



CHG.	SIZE	CODE IDENT. NO.	
	A	04236	40 M 500 II
	SCALE	PAGE	SHEET 2

## FOREWORD

This document is submitted in response to the requirements of DOE Contract No. DE-AC03-79ET21007 dated 9/5/78, Collector Subsystem Statement of Work, Task B1,d.1.

1.0 SCOPE

This installation plan includes the steps and tooling necessary for installation of a heliostat assembly in the heliostat field. The sequence of the steps will be followed as planned. Exceptions to the sequence shall be negotiated between the installation supervisor, site installation manager, safety/quality representative and SFDI representative. When negotiating exceptions, considerations shall be given to the following items:

- a. Access to heliostat foundation
- b. Pointing/bias schedule and progress
- c. Installation schedule impact
- d. Sub-assembly(s) availability
- e. Availability and utilization of installation tools and service equipment.

1.1 The installation lead technician shall ensure that completed quality data sheets for the drive mechanism, elevation encoder, azimuth encoder and the HC are in order and represent historical data for the particular heliostat being installed. This data shall be placed in an envelope and the heliostat serial number recorded on the envelope. Retain this envelope with the heliostat until installation is complete.

1.2 The installation lead technician shall obtain quality data sheet(s) for heliostat installation. The lead technician and/or Quality Control Representative shall record data or verify steps as required in quality data sheet(s). Recordings and/or verifications shall be entered as each step is completed. Upon completion of the installation, the completed data sheet(s) shall be placed in the heliostat data envelope, and the data envelope with all pertinent data shall be returned to the Quality Control files.

## 2.0

### EQUIPMENT AND TOOLS

- o Reflective assembly transporter - Tool No. 40M500X1327XX
- o 5 Ton short wheel base tractor/truck (fifth wheel)
- o 10 Ton mobile crane - 30 ft boom extension
- o 5K pound capacity high lift fork (30 ft) fork lift
- o Mobile work platform - 600 lb cap x 30 ft height extension
- o Torque wrench - 600 ft lb
- o Torque wrench - 200 ft lb
- o Electronic leveling tool - Tool No. 40M500X1327XX
- o Movement pallet - drive mechanism - Tool No. 40M500X1327XX
- o Handling sling - reflective assembly - Tool No. 40M500X1327XX
- o Manual control box - direct drive - Tool No. 40E500X1327XX
- o Manual control box - (HC) - Tool No. 40E500X1327XX
- o Nylon choker - 3000 lb capacity
- o Kits - hand tools
- o Pedestal lifting adapter - Tool No. 40M500X1327XX

## 3.0

### DOCUMENTS

- o Heliostat Assembly - 40M5005132720
- o Electrical Installation - 40E50051327XX
- o Drive Mechanism Assembly - 40M5005132721

## 4.0

### SAFETY EQUIPMENT

- o Safety sun glasses - American Optical Calobar Super Armor Plate Lenses - 2.5 minimum shade or equivalent as needed.
- o Hard hats

## 4.1

Safety Note: All lifting slings, nylon chokers and associated rigging hardware shall be inspected for damage, proof load tags, correct load capacity for the installation operations and

general physical condition. Any lifting devices that are suspect shall be routed to specified safety organization for inspection and/or proof test. The field inspection will be the responsibility of the installation lead technician and shall be accomplished at the beginning of each shift.

## 5.0 HELIOSTAT ASSEMBLY INSTALLATION

### 5.1 Pedestal Installation

Note: Pedestals will be checked through the receiving/staging area and then transported by the delivering agency to the heliostat field. Martin Marietta Corporation personnel will accompany the delivering agency to the site and instruct the agency to off load pedestals at specific heliostat foundations. Martin Marietta Corporation personnel will provide wood 4"x4"x24" shoring and will ensure that pedestal is resting on shoring in a manner that flange interface and pedestal studs are not contacting the ground. Martin Marietta Corporation personnel will chock the pedestals to prevent the pedestal from rolling off the shoring.

#### 5.1.1 Preparation of Pedestal for Installation

- a. Remove protective shipping devices from pedestal studs and from flange interface.
- b. Install pedestal lifting adapter (40M500X1327XX) on pedestal studs (two (2) diametrical opposing studs). Secure adapter with two (2) 1.0" flat washers and two 1-8 UNC nuts. Torque snug.

- c. Attach nylon lifting choker to the adapter with tooling hardware.

#### 5.1.2 Installation of Pedestal on Foundation

- a. Remove (8)  $1\frac{1}{2}$  CFE nuts and washers from foundation studs.
- b. Ensure that there are (8)  $1\frac{1}{2}$  nuts and washers remaining on the foundation studs and that they are run down on the studs until touching the foundation preload nuts.
- c. Attach nylon lifting choker to the fork of the high lift fork lift.
- d. Lift the pedestal vertical with the fork lift.

CAUTION: Protect the pedestal flange during this operation by placing a 2 ft x 2 ft x 1 inch piece of plywood under the flange.

