

PLANT DRAINS AND SUMPS

PREOPERATIONAL TEST

PROCEDURE 940

REVISION: 0

UNITED STATES DEPARTMENT OF ENERGY/
SOUTHERN CALIFORNIA EDISON COMPANY

10 MWe SOLAR PILOT PLANT

DAGGETT, CALIFORNIA

PROJECT: C-21700

STEARNS-ROGER ENGINEERING CORPORATION

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PLANT DRAINS AND SUMPS

SYSTEM (940)

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1.0 OBJECTIVES

- 1.1 Demonstrate operation of Raw/Service Water Sump Pump P-715 through LS 1605.
- 1.2 Demonstrate operation of TSU Area Sump Pump P-717 through LS 1606.
- 1.3 Demonstrate normal operation of the Maintenance Oil Sump Pump P-718.
- 1.4 Demonstrate normal operation of the Oil Sump Pump P-714.
- 1.5 Demonstrate that LLH 1603 is activated through LS 1603.
- 1.6 Demonstrate normal operation of the Separator Sludge Pump P-716.
- 1.7 Demonstrate manual operation of Separator Waste Water Pumps P-711 and P-712 and related interlock functions.
- 1.8 Demonstrate automatic operation of Separator Waste Water Pumps P-711 and P-712 and related interlock functions.
- 1.9 Demonstrate that the Separator Waste Water Pumps are capable of pumping at the design capacities.
- 1.10 Demonstrate that the bearing lube water is controlled through the operation of SOV-1602.
- 1.11 Demonstrate the Oil Water Separator SE-701 high level alarm function LAH-1602.

2.0 ACCEPTANCE CRITERIA

		<u>VERIFICATION PARAGRAPH</u>	<u>OBJECTIVE</u>
2.1	Raw/Service Water Sump Pump P-715 starts at sump level 1 ft. and stops at sump level 8 in. P&ID 40P7005133149.	8.1.2	1.1
2.2	TSU Area Sump Pump P-717 starts at top of sump level and stops at sump level 1 ft. P&ID 40P7005133149.	8.2.1	1.2
2.3	Maintenance Oil Sump Pump P-718 is capable of emptying the sump P&ID 40P7005133149.	8.3.1	1.3
2.4	Oil Sump Pump P-714 is capable of emptying the sump. P&ID 40P7005133149.	8.4.1	1.4
2.5	LLH 1603 lights when the sump level is 50 in.	8.4.2	1.5
2.6	Separator Sludge Pump P-716 is capable of emptying the sump. P&ID 40P7005133149.	8.5.1	1.6
2.7	Separator Waste Water Pumps P-711 and P-712 can be started and stopped manually from local control hand switches HS 1602A and HS 1602B P&ID 40P7005133149 9033/4 E6-1068	8.6.1 8.6.2 8.6.3 8.6.4	1.7
2.8	Separator Waste Water Pumps P-711 and P-712 will start and stop automatically when respective hand switches are placed in the "Auto" position. P-711 Starts when the level in the sump reaches 40 in. and stops at 12 in. P-712 starts when the level in the sump reaches 48 in. and stops at 40 in. P&ID 40P7005133149 9033/4 E6-1068	8.7.1 8.7.2 8.7.3	1.8

2.0 Acceptance Criteria (Contd)

	<u>Verification Paragraph</u>	<u>Objective</u>
2.9 Separator Waste Water Pump (Single Pump Operation)pumps at a rate of 175 gpm and the combined discharge rate of P-711 & P-712 (Both pumps running) is 320 gpm. P&ID 40P7005133149.	8.7.3	1.9
2.10 SOV-1602 deenergizes when pumps start and energizes when the pumps stop. P&ID 40P7005133149	8.6.1 8.6.2 8.6.3 8.6.4	1.10
2.11 LAH-1602 Alarms on the EPGS CRT when a high level of 54 in. is reached P&ID 40P7005133149.		8.7.3 1.11

3.0 REFERENCES

3.1 Pilot Plant System Description

3.2 Logic Diagrams

N/A

3.3 Line Schedules

40P7002133104, Rev. 2

- a) Drains (DR), Pg 1 of 2
- b) Equipment Drains (ED), Pg 1 of 1
- c) Oily Waste (OW), Pg 1 of 1
- d) Service Water (SW), Pg 2 of 2
- e) Thermal Oil (TO), Pg 2 of 3
- f) Waste Drains (WD), Pg 1 of 1

3.4 Single Line Diagrams

- a) 40E7005133192, Rev. 0, 480 Volt MCC B
- b) 40E7005133193, Rev. 0, 480 Volt MCC C

3.5 Piping and Instrumentation Diagrams

- a) 40P7005133149, Rev. 3, Plant Support Subsystem (PSS), Liquid Waste and Drains, Sheet 1 of 1.
- b) 40P7005133152, Rev. 2, Plant Support Subsystem (PSS), Miscellaneous Subsystems, Sheet 1 of 1.
- c) 40P3005132192, Rev. 1, Thermal Storage Subsystem (TSS), Charging Oil, Sheet 1 of 1.
- d) 40P3005132194, Rev. 1, Thermal Storage Subsystem (TSS), Extraction Oil, Sheet 1 of 1.
- e) 40P3005132195, Rev. 1, Thermal Storage Subsystem (TSS), Extraction Steam and Condensate, Sheet 1 of 1.
- f) 40P9005133302, Circulating Water System.
- g) 40P9005133308, Rev. 0, Drain and Sump Systems.

