8.4.19.9	Perform closed loop flow control test on TC 2602 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2602.		
8.4.19.10	Perform closed loop flow control test on TC 2603 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2603.		

		Initial	Date
8.4.19.11	Perform closed loop flow control test on TC 2701 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2701.		
8.4.19.12	Perform closed loop flow control test on TC 2702 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2702.		
8.4.19.13	Perform closed loop flow control test on TC 2703 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2703.		
8.4.19.14	Perform closed loop flow control test on TC 2801 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2801.		
8.4.19.15	Perform closed loop flow control test on TC 2802 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2802.		
8.4.19.16	Perform closed loop flow control test on TC 2803 by repeating the steps of 8.4.18.3 as appropriate for controller TC 2803.		
8.4.20	Obtain open loop process control data required for control tuning of the receiver feed pump. Determine pressure, flow, speed response characteristics to commanded pump speed changes for flowrates $\pm$ 40,000 lb/hr.		

Initial	Date

8.4.20.1 Configure the system to the desired test conditions by carrying out the following steps:

1) Adjust feed pump pressure set point to achieve a flow rate of $\sim$ 35,000 lb/hr.

2) Confirm all panels are in flow control i.e., (FCM 2301 --- FCM 2803) in auto and console mode.

3) Set FCM 2301 to manual.

4) Set FCM 2501 to manual.

5) Set AM 1105 to manual.

8.4.20.2 Perform open loop step response test on the receiver feed pump by carrying out the following steps:

1) Increase speed command (AM 1105) by 10% of nominal and monitor on DAS strip charts PI 2007, PI 2006, FI 2301, PDTX 2330, ZI 2301, FI 2501, PDTX 2530, ZI 2501, FCM 2303, PDTX 2332, ZI 2302, FCM 2503, PDTX 2532, and ZI 2503. Allow system to reach steady state condition.

2) Decrease speed command (AM 1105) back to nominal value and allow system to reach steady state.

Initial	Date

3) Decrease speed command (AM 1105) by 10% from nominal and allow system to reach steady state.

4) Increase speed command back to nominal value and allow system to reach steady state.

8.4.20.3 Perform open loop frequency response test on the receiver feed pump by carrying out the following steps:

1) Insert the controls test unit (CTU) on to the drive of the receiver feed pump (AM 1105 output-analog output #4, MVCU 1-10).

2) Verify AM 1105 in manual mode.

3) Verify FCM 2302 -- FCM 2803 (excluding FCM 2501) are in auto while FCM 2301 and FCM 2501 are in manual mode.

4) Using the transfer function analyzer (TFA), insert a 0.1 Hz sine wave into the CTU and adjust the TFA output such that a ± 10% of nominal speed variation (peak-to-peak) is achieved on SI 1105.

5) Verify that the variation in output flow and pressure on panels 204, 206, 210, and 212 are measurable on strip charts on the DAS recording system. If not, adjust TFA amplitude to achieve desired response.

	Initial	Date
6) Set the TFA frequency of 0.01 Hz and allow system to reach steady state (3-4 cycles).		
7) Repeat 6 at a frequency of 0.02 Hz		
8) Repeat 6 at a frequency of 0.05 Hz		
9) Repeat 6 at a frequency of 0.07 Hz		
10) Repeat 6 at a frequency of 0.1 Hz		
11) Repeat 6 at a frequency of 0.2 Hz		
12) Repeat 6 at a frequency of 0.5 Hz		
13) Repeat 6 at a frequency of 0.7 Hz		
14) Repeat 6 at a frequency of 1.0 Hz		
15) Repeat 6 at a frequency of 2.0 Hz		
8.4.20.4 Restore the system to the desired conditions.		
1) Remove CTU from system 2) Set FCM 2301 to auto 3) Set FCM 2501 to auto 4) Set AM 1105 to auto 5) Confirm PC 1105 in pressure control		
8.4.21 Demonstrate satisfactory closed loop control of the receiver feed pump while under valve control for flowrates $\sim$ 40,000 lb/hr (Ref set point values listed in Section 8.4.13).		

	Initial	Date
8.4.21.1 Configure the system to the desired test condition by carrying out the following steps: 1) Verify TC 2301 -- TC 2803 are operating on flow control. 2) Verify PC 1105 is operating on pressure control.		
8.4.21.2 Increase the set point on FCM 2301 until the valve command of FCM 2301 exceeds all other valve command by 50%. Record value.		
8.4.21.3 Set this maximum valve command set point on pump controller PC 1105.		
8.4.21.4 Switch PC 1105 from pressure control to valve control mode. Observe response on DAS strip charts for FCM 2301, UC 1105, SI 1105, PI 2002, PI 2006, FCM 2501, and PDTX 2230. Allow system to achieve steady state conditions.		
8.4.21.5 Increase FCM 2301 set point by 20% above the nominal value established in 8.4.24.2. Observe the response and allow to reach steady state.		
8.4.21.6 Decrease FCM 2301 set point back to nominal and allow to reach steady state.		
8.4.21.7 Decrease FCM 2301 set point by 20% below the nominal value established in 8.4.24.2. Observe the response and allow to reach steady state.		

	Initial	Date
8.4.21.8 Increase FCM 2301 set point back to nominal and tune controller PC 1105 if required.		
8.4.21.9 Reconfigure the system to the desired test conditions by carrying out the following steps:		
1) Reduce the set point on FCM 2301 back to the original value as it existed in step 8.4.21.1.		
2) Verify TC 2301 --- TC 2803 are operating on flow control.		
3) Verify PC 1105 is operating on pressure control.		
8.4.21.10 Increase the set point on FCM 2501 until the valve command on FCM 2501 exceeds all other valve commands by 50%. Record value.		
8.4.21.11 Set this maximum valve command set point on pump controller PC 1105.		
8.4.21.12 Switch PC 1105 from pressure control to valve control mode. Observe response on DAS strip charts for FCM 2301, UC 1105, SI 1105, PI 2002, PI 2006, FCM 2501, and PDTX 2530. Allow system to achieve steady state conditions.		

		Initial	Date
8.4.21.13	Increase FCM 2501 set point by 20% above the nominal value established in 8.4.21.10. Observe the response and allow to reach steady state.		
8.4.21.14	Decrease FCM 2501 set point back to nominal and allow to reach steady state.		
8.4.21.15	Decrease FCM 2501 set point by 20% below the nominal value established in 8.4.21.10. Observe the response and allow to reach steady state.		
8.4.21.16	Increase FCM 2501 set point back to nominal and tune controller PC 1105 if required.		