- e. Lift the pedestal vertical until the flange is four to six inches above the electrical conduit stubs. Position the pedestal over the foundation studs using the fork lift and two (2) techs to steady the pedestal during the positioning.
- f. Orient the pedestal clocking so that the pedestal access doors face east.
- g. Carefully lower pedestal onto the foundation studs, keeping flange holes aligned with foundation studs.
- h. Install (8)  $1\frac{1}{2}$  dia. flat washers and (8)  $1\frac{1}{2}$  nuts. Run nuts down to contact pedestal flange. Do not tighten. Detach lifting adapter - lift adapter with fork lift and move to clear area adjacent to foundation.

#### 5.2 Drive Mechanism Installation

Note: Drive mechanisms will be transported by truck to site foundations by the installation crew. The mechanisms will be secured to their original shipping pallets.

### 5.2.1 Preparation of Drive Mechanism

- a. Install nylon lifting choker to drive mechanism lifting eye.
- b. Attach choker to fork of high lift fork lift.
- c. Lift drive mechanism clear of truck and remove the shipping pallet.

### 5.2.2 Installation of Drive Mechanism

- a. Elevate drive mechanism with fork lift and position mechanism over the heliostat pedestal. Clock the mechanism so that the drive motors face south.
- b. Lower the mechanism to within  $\frac{1}{4}$  inch of the pedestal studs, line up the mechanism holes with pedestal studs and carefully lower the mechanism onto the pedestal interface.
- c. Install 1.0 inch plain washers, lock washers and nuts (8) places. Detach lifting sling from drive and move fork lift to next foundation.
- d. Tighten the nuts and torque to 135-165 foot pounds.

## 5.3 Adjusting Perpendicularity of Azimuth Axis

### 5.3.1 Leveling Preparations

- a. Place "Talyvel" level sensor on leveling pad of drive mechanism. Orient in a north-south direction.
- b. Connect level sensor to "Talyvel" indicator and place indicator near base of pedestal. Turn level system on and zero check.
- c. Plug manual control box into azimuth drive motor. Connect box to 115 VAC.
- d. Back off pedestal hold-down nuts two turns 8 places.

### 5.3.2 Leveling Operations

- a. Using lower nuts at pedestal/adaptor interface, favoring north-south axis, bring level indicator to zero reading.



- b. Using manual control box, drive mechanism to a northerly direction. Repeat Step 5.3.2a to remove  $\frac{1}{2}$  of error indicated by level indicator and remove other  $\frac{1}{2}$  error by adjusting micrometer knobs on level sensor.
- c. Using manual control box, drive mechanism to an easterly direction. Using lower nuts at pedestal/adaptor interface favoring east-west axis, bring level indicator to zero reading.
- d. Using manual control box, drive mechanism to a westerly direction. Repeat Step 5.3.2c to remove  $\frac{1}{2}$  of error indicated by level indicator and remove other  $\frac{1}{2}$  error by adjusting micrometer knobs on level sensor.
- e. Repeat Steps 5.3.2a thru 5.3.2 until level indicator indicates zero  $\pm$  15 seconds in all positions.
- f. Tighten holddown nuts of pedestal-torque to 180-220 ft/lb, check level N-S, E-W during torquing operation - make necessary adjustments to maintain level indication.
- g. Using manual control box, drive mechanism thru  $360^{\circ}$  while watching level indicator. Indicator shall indicate zero  $\pm$  30 seconds throughout the  $360^{\circ}$ . Remove level sensor and manual control box.

#### 5.4 Installation of Reflective Assembly

Note: Reflective assemblies will be transported by special transporter (40M500X1327XX) to the site foundations by the installation crew heavy equipment operator.

##### 5.4.1 Preparation of Reflective Assembly for Lift

- a. Position transporter and mobile crane in relation to foundation/pedestal so that assembly may be lifted from the transporter with the crane and swung over pedestal.

CAUTION: As soon as crane is positioned correctly, all four

(4) crane outriggers will be extended to the ground.

- b. Attach lifting sling (40M500X1327XX) to mobile crane. Position boom 30 degrees up from horizontal and extend to approximately 24 feet.
- c. Position mobile crane-boom over reflective assembly on transporter and lower lifting sling to assembly.
- d. Attach lifting sling to torque tube - have crane operator take up load.
- e. Attach taglines - (min. 15 ft long) to bar joists near four corners of reflective assembly.

#### 5.4.2 Installation Operations for Reflective Assembly

- a. Position men at each corner of reflective assembly-lift reflective assembly with crane to clear transporter. Men shall steady assembly with tag lines.
- b. Move reflective assembly with crane from transporter to heliostat support pedestal. Steady assembly with tag lines.
- c. Plug manual control box into elevation drive motor. Using control box, drive elevation shaft keyway approximately 15° below horizontal in a northerly facing direction.
- d. Raise reflective assembly, with crane, to clear mechanism on pedestal.
- e. Position reflective assembly over pedestal and lower until control arms can be aligned with elevation shafts.
- f. Install key in elevation shafts.
- g. Using manual control box, rotate elevation shafts until key of shafts is aligned with keyways in control arms.

