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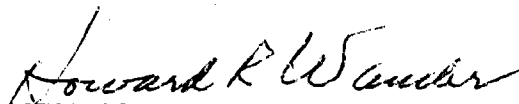
MCR-79-1352B

QUALITY ASSURANCE PLAN

FOR

10 MWe PHASE II

OCTOBER 1980



Howard R. Wander, Chief
Quality and Safety, SES



P. R. Brown, Manager
Solar Collector Systems

Prepared Under Contract No. DE-AC03-80SF10539

By

Martin Marietta Corporation

For

Department of Energy

FOREWORD

This document is prepared in compliance with Phase II
Collector Subsystem Statement of Work Task D.3.

QUALITY ASSURANCE PLAN FOR 10 MWe PHASE II

1.0 SCOPE

This document describes Martin Marietta's system for implementing the "Collector Subsystem for the 10 MWe Solar Thermal Central Receiver Pilot Plant" Quality Assurance Program. The plan in format and content is in general agreement with DOE Manual Chapter 0820, Quality Assurance.

The 10 MWe Phase II Quality Assurance Plan (QA Plan) establishes the requirements and controls that will be implemented during procurement, fabrication, assembly, installation checkout, and acceptance of 10 MWe Phase II hardware and software.

1.1 ORGANIZATION

The Program Quality and Safety organization will provide the system for managing and assessing the 10 MWe Phase II programs in conjunction with other program disciplines to assure requirements are identified and verified through all phases of contract performance.

Program Quality requirements and responsibilities are stated in detail in the following sections.

1.2 QUALITY ASSURANCE PROGRAM MANAGEMENT

The Quality Assurance Chief is responsible for direction and administration of all Quality and Safety activities of the Program. He reports administratively to the Manager of Quality Assurance and Safety, (Solar Energy Programs) and functionally to the Program Manager. He will represent Martin Marietta in liaison with STMPO in all matters relating to collector subsystem quality and safety. It is planned that all quality/safety matters will be worked directly with STMPO Quality/Safety personnel.

2.0 APPLICABLE DOCUMENTS

The following documents of the issue indicated form a part of this document to the extent specified herein:

DOE Contract Exhibit III	<u>Technical Specification for the Collector Subsystem Phase II</u>
Chapter 0820	<u>DOE Manual, Quality Assurance (No date)</u>
MDCG 7852	<u>CS-MCS and CS Plant Interface Requirements</u>
Military - MIL-STD-454(F) (Requirement 1)	<u>Standard General Requirements for Electronic Equipment, March 1978</u>
Martin Marietta 40 0 500 5P	Phase II Acceptance Plan, 10 MWe, September 1979

3.0 QUALITY ENGINEERING AND PLANNING (QE)

3.1 DESIGN REVIEW

Martin Marietta design review/system safety checklist parallels Requirement 1 of MIL-STD-454, Standard General Requirements for Electronic Equipment. The checklist was imposed on the electronics/electrical designers during Phase I and will continue to be used in Phase II for any design changes.

In addition to verifying that contract and specification requirements are met, the Phase II inspection system will verify that the hardware complies with the design review/system safety checklist.

3.2 MANDATORY VERIFICATION POINTS (MVP)

Quality will identify mandatory verification points (MVPs) that require verification during all increments of the program. MVPs are identified to program support disciplines and suppliers for inclusion into procurement documents, receiving inspection plans, source inspection statements of work (SOW), installation and assembly instructions and acceptance test procedures.

3.3 STAMP CONTROLS

The inspection stamp control system provides for the identification, issue and control of inspection stamps and traceability of stamps to the authorized custodian.

3.4 CONFIGURATION CONTROL

Quality will be an active member of the project change authorization committee (CAC). Quality will assure that changes have been correctly scheduled, effectivities established, and that rework/retest requirements are identified for all Martin Marietta built and procured items. Quality will verify the incorporation of all approved changes into procurement documents, fabrication, instruction, test procedures, and software documentation.