		Initial	Date
8.5	Flash Tank Pressure/Leak Check		
8.5.1	Place PC 2906 in manual (PCM 2906) with a commanded output of 100%. This will prevent the flash tank vent valve from operating during this portion of the test.		
8.5.2	Verify that the receiver feed pump controller is operating in a pressure control mode.		
8.5.3	Verify that no personnel are in the vicinity of the receiver flash tank safety valve discharge line. Subsequent steps of this section could result in the lifting of the flash tank safety valve.		
8.5.4	Increase the feed pump pressure control set point until a pressure of 500 psig is created in the receiver flash tank. Monitor PI 2906 A and B. Verify the flash tank high pressure alarm is activated. Increase feed pump pressure set point to 540 psig and verify that the high high alarm is activated.		
8.5.5	Decrease the feed pump pressure control set point until the high pressure alarm PAH 2906 clears. Record the pressure at which the alarm clears Alarm threshold values _____		

		Initial	Date
8.5.6	Reduce the feed pump pressure control set point to 300 psig and place pressure controller PC 2906 into automatic with a set point of 485 psig. Inspect the flash tank condensate system for leaks. (Piping from flash tank inlet valve to the flash tank drain valves - LV 74A and LV 74C.) Particular attention should be paid to recently restored equipment.		

		Initial	Date
8.6	Receiver Pressure/Leak Check		
8.6.1	Verify that all receiver feed pump recirculation equipment is ready for operation. Subsequent procedure steps will cause the pump to operate in its recirculation mode.		
8.6.2	Close the flash tank inlet valve AOV 2911 which will produce a dead head condition and cause the pump to go to the recirculation mode.		
8.6.3	Verify that no personnel are in the vicinity of the receiver safety valve discharge line. Subsequent steps of this section could result in the lifting of the safety valves.		
8.6.4	Increase the feed pump pressure control set point until a pressure of 1890 psig exists in the boiler manifold. Monitor PI 2006. Verify the manifold high pressure alarm is activated. Increase the pressure set point to 1930 psig and verify the high, high alarm is actuated.		
8.6.5	Decrease the feed pump pressure control set point until the high pressure alarm PAHL 2006 clears. Record the manifold pressure at which the alarm clears. Alarm threshold value _____		
8.6.6	Close the boiler manifold inlet (manual) isolation valve, V-FW-228-203.		

		Initial	Date
8.6.7	Increase the feed pump pressure control set point to 1950 psig. Verify the inlet header high pressure alarm (PAH 2002) is activated. Increase the pressure set point to 2010 psig and verify the high, high pressure alarm is actuated. Monitor boiler manifold pressure to ensure V-FW-228-203 is not leaking.		
8.6.8	Decrease the feed pump pressure control set point until the high pressure alarm (PAH 2002) clears. Record the inlet header pressure PI 2002 at which the alarm clears. Alarm threshold value _____		
8.6.9	Reduce feed pump pressure control set point to 1500 psig. Leak check the preheater system from the feed pump to V-FW-228-203. Particular attention should be paid to recently restored equipment.		
8.6.10	Reduce the feed pump set point pressure to 1000 psig. Open AOV-2007 momentarily to vent the boiler system pressure to ∿ 1000 psig. Open V-FW-228-203 and leak check from V-FW-228-203 to UV 2905 and AOV 2911.		
8.6.11	Reduce the feed pump pressure set point to 400 psig. Momentarily open receiver vent valve AOV 2903 and vent the boiler to ∿ 400 psig.		

		Initial	Date
8.6.12	Open the flash tank inlet valve AOV 2911 and allow feedwater flow to resume to the flash tank.		
8.6.13	Switch the receiver feed pump controller to manual (AM 1105 switch to "manual") and reduce the pump speed to ∿ 1850 RPM.		
8.6.14	Turn off the receiver feed pump (dedicated handswitch HS 44B or keyboard command HS 44A). Monitor receiver pressure, PI 2906 A or B and initiate the GN_2 blanket function (HS 2016 - open) when the pressure decays below approximately 100 psig.		
8.6.15	Turn off the condensate hotwell pump (keyboard function HS 131A or dedicated hand switch HS 131B) and shut down the condensate and feedwater chemical feed pumps - ammonia pump (HS 450A), hydrazine feed pump (HS 449A). Maintain vacuum system, gland seal steam supply, gland seal steam exhaust pump, circulating water pumps, circulating water chemical feed pumps, and cooling tower fans operational as required to support subsequent receiver draining operations.		

		Initial	Date
8.7	Receiver Drain and GN_2 Backfill		
8.7.1	Verify that the receiver low pressure GN_2 system is ready for operation and that neither PAH 2015B nor PAL 2015A alarms are activated.		
8.7.2	Record initial condenser water level from either LIT 142 or LIT 146. This level will serve as the initial reference condition for the receiver draining operation.		
	Measured Value _____		
8.7.3	Verify that the receiver pressure is <140 psig as indicated by PI 2902 and PI 2006. This is the pressure limit for activating the drain system. If a higher pressure exists, reduce pressure by draining water from the flash tank by placing LC 74C in manual and opening it to 5% stroke. Allow flash tank to drain until receiver pressure control mode is at its normal set point.		
8.7.4	Open the low pressure GN_2 solenoid valve SOV 2016A and allow nitrogen to flow to the receiver panels.		
8.7.5	Open the panel drain valves by placing the console hand switch (HS 2913A) in the "enable" position followed by the keyboard open command (HS 2913B). Record time at which drain function is initiated. Note that condenser vacuum system operation should be maintained during		

	Initial	Date

this period to prevent a high condenser pressure from occurring. If the low pressure alarm PAL 2015A is activated during the draining activity, close the drain valve until the alarm clears.

8.7.6 Monitor condenser water level (LIT 142 or LIT 146). When the water level stops rising, the receiver draining operation should be complete. Record the time at which the draining operation is complete. Close the receiver drain valves by placing the dedicated console hand switch (HS 2913A) in the "disable" position. Record the final condenser water level.

Measured drain time:	_____
Estimated drain time:	5-20 min. depending on initial pressure.
Increase in condenser water level:	_____
Calculated (post test) drain water added to the condenser:	_____
Estimated total drain volume:	650 gal

8.7.7 Verify that the receiver moisture separator level control set point is at 10" in preparation for verifying the drain function.

8.7.8 Open the moisture separator drain valve by placing the dedicated switch for AOV 2901 in the "enable" position. Monitor the decreasing level as indicated by LI 2901 on

		Initial	Date
	the receiver console. Record the level at which the drain valve AOV 2901 automatically closes and compare to the set point value. Set point level 10 in Measured closure level _____		
8.7.9	Complete the plant shutdown and prepare for the receiver inspection steps listed in Section 8.8.		