3.6 Electrical Elementary Diagrams

40E7005133192	One Line Diagram - 480V - MCC-B
40E7005133193	One Line Diagram - 480V - MCC-C

3.7 Instrument Index

40I700218I, Rev. 2

- a) Page 7 of 9
- b) Page 8 of 9

3.0 REFERENCES (Contd)

3.8 Material Requisition and/or Specification

Technical Specification, D.O.E. No. 40M700-6S, for Piping and Mechanical Equipment, Volume II, Supplements and Appendices. Appendix 4, Contractor-Furnished equipment

- a) Oil Water Separator (SE-701) which includes:
 - Separator Waste Water Pumps P-711 and P-712, Oil Sump Pump P-714, and Separator Slug Pump P-716
- b) TSU Maintenance Oil Sump Pump (P-718)
- c) Raw/Service Water Sump Pump (P-715)
- d) TSU Area Sump Pump (P-717)

3.9 Vendor Data

- a) (SE-701 P-711, P-712, P-714, P-716) TBD
 - P-711, P-712 - Aurora Model 531
 - 2 1/2 x 3 x 11 1/4
 - P714-Gorman-Rupp Model
 - 81 1/4 A3-X1/2
 - P716-Gorman-Rupp Model
 - 20-x 3/4-3P
- b) (P-718) Engineers Sales-Service Co. VSS-4C
- c) (P-715) Engineers Sales-Service Co.
VSS-3-4
- d) (P-717) Aurora Model 530 - 1 1/2 x 2 x 7

3.10 Standards

N/A

3.11 Startup Schedules

- a) Detail Start-up Test Schedule October 3, 1980.

4.0 PREREQUISITES

- 4.1 Turnover of the system to the SCE is complete and in accordance with Section 5.4 of the SCE Startup Manual.

_____/_____
INITIAL DATE

- 4.2 Reference Material has been reviewed and later revisions (if any) will not affect this test.

_____/_____
INITIAL DATE

- 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.

_____/_____
INITIAL DATE

- 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.

_____/_____
INITIAL DATE

- 4.5 The system has been walked through and verified complete to the extent required to conduct this test.

_____/_____
INITIAL DATE

- 4.6 Prerequisite component tests and calibration have been completed for components listed on Appendix 10C, 10D and 10E.

_____/_____
INITIAL DATE

- 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 The following equipment should not be operated during the time the Plant Drains and Sumps System is removed from service:
- a) Charging Oil Pump Skid SA-304
 - b) Extraction Oil Pump Skid SA-309
 - c) Thermal Storage Heater Skid SA-303
 - d) Thermal Storage Heater Skid SA-302
 - e) Desuperheater & Flash Tank Skid SA-301
 - f) Preheater Boiler & Superheater Skids SA-305 & SA-307
 - g) Preheater Boiler & Superheater Skids SA-306 & SA-308
 - h) Thermal Storage Blowdown Tank V-308
 - i) EPGS Area Drains
- 5.2 Area containing automatically starting pumps posted with "Caution" signs or identified in a conspicuous manner.
- 5.3 Observe vendor operating and maintenance instructions.
- 5.4 Notify the control room prior to withdrawing water from any fire hydrant temporary water supply.

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 will be verified for expected test time period.

6.1 Indicating Instruments

None Required

6.2 Sensors and Transducers

None Required

6.3 Recording Equipment

None Required

6.4 Other

6.4.1 Calibrated Dipstick

7.0 INITIAL CONDITIONS

7.1 Environmental Conditions

7.1.1 This test will be performed at above freezing ambient conditions.

7.2 Temporary Installations

7.2.1 Disconnect Maintenance Oil Sump Pump P-718 discharge flexible hose at discharge block valve. Discharge hose into TSU Area Sump.