3.5 WORKMANSHIP STANDARDS

Electrical/electronics hardware workmanship standards shall be the Martin Marietta Denver Division Electronic Manufacturing Standards Series EMS-100. Structural hardware standards are stated in the engineering drawings.

3.6 SKILL CERTIFICATION AND TRAINING

Skill certification and training are required to the extent that satisfies the requirements of EMS-100, Workmanship Standards. During the selection process, supplier's programs for personnel training and certification will be evaluated. Subcontractor skill certification and training programs and workmanship standards documents may be substituted for EMS-100 when approved by program Quality.

3.7 DOE PARTICIPATION

DOE participation will be invited during validation of assembly processes for reflective assemblies and drive units and validation of installation and checkout procedures for heliostat assemblies. DOE will be notified of changes to validated processes and procedures. DOE participation will also be needed at each presentation of QDS for verification and acknowledgment of hardware acceptability.

4.0 PROCUREMENT CONTROLS

4.1 MAJOR PROCUREMENTS

Materials will be supplied from program-approved sources. Program Quality has performed required surveys to ensure that a supplier can deliver a product that meets specification/drawing requirements and that the supplier's inspection system can verify program-identified MVPs.

4.2 PURCHASE DOCUMENTS

Purchase documents will have Quality requirements stated either as quality codes on requisitions or in a detailed SOW as warranted by the complexity of the procurement. Quality will approve purchase documents prior to issuance to suppliers and all changes thereto.

4.3 SOURCE INSPECTION

Source Inspection is imposed on all supplied major components/subassemblies to the extent shown herein. No Government Source Inspection (GSI) is planned.

Source Inspection will be performed by program personnel and supplemented by Procurement Quality field personnel to the extent practical and economically feasible.

4.3.1 STRUCTURES

Structures having interface critical fit requirements shall have production tooling, jigs, and fixtures verified and first article inspection performed before production start.

4.3.2 ELECTRICAL/ELECTRONICS HARDWARE

Quality will approve supplier test plans and incorporate MVPs into plans. Quality will validate test procedures and special tools before production run start. The type equipment in this category includes the HST cable assemblies.

4.3.3 PRINTED CIRCUIT BOARDS (PCB)

Quality requires supplier submittal of PCB fabrication flow charts for process approval and insertion of MVPs. Physical inspection of PCB's at the supplier's facility will be performed by Quality.

4.3.4 SOURCE AUDITS

Periodic source inspection audits will ensure that established process controls are maintained. The audit schedule will be dictated by the production run and the supplier's performance.

4.4 RECEIVING INSPECTION

Receiving inspection will be performed in the product area by the user, except in those cases where Quality has indicated in the procurement documents that mandatory inspection is required. Considering the previously accomplished source inspections, receiving inspection will be limited to accountability and determining that the proper type and quantity was received as ordered, no shipping damage is evident, and the mandatory supplier certifications and required data accompany the hardware.

4.5 DROP SHIP HARDWARE

4.5.1 Quality will perform required inspection, test and acceptance responsibilities at the supplier facility for any hardware to be shipped directly to overseas destinations.

The supplier's pack and ship procedures will be approved by Quality to assure compliance to shipping environmental constraints.

The off-site MMC subcontractor has responsibility to receive, store and provide accountability for all hardware delivered to the installation site. Program Quality will review and approve subcontractor receiving inspection plans and identify MVPs.

5.0 MATERIALS & PARTS CONTROL

Parts and materials will be stored and segregated in designated facilities to assure first in first out stock control. Time and temperature-sensitive materials used in production will have special controls established to preclude degradation.

Materials such as epoxies, resins and sealants used in assembly of production hardware will be verified prior to release for production use.

In-process inspection will verify that the correct materials are used as required by the process and that required sampling is performed.

To the extent possible, Heliostat Controller and Heliostat Field Controller black boxes will use standard piece parts screened to the equivalent of Level B Reliability Factor. Hi-Rel EEE parts will only be used where a commercial equivalent is not available or if its use is specified on engineering drawings.

5.1 GFP CONTROL

All GFP will be issued to the Program as consumable materials and will require no accountability until redelivery as an integral part of the system.