Initial	Date

8.8 Shutdown and Inspection

8.8.1 Remove the filter element from the receiver inlet filter (PF-FW-200-201) and inspect for foreign particles. As required, analyze foreign particles to determine material and source as well as estimating fouling rate. Clean and reinstall filter element. Restore insulation. Note: Vent the receiver to atmosphere before opening lines or plugs. Close the vents and resume the low pressure purge while the system is open.

8.8.2 Open the following filters and inspect, clean, and replace as necessary:

PF-FW-200-201	(receiver inlet)
PF-FW-205-205	(receiver panel 205)
PF-FW-207-207	(receiver panel 207)
PF-FW-213-213	(receiver panel 213)
PF-FW-219-219	(receiver panel 219)

As required, analyze building rate and estimate fouling rate. Reinstall filter elements and restore insulation.

8.8.3 Remove the appropriate water manifold inspection plugs and inspect the tube orifices for each of the tubes listed below. Inspect for indications of fouling.

Initial	Date

Panel Number	Tube (orifice) Location
205	21, 25, 26, 35, and 36
207	24, 25, 26, 35, and 36
213	35 and 36
219	35 and 36

Reinstall the inspection plugs, leak check, and restore the insulation. The leak check should be made using 200 psig GN_2 or water at 60% of operating pressure.

		Initial	Date
9.0	SYSTEM RESTORATION		
9.1	Reassemble all receiver elements dismantled during the component inspection and restore the insulation.		
9.2	Blanket the receiver with low pressure GN_2 upon completion of the receiver restoration.		
9.3	Remove supporting electronic checkout equipment e.g., strip chart recorders, control test unit, or transfer function analyzer from the individual MVCU's (unless required for subsequent testing) and restore control wiring.		
9.4	Inform SCE station shift operating foreman that the test is completed and the plant may be prepared for the next test.		

10.0 ATTACHMENTS

Appendix 10A Master Tracking System
Appendix 10B Abnormal Equipment and Circuits
Appendix 10C Controller/Hand Switch Initial Position
Appendix 10D SDPC and DARMS Data Scan List
Appendix 10E Controller Loop Tuning Forms

Appendix 10A

MASTER TRACKING SYSTEM

Item No.	Description	Section Affected	Initial/Date

Appendix 10B

ABNORMAL EQUIPMENT AND CIRCUITS

Item No.	Description	Section Affected	Initial/Date

Appendix 10C

CONTROLLER/HANDSWITCH INITIAL POSITION

Table 10C-1

Controller/Handswitch		Control Mode	Set Point	Commanded Output
		INITIAL CONDITIONS FOR TEST SECTION 8.1		
UC 2905	(P3-1208)	Manual		Closed
HS 2004	(P3-1201)	----		Closed
HS 2007	(P3-1208)	----		Closed
HS 2902	(P3-1208)	----		Closed
HS 2903	(P3-1208)	----		Closed
HS 2016	(P3-1208)	----		Closed
HS 2019	(P3-1208)	----		Closed
HS 2901	(P3-1208)	----		Disabled and Closed
HS 2911	(P3-1208)	----		Closed
HS 2913	(P3-1208)	----		Disabled and Closed
HC 2002	(P3-1208)	Manual		0 - Closed
PC 2906	(P3-1208	Auto	485 psig	
PC 1000	(P3-1901)	Auto	500 psig	
PC 647B	(P3-1901)	Auto	20 psig	
LV 74A	(P3-1903)	Auto	8.5 in.	
LV 74C	(P3-1903)	Auto	25 in.	
PC 1105	(P3-1903)	Manual		Off
		INITIAL CONDITIONS FOR TEST SECTION 8.2		
HS 131A	(P3-1903)	----		ON
PC 1105	(P3-1903)	Manual		*
HS 33	(P3-1903)	----		Open
HS 110	(P3-1903)	----		Open
LIC 83A	(P3-1903)	Auto	TBD	
LIC 83B	(P3-1903)	Auto	TBD	

*Fraction of maximum speed required to establish a feedwater cleanup flow of ~28,500 lb/hr (60 gpm).

Appendix 10D
SDPC AND DARMS DATA SCAN LIST

SCAN LISTS

This appendix contains 5 DAS Scan Lists to be employed during Test 1010. Theses lists are

SLSD01 - Basic Cold Flow SDPC List
SLSD02* - Expanded Cold Flow SDPC List
SLDA01 - Basic Cold Flow DARM List
SLDA02**- Expanded Cold Flow DARM List
SLSH01 - SHIMMS Scan List

It is intended to use the "Basic Cold Flow" scan lists (SLSD01 and SLDA01) during the conduct of Test 1010. At a convenient point during Test 1010, scan lists SLSD02, SLDA02, and SLSH01 shall be initiated to verify the capability to scan, record, display (as required), and transmit to MDAC Huntington Beach the significantly larger quantity of data anticipated for Test 1030.

The SDPC scan lists (SLSD01 and SLSD02) shall be recorded on site and at MDAC Huntington Beach at a frequency of once every two seconds or at a rate defined by the lead test engineer. The DARM scan lists (SLDA01 and SLDA02) shall be recorded on site and at MDAC Huntington Beach at a rate of once every second or at a rate defined by the lead test engineer. In the event of a breakdown of the data link between the site and MDAC Huntington Beach, the testing may continue at the discretion of the lead test engineer.

Individual site DAS data displays (tabulations, plots, and strip chart traces) shall be formatted as defined in the DAS menu index available on site.

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*Includes all of list SLSD01 plus additional parameters
**Includes all of list SLDA01 plus additional parameters

SD (No.)

DA

SH

SLSD01

Title (28 Char): Basic Cold Flow SDPC List

AI706P	AI707P	AI715P	AI716P	AI729P	AI733P
AI735P	AIC725P	AM1000C	AM1000P	AM1105C	AM1105P
AM647BC	AM647BP	AM74AC	AM74AP	CI708P	CI717P
CI718P	CI720P	CI727P	CI728P	CI736P	CIC726P
FC2301AP	FC2301BP	FC2302AP	FC2302BP	FC2303AP	FC2303BP
FC2401AP	FC2401BP	FC2402AP	FC2402BP	FC2403AP	FC2403BP
FC2501AP	FC2501BP	FC2502AP	FC2502BP	FC2503AP	FC2503BP
FC2601AP	FC2601BP	FC2602AP	FC2602BP	FC2603AP	FC2603BP
FC2701AP	FC2701BP	FC2702BP	FC2703AP	FC2703BP	FC2801AP
FC2801BP	FC2802AP	FC2802BP	FC2803AP	FC2803BP	FCM2301P
FCM2301S	FCM2302C	FCM2302P	FCM2302S	FCM2303C	FCM2303P
FCM2303S	FCM2401C	FCM2401P	FCM2401S	FCM2402C	FCM2402P
FCM2402S	FCM2403C	FCM2403P	FCM2403S	FCM2501C	FCM2501P
FCM2501S	FCM2502C	FCM2502P	FCM2502S	FCM2503C	FCM2503P
FCM2503S	FCM2601C	FCM2601P	FCM2601S	FCM2602C	FCM2602C
FCM2602P	FCM2602S	FCM2603C	FCM2603P	FCM2603S	FCM2701C

SD (No.)