7.2.2 Discharge Oil Sump Pump P-714 into Oil Water Separator SE-701.

7.2.3 Discharge Separator Sludge Pump P-716 into Oil Water Separator SE-701.

7.2.4 Temporary Water Supply from fire system hydrants to point of use by hoses.

7.3 Support Systems/Plant Operating Status

7.3.1 Service Water to SOV-1602 is available.

7.3.2 SDPC System Display and alarm functions operational to support Section 8.7.3.

7.4 Component Lineup

7.4.1 Initial circuit breaker positioning for step 8.1.1 as noted in Appendix 10F completed.

_____/_____
INITIAL DATE

7.4.2 Initial control switch positioning for step 8.1.1 as noted in Appendix 10G completed.

_____/_____
INITIAL DATE

7.4.3 Initial valve lineup for step 8.1.1 as noted in Appendix 10H completed.

_____/_____
INITIAL DATE

7.5 Other Initial Conditions

7.5.1 Establish communications between control room and local test stations as required.

INITIAL / DATE

8.0 PROCEDURE AND DATA COLLECTION

8.1 Raw/Service Water Sump Pump P-715

8.1.1 Verify that initial conditions have been established.

_____/_____
INITIAL DATE

8.1.2 Observe precaution 5.4 and fill Raw/Service Water Sump with water and record the following using the Test Equipment dipstick:

	<u>Design</u>	<u>Actual</u>
Pump Start	12 inches	_____ In.
Pump Stop	8 inches	_____ In.

_____/_____
INITIAL DATE

8.2 TSU Area Sump Pump P-717

8.2.1 Observe precaution 5.4 and fill TSU Area Sump with water and record the following using the Test Equipment dipstick:

	<u>Design</u>	<u>Actual</u>
Pump Start	Top of Sump	_____ Ft.
Pump Stop	1 Ft.	_____ Ft.

_____/_____
INITIAL DATE

8.3 Maintenance Oil Sump Pump P-718

8.3.1 Observe precaution 5.4 and fill Maintenance Oil Sump with water and verify that pump starts, empties the sump and stops by actuating Manual Switch on and off.

_____/_____
INITIAL DATE

8.0 Procedure and Data Collection (Contd)

8.4 Oil Sump Pump P-714

8.4.1 Observe precaution 5.4 and fill Oil Sump with water and verify that the pump starts, empties the sump and stops by actuating Manual Switch on and off.

_____/_____
INITIAL DATE

8.4.2 LS 1603 Illuminates LLH 1603 at:
(Utilize the test equipment dipstick)

<u>Design</u>	<u>Actual</u>
50 In.	_____ In.

_____/_____
INITIAL DATE

8.5 Sludge Pump P-716

8.5.1 Observe precaution 5.4 and fill Sludge Sump with water and verify that the pump starts, empties the sump and stops by actuating Manual Switch on and off.

_____/_____
INITIAL DATE

8.6 Separator Waste Water Pumps P-711 & P-712 Manual Start/Stop

8.6.1 At SE-701 place HS 1602A in "Hand" position. Verify starting of pump P-711, illumination of the Run Light and bearing water flow.

_____/_____
INITIAL DATE

8.6.2 At SE-701 place HS 1602A in "Off" position. Verify stopping of pump P-711, run light turns off and no bearing water flow.

_____/_____
INITIAL DATE

8.6.3 At SE-701 place HS 1602B in "Hand" position. Verify starting of pump P-712, illumination of the run button and bearing water flow.

_____/_____
INITIAL DATE

8.0 Procedure and Data Collection (Contd)

8.6.4 At SE-701 place HS 1602B in "Off" position. Verify stopping of pump P-712, run light turns off and no bearing water flow.

_____/_____
INITIAL DATE

8.7 Separator Waste Water Pumps P-711 & P-712 "AUTO" Start/Stop

8.7.1 Place HS 1602A in the "Auto" position.

_____/_____
INITIAL DATE

8.7.2 Place HS 1602B in the "Auto" position.

_____/_____
INITIAL DATE

8.7.3 Observe precaution 5.4 and fill the Separator Waste Water Sump with water at a rate greater than 175 GPM. Record the following (SDPC dependant tests to be performed when SPDC is operational):

	<u>Design</u>	<u>Actual</u>
First Pump Start	40 in	_____ in
Second Pump Start	48 in	_____ in
LAH 1602 Alarms (See Sect. 7.3.2)	54 in	_____ in
Flow Through FE 1601 (See Sect. 7.3.2) With One pump running)	175 min. gpm	_____ gpm
Flow Through FE 1601 (With both pumps running)	320 min. gpm	_____ gpm
	_____/_____ INITIAL	_____ DATE

9.0 SYSTEM RESTORATION

9.1 Remove all temporary test equipment, hoses, etc., or note in Abnormal Equipment and Circuits Log.

_____/_____
INITIAL DATE

9.2 Reconnect the Maintenance Oil Sump Pump P-718 discharge flexible hose at discharge block valve.

_____/_____
INITIAL DATE

9.3 Inform the shift Operating Foreman that the test is completed and the system may be lined up and placed in service in accordance with station operating procedures.