- h. Install caps on control arms and torque cap bolts to TBD foot pounds.
- i. Slack off crane and remove handling sling from reflective assembly.
- j. Move crane to clear area. Use manual control box to put heliostat in a stow position. Disconnect manual control box. Move equipment to next foundation. This completes mechanical installation.

5.5 Electrical/Electronic Installation

5.5.1 Install Encoders - Elevation and Azimuth

- a. Procedure TBS.

5.5.2 Install HC/HFC in Pedestal

- a. Procedure TBS.

5.5.3 Install Interconnecting Cabling between Site Interface and Heliostat HC, Drive Motors and Encoders. Installation Procedure TBD.

5.5.4 Heliostat will be Functionally Checked out by Martin Marietta Corporation Test Procedure. - 400500XX



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

Reply to:  
DOE Site Office  
Post Office Box 366  
Daggett, CA 92327

Mr. Melvin T. Frohardt  
Martin Marietta Aerospace  
Post Office Box 179  
Denver, CO 80201

DEC 06 1983

Subj.: Closeout Actions on Martin Marietta Contracts with DOE San Francisco Operations Office

Dear Mel:

Nearly six months ago, I requested your assistance in finalizing patent clearance on a number of the documents from the Collector Phase I and Phase II contracts which we wish to enter into the DOE Technical Information Center system. Thus far, I have not had any response to this request. We are about to issue the bibliography developed by Burns & McDonnell under the EPRI-funded "Lessons Learned and Project Documentation" study (I assume you have received a copy of Vol. 1, "Lessons Learned" - if not, let me know and I will send you one), and we and TIC anticipate a substantial number of requests for key documents, including yours.

In addition, SAN Contracts Closeout (Sonia Jackson) advises me that several of the final documents needed to complete closeout (and release final payment of withheld funds), ~~is~~ as yet lacking, not only on the above two contracts, but also on the old Preliminary Design contract. I would greatly appreciate your assistance (or your guidance as to who can assist us) in getting this wrapped up and off both of our desks. To recapitulate (adding the items needed by SAN) for the three contracts:

DE-AC03-76ET20422 (Old Contract -1110), Central Receiver System Prel. Design:

- o A "Final Invoice", to be submitted to Sonia Jackson, with copy to me;
- o "Contractors Assignment of Refunds and Rebates", to Sonia;
- o "Contractors Release", to Sonia;
- o "Contractor Request for Patent Clearance" (send to me, only), for:
  - MCR-77-161, "System Safety Design Criteria for Central Receiver...System",
  - MCR-77-162, "System Safety Program Requirements for Solar Thermal Systems".(These were done under an extension to the Preliminary Design contract, and are valuable background documents.)

DE-AC03-78ET21007 Collector System, Phase I:

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  - MTR-78-1330, "10-MWe Solar Thermal Pilot Plant Preliminary Design Review";
  - MCR-79-1302, "10-MWe Solar Thermal Pilot Plant Final Design Review (2 Vols.)";
  - 40-0-500-4P, "10-MWe Solar Thermal Pilot Plant Phase II O&M Equipment";
  - 40-0-500-6P, "10-MWe Solar Thermal Pilot Plant Phase II Planning."

DE-AC03-80SF10539, Collector System Phase II

- o "Final Invoice", to Sonia, copy to me;
- o "Assignment of Funds and Rebates", to Sonia;
- o "Contractors Release", to Sonia;
- o "Contractor Request for Patent Clearance", to me, for:
  - MCR-79-1352B\* "Quality Assurance Plan for 10-MWe Phase II Collector..";
  - MCR-80-1304, "10-MWe Solar Pilot Plant Collector Subsystem Safety Plan";
  - MCR-81-1331B, "Hazard Analysis for 10-MWe ...Pilot Plant";
  - 40-0-500-2P, "10-MWe ...Pilot Plant Phase II Mfg. Plan, Rev. 2";
  - MCR-80-1341A, "10-MWe Collector Sybsystem Software/Firmware Functional Req'ts.";
  - MCR-80-1362, "System Description Document, Collector Subsystem...";
  - MCR-80-1376\* "Heliostat Stimulator Operators' Manual";
  - MCR-81-1708, "Operation Instructions, Heliostat Field Subsystem...";
  - MCR-81-1709A, "Maintenance Instructions, Heliostat Field Subsystem...";
  - MTR-81-1769, "...Collector Subsystem Functional Test Report";
  - MCR-81-1770, "Supplemental Spares Plan, Heliostat Field...";
  - MCR-80-1377A, "Software/Firmware Design Specifications...";
  - MCR-82-1701, "Control System Theory of Operation";
  - Drawing Set, as Identified in "Drawing Tree 400500 5132701";
  - Source Listing of Code for Heliostat Controller ROM or EPROM\*
  - Source Listing of Code for Heliostat Field Controller ROM/EPROM\*

Our files do not have current copies of the following other items identified in the Drawing Tree (400500 5132701):

*STMPD-576*

Documents: 40M500-2S, "Foundation Req'ts.", 40M500-1T, "Installation Instructions", 40M500-2M, "Canting Procedures", 40M500-5P, "Acceptance Plan", MCR-80-1361, "Collector System Functional Test Plan", and MCR-81-1715, "Collector System Integrated Acceptance Test Plan."

