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COLLECTOR SUBSYSTEM

HELIOSTAT READINESS TEST

TEST PROCEDURE 101

AUGUST 4, 1981


DOE/SF/10539-16
(STMPO-566)

REVISION 0

UNITED STATES DEPARTMENT OF ENERGY/
SOUTHERN CALIFORNIA EDISON COMPANY
10 MWe SOLAR PILOT PLANT
DAGGETT, CALIFORNIA

MARTIN MARIETTA AEROSPACE
DENVER, COLORADO


Author


G.R. Rose

Reviewed by


J. Stiller

Approved by


R. Weeks

FOREWORD

This document has been prepared in order to establish a method to verify that the heliostat field is configured properly prior to performing the preoperational tests as specified in procedure numbers 106, 111 and 116. This document is an interim procedure which shall be incorporated as part of the Field Master Operating Procedure.

COLLECTOR SUBSYSTEM
HELIOSTAT READINESS TEST
TEST PROCEDURE 101

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1.0 OBJECTIVES

- 1.1 Verify the heliostat field is cleared of all obstacles which could impede or damage heliostats in motion.
- 1.2 Identify to the HAC operator any heliostats which are not in service.
- 1.3 Verify collector field power has been applied in accordance with procedure 821, "4160V Collector Field System" and 826, "208V Collector Field System."

2.0 ACCEPTANCE CRITERIA

		<u>Verification Paragraph</u>	<u>Objective</u>
2.1	The heliostat field is cleared of all obstacles which could impede or damage heliostats in motion and pro- visions to prohibit vehicular traffic in the heliostat field is pro- vided.	8.1.4 8.1.5	1.1
2.2	Out of service heliostats have been identified to the HAC operator.	8.2.1	1.2
2.3	Power is applied to heliostat field.	8.3	1.3

3.0 . REFERENCES

- 3.1 Software/Firmware Design Specification for 10 MWe Solar Thermal Central Receiver Pilot Plant, Martin Marietta, MCR-80-1377, March, 1981.
- 3.2 Pilot Plant Startup and Acceptance Test Plan, McDonnell Douglas, MDCG9330, December 1980.
- 3.3 Operations Manual, MCR-81-1708, April, 1981, Martin Marietta.
- 3.4 Maintenance Manual, MCR-81-1709, April, 1981, Martin Marietta.

4.0 PREREQUISITES

- 4.1 Collector Subsystem Individual Heliostat Tests shall be complete in accordance with the MMC Master Control Procedure, 40 0 500 29 0, latest revision.
- 4.2 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.
- 4.3 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.
- 4.4 The system has been walked through and verified complete to the extent required to conduct this test.
- 4.5 A pretest indoctrination meeting has been held to familiarize test and operations personnel with the requirements of this test and proper safety criteria to be exercised.

5.0 LIMITS AND PRECAUTIONS

5.1 Prior to the start of this test, the Test Conductor shall ensure all personnel and equipment are out of the arc to be swung by the heliostats under test.

5.2 Prior to the start of this test, the operator must read and understand the complete procedure, noting those actions required to terminate any critical condition.

5.3 This procedure must be performed in sequence.

5.4 Definitions:

CB - Circuit Breaker

CC - Control Console

CW - Clockwise

CCW - Counter-Clockwise

HC - Heliostat Controller

HFC - Heliostat Field Controller

RTN - Return (HAC Console Keyboard)

HST - Heliostat

FO - Field Observer

AZ - Azimuth

EL - Elevation

TC - Test Conductor

CLLP - Corridor Lower Limit
Point

CULP - Corridor Upper Limit
Point

6.0 TEST EQUIPMENT

6.1 Communications Equipment

6.1.1 Radios (2 each)

6.1.2 Base station radio in control room.

6.2 Other

6.2.1 None required.

7.0 INITIAL CONDITIONS

7.1 Environmental Conditions

N/A

7.2 Temporary Installations

7.2.1 None required.

7.3 Support Systems/Plant Operating Status

7.3.1 Plant power available to HAC and heliostat field.

7.4 Heliostat Array Controller (HAC) Start-up

7.4.1 Power up and initialize the HAC in accordance with the Operations Manual, MCR-81-1708.

7.5 Field Observer Position and Communications Check

7.5.1 Verify that the Field Observer is positioned to monitor heliostat (s) movements and establish radio communication.

8.0 PROCEDURE AND DATA COLLECTION

8.1 Heliostat Field Clearance

8.1.1 Position an adequate number of field observers to provide visual coverage for the portions of the heliostat field to be tested.