_____/_____
INITIAL DATE

10.0 ATTACHMENTS

Appendix 10A	Master Tracking System
Appendix 10B	Abnormal Equipment and Circuits
Appendix 10C	Electrical Prerequisite Tests
Appendix 10D	Instrumentation and Control Prerequisite Tests and Calibrations
Appendix 10E	Mechanical Prerequisite Tests
Appendix 10F	Initial Status of Breakers for Test Procedure Step 8.1.1
Appendix 10G	Initial Status of Switches for Test Procedure Step 8.1.1
Appendix 10H	Initial Status - Valve Lineup for Test Procedure Step 8.1.1

APPENDIX 10A

MASTER TRACKING SYSTEM

ITEM NO.	DESCRIPTION	SECTION AFFECTED	INITIAL/DATE
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APPENDIX 10B

ABNORMAL EQUIPMENT AND CIRCUITS

ITEM NO.	DESCRIPTION	SECTION AFFECTED	INITIAL/DATE
----------	-------------	------------------	--------------

N/A

APPENDIX 10C

ELECTRICAL PREREQUISITE TESTS

Component		Generic Test	Test Complete
Number	Description	Procedure No.	Initial/Date

N/A

APPENDIX 10D

INSTRUMENTATION & CONTROLS
PREREQUISITE TESTS AND CALIBRATIONS

Component				Generic Test Procedure No.	Test Complete Initial/Date
Number	Description	Set Point	Field Setting		
FE-1601	Flow Indicator	N/A		Flow-Pressure Curve Vendor Supplied	
FT-1602	Flow Transmitter			Calibrate	
LS-1602	Level Switch Energize First Pump 40 in. Deenergize First Pump 12 in. Energize Second Pump 48 in. Deenergize Second Pump 40 in. Alarm Level		54 in.	Adj. Set Point	
LS-1603	Level Switch		50 in.	Adj. Set Point	
LS-1605	Level Switch Close Open		12 in. 8 in.	Adj. Set Point	
LS-1606	Level Switch Close Open		Top of Sump 1 ft.	Adj. Set Point	
SOV-1602	Sol Valve	N/A		Stroke	

APPENDIX 10E

MECHANICAL PREREQUISITE TESTS

Number	Component Description	Generic Test Procedure No.	Test Complete Initial/Date
1	Verify that sumps and piping systems are in a clean enough condition to conduct this test.	N/A	

APPENDIX 10F

INITIAL STATUS OF BREAKERS FOR TEST PROCEDURE STEP 8.1.1

<u>BREAKERS</u>				
<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>POSITION</u>	<u>STATUS</u>	<u>INITIAL/DATE</u>
BL-712-MCC-B-4KR	SE-701 Feed	Closed		
BL-712-MCC-B-4KL	P-717	Closed		
BL-712-MCC-B-1DR	P718	Closed		
BL-702-MCC-C-3HL	P715	Closed		

APPENDIX 10G

INITIAL STATUS OF SWITCHES FOR TEST PROCEDURE STEP 8.1.1

<u>SWITCH</u>			
<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>STATUS</u>	<u>INITIAL/DATE</u>
HS-1602A	Separator Waste Water Pump P-711	Off	
HS-1602B	Separator Waste Water Pump P-712	Off	

APPENDIX 10H

INITIAL STATUS - VALVE LINEUP LIST FOR TEST PROCEDURE STEP 8.1.1

VALVE TAG NO.	INFO ONLY DRAWING NUMBER **	INFO ONLY COORD	DESCRIPTION	POSITION	INITIAL	DATE
*	7005133149	H-17	Pump P-715 Disch. Block Valve	O		
V-OW-8-1	7005133149	J-13	Maintenance Oil Sump Drain	C		
*	7005133149	I-12	Pump P-717 Disch. Block Valve	O		
*	7005133149	H-8	Pump P-714 Disch. Block Valve	O		
*	7005133149	H-8	Pump P-716 Suct. Block Valves (3)	O		
V-WD-1-2	7005133149	H-6	Pump P-711 Disch. Block Valve	O		
V-WD-1-4	7005133149	H-5	Pump P-712 Disch. Block Valve	O		
*	7005133149	I-4	SOV-1602 Isolation Valves (2)	O		
*	7005133149	I-4	PF-SW-28-1 Drain Valve	C		
*	7005133152	-	All 943 System Valves	C		
*	3005132192	-	All 941 System Valves	C		
*	3005132194	-	All 941 System Valves	C		
*	3005132195	-	All 941 System Valves	C		
402 - 4"	9005133302	D-12	Evaporation Pond Block Valve	LO		
403 - 4"	9005133302	D-12	Evaporation Pond Future Connection	C (Blind Flange)		

O = Open C - Closed T - Throttled LO - Locked Open LC - Locked Closed

*Number assigned by TBD - No existing Valve Tag Number.