6.0 PROCESS CONTROLS

6.1 GENERAL

Quality will review and approve all manufacturing processes and Non-Standard Processes (NSP), fabrication, assembly and installation plans and test procedures.

Quality will assure all processes and associated equipment is approved for that particular operation. When non-standard processes or equipment are required, Quality will verify acceptance criteria, equipment certification, and recertification requirements. Quality will assure all non-standard process associated equipment is identified as to approved usage and recertification requirements.

Inspection stamps are used to evidence the status and results of inspections and identify articles that have undergone acceptable in-process inspections, functional testing and final inspections.

6.2 IN-PROCESS VERIFICATION

In-process fabrication and test inspection will be performed to assure that MVPs have been accomplished and documented. Manufacturing processes, NSPs, fabrication plans, and test procedures will be validated at first use. Changes and refinements in the processes that occur during validation will be incorporated in the documents and released for use. Subsequent changes will be reviewed and approved by Quality to determine the impact on processes and procedures.

6.3 SURVEILLANCE INSPECTION

Surveillance will be performed by Quality to assure proper documents are in use and are being followed and all tools, measuring and test instruments have been calibrated and are within established calibration dates.

6.4 FORMAL ACCEPTANCE TESTING

Any test performed to document acceptance data at any level of fabrication or assembly will be performed to a Quality/Safety approved test procedure. The Acceptance Test Procedure (ATP) will be validated at first usage and updated prior to release for subsequent usage.

6.4.1 SYSTEMS TEST

Prior to start of systems level testing, a Certificate of Readiness to Test (CORT) will be executed. The CORT will document:

Prerequisites are Complete; Test Procedure Configuration is Compatible with Test Item, and Approved; Hardware/Software is to Latest Configuration; Test Support Equipment Available and Calibrated Constraints to Test Resolved.

Authorizing signatures required to proceed include as a minimum:

Test Conductor; Engineering Lead (Specific Discipline); Quality (Software and/or Hardware); Safety

6.4.2 PROCEDURE CHANGE NOTICE (PCN)

All test procedure PCNs require Quality/Safety approval. Revalidation of ATP due to changes will be controlled by Quality.

7.0 QUALITY RECORDS

7.1 QUALITY DATA SHEETS (QDS)

QDS are used to document configuration, assembly and test data, provide historical data and a certificate of compliance for the item. The reverse side of the QDS provides space to record events pertinent to the end item, i.e., remove, replace, etc. See Figure 1 for example of heliostat final assembly QDS.

7.1.1 QDS ARE REQUIRED FOR DEFINABLE WORK INCREMENTS SUCH AS:

- Drive Mechanism Assembly
- HC, HC/HFC Units
- Heliostat Final Assembly (individual)
- Heliostat Groups (HFC, Segment, Ring, Wedge, Full Field)
- Deliverable End Items and Tools

7.2 HELIOSTAT RECORDS AND LOG BOOKS

The hardware records and retrieval system is based on the accumulation into a log/folder containing QDS and vendor certification data for a given heliostat by serial number that is in a specific field location. Two objectives are met in this system:

- 1) Location of major components in the field for directed rework for modification operations.
- 2) With the test and checkout MVPs validated by Quality (and customer if required), incremental acceptance of field installations can be expedited.

7.3 QUALITY RECORDS

All assembly, inspection and acceptance records will be retained by Quality and will be available for review and microfilming by STEMPO. Mirror supplier in-process records shall be included.

Receiving and source inspection records, supplier certifications, completed fabrication plans, as run test procedures/data and closed out nonconformance records constitute quality data. Completion of these records is the basis for acceptance.

8.0 SITE OPERATIONS

The controls and procedures established throughout this plan also apply to installation site activities.

Processes will be validated and finalized and production tools will be certified during activation and/or pilot run operations. Resident Quality/Safety personnel are assigned to the Mirror Module Manufacturing Facility and the Collector Subsystem Installation Site.

8.1 MIRROR MODULE MANUFACTURING FACILITY

Quality personnel are assigned to perform receiving inspection, in-process fabrication, assembly, test and pack and ship inspections.