DA

SH

SLSD01

Title (28 Char): Basic Cold Flow SDPC List

FCM2701P	FCM2701S	FCM2702C	FCM2702P	FCM2702S	FCM2703C
FCM2703P	FCM2703S	FCM2801C	FCM2801P	FCM2801S	FCM2802C
FCM2802P	FCM2802S	FCM2803C	FCM2803P	FCM2803S	FI113AP
FI113BP	FI2330P	FI2231P	FI2232P	FI2233P	FI2301P
FI2302P	FI2303P	FI2401P	FI2402P	FI2403P	FI2501P
FI2502P	FI2503P	FI2601P	FI2602P	FI2603P	FI2701P
FI2702P	FI2703P	FI2701P	FI2802P	FI2803P	FI35AP
FI37P	FI44P	HC2002C	HC2002S	HIC659C	HS1007P
HS110BP	HS110P	HS131AP	HS131B2P	HS131BP	HS155BP
HS155P	HS2004P	HS2007P	HS2015P	HS2016P	HS2019P
HS2901P	HS2902P	HS2903P	HS2911P	HS2913AP	HS2913P
HS31BP	HS31P	HS33BP	HS33P	HS44AP	HS44BP
HS44CP	HS44P	HS50A2P	HS50BP	HS50CP	HS50P
HS659BP	HS659P	HS71BP	HS71P	HS131A2P	II44P
II5001P	LC74A	LC74AC	LC74AP	LC74AS	LC83BP
LC83BS	LCM74CC	LCM74CP	LCM74CS	LI103P	LI142P

SD (No.)

DA

SH

SLSD01

Title (28 Char): Basic Cold Flow SDPC List

LI146P	LI160P	LI23P	LI24P	LI2901P	LI2908P
LI79P	LI7P	LI8P	LIC104C	LIC104P	LIC104S
LIC146C	LIC146P	LIC146S	LIC24C	LIC24P	LIC24S
LIC83BC	LIC8C	LIC8P	LIC8S	LIM83BP	LIT160P
LT2908P	LY146AP	LY146AS	LY146BC	LY146BP	LY146BS
LY146C	LY24AC	LY24AP	LY24AS	LY24BC	LY24BP
LY24BS	PC1105C	PC1105P	PC1105S	PC635C	PC635P
PC635S	PCM2906C	PCM2906P	PCM2906S	PCY635C	PCY635P
PCY635S	PD1105P	PDI2008P	PDI2009P	PDI86AP	PDI86P
PF611P	PFI635P	PFI647P	PI127P	PI2002P	PI2006P
PI2015AP	PI2015BP	PI2018AP	PI2018BP	PI2902P	PI2905P
PI2906AP	PI2906BP	PI2906P	PI611P	PI635P	PI640GP
PI64GX	PI640P	PI647P	PI655P	PI77P	PIC635C
PIC635P	PIC635S	PIC647C	PIC647P	PIC647S	PIH2006P
PIH2018P	PIH2019P	PIH2906P	PIH2911P	PIL1105P	PIL2018P
PIT655P	PY647AC	PY647AP	PY647AS	SI1105P	TC1105P

SD (No.)

DA

SH

SLSD01

Title (28 Char): Basic Cold Flow SDPC List

TI1105CP	TI1105DP	TI1105EP	TI1105FP	TI1105GP	TI1105P
TI115P	TI128P	TI13P	TI2001P	TI40P	TI658P
TI90P	UC1105C	UC1105P	UC1105S	XI1105AP	ZI1000AP
ZI1000P	ZI1105P	ZI110BP	ZI110P	ZI131BP	ZI131P
ZI140BP	ZI140P	ZI2002P	ZI2004BP	ZI2004P	ZI2007BP
ZI2007P	ZI2301P	ZI2302P	ZI2303P	ZI2401P	ZI2402P
ZI2403P	ZI2501P	ZI2502P	ZI2503P	ZI2601P	ZI2602P
ZI2603P	ZI2701P	ZI2702P	ZI2703P	ZI2801P	ZI2802P
ZI2803P	ZI2901BP	ZI2901P	ZI2902BP	ZI2902P	ZI2903BP
ZI2903P	ZI2905BP	ZI2905P	ZI2906BP	ZI2906P	ZI2911BP
ZI2911P	ZI2913P	ZI2914BP	ZI2914P	ZI2915BP	ZI2915P
ZI291P	ZI31P	ZI37BP	ZI37P	ZI44BP	ZI44FP
ZI44P	ZI4P	ZI659P	QAI6200		

SD (No.)

DA

SH

SLSD02

Note: Scan List SLSD02 Includes All Items from List SLSD01 Plus Items Listed in This List.

Title (28 Char): Expanded Cold Flow SDPC List

AM1001C	AM1001P	HS1001BP	HS1010P	HS1011P	HS1012P
HS1013P	HS1015P	HS1016P	HS208HP	HS208LP	HS209BP
HS209P	HS213HP	HS213LP	HS214BP	HS214P	HS232HP
HS232LP	HS242A2P	HS242AP	HS242B2P	HS242BP	HS260A2P
HS260AP	HS260B2P	HS260BP	HS2914P	HS2915P	LI1010P
LI1011P	LI1012P	LI1015P	LI1016P	LI1013P	LIH1010P
LIH1011P	LIH1013P	LIH1015P	LIH1016P	PC1001	PC1000C
PC1000P	PC1000S	PC1001C	PC1001P	PC1001S	PC647BP
PC647BS	PC647C	PCM1003C	PCM1003S	PD1000P	PD1001AP
PD1001BP	PD1001CP	PD647BP	PI1001FP	PI1001P	PI1002P
PI1003P	PI2099P	PIH167P	PSP1001C	PSP1001S	T2207P
TAC2801P	TC2301AC	TC2301BC	TC2301C	TC2301P	TC2301S
TC2302AC	TC2302BC	TC2302BS	TC2302C	TC2302P	TC2302S
TC2303AC	TC2303AS	TC2303BC	TC2303C	TC2303P	TC2303S
TC2401AC	TC2401BC	TC2401C	TC2401P	TC2401S	TC2402AC
TC2402BC	TC2402C	TC2402P	TC2402S	TC2403AC	TC2403BC

SD (No.)