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 \* Current copies of these four items are lacking from the Project files; your assistance in obtaining at least one copy of each will be most appreciated.

Drawings: 40M500 5132788, "Adapter Plate/Control Arm Heat Tool", 40M500 5132771, "Field Canting Tool", and 40E500 5132776, "Drive Unit Checkout Console".

While these items are not carried in the current version of the Bibliography (none of the Plant as-built drawings have been entered as yet), many, if not all, of them may be expected to be of interest to the solar community. I would appreciate at least one copy of each, again with your release. To save you considerable effort in preparing the Patent Clearance Request forms (I am enclosing several copies of the form), you may combine many of the above by simply clearing the "Drawing Tree", with its contents.

If you need the other closeout forms cited above (your Contract Administration staff should have them in stock), please call Sonia Jackson at FTS 536-4179, or write her at:

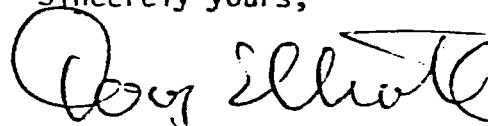
Ms. Sonia Jackson (CM)  
Department of Energy  
1333 Broadway  
Oakland, CA 94612

Finally, since we are required to forward two clean, reproducible copies of each document to DOE/TIC, as well as needing one clean copy for our on-site archives, any "extras" you can turn up around your offices would be greatly appreciated; certainly, rather than throw anything of possible interest out, send it to me.

Mel, I know (believe me!) that this is all a significant amount of work, and I wish I didn't have to ask you (or your staff) to go through it, but it will be to our mutual benefit in the end to get these three contracts all cleaned up, and a comprehensive package of Project documentation (currently, over 550 documents, plus drawings) into the archives. If there is anything further I can do to assist you in this effort, please call on me.

Encl.: DOE Proj. Ofc. ltr. 6/25/83  
Patent Clearance Req. Forms

Sincerely yours,



S. D. Elliott, Jr., Director,  
DOE Project Office, Barstow

cc: H. C. Wroton, MMC  
Sonia Jackson, DOE/SAN (CM)

PS: I keep running across references to a document I can't identify: MCR-78-1325; what was it?

TIN MARIETTA AEROSPACE

DENVER DIVISION  
POST OFFICE BOX 179  
DENVER, COLORADO 80201  
TELEPHONE (303) 877-3000

January 30, 1984

Mr. Doug Elliott  
DOE Site Office  
Post Office Box 366  
Daggett, CA 92327

Subject: Closeout Actions on Martin Marietta Contracts with DOE San Francisco Operations Office

Reference: Letter of December 06, 1983, S.D. Elliott, Jr. to M. Frohardt, Closeout of Contracts

In regard to the referenced letter, following is the status and actions in process to close out these items:

1. Contract Closeout Status

In regard to the closeout of cost type contracts DE-AC03-76ET20422, Central Receiver Test Facility, and DE-AC03-78ET21007, Collector System Phase I, we include the "Contractors Assignment of Refunds and Rebates" and "Contractors Release" with our final invoice package. The final invoices for these two contracts will be submitted upon completion of final settlement negotiations for our 1979 overhead and G&A rates which is currently in progress. In reference to the closeout of contract DE-AC03-80SF10539, Collector System Phase II, please see Attachment 1, the letter to Ms. Joann Littlehales dated January 23, 1984, for the current status.

2. Patent Clearance

The following documents are in the process of being cleared by our Patent office. When this transmittal is available, I will send a copy to you.

MCR-78-1323, "10-MWe Solar Thermal Pilot Plant Conceptual Design Review"  
MCR-78-1330, "10-MWe Solar Thermal Pilot Plant Preliminary Design Review"  
MCR-79-1302, "10-MWe Solar Thermal Pilot Plant Final Design Review (2 Vols)"  
40-0-500-4P, "10-MWe Solar Thermal Pilot Plant Phase II O&M Equipment"  
40-0-500-6P, "10-MWe Solar Thermal Pilot Plant Phase II Planning"

Mr. Doug. Elliott  
January 27, 1984  
Page 2

The remainder of the documents have been previously cleared by the following letters, copies of which are included in Attachment 2.

Letters from Phillip DeArment to Roger Gaither:

DAC-83-417, dated May 24, 1983  
80-Y-15555, dated July 28, 1980  
DAC-82-389, dated May 3, 1982  
Letter dated March 11, 1982  
Letter dated November 10, 1982

3. Documents

You requested copies of some documents and drawings in the referenced letter. Copies of the following drawings and documents are being submitted under Attachment 3.