Materials used in Mirror Module Production will be traceable in Quality Records throughout fabrication and subsequent use. Work station logs keyed to module serial number will document installed materials by lot codes.

Contour measurements will be made to verify tooling repeatability and the bonding process. Contour measurements will be recorded for each module (100 units) during process verification. Subsequent to establishment of process parameters recordings will be made to a sampling plan. Sampling requirements to verify materials will be established in engineering processes.

Pack and ship inspection will assure packaging conforms to Pack and Ship Process Plan Requirements.

Quality will maintain receiving inspection record sheets, station logs and test data as Quality Records. Minor in-process inspection or test nonconformances will be documented on a Visual Defects Chart (VDC), Discrepancy Report (DR) or Martin Automatic Reporting System (MARS) forms.

8.2 COLLECTOR SUBSYSTEM INSTALLATION SITE

Quality and Safety Personnel are assigned to perform receiving inspection, in-process assembly and test inspections, installation and checkout inspection and to monitor acceptance tests.

Acceptance of the system will be performed incrementally in accordance with the Phase II Acceptance Plan (40 0 500 5P).

9.0 NONCONFORMANCE MATERIAL AND ARTICLE CONTROL

The Nonconformance Control (NC) system provides for a method of documentation, fault-isolation, dispositions and corrective action. The NC system applies to all hardware and software.

9.1 NONCONFORMANCE CATEGORIES

Nonconformances are divided into major and minor categories:

- 1) Major nonconformances are those that require Material Review Board MRB action;
- 2) All other nonconformances fall into the minor category (No MRB action required).

9.2 NONCONFORMANCE DOCUMENTS AND CONTROLS

Anomalies may be documented on Inspection Record Sheets, Discrepancy Report (DR) forms, MARS forms, Visual Defect Charts (VDC), or Flag Item Sheet forms. The form, detailed disposition, and the requirement for corrective action depends on the occurrence activity and/or the complexity of the problem.

Quality will issue a program directive to identify the use of specific NC reporting forms required for the program. Nonconforming material and articles are identified and where practical, retained in a segregated area. Quality will assure follow-up actions have been completed on nonconformance documents as required. Records of nonconformance will be maintained by the Program.

9.3 MATERIAL REVIEW BOARD (MRB)

Quality will employ two levels of MRB:

- 1) Martin Marietta 10 MWe program MRB.
- 2) Full board MRB (customer approval of the disposition is required).

9.3.1 MARTIN MARIETTA 10 MWE SYSTEM PROGRAM MRB

The Martin Marietta MRB is a two-man board that will process MRB actions dispositioned to "USE AS IS" or "REPAIR" that are not a deviation to contract requirements.

MRB actions will be documented on MARS forms. Use as is or repair dispositions require an engineering rationale documented to support the disposition.

A list of QA program personnel and program engineers authorized as MRB members will be approved, certified and maintained by Quality.

9.3.2 MRB, FULL BOARD

Formal MRB actions require customer approval of the recommended disposition documented on the MARS form. It is planned that DOE will not be required in MRB activities other than in waiver circumstances, i.e., when the recommended MRB disposition constitutes a deviation from contract requirements. Nonconforming GFP will be documented on a MARS form, segregated from production hardware and submitted to customer for disposition.

10.0 SOFTWARE QUALITY ASSURANCE (SQA)

10.1 CONFIGURATION CONTROL

The Software Quality Assurance (SQA) engineer will control the software configuration management activity on the program. He will maintain software baselines current to the requirements of the Software Development Specification (SDS) and the Functional Requirements Specification (FRS). SQA will be an active member of the CAC. He will audit software change activity and approve software changes before implementation into the baseline documents.

10.2 SOFTWARE NONCONFORMANCE CONTROL

A potential source for software changes will originate from nonconformances identified during testing and system checkout activities.

Software nonconformances will be documented on the Flag Item Sheet. Resolution of the problem will be an engineering responsibility, subsequent action taken toward disposition of the item will be the responsibility of the change authorization committee (CAC).