DA

SH

SLSD02

Title (28 Char): Expanded Cold Flow SDPC List

TC2403C	TC2403P	TC2403S	TC2501AC	TC2501BC	TC2501C
TC2501P	TC2501S	TC2502AS	TC2502BS	TC2502C	TC2502P
TC2502S	TC2503AC	TC2503BC	TC2503C	TC2503P	TC2503S
TC2601AC	TC2601BC	TC2601C	TC2601P	TC2601S	TC2602AC
TC2602BC	TC2602C	TC2602P	TP2602S	TC2603AC	TC2603BC
TC2603C	TC2603P	TC2603S	TC2701AC	TC2701BC	TC2701C
TC2701P	TC2701S	TC2702AC	TC2702BC	TC2702C	TC2702P
TC2702S	TC2703AC	TC2703BC	TC2703C	TC2703P	TC2703S
TC2793AS	TC2801AC	TC2801BC	TC2801C	TC2801P	TC2801S
TC2802AS	TC2802BS	TC2802C	TC2802P	TC2802S	TC2803AC
TC2803BC	TC2803C	TC2803P	TC2803S	TC2907C	TC2907P
TC2907S	TCM1002C	TCM1002P	TCM1002S	TCM1003P	TCM1004P
TD2301AP	TD2301BP	TD2301CP	TD2301DP	TD2301EP	TD2301FP
TD2302AP	TD2302BP	TD2302CP	TD2302DP	TD2302EP	TD2302FP
TD2303AP	TD2303BP	TD2303CP	TD2303DP	TD2303DP	TD2303 FP
TD2303P	TD2401AP	TD2401BP	TD2401CP	TD2401DP	TD2401EP

SD (No.)

DA

SH

SLSD02

Title (28 Char): Expanded Cold Flow SDPC List

TD2401FP	TD2402AP	TD2402BP	TD2402CP	TD2402DP	TD2402EP
TD2402FP	TD2403AP	TD2403BP	TD2403CP	TD2403DP	TD2403EP
TD2403FP	TD2501AP	TD2501BP	TD2501CP	TD2501DP	TD2501EP
TD2501FP	TD2502FP	TD2502BP	TD2502CP	TD2502DP	TD2020DX
TD2502EP	TD2502FP	TD2503AP	TD2503BP	TD2503CP	TD2503DP
TD2503EP	TD2601AP	TD2601BP	TD2601CP	TD2601DP	TD2601EP
TD2601FP	TD2602AP	TD2602BP	TD2602CP	TD2602EP	TD2602FP
TD2603AP	TD2603BP	TD2603CP	TD2603DP	TD2603EP	TD2603FP
TD2701AP	TD2701BP	TD2701CP	TD2701DP	TD2701EP	TD2701FP
TD2702AP	TD2702BP	TD2702CP	TD2702DP	TD2702EP	TD2702FP
TD2703AP	TD2703BP	TD2703CP	TD2703DP	TD2703EP	TD2703FP
TD2801AP	TD2801BP	TD2801CP	TD2801DP	TD2801EP	TD2801FP
TD2802AP	TD2802BP	TD2802CP	TD2802DP	TD2802EP	TD2803FP
TD2803AP	TD2803BP	TD2803CP	TD2803DP	TD2803EP	TD2803FP
TD2929P	TI1001P	TI1002P	TI1004P	TI2005P	TI2009P
TI2107P	TI2108P	TI2109P	TI2207P	TI2208P	TI2209P

SD (No.)

DA

SH

SLSD02

Title (28 Char): Expanded Cold Flow SDPC List

TI2301AP	TI2301BP	TI2301CP	TI2301P	TI2302	TI2302AP
TI2302BP	TI2302P	TI2303AP	TI2303BP	TI2303P	TI2304AP
TI2304BP	TI2304P	TI2305AP	TI2305BP	TI2305P	TI2603AP
TI2306BP	TI2306P	TI2401AP	TI2401BP	TI2401P	TI2402AP
TI2402BP	TI2402P	TI2403AP	TI2403BP	TI2403P	TI2404AP
TI2404BP	TI2404P	TI2405AP	TI2405BP	TI2405P	TI2406AP
TI2406BP	TI2406P	TI2501AP	TI2501BP	TI2501P	TI2502AP
TI2502BP	TI2502P	TI2503AP	TI2503BP	TI2503P	TI2504AP
TI2504BP	TI2504P	TI2505AP	TI2505BP	TI2505P	TI2560AP
TI2506BP	TI2506P	TI2601AP	TI2601BP	TI2601P	TI2602AP
TI2602BP	TI2602P	TI2603AP	TI2603B	TI2603BP	TI2603P
TI2604AP	TI2604BP	TI2604P	TI2605AP	TI2605BP	TI2605P
TI2606AP	TI2606BP	TI2606P	TI2701AP	TI2701BP	TI2701P
TI2702AP	TI2702BP	TI2702CP	TI2702P	TI2703AP	TI2703BP
TI2703BP	TI2704AP	TI2704BP	TI2704P	TI2705AP	TI2705BP
TI2705P	TI2706AP	TI2706BP	TI2706P	TI2801AP	TI2801BP

SD (No.)

DA

SH

SLSD02

Title (28 Char): Expanded Cold Flow SDPC List

TI2801P	TI2802AP	TI2802BP	TI2802P	TI2803AP	TI2803BP
TI2803P	TI2804AP	TI2804BP	TI2804P	TI2805AP	TI2805BP
TI2805P	TI2806AP	TI2806BP	TI2806P	TI2903P	TI2904P
TI2905P	TI2907P	TIH2911P	TSP2929C	TSP2929S	UCM2905C
UCM2905S	YI2112AP	YI2112BP	YI2112CP	YI2210AP	YI2210BP
YI2210CP	YI2211AP	YI2211BP	YI2211CP	YI2212AP	YI2212BP
YI2212CP	YI2307AP	YI2307BP	YI2307P	YI2308AP	YI2308BP
YI2308CP	YI2308P	YI2309AP	YI2309BP	YI2309CP	YI2309P
YI2407AP	YI2407BP	YI2407P	YI2408AP	YI2408BP	YI2408CP
YI2408P	YI2409AP	YI2409BP	YI2409CP	YI2409P	YI2507AP
YI2507BP	YI2507P	YI2508AP	YI2508BP	YI2508CP	YI2508P
YI2509AP	YI2509BP	YI2509CP	YI2905P	YI2607AP	YI2607BP
YI2607P	YI2608AP	YI2608BP	YI2608CP	YI2608P	YI2609AP
YI2609BP	YI2609CP	YI2609P	YI2707AP	YI2707BP	YI2707P
YI2708AP	YI2708BP	YI2708CP	YI2708P	YI2709AP	YI2709BP
YI2709CP	YI2709P	YI2807AP	YI2807BP	YI2807P	YI2808AP

SD (No.)