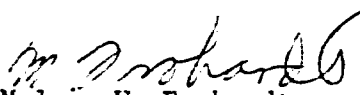
MCR-78-1330, "Preliminary Design Review Package"  
MCR-79-1352B, "Quality Assurance Plan for 10-MWe Phase II  
Collector"  
MCR-80-1376, "Heliostat Stimulator Operators' Manual"  
40M500-2S, "Foundation Requirements"  
40M500-2M, "Canting Procedures"  
*STMA0-576* ~~40M500-1T~~, "Installation Instructions"  
40M500-5P, "Acceptance Plan"  
MCR-81-1715, "Collector System Integrated Acceptance Test Plan"  
MCR-80-1361, "Collector System Functional Test Plan"  
40M500 5132788, "Adapter Plate/Control Arm Heat Tool"  
40M500 5132771, "Field Canting Tool"  
Source Listing of Code for Heliostat Controller ROM or EPROM\*  
Source Listing of Code for Heliostat Field Controller ROM/EPROM

No drawing exists for 40E500 5132776, "Drive Unit Checkout Console" as this checkout console consisted of a stimulator to operate a production Drive Mechanism Assembly. Also MCR-78-1330 is the correct document number for the Preliminary Design Review Package rather than MCR-78-1325. MCR-78-1325 is the document number assigned to all the Monthly Progress Reports written during the Phase I contract.

Doug, I hope this will help in getting the documentation finalized. I will follow-up with the additional information identified. If you have any questions please call on me.

Sincerely yours,

MARTIN MARIETTA CORPORATION

  
Melvin W. Frohardt  
Solar Programs

Enclosures

cc: H. Wroton  
Sonia Jackson



U.S. DEPARTMENT OF ENERGY

# memorandum

DATE **AUG 06 1984**

RE: **Doug Elliott, Director, DOE Solar One Project Office**

SUBJECT **Submission of Six Reports by Martin Marietta Corporation under Contracts DE-AC03-79ET21007 (Phase I) and DE-AC03-80SF10539 (Phase II) for Solar One Collector System**

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

Enclosed are copies of six reports prepared by Martin Marietta Corporation (Denver Aerospace Division) under the Phase I and Phase II contracts for the Collector (Heliostat) System for the 10-MWe Solar One Pilot Plant:

<u>Primary No.</u>	<u>Secondary No.</u>	<u>Short Title</u>
DOE/SF/10539-21	STMPO-571	Phase II Acceptance Plan (Revised)
DOE/SF/10539-22	STMPO-572	Collector System Functional Test Plan (Revised)
DOE/SF/10539-23	STMPO-573	Collector System Integrated Acceptance Test Plan
DOE/SF/10539-24	STMPO-574	Assembly Canting Fixture Operations, Phase II (Revision 2)
DOE/ET/21007-6	STMPO-575	Collector System Foundation Requirements (Revision A)
DOE/ET/21007-7	STMPO-576	Heliostat Installation Instructions

One copy of each document, accompanied by a completed SAN Form 70, is provided to DOE/SAN Office of Patent Counsel for patent review and clearance. Project Office release is based upon correspondence requesting (Attch. 1) and forwarding (Attch. 2) the respective documents; in addition, documents STMPO-572 and -573 are cited by MMC in their November, 1982 letter of Patent Certification (extract, Attch. 3). SAN-OPC's copies may be destroyed on completion of the clearance process.

Two copies of each report, accompanied by a completed DOE Form RA-426, is provided to the DOE Office of Scientific and Technical Information, Document Control and Evaluation Division, for abstracting, microfiching, archiving, announcement and forwarding to the National Technical Information Service.

Please call upon me at (619) 254-2672 if any further information is required.

Attchs.: 3, as stated

Encls.: 6 documents, w/forms

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

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



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

Reply to:  
 DOE Site Office  
 Post Office Box 366  
 Daguerre, CA 92327

Mr. Melvin T. Frohardt  
 Martin Marietta Aerospace  
 Post Office Box 179  
 Denver, CO 80201

DEC 06 1983

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 Operations Office

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  - MCR-79-1302, "10-MWe Solar Thermal Pilot Plant Final Design Review (2 Vols.)";
  - 40-G-500-4F, "10-MWe Solar Thermal Pilot Plant Phase II O&M Equipment";
  - 40-G-500-6F, "10-MWe Solar Thermal Pilot Plant Phase II Planning."