**Drawing Numbers start with "40P"

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ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME		UNIT NO.	S.C.E. J.O. NO.
CONTRACTOR			CONTRACTOR J.O. NO.
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-711 Separator Waste Water Pump			

EQUIPMENT NAME PLATE DATA			
NAME OF MANUFACTURER		SERIAL NO.	FRAME
TYPE	CODE	DUTY	MODEL
S.F.	H.P.	R.P.M.	AMPS VOLTS

START-UP AND TEST DATA			
TYPE MEGGER _____		MOTOR INSULATION WITH LEADS: _____ MEGAOHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES <input type="checkbox"/> NO	MOTOR COUPLED: <input type="checkbox"/> YES <input type="checkbox"/> NO	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____ _____ _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
--	----------------------

DISTRIBUTION
SERVICE ENGR. TO RETAIN ORIGINAL & SEND 1 COPY TO S.C.E. START-UP ENGR.

ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME		UNIT NO.	S.C.E. J.O. NO.
CONTRACTOR		CONTRACTOR J.O. NO.	
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-712 Separator Waste Water Pump			

EQUIPMENT NAME PLATE DATA			
NAME OF MANUFACTURER		SERIAL NO.	FRAME
TYPE	CODE	DUTY	MODEL
S.F.	H.P.	R.P.M.	AMPS VOLTS

START-UP AND TEST DATA			
TYPE MEGGER _____		MOTOR INSULATION WITH LEADS: _____ MEGA OHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES CONNECTED: <input type="checkbox"/> NO	MOTOR <input type="checkbox"/> YES COUPLED: <input type="checkbox"/> NO	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____ _____ _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
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ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME	UNIT NO.	S.C.E. J.O. NO.	
CONTRACTOR			CONTRACTOR J.O. NO.
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-714 Oil Sump Pump			

EQUIPMENT NAME PLATE DATA			
NAME OF MANUFACTURER		SERIAL NO.	FRAME
TYPE	CODE	DUTY	MODEL
S.F.	H.P.	R.P.M.	AMPS
			VOLTS

START-UP AND TEST DATA			
TYPE MEGGER: _____		MOTOR INSULATION WITH LEADS: _____ MEGAOHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES <input type="checkbox"/> NO	MOTOR COUPLED: <input type="checkbox"/> YES <input type="checkbox"/> NO	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
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DISTRIBUTION
SERVICE ENGR. TO RETAIN ORIGINAL & SEND 1 COPY TO S.C.E. START-UP ENGR.

ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME		UNIT NO.	S.C.E. J.O. NO.
CONTRACTOR			CONTRACTOR J.O. NO.
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-715 Raw/Service Water Sump Pump			

EQUIPMENT NAME PLATE DATA				
NAME OF MANUFACTURER		SERIAL NO.	FRAME	
TYPE	CODE	DUTY	MODEL	
S.F.	H.P.	R.P.M.	AMPS	VOLTS

START-UP AND TEST DATA			
TYPE MEGGER: _____		MOTOR INSULATION WITH LEADS: _____ MEGAOHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES CONNECTED: <input type="checkbox"/> NO	MOTOR <input type="checkbox"/> YES COUPLED: <input type="checkbox"/> NO	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____ _____ _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
--	----------------------

DISTRIBUTION
SERVICE ENGR. TO RETAIN ORIGINAL & SEND 1 COPY TO S.C.E. START-UP ENGR.

ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME	UNIT NO.	S.C.E. J.O. NO.	
CONTRACTOR			CONTRACTOR J.O. NO.
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-716 Sludge Pump			

EQUIPMENT NAME PLATE DATA			
NAME OF MANUFACTURER		SERIAL NO.	FRAME
TYPE	CODE	DUTY	MODEL
S.F.	H.P.	R.P.M.	AMPS
			VOLTS

START-UP AND TEST DATA			
TYPE MEGGER: _____		MOTOR INSULATION WITH LEADS: _____ MEGOHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES CONNECTED: <input type="checkbox"/> NO	MOTOR <input type="checkbox"/> YES COUPLED: <input type="checkbox"/> NO	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
--	----------------------

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SERVICE ENGR. TO RETAIN ORIGINAL & SEND 1 COPY TO S.C.E. START-UP ENGR.

ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME	UNIT NO.	S.C.E. J.O. NO.	
CONTRACTOR			CONTRACTOR J.O. NO.
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-717 TSU Area Sump Pump			

EQUIPMENT NAME PLATE DATA			
NAME OF MANUFACTURER		SERIAL NO.	FRAME
TYPE	CODE	DUTY	MODEL
S.F.	H.P.	R.P.M.	AMPS
		VOLTS	

START-UP AND TEST DATA			
TYPE MEGGER _____		MOTOR INSULATION WITH LEADS: _____ MEGAOHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES	MOTOR <input type="checkbox"/> YES	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
CONNECTED: <input type="checkbox"/> NO	COUPLED: <input type="checkbox"/> NO		
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
--	----------------------

DISTRIBUTION
SERVICE ENGR. TO RETAIN ORIGINAL & SEND 1 COPY TO S.C.E. START-UP ENGR.