DA

SH

SLSD02

Title (28 Char): Expanded Cold Flow SDPC List

YI2808BP	YI2808CP	YI2808P	YI2809AP	YI2909BP	YI2809CP
YI2809P	VTX2307C	VTX2407C	VTX2507C	VTX2607C	VTX2707C
VTX2807C	ZI1001P	ZI1002P	ZI1003P	ZI1006BP	ZI1006P
ZI1007BP	ZI1007P	ZI1009BP	ZI1009P	ZI1010BP	ZI1010P
ZI1011BP	ZI1011P	ZI1012BP	ZI1012P	ZI1013BP	ZI1013P
ZI1015BP	ZI1015P	ZI1016BP	ZI1016P	ZI1030BP	ZI1030P
ZI1031BP	ZI1031P				

SD (No.)

DA

SH

SLDA01

Title (28 Char): Basic Cold Flow DARM List

ESHX5100	ESLX5100	ESX5100	EYX5100	IDSX5002	IDSX5100
IDSX5101	ISX44	ISX5001	ISX5002	ISX5003	ISX5004
ISX5006	ISX5010	ISX5015	ISX5020	ISX5021	ISX5023
ISX5001	ISX5101	ISX5200	KYX5100	KYX5101	LSLLX833
LSLLX872	PSHHX957	PSLLX811	PSLLX864	PSLX908	PSLX810
SHLX5100	SSLX907	TCX1022	TCX1025	TSHHX956	TSHH955
ZSX5100A	ZSX5101A	ZSX5001	ZSX5012A	ZSX5003	ZSX5004
ZSX44	ZSX5006	ZSX5010	ZSX5020	ZSX5021	ZSX5025
ZSX5015	ZSX131A	ZSHHX917			

SD (No.)

DA

SH

SLDA01

Title (28 Char): Basic Cold Flow DARM List

FIX2301	FIX2401	FIX2501	FIX2601	FIX2701	FIX2801
FIX2803	JTX1464	JTX1465	JTX1466	JTX44	JTX5001
JTX5003	JTX5004	JTX5006	JTX5200	OTX2136	OTX2137
OTX2142A	OTX2142B	OTX2142C	OTX2336	OTX2338	OTX2341
OTX2436	OTX2439	OTX2537	OTX2538A	OTX2538B	OTX2538C
OTX2538D	OTX2544A	OTX2544B	OTX2544C	OTX2544D	OTX2544E
OTX2544F	OTX2636	OTX2637	OTX2736	OTX2737	OTX2741
OTX2836	OTX2837	OTX2839	OTX2844A	OTX2844B	OTX2844C
PDI3401P	PDIT86	PDTX2330	PDTX2332	PDTX2431	PDTX2530
PDTX2532	PDTX2631	PDTX2731	PDTX2830	PDTX2832	PDTX2949
PIX2006	PIX2902	PIX2906A	TEX1102	TEX2	TEX2050
TEX2351	TEX2533	TEX2940	TEX2941	TEX2942	TEX2943
TEX2946	TEX2947	TEX2948	TEX2950	TEX2951	TTX2333
TTX2334	TTX2345	TTX2346	TTX2347	TTX2434	TTX2445
TTX2446	TTX2447	TTX2533	TTX2535	TTX2545	TTX2546
TTX2547	TTX2634	TTX2645	TTX2646	TTX2647	TTX2734

SD (No.)

DA

SH

SLDA01

Title (28 Char): Basic Cold Flow DARM List

TTX2745	TTX2747	TTX2833	TTX2835	TTX2845	TTX2846
TTX2847	ZIX2004A	ZIX2301	ZIX2401	ZIX2501	ZIX2601
ZIX2701	ZIX2801	ZIX2803	ZIX2905	ZIX74A	ZIX74C
TTX1831					

SD (No.)

DA

SH

SLDA02

Title (28 Char): Expanded Cold Flow DARM List

JQX1451	JQX1452	JQX1453	JQX1454	JQX1455	JQX1456
JQX1457	JQX1458	JTX1451	JTX1452	JTX1453	JTX1454
JTX1455	JTX1456	JTX1457	JTX1458	JTX1459	JTX242
JTX260	LTX1806	MTX1805	MTX1832	TEX2053A	TEX2053B
TEX2053C	TEX2053D	TEX2053E	TEX2053G	TEX2053I	TEX2053J
TEX2053K	TEX2053L	TEX2053M	TEX2053N	TEX2353	TEX2354A
TEX2354B	TEX2354C	TEX2354D	TEX2355A	TEX2355B	TEX2355C
TEX2355D	TEX2356A	TEX2356B	TEX2356C	TEX2356D	TEX2356E
TEX2356F	TEX2356G	TEX2356H	TEX2356I	TEX2356J	TEX2356K
TEX2356L	TEX2356M	TEX2356N	TEX2356P	TEX2356Q	TEX2356R
TEX2356S	TEX2356T	TEX2356U	TEX2356V	TEX2356W	TEX2356Y
TEX2356Z	TEX2359A	TEX2359C	TEX2359D	TEX2359E	TEX2359G
TEX2359H	TEX2359I	TEX2359K	TEX2359L	TEX2359P	TEX2359U
TEX2359X	TEX2362B	TEX2454A	TEX2454B	TEX2454C	TEX2454D
TEX2455A	TEX2455B	TEX2455C	TEX2455D	TEX2456A	TEX2456B
TEX2456C	TEX2456D	TEX2554A	TEX2554B	TEX2554C	TEX2554D

SD (No.)

DA

SH

SLDA02

Note: Scan list SLDA02 includes all items from list SLDA01 plus items listed in this list.

Title (28 Char): Expanded Cold Flow DARM List

TEX2555A	TEX2555B	TEX2555C	TEX2555D	TEX2556A	TEX2556B
TEX2556C	TEX2556D	TEX2556E	TEX2556F	TEX2556G	TEX2556H
TEX2556I	TEX2556J	TEX2556K	TEX2556L	TEX2556M	TEX2556N
TEX2556P	TEX2556Q	TEX2556R	TEX2556S	TEX2556T	TEX2556U
TEX2556V	TEX2556W	TEX2556Y	TEX2556Z	TEX2559A	TEX2559C
TEX2559E	TEX2559G	TEX2559H	TEX2559I	TEX2559K	TEX2559L
TEX2559P	TEX2559U	TEX2559X	TEX2562B	TEX2654A	TEX2654B
TEX2654C	TEX2654D	TEX2655A	TEX2655B	TEX2655C	TEX2655D
TEX2656A	TEX2656B	TEX2656C	TEX2656D	TEX2754A	TEX2754B
TEX2754C	TEX2754D	TEX2755A	TEX2755B	TEX2755C	TEX2755D
TEX2755E	TEX2755F	TEX2755G	TEX2755H	TEX2755I	TEX2755J
TEX2755K	TEX2755L	TEX2755M	TEX2755N	TEX2755O	TEX2755P
TEX2755Q	TEX2755R	TEX2755S	TEX2755T	TEX2755U	TEX2755V
TEX2755W	TEX2755Y	TEX2755Z	TEX2756A	TEX2756B	TEX2756C
TEX2756D	TEX2758A	TEX2758C	TEX2758D	TEX2758E	TEX2758G
TEX2758H	TEX2758I	TEX2758K	TEX2756L	TEX2758P	TEX2758U

SD (No.)