DE-AC03-80SF10539, Collector System Phase II

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- o "Contractors Release", to Sonia;
- o "Contractor Request for Patent Clearance", to me, for:
  - MCR-79-1352B\*, "Quality Assurance Plan for 10-MWe Phase II Collector..";
  - MCR-80-1304, "10-MWe Solar Pilot Plant Collector Subsystem Safety Plan";
  - MCR-81-1331B, "Hazard Analysis for 10-MWe ...Pilot Plant";
  - 40-G-500-2P, "10-MWe ...Pilot Plant Phase II Mfg. Plan, Rev. 2";
  - MCR-80-1341A, "10-MWe Collector Sybsystem Software/Firmware Functional Req'ts.";
  - MCR-80-1362, "System Description Document, Collector Subsystem...";
  - MCR-80-1376\*, "Heliostat Stimulator Operators' Manual";
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  - MCR-81-1709A, "Maintenance Instructions, Heliostat Field Subsystem...";
  - MTR-81-1769, "...Collector Subsystem Functional Test Report";
  - MCR-81-1770, "Supplemental Spares Plan, Heliostat Field...";
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-----  
 \* Current copies of these four items are lacking from the Project files; your assistance in obtaining at least one copy of each will be most appreciated.

Drawings: 40M500 5132780. "Adapter Plate/Control Arm Heat Tool". 40M500 5132771, "Field Canting Tool", and 40E500 5132776. "Drive Unit Checkout Console".

While these items are not carried in the current version of the Bibliography (none of the Plant as-built drawings have been entered as yet), many, if not all, of them may be expected to be of interest to the solar community. I would appreciate at least one copy of each, again with your release. To save you considerable effort in preparing the Patent Clearance Request forms (I am enclosing several copies of the form), you may combine many of the above by simply clearing the "Drawing Tree", with its contents.

If you need the other closeout forms cited above (your Contract Administration staff should have them in stock), please call Sonia Jackson at FTS 536-4179, or write her at:

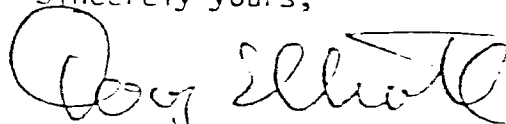
Ms. Sonia Jackson (CM)  
Department of Energy  
1333 Broadway  
Oakland, CA 94612

Finally, since we are required to forward two clean, reproducible copies of each document to DOE/TIC, as well as needing one clean copy for our on-site archives, any "extras" you can turn up around your offices would be greatly appreciated; certainly, rather than throw anything of possible interest out, send it to me.

Well, I know (believe me!) that this is all a significant amount of work, and I wish I didn't have to ask you (or your staff) to go through it, but it will be to our mutual benefit in the end to get these three contracts all cleaned up, and a comprehensive package of Project documentation (currently, over 550 documents, plus drawings) into the archives. If there is anything further I can do to assist you in this effort, please call on me.

Encl.: DOE Proj. Ofc. ltr. 6/25/83  
Patent Clearance Req. Forms

Sincerely yours,



S. D. Elliott, Jr., Director,  
DOE Project Office, Barstow

cc: H. C. Wroton, MMC  
Sonia Jackson, DOE/SAN (CM)

PS: I keep running across references to a document I can't identify: MCR-78-1325; what was it?

TIN MARIETTA AEROSPACE

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

January 30, 1984

Mr. Doug Elliott  
DOE Site Office  
Post Office Box 366  
Daggett, CA 92327Subject: Closeout Actions on Martin Marietta Contracts with DOE San  
Francisco Operations OfficeReference: Letter of December 06, 1983, S.D. Elliott, Jr. to M. Frohardt,  
Closeout of ContractsIn regard to the referenced letter, following is the status and actions in  
process to close out these items:

## 1. Contract Closeout Status

In regard to the closeout of cost type contracts DE-AC03-76ET20422, Central Receiver Test Facility, and DE-AC03-78ET21007, Collector System Phase I, we include the "Contractors Assignment of Refunds and Rebates" and "Contractors Release" with our final invoice package. The final invoices for these two contracts will be submitted upon completion of final settlement negotiations for our 1979 overhead and G&A rates which is currently in progress. In reference to the closeout of contract DE-AC03-80SF10539, Collector System Phase II, please see Attachment 1, the letter to Ms. Joann Littlehales dated January 23, 1984, for the current status.

## 2. Patent Clearance

The following documents are in the process of being cleared by our Patent office. When this transmittal is available, I will send a copy to you.

- MCR-78-1323, "10-MWe Solar Thermal Pilot Plant Conceptual Design Review"
- MCR-78-1330, "10-MWe Solar Thermal Pilot Plant Preliminary Design Review"
- MCR-79-1302, "10-MWe Solar Thermal Pilot Plant Final Design Review (2 Vols)"
- 40-0-500-4P, "10-MWe Solar Thermal Pilot Plant Phase II O&M Equipment"
- 40-0-500-6P, "10-MWe Solar Thermal Pilot Plant Phase II Planning"

Mr. Doug. Elliott  
January 27, 1984  
Page 2

The remainder of the documents have been previously cleared by the following letters, copies of which are included in Attachment 2.

Letters from Phillip DeArment to Roger Gaither:

DAC-83-417, dated May 24, 1983  
80-Y-15555, dated July 28, 1980  
DAC-82-389, dated May 3, 1982  
Letter dated March 11, 1982  
Letter dated November 10, 1982

3. Documents

You requested copies of some documents and drawings in the referenced letter. Copies of the following drawings and documents are being submitted under Attachment 3.