ELECTRICAL CIRCUIT TEST RECORD AND EQUIPMENT DATA SHEET

EQUIPMENT IDENTIFICATION			
STATION NAME	UNIT NO.	S.C.E. J.O. NO.	
CONTRACTOR		CONTRACTOR J.O. NO.	
FILE NO.	SCHEDULE NO.	CIRCUIT NO.	DRAWING NO.
EQUIPMENT: P-718 Maintenance Oil Sump Pump			

EQUIPMENT NAME PLATE DATA			
NAME OF MANUFACTURER		SERIAL NO.	FRAME
TYPE	CODE	DUTY	MODEL
S.F.	H.P.	R.P.M.	AMPS
			VOLTS

START-UP AND TEST DATA			
TYPE MEGGER _____		MOTOR INSULATION WITH LEADS: _____ MEGAOHMS	
MOTOR RESISTANCE (OHMS): <input type="checkbox"/> WITH, <input type="checkbox"/> WITHOUT LEADS: _____ A-B, _____ B-C, _____ C-A			
GROUND STRAP <input type="checkbox"/> YES CONNECTED: <input type="checkbox"/> NO	MOTOR <input type="checkbox"/> YES COUPLED: <input type="checkbox"/> NO	LUBRICATION: <input type="checkbox"/> FACTORY, <input type="checkbox"/> FIELD	LUBE TAG: <input type="checkbox"/> YES, <input type="checkbox"/> NO
VIBRATION: _____ MILS	ROTATION VIEWED FROM COUPLING END: <input type="checkbox"/> CCW, <input type="checkbox"/> CW		
INRUSH AMPS _____	NO LOAD AMPS _____	TYPE OF CONTROL: <input type="checkbox"/> LOCAL, <input type="checkbox"/> BOARD	
OPERATING TIME IN SECONDS: CLOSE _____ OPEN _____			
POWER CABLE SIZE _____	FUSE SIZE _____	O/L SIZE _____	
COMMENTS: _____			

REV. NO.	DATE REVISION	S.C.E. APPROVED	CONTRACTOR OK	DATE ASSIGNED	START DATE	DATE COMPLETED	REMARKS

SIGNED: S.C.E. START-UP ENGINEER _____	SHEET _____ OF _____
--	----------------------

EQUIPMENT DATA SHEET

- MECHANICAL -

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-711 Separator Waste Water Pumps

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

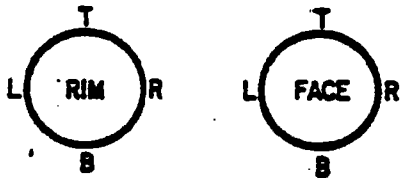
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

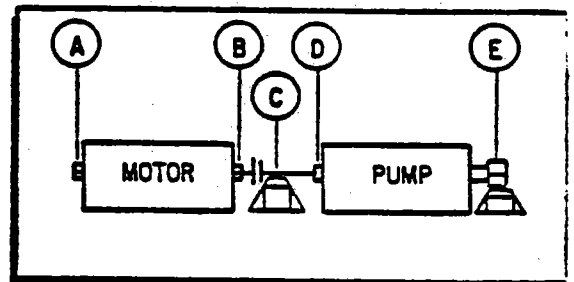
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____

S.C.E. START-UP ENG.

DATE: _____

SIGNED: _____

S.C.E. CONST. ENG.

DATE: _____

SIGNED: _____

CONTRACT REP.

DATE: _____

EQUIPMENT DATA SHEET

-MECHANICAL-

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-712 Separator Waste Water Pump

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

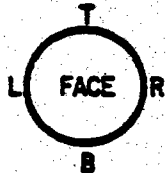
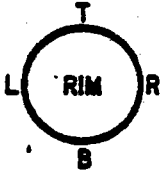
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

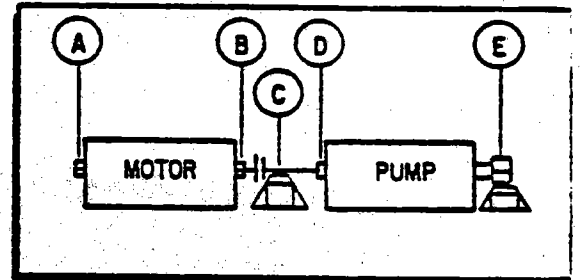
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____
S.C.E. START-UP ENG.

DATE: _____

SIGNED: _____
S.C.E. CONST. ENG.

DATE: _____

SIGNED: _____
CONTRACT REP.