11.0 PACK AND SHIP INSPECTION

11.1 Pack and ship inspection will be performed to assure that hardware is environmentally protected and packaged to preclude transportation damage.

Quality will review and approve pack and ship documents and incorporate MVPs.

11.2 PACKAGING, HANDLING TRANSPORTATION RECORD (PHTR)

PHTR forms will be provided on hardware that requires special controls during pack and ship or handling operations. Candidates for PHTR forms include the drop ship hardware and mirror modules.

12.0 METROLOGY CONTROL

12.1 DENVER FACILITIES

The Martin Marietta Quality Metrology Laboratory and Gauge Laboratory provide prime standards and maintain laboratory facilities to ensure the calibration and certification of measuring and test instruments used to verify the quality of materials, supplies, products and processes. The laboratories maintain the traceability of inter-laboratory and reference standards to the National Bureau of Standards (NBS).

12.2 OFFSITE FACILITIES

Measuring equipment used to gather acceptance data shall be calibrated traceable to a primary standard. Selected calibration facilities will be approved by Quality.

STMPD-288

MARTIN MARIETTA AEROSPACE

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

May 3, 1982

Refer to: DAC-82-389

To: U. S. Department of Energy
P. O. Box 808
Livermore, California 94550

Attn: Roger S. Gaither, Esq.
Assistant Chief for Prosecution
Office of Patent Counsel, L-376

Subj: Contract DE-ACO3-80SF10539

1. Attached is the Patent Certification on the subject contract.
2. If you have any questions, please contact me at (303) 977-6109.

Very truly yours,

MARTIN MARIETTA CORPORATION

Phillip L. DeArment
Phillip L. DeArment
Assistant Patent Counsel

PLD:jes

PATENT CERTIFICATION

DOE CONTRACT NO. DE-ACO3-80SF10539

1. The following is a complete list of technical reports prepared during the course of the work under this contract and the DOE office to which the reports were sent:

See Attachment I

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

See Attachment II

3. Each of the above-listed documents under paragraphs 1 and 2 has been examined for invention subject matter by me and/or technical personnel under my direction; to the best of my knowledge and belief, no inventions or discoveries were made or conceived in the course of or under this contract other than the following:

<u>CONTRACTOR NO.</u>	<u>TITLE</u>	<u>DATE REPORTED</u>	<u>DOE NO.</u>
Docket # 80YD41	FASTON TERMINAL INSTALLATION TOOLS	03/09/81	S-55,956, RL-8354
Docket # 81YD19	FASTON TERMINAL EXTRACTION TOOLS	05/03/82	S-59,046, RL-8843

4. There were no subcontracts or purchase orders involving research and development, except as follows:

NONE

5. The completion date of this contract is as follows: February 13, 1982

6. The following period is covered by this certification:

December	3,	1979	to	February	13,	1982
<u>Month</u>	<u>Day</u>	<u>Year</u>		<u>Month</u>	<u>Day</u>	<u>Year</u>

Martin Marietta Corporation
Contractor Denver Aerospace
P. O. Box 179
Denver, Colorado 80201
Address

Phillip L. DeArment
Signature Phillip L. DeArment
Assistant Patent Counsel

Title

Submit in duplicate to:

Roger S. Gaither
Assistant Chief for Prosecution
California Patent Group, L-376
U. S. Department of Energy
P. O. Box 808
Livermore, California 94550

Form completed by: M. Frohardt
Date: Feb 23, 1982

Date of Certification

February 22, 1982
Attachment I
Patent Certification
DOE Contract No. DE-AC03-80SF10539

1. The following is a complete list of technical reports prepared during the course of the work under this contract and the DOE office to which the reports were sent:

<u>Report Type</u>	<u>Office Mailed</u>
Monthly Submittals	Huntington Beach
Technical Status Report Issue 1 through Issue 25	Huntington Beach
Design and Manufacturing Drawings	Huntington Beach and Canoga Park
Technical Correspondence	Huntington Beach and Canoga Park
Contract Correspondence	Oakland, CA.
Deliverables	Huntington Beach and Canoga Park
Periodic Reports	Huntington Beach and Canoga Park