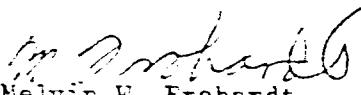
MCR-78-1330, "Preliminary Design Review Package"  
MCR-79-1352B, "Quality Assurance Plan for 10-MWe Phase II  
Collector"  
MCR-80-1376, "Heliostat Stimulator Operators' Manual"  
40M500-2S, "Foundation Requirements"  
40M500-2M, "Canting Procedures"  
40M500-1T, "Installation Instructions"  
40M500-5P, "Acceptance Plan"  
MCR-81-1715, "Collector System Integrated Acceptance Test Plan"  
MCR-80-1361, "Collector System Functional Test Plan"  
40M500 5132788, "Adapter Plate/Control Arm Heat Tool"  
40M500 5132771, "Field Canting Tool"  
Source Listing of Code for Heliostat Controller ROM or EPROM\*  
Source Listing of Code for Heliostat Field Controller ROM/EPROM

No drawing exists for 40E500 5132776, "Drive Unit Checkout Console" as this checkout console consisted of a stimulator to operate a production Drive Mechanism Assembly. Also MCR-78-1330 is the correct document number for the Preliminary Design Review Package rather than MCR-78-1325. MCR-78-1325 is the document number assigned to all the Monthly Progress Reports written during the Phase I contract.

Doug, I hope this will help in getting the documentation finalized. I will follow-up with the additional information identified. If you have any questions please call on me.

Sincerely yours,

MARTIN MARIETTA CORPORATION

  
Melvin W. Frohardt  
Solar Programs

Enclosures

cc: H. Wroton  
Sonia Jackson

MARTIN MARIETTA AEROSPACE

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

10 November 1982

Ms. Mary Jane Holliday  
Contract Examiner  
Department of Energy  
California Patent Group  
San Francisco Operations Office  
Oakland, California 94612

Re: Final Patent Certification for DOE  
Contract DE-ACO3-80SF10539

Dear Ms. Holliday:

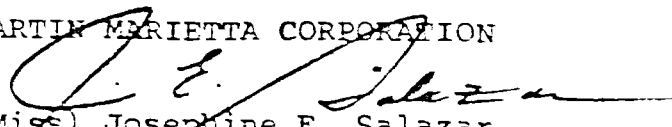
Pursuant to your letter of September 7, 1982, addressed to Mr. Cecil W. Duclon, I have made the corrections you requested thereon.

With respect to Invention Disclosures 81YD16, 81YD24 and 81YD25, please see our attached letters dated March 11, 1982 wherein you were notified that these inventions are not reportable. I am also attaching Mr. Carnahan's letter dated March 22, 1982.

If we can be of further assistance, please contact our office. Mr. DeArment may be reached at (303) 977-6109 and I may be reached at (303) 977-6501/6110.

Very truly yours,

MARTIN MARIETTA CORPORATION

  
(Miss) Josephine E. Salazar  
Assistant to Phillip L. DeArment  
Assistant Patent Counsel

cc: C. W. Duclon  
W. A. Brever  
J. T. Weber

2. Technical data of this contract other than reports (i.e., notebooks, drawings, etc.) are completely listed, as follows:

All correspondence, reports, etc., mailed to Huntington Beach office.

Monthly submittals, Issue 1 through 25 as follows:

- a. Milestone Schedule and Status Report
- b. Cost Management Report
- c. Project Status Report
- d. Documentation Tab Run
- e. List of active changes/modifications
- f. List of drawing revisions/levels
- g. Indentured Parts List

Minority Business Reports

Updated OPDD Documentation

Controls Hardware Drawings

Software Design Specification

Safety Plan

Hazard Analysis

Preliminary Design Review Package

Preliminary Design Review Package Final

Manufacturing Plan

Quality Assurance Plan

~~STMPD-572~~ Functional Test Plan

MCR-80-1361

Functional Test Report

~~STMPD-573~~ C/S Integrated Acceptance Test Plan

MCR-81-1715





DEPARTMENT OF ENERGY  
SAN FRANCISCO OPERATIONS OFFICE

CONTRACTOR REQUEST FOR PATENT CLEARANCE  
FOR RELEASE OF UNCLASSIFIED DOCUMENT

Prime Contract No. DE-AC03-79ET21007
Subcontract No. (N/A)
Report No. DOE/ET/21007-7 (STMP0-576)
Date of Report January, 1979
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  
ATTN: S. D. Elliott, Jr.

- Document Title:  
10 MWe Solar Pilot Plant: Heliostat Installation Instructions
- 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.