DATE: _____

EQUIPMENT DATA SHEET

- MECHANICAL -

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-714 Oil Sump Pump

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

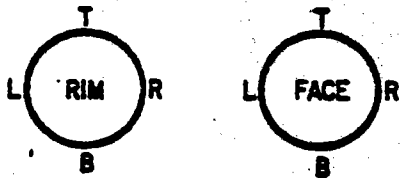
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

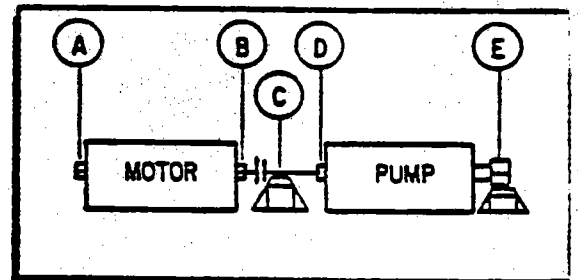
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____

S.C.E. START-UP ENG.

DATE: _____

SIGNED: _____

S.C.E. CONST. ENG.

DATE: _____

SIGNED: _____

CONTRACT REP.

DATE: _____

EQUIPMENT DATA SHEET

-MECHANICAL-

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-715 Raw/Service Water Pump.

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

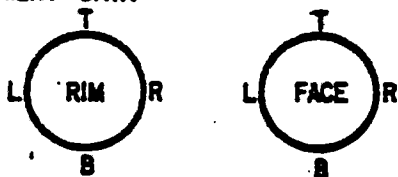
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

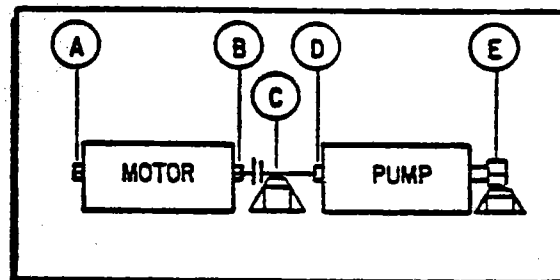
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____

S.C.E. START-UP ENG.

DATE: _____

SIGNED: _____

S.C.E. CONST. ENG.

DATE: _____

SIGNED: _____

CONTRACT REP.

DATE: _____

EQUIPMENT DATA SHEET

- MECHANICAL -

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-716 Sludge Pump

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

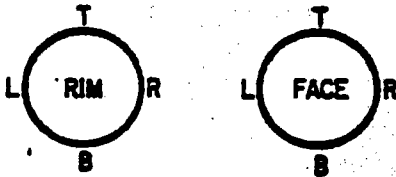
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

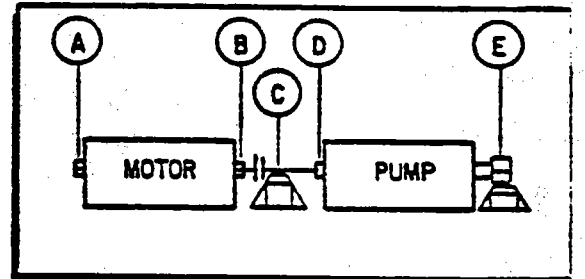
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____
S.C.E. START-UP ENG.

DATE: _____

SIGNED: _____
S.C.E. CONST. ENG.

DATE: _____

SIGNED: _____
CONTRACT REP.

DATE: _____

EQUIPMENT DATA SHEET

-MECHANICAL-

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-717 TSU Area Sump Pump

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

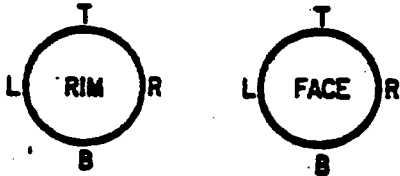
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

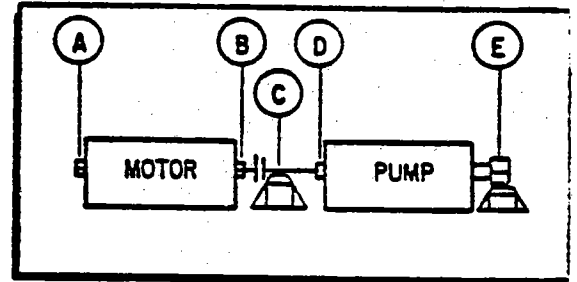
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____
S.C.E. START-UP ENG.
 DATE: _____
 SIGNED: _____
S.C.E. CONST. ENG.
 DATE: _____
 SIGNED: _____
CONTRACT REP.
 DATE: _____

EQUIPMENT DATA SHEET

- MECHANICAL -

GENERATING STATION: _____ DATE: _____

UNIT NUMBER: _____ S.C.E. J.O. NO.: _____

EQUIPMENT: P-718 Maintenance Oil Sump Pump

MANUFACTURER: _____ SERIAL NO.: _____

RATING: _____ CAPACITY: _____

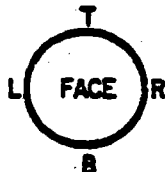
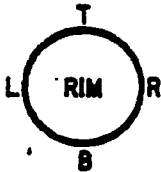
START-UP AND TEST DATA

DATE OF LUBRICATION: _____ RPM: _____

SUCTION PRESSURE AND TEMPERATURE: _____ PSIG: _____ °F.