_____/_____
Initial Date

8.1.2 Provide a sufficient number of radios to field observers to provide adequate communication coverage.

_____/_____
Initial Date

8.1.3 Verify communication is established between control console operator and field observers.

_____/_____
Initial Date

8.1.4 Field observers shall verify that the heliostat field is clear of obstructions and report field condition to the control console operator. All in service heliostats shall be verified to be in stow position.

_____/_____
Initial Date

8.1.5 The heliostat field or portions to be tested shall be roped off, or other adequate means to prohibit vehicular traffic. The field observers shall monitor for vehicular traffic at all times and stop any traffic in the test area.

_____/_____
Initial Date

8.2 Reporting Out of Service Heliostats

8.2.1 The test conductor shall provide a list of heliostats which are out of service to the control console (HAC) operator. This list shall be Appendix 10C of this procedure.

_____/_____
Initial Date

8.3 Heliostat Field Power-up

- 8.3.1 Energize heliostat field feeder power panel numbers 1 through 14. Verify branch circuit breakers are in the ON position.
- 8.3.2 Visually observe the heliostat field for heliostat movement. No heliostat motion should occur.
- 8.3.3 Field observers shall report any heliostat movement to the control room operator and remove power by turning off circuit breaker at the pedestal and place the heliostats out of service. Any heliostats which are placed out of service shall be noted on the out of service heliostat list.

9.0 SYSTEM RESTORATION

9.1 Verify all in service heliostats are in the stow mode.

_____/_____
Initial Date

10.0 ATTACHMENTS

- Appendix 10A Master Tracking System
- Appendix 10B Abnormal Equipment and Circuits
- Appendix 10C Out of Service Heliostat List

APPENDIX 10A
MASTER TRACKING SYSTEM

<u>Item No.</u>	<u>Description</u>	<u>Section Affected</u>	<u>Initial/Date</u>
N/A			

APPENDIX 10B
ABNORMAL EQUIPMENT AND CIRCUITS

<u>Item No.</u>	<u>Description</u>	<u>Sections Affected</u>	<u>Initial/Date</u>
N/A			

APPENDIX 10C

OUT OF SERVICE HELIOSTAT LIST

Heliostat No.

Reason

Initial/Date

MARTIN MARIETTA AEROSPACE

DENVER DIVISION
POST OFFICE BOX 179
DENVER, COLORADO 80201
TELEPHONE (303) 977-3000

August 4, 1981

Refer to: SOL-81-593

To: U.S. Department of Energy
San Francisco Operations Office
1333 Broadway
Oakland, California 94612

Attn: Ms. J. Macrusky

Subj: Contract DE-AC03-81SF-10539

Encl: Test Procedure 101, Collector Subsystem Heliostat
Readiness Test, Revision 0.

1. Enclosure 1 is transmitted for information purposes. This is one of several preoperational test procedures. The remainder will be issued as they are updated to incorporate the Test Working Group's comments.
2. Questions regarding this transmittal may be addressed to Mr. Ray Weeks, at (714) 254-2966 or P.O. Box 245, Daggett, California, 92311.

Very truly yours,

MARTIN MARIETTA CORPORATION



Raymond M. Weeks
Site Manager
10 MWe Heliostat Program
Barstow, California

RMW:kmd

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U.S. DEPARTMENT OF ENERGY
memorandum

DATE: JUN 08 1984

RE: TO
ATTN OF S. D. Elliott, Jr., Director, DOE Solar One Project Office

SUBJECT Submission of Five Documents Prepared under DOE Contract DE-AC03-80SF10539 with Martin Marietta Corporation for OPC and OSTI Processing

TO: Roger S. Gaither, DOE/SAN (OPC)
William D. Matheny, DOE/OSTI Document Control

Enclosed are five test procedure documents prepared for the Solar One Project by Martin Marietta Corporation under Contract DE-AC03-80SF10539:

<u>Primary Document No.</u>	<u>Secondary No.</u>	<u>Brief Title</u>
DOE/SF/10539-16	(STMP0-566)	Test Procedure 101 (Rev. 0) Heliostat Readiness
DOE/SF/10539-17	(STMP0-567)	Test Procedure 106 (Rev. 0) Dual H.A.C. Test
DOE/SF/10539-18	(STMP0-568)	Test Procedure 111 (Rev. 1) System Functional Test
DOE/SF/10539-19	(STMP0-569)	Test Procedure 116 (Rev. 0) Targeting Verification
DOE/SF/10539-20	(STMP0-570)	Test Procedure 118 (Rev. A) Optical Performance