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

- Not 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:
  - Attention should be directed to pages \_\_\_\_\_ of this document.
  - This document describes matter relating to an invention:
    - Contractor Invention Docket No. \_\_\_\_\_
    - A disclosure of the invention was submitted to DOE on \_\_\_\_\_ (date)
    - A disclosure of the invention will be submitted shortly \_\_\_\_\_ (approximate date)
    - A waiver of DOE's patent rights to the contractor:
  has been granted,  has been applied for; or  will be applied for \_\_\_\_\_ (date)  
by me
- This document is being submitted, but no review has been made of this document for possible inventive subject matter.
- Remarks: Return copy of clearance to Project Office; document may be destroyed

Reviewing/Submitting Official: Name (Print/Type) S. D. Elliott, Jr., Director,  
Title DOE Solar One Project Office  
Signature *S. D. Elliott* Date 6 August, 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 \_\_\_\_\_

DOE AND MAJOR CONTRACTOR RECOMMENDATIONS FOR  
ANNOUNCEMENT AND DISTRIBUTION OF DOCUMENTS

See Instructions on Reverse Side

1. DOE Report No. DOE/ET/21007-7 (STMP0-576)	2. Contract No. DE-AC03-79ET21007	3. Subject Category No. UC-62, -62c, -62d
---	--------------------------------------	--

4. Title  
10 MWe Solar Pilot Plant: Heliostat Installation Instructions

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.)

6. Copies Transmitted ("x" one or more)  
 a. Copies being transmitted for standard distribution by DOE-TIC.  
 b. Copies being transmitted for special distribution per attached complete address list.  
 c. Two completely legible, reproducible copies being transmitted to DOE-TIC. (Classified documents, see instructions)  
 d. Twenty-seven copies being transmitted to DOE-TIC for TIC processing and NTIS sales.

7. Recommended Distribution ("x" one)  
 a. Normal handling (after patent clearance): no restraints on distribution except as may be required by the security classification.  
Make available only  b. To U.S. Government agencies and their contractors.  c. within DOE and to DOE contractors.  
 d. within DOE.  e. to those listed in item 13 below.  
 f. Other (Specify)

8. Recommended Announcement ("x" one)  
 a. Normal procedure may be followed.  b. Recommend the following announcement limitations:

9. Reason for Restrictions Recommended in 7 or 8 above.  
 a. Preliminary information.  b. Prepared primarily for internal use.  c. Other (Explain)

10. Patent, Copyright and Proprietary Information  
Does this information product disclose any new equipment, process or material?  No  Yes If so, identify page nos. \_\_\_\_\_  
Has an invention disclosure been submitted to DOE covering any aspect of this information product?  No  Yes  
If so, identify the DOE (or other) disclosure number and to whom the disclosure was submitted.  
Are there any patent-related objections to the release of this information product?  No  Yes If so, state these objections.  
Does this information product contain copyrighted material?  No  Yes  
If so, identify the page number \_\_\_\_\_ and attach the license or other authority for the government to reproduce.  
Does this information product contain proprietary information?  No  Yes If so, identify the page numbers \_\_\_\_\_,  
("x" one  a. DOE patent clearance has been granted by responsible DOE patent group.  
 b. Document has been sent to responsible DOE patent group for clearance.

11. National Security Information (For classified document only; "x" one)  
Document  a. does  b. does not contain national security information

12. Copy Reproduction and Distribution  
Total number of copies reproduced 25 Number of copies distributed outside originating organization 15

13. Additional Information or Remarks (Continue on separate sheet, if necessary)

14. Submitted by (Name and Position) (Please print or type)  
S. D. Elliott, Jr., Director, DOE Solar One Project Office  
Organization

Post Office Box 366, Daggett, CA 92327 (619) 254-2672

Signature *S. D. Elliott, Jr.* Date AUG 06 1984



DEPARTMENT OF ENERGY  
SAN FRANCISCO OPERATIONS OFFICE

CONTRACTOR REQUEST FOR PATENT CLEARANCE  
FOR RELEASE OF UNCLASSIFIED DOCUMENT

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  
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ATTN: S. D. Elliott, Jr.

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- Document Title:  
10 MWe Solar Pilot Plant: Heliostat Installation Instructions
- Type of Document:  Technical Report,  Conference Paper,  Journal Article,  Abstract or Summary,  
 Copy of Oral Presentation,  Other (please specify): \_\_\_\_\_  
(Routine)
- In order to meet a publication schedule or submission deadline, patent clearance by \_\_\_\_\_ would be desired.

**SENDER 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:

- Contractor Invention Docket No. \_\_\_\_\_.
- A disclosure of the invention was submitted to DOE on \_\_\_\_\_ (date)
- A disclosure of the invention will be submitted shortly \_\_\_\_\_ (approximate date)
- 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: Return copy of clearance to Project Office; document may be destroyed

Reviewing/Submitting Official: Name (Print/Type) S. D. Elliott, Jr., Director,  
Title DOE Solar One Project Office  
Signature *S. D. Elliott* Date 6 August, 1984

TO: INITIATOR OF REQUEST X

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 *L. E. Corrahan* Date Mailed 8/10/84