DISCHARGE PRESSURE: _____ PSIG

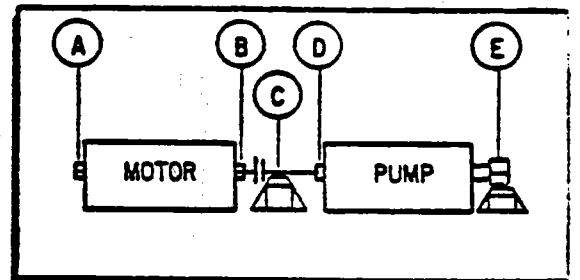
ALIGNMENT DATA:



DIAL INDICATOR MOUNTED ON: _____

VIBRATION DATA:

POINT	VIBRATION, MILS		
	HORIZ.	VERT.	AXIAL
A			
B			-----
C			-----
D			-----
E			



COMMENTS: _____

SIGNED: _____

S.C.E. START-UP ENG.

DATE: _____

SIGNED: _____

S.C.E. CONST. ENG.

DATE: _____

SIGNED: _____

CONTRACT REP.

DATE: _____

A3-202-EP-RGR-444
28 July 1981

T62

Department of Energy
San Francisco Operations Office
1333 Broadway
Oakland, CA 94612

Attention: Mr. David J. Tenca, Contracting Officer

Subject: CONTRACT DE-AC03-79SF10499
SOLAR FACILITIES DESIGN INTEGRATION
SECOND PARTIAL SUBMITTAL OF SUBSYSTEM STAND ALONE
(PREOPERATIONAL) TEST PROCEDURES (RADL ITEM 2-45)

- References:
- (a) MDAC Letter A3-130-EP-DSB-138, dated 3 March 1981,
"Revised Delivery Date for Subsystem Stand Alone
Test Procedures" (RADL Item 2-45)
 - (b) MDAC Letter A3-202-EP-RGR-417, dated 17 July 1981,
"Partial Submittal of Subsystem Stand Alone
(Preoperational) Test Procedures" (RADL Item 2-45)

Dear Mr. Tenca:

One (1) each of four of the Preoperational Test Procedures that comprise a portion of the subject RADL item is being submitted in accordance with the requirements of the Phase II Reports and Deliverables List of the subject contract, as modified by the contents of the Reference (a) letter. The initial transmittal was accomplished per the Reference (b) letter.

This letter transmits the following Preoperational Test Procedures:

- 205/250 Thermal Storage System Revision 0
- 340 Operating Control System - Data Acquisition System (Part A) Revision 0
- 405 Main/Admission Steam Revision 0
- 940 Plant Drains & Sumps Revision 0

It should be noted that the 340 Preoperational Test Procedure will be written and submitted in two parts, with this first submittal being called Part A.

A copy of this letter also transmits the master copy of each of the procedures to Southern California Edison (L. H. Chillcott) at the Solar One site for control and implementation. Any revisions to these procedures which are originated by the SFDI will be coordinated informally with SCE and subsequently transmitted by letter in the same manner as the subject documents.

Additional submittals will be made as other preoperational test procedures become available in Revision 0 versions, and you will be notified when all of the preoperational test procedures that comprise RADL item 2-45 have been submitted.

Technical questions regarding these procedures should be directed to R. G. Riedesel at (714) 896-3357. For contractual questions, please call the undersigned at (714) 896-1340.

Very truly yours,



D. S. Butler
Contract Administrator
Solar Facilities Design Integration

Enclosure: (as noted)

Cy: L. H. Chillcott, SCE-Daggett (1)
J. M. Slaminski, DOE/STMPO (1)

(w/o enclosure)

R. N. Schweinberg, DOE/STMPO
J. C. Corcoran, DOE/STMPO
D. W. Christian, DOE/Daggett
F. Koyach, T&B-Daggett
R. M. Weeks, MMC-Daggett
C. W. Lopez, SCE-Daggett
A. Maitino, T&B-Daggett
D. L. Williams, Stearns-Roger
H. D. Eden, Aerospace/STMPO
R. O. Rogers, Aerospace/STMPO
R. W. Wiese, ETEC/STMPO
K. L. Adler, ETEC/STMPO
D. N. Tanner, Sandia-Livermore
W. S. Rorke, Sandia-Livermore
J. N. Reeves, SCE
N. J. DeHaven, SCE
C. P. Winarski, SCE
W. R. Lang, Stearns-Roger
J. M. Friefeld, Rocketdyne
L. L. Vant-Hull, Univ. of Houston
T. E. Olson, SFDI Field Office