One copy of each report, accompanied by a completed SAN Form 70, is provided for SAN Office of Patent Counsel review and clearance. (The first four test procedures, with tests checked-off as performed, were incorporated in the previously cleared "10 MWe Solar Thermal Central Receiver Pilot Plant: Collector Subsystem Functional Test Report", DOE/SF/10539-10 (STMP0-297); the last was not utilized in the present form and is provided for historical reference.) Please return a copy of the clearance to me at the Project Office; the original documents should be forwarded after clearance to Mike Lopez at DOE/SAN (FGS).

Two copies of each report, accompanied by a completed DOE Form RA-426, are provided to DOE Office of Scientific and Technical Information for processing, archiving, announcement and forwarding to the National Technical Information Service.

Encls.: 5 Technical Reports:
1 cy. ea. w/SAN Form 70
2 cys. ea. w/DOE Form RA-426

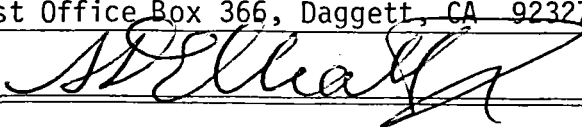

S. D. Elliott, Jr.

cc: M. Lopez, DOE/SAN (FGS)
D. Holz, DOE/SAN (ISEA)
M. Soderstrum, Burns & McDonnell

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See Instructions on Reverse Side

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4. Title "COLLECTOR SUBSYSTEM HELIOSTAT READINESS TEST: TEST PROCEDURE 101 (REVISION 0)"		
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S. D. Elliott, Jr., Director, DOE Solar One Project Office
Organization
Post Office Box 366, Daggett, CA 92327 (619) 254-2672
Signature  Date MAY 29 1984



DEPARTMENT OF ENERGY
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TO: Roger S. Gaither, Asst. Chief for Prosecution
Office of Patent Counsel/Livermore Office
P.O. Box 808, L-376
Livermore, California 94550

FROM: DOE Solar One Project Office
Post Office Box 366
Daggett, CA 92327
ATTEN: S. D. Elliott, Jr.

Prime Contract No.
DE-AC03-80SF10539
Subcontract No.
(N/A)
Report No.
DOE/SF/10539-16 (STMP0-566)
Date of Report
August 1981
Name & Phone No. of DOE Technical Representative
S. D. Elliott, Jr. (619) 254-2672

- Document Title:
"COLLECTOR SUBSYSTEM HELIOSTAT READINESS TEST: TEST PROCEDURE 101 (REVISION 0)"
- Type of Document: Technical Report, Conference Paper, Journal Article, Abstract or Summary,
 Copy of Oral Presentation, Other (please specify): _____
- In order to meet a publication schedule or submission deadline, patent clearance by _____ (routine) would be desired.

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 - A disclosure of the invention was submitted to DOE on _____ (date)
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- This document is being submitted, but no review has been made ^{by me} of this document for possible inventive subject matter.
- Remarks: Return Clearance to Project Office; document to M. Lopez, SAN/FGS

Reviewing/Submitting Official: Name (Print/Type) S. D. Elliott, Jr., Director
 Title DOE Solar One Project Office
 Signature *S. D. Elliott* Date 29 May, 1984

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 _____



DEPARTMENT OF ENERGY
SAN FRANCISCO OPERATIONS OFFICE

CONTRACTOR REQUEST FOR PATENT CLEARANCE
FOR RELEASE OF UNCLASSIFIED DOCUMENT

Prime Contract No.
DE-AC03-80SF10539
Subcontract No.
(N/A)
Report No.
DOE/SF/10539-16 (STMP0-566)
Date of Report
August 1981
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-376
Livermore, California 94550

FROM: DOE Solar One Project Office
Post Office Box 366
Daggett, CA 92327
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- This document describes matter relating to an invention:
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 - A disclosure of the invention was submitted to DOE on _____ (date)
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Reviewing/Submitting Official: Name (Print/Type) S. D. Elliott, Jr., Director
 Title DOE Solar One Project Office
 Signature *S. D. Elliott* Date 29 May, 1984

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M. Lopez, SAN

*280
6/10/84*

Signed *L.E. Coranahan* Date Mailed *6/13/84*