DA

SH

SLDA02

Title (28 Char): Expanded Cold Flow DARM List

TEX2758X	TEX2716B	TEX2854A	TEX2754B	TEX2754C	TEX2754D
TEX2855A	TEX2855B	TEX2855C	TEX2855D	TEX2856A	TEX2856B
TEX2856C	TEX2856D	TEX2856E	TEX2856F	TEX2856G	TEX2856H
TEX2856I	TEX2856J	TEX2856K	TEX2856L	TEX2856M	TEX2856N
TEX2856P	TEX2856Q	TEX2856R	TEX2856S	TEX2856T	TEX2856U
TEX2856V	TEX2856W	TEX2856Y	TEX2856Z	TEX2859A	TEX2859C
TEX2859D	TEX2859E	TEX2859G	TEX2859H	TEX2859I	TEX2859K
TEX2859L	TEX2859P	TEX2859U	TEX2859X	TEX2862B	ZIX1000
ZIX1001	ZIX647B	TIX2607A			

SD (No.)

DA

SH

SLSH01

Title (28 Char): Expanded SHIMMS Scan List

ATX1808	ATX1809	ATX1812	ATX1813	ATX1814	ATX1817
ATX1818	ATX1819	ATX1820	ATX1821	ATX1824	ATX1825
ATX1826	ATX1833	ATX1834	OTX 1802	OTX1811	ATX1816
OTX1823	OTX1828	OTX1830	OTX1842	OTX1846	OTX1850
OTX1854	OTX1858	OTX1862	STX1801	STX1810	STX1815
STX1822	STX1827	STX1829	STX1839	STX1840	STX1841
STX1843	STX1844	STX1845	STX1847	STX1848	STX1849
STX1851	STX1852	STX1853	STX1855	STX1856	STX1857
STX1859	STX1860	STX1861			

Appendix 10E

CONTROLLER LOOP TUNING FORMS

Control Loop Tuning

Controller Tag LC 74A

MVCU No. 4-4

Function Type LI

Test No. 1010

Paragraph 8.2.11

Line 6

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag LC 74C

Paragraph 8.2.13

MVCU No. 4-4 Line 11 Control Engr. _____

Function Type LI

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag PC1105

MVCU No. 1-10

Function Type _____

Test No. 1010

Paragraph 8.2.18

Line 7

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag LC 74A

Paragraph 8.4.10.1

MVCU No. 4-4 Line 6 Control Engr. _____

Function Type LI

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag LIC 24 (LV 24A)

Paragraph 8.4.10.2

MVCU No. 4-1 Line 2 Control Engr. _____

Function Type LI

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag LIC 24 (LV 24B)

Paragraph 8.4.10.2

MVCU No. 4-1 Line 5 Control Engr. _____

Function Type LI

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag LIC 83A

MVCU No. 4-1

Function Type LI

Test No. 1010

Paragraph 8.4.10.3

Line 10 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag LIC 83B

Paragraph 8.4.10.4

MVCU No. 4-1 Line 29 Control Engr. _____

Function Type LI

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag LC 74C

MVCU No. 4-4

Function Type _____

Test No. 1010

Paragraph 8.4.12

Line 6

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag TC 2301

Paragraph 8.4.18.2

MVCU No. 1-1 Line 18 Control Engr. _____

Function Type Flow

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag TC 2501

Paragraph 8.4.18.3

MVCU No. 1-4 Line 18 Control Engr. _____

Function Type Flow

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag TC 2302

Paragraph 8.4.19.1

MVCU No. 1-1 Line 38 Control Engr. _____

Function Type Flow

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2303

MVCU No. 1-2

Function Type Flow

Test No. 1010

Paragraph 8.4.19.2

Line 18

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Test No. 1010

Controller Tag TC 2401

Paragraph 8.4.19.3

MVCU No. 1-2 Line 38 Control Engr. _____

Function Type Flow

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2402

MVCU No. 1-3

Function Type Flow

Test No. 1010

Paragraph 8.4.19.4

Line 18 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2403

MVCU No. 1-3

Function Type Flow

Test No. 1010

Paragraph 8.4.19.5

Line 38 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2502

MVCU No. 1-4

Function Type Flow

Test No. 1010

Paragraph 8.4.19.6

Line 38 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2503

MVCU No. 1-5

Function Type Flow

Test No. 1010

Paragraph 8.4.19.7

Line 38 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2601

MVCU No. 1-5

Function Type Flow

Test No. 1010

Paragraph 8.4.19.8

Line 38 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2602

MVCU No. 1-6

Function Type Flow

Test No. 1010

Paragraph 8.4.19.9

Line 18

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2603

MVCU No. 1-6

Function Type Flow

Test No. 1010

Paragraph 8.4.19.10

Line 38 Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2701

MVCU No. 1-7 Line 18

Function Type Flow

Test No. 1010

Paragraph 8.4.19.11

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2702

MVCU No. 1-7

Function Type Flow

Test No. 1010

Paragraph 8.4.19.12

Line 38

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2703

MVCU No. 1-8

Function Type Flow

Test No. 1010

Paragraph 8.4.19.13

Line 18

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2801

MVCU No. 1-8

Function Type Flow

Test No. 1010

Paragraph 8.4.19.14

Line 38

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2802

MVCU No. 1-9

Function Type Flow

Test No. 1010

Paragraph 8.4.19.15

Line 18

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag TC 2803

MVCU No. 1-9

Function Type Flow

Test No. 1010

Paragraph 8.4.19.16

Line 38

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

Control Loop Tuning

Controller Tag PC 1105

MVCU No. 1-10 Line 06

Function Type Valve Control

Test No. 1010

Paragraph 8.4.21

Control Engr. _____

Date _____

		Initial Setting	Trial 1	Trial 2	Trial 3	Trial 4	Final Values
Gains	K1						
	K2						
	K3						
	K4						
	K5						
Alarms (Values)							
	Setpoint Low						
	Setpoint High						
	PV Low						
	PV High						
	Output Low						
	Output High						
Ramp Rates (Values)							
	Output						
	Setpoint						
Limiting (Select)							
	Setpoint						
	Output						
	High Dynamic						
	Low Dynamic						
Mode (Select)							
	Cascade						
	Normal						
Setpoint							

AUG 1 3 1984

John Raetz and/or
Bob Riedesel

Were there letters of transmittal to STMPO for Test Procedures 1010 or 1030 (1030 came in two pieces, Sections 1-9 and Section 10-Appendices)? I've never seen transmittal letters or memos, and they may just have been handed to DOE without formal correspondence. (For heaven's sake, don't concoct any at this late date!).

AUG 1 3 1984

John Raetz and/or
Bob Riedesel

Were there letters of transmittal to STMPO for Test Procedures 1010 or 1030 (1030 came in two pieces, Sections 1-9 and Section 10-Appendices)? I've never seen transmittal letters or memos, and they may just have been handed to DOE without formal correspondence. (For heaven's sake, don't concoct any at this late date!).

Aug 16 1984

RG Received

No letter of transmittal. See TP 1010 or 1030, or for updates & TP 980. (No Date, too)

Department of Energy
San Francisco Operations Office
[illegible]
Oakland, California 94612

Reply To: DOE Solar One Project Office
P.O. Box 366
Daggett, CA 92327

AUG 16 1984

Mr. Robert L. Gervais
Solar One Project Office
McDonnell Douglas Astronautics Corp.
P.O. Box 366
Daggett, CA 92327

Subject: Clearance of Control Contract DE-AC03-79SF10499
Solar One Reports for DOE/TIC Inclusion.

Dear Bob:

Enclosed are copies of covers and title pages of eight reports prepared by McDonnell Douglas Astronautics Corporation for the Solar One Project under the above referenced contract. In preparation for delivery of these documents to DOE/TIC, I have prepared a SAN form 70 "Request for Patent Clearance" and a DOE form RA-426 "Recommendations for Announcement and Distribution of Documents" for each document.

Please have the appropriate MDAC personnel complete and sign these forms. As agreed, SAN form 70 should be forwarded to SAN/OPC by your office with copies of the completed SAN form 70 and the transmittal letter being sent to me. The completed DOE form RA-426 should be sent directly back to me.

The documents covered by this letter are:

Primary Document No.	Secondary No.	Brief Title
DOE/SF/10499-T117	STMPO 581	Test Procedure 210, Rev. 1
DOE/SF/10499-T118	STMPO 587	Test Procedure 820, Rev. 0
DOE/SF/10499-T119	STMPO 588	Test Procedure 871, Rev. 0
DOE/SF/10499-T120	STMPO 589	Test Procedure 905, Rev. 0
DOE/SF/10499-T121	STMPO 590	Test Procedure 910, Rev. 0
DOE/SF/10499-T138	STMPO 593	Test Procedure 1010, Rev. 0
DOE/SF/10499-T139	STMPO 594	Test Procedure 1030, Rev. 0, Sec. 1-9
DOE/SF/10499-T140	STMPO 595	Test Procedure 1030, Rev. 0, Sec. 10

If you should have any questions or concerns please do not hesitate to contact me by telephone at, (619) 254-2672.

Sincerely,

S.D. Elliott, Jr., Director
DOE Solar One Project Office

SDE/aks
Project File: CCC005.RNO(SA3)

Encl: Eight Document Covers W/forms 70 and RA-426

cc: Roger Gaither, SAN/OPC
W.D. Matheny, DOE/TIC
Mike Lopez, DOE/SAN (FGS)
Mary Soderstrum, B&McD

SAN FORM 70 10/80

SAN FRANCISCO OPERATIONS OFFICE

CONTRACTOR REQUEST FOR PATENT CLEARANCE FOR RELEASE OF UNCLASSIFIED DOCUMENT

Prime Contract No.	DE-AC03-79SF10499
Subcontract No.	(N/A)
Report No. (STMPO 593)	DOE/SF/10499-T138
Date of Report	
Name & Phone No. of DOE Technical Representative	S.D. Elliott, Jr. (619) 254-2672

TO: Roger S. Gaither, Asst. Chief for Prosecution
Office of Patent Counsel/Livermore Office
P.O. Box 808, L-37
Livermore, California 94550

FROM:
McDonnell Douglas Corporation
3855 Lakewood Blvd.
Long Beach, CA 90846

1. Document Title: Receiver "Cold Flow" (Controls) Preoperational Test Procedure 1010, Revision 0

2. Type of Document: ☒ Technical Report, ☐ Conference Paper, ☐ Journal Article, ☐ Abstract or Summary, ☐ Copy of Oral Presentation, ☐ Other (please specify): _____

3. In order to meet a publication schedule or submission deadline, patent clearance by (Routine) would be desired.

REMARK IS TO CHECK BOX #4 OR #5 BELOW.

☐ 4. I have reviewed (or have had reviewed by technically knowledgeable personnel) this document for possible inventive subject matter (Subject Inventions) and that no inventions or discoveries (Subject Inventions) are deemed to be disclosed in this document except as stated below:

a. Attention should be directed to pages _____ of this document.

b. This document describes matter relating to an invention:

i. Contractor Invention Docket No. _____.
ii. A disclosure of the invention was submitted to DOE on _____ (date)
iii. A disclosure of the invention will be submitted shortly, _____ (approximate date)
iv. A waiver of DOE's patent rights to the contractor:
☐ has been granted, ☐ has been applied for; or ☐ will be applied for _____ (date)

☐ 5. This document is being submitted, but no review has been made of this document for possible inventive subject matter.

6. Remarks. Provide copy of clearance to: Solar One Project Office
P.O. Box 368, Daggett, CA 92327

Reviewing/Submitting Official: Name (Print/Type) _____
Title _____
Signature _____ Date _____

TO: INITIATOR OF REQUEST

FROM: ASSISTANT CHIEF FOR PROSECUTION
Office of Patent Counsel/Livermore Office

☐ No patent objection to above-identified release.

☐ Please defer release until advised by this office.

Signed _____ Date Mailed _____

DOE Form RA-426
(10/80)

U.S. DEPARTMENT OF ENERGY

OMB NO. 038-R0190

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See Instructions on Reverse Side

1. DOE Report No.	2. Contract No.	3. Subject Category No.
DOE/SF/10499-T138 (STMPO 593)	DE-AC03-79SF10499	UC 62, 62c, 62d

4. Title

Receiver "Cold Flow" (Controls) Preoperational Test Procedure 1010, Rev. 0

5. Type of Document ("x" one)

☒ a. Scientific and technical report

☐ b. Conference paper: Title of conference _____

_____ Date of conference _____

Exact location of conference _____ Sponsoring organization _____

☐ c. Other (specify planning, educational, impact, market, social, economic, thesis, translations, journal article manuscript, etc.)

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S.D. Elliott, Jr., Director, DOE Solar One Project Office

Organization

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