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

Functional Test Plan

Functional Test Report

C/S Integrated Acceptance Test Plan

February 22, 1982
Attachment II
Patent Certification
DOE Contract No. DE-AC03-80SF10539

Page Two

C/S Integrated Test Report

Supplemental Spares Plan

Two Copies of Drawings with Latest Revisions

Operational and Maintenance Manuals

Collector Subsystem Instrumentation

Maintenance Instructions

Control System Theory of Operations

Software/Firmware Design Specifications

STM 10-288

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:

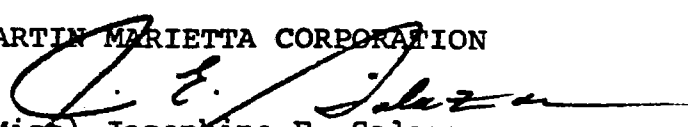
Pursuant to your letter of September 7, 1982, addressed to Mr. Cecil W. Duclon, I have made the corrections you requested thereon.

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. Brevier
J. T. Weber



STMPD-298

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

Reply to:
DOE Site Office
P.O. Box 366
Daggett, CA 92327
ATTN: S. D. Elliott, Jr.

Melvin W. Frohardt
Martin Marietta Aerospace
P.O. Box 179
Denver, CO 80201

JUN 25 1983

Subj.: Request for patent clearance and TIC Distribution of Documents from
DOE Contracts ET21007 and SF10539 (Solar One Heliostats, Phases I & II)

Dear Mel:

We are about to come out, with the help of EPRI, with a bibliography of key Project documents. To cope with anticipated requests for copies, I would like to arrange for properly cleared documents to be filed with and distributed through the DOE Technical Information Center at Oak Ridge. A check with TIC shows that only MCR-80-1377 has been cleared by them to date. Can you provide me with signed-off Patent Clearance Requests for:

- o The five indicated documents from the Phase I study (ET21007);
- o The twelve indicated documents from Phase II (SF10539);
- o The as-built drawing set provided via Sandia at the end of Phase II;
- o Any other Project documents generated by MMC you think the utility/industry community should have.

I'd also appreciate a check on the Phase I CDR handout; was it MCR-78-1325?

Your help is greatly appreciated; it will save me (and you) a lot of running about once the bibliography comes out. I will insure that you get a copy; it lists about 500 documents, not including drawings (these we will provide to TIC in aperture card form at a later date, with a full index). Please call me ((619) 254-2672/-2142) if you have any questions or concerns.

Sincerely yours,

S. D. Elliott, Jr.
DOE Project Director



STAMP-288

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:

- 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-78-1323, "10-MWe Solar Thermal Pilot Plant Conceptual Design Review";
 - 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):

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 Cantino 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:

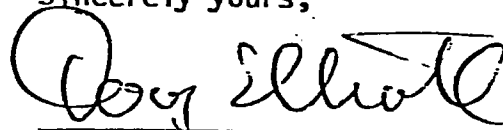
Ms. Sonia Jackson (CM)
Department of Energy
1333 Broadway
Oakland, CA 94612

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?

STMPO-288

MARTIN 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 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"
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 **MAY 14 1984**

REPLY TO
ATTN OF

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

SUBJECT Submission of Thirteen Reports Prepared for 10-MWe Pilot Plant ("Solar One") Project by Martin Marietta Corporation under Contract DE-AC03-80SF10539

TO: Roger S. Gaither, DOE/SAN Office of Patent Counsel
William D. Matheny, DOE/TIC Document Control


Enclosed are thirteen documents prepared by the Martin Marietta Corporation, Denver Aerospace Division, for the Solar Ten-Megawatt Project Office in conjunction with design and fabrication of the Pilot Plant Collector (Heliostat) System, under Contract DE-AC03-80SF10539:

<u>Primary Document No.</u>	<u>Secondary No.</u>	<u>Brief Title</u>
DOE/SF/10539-01	(STMPO-288)	"Quality Assurance Plan..."
DOE/SF/10539-02	(STMPO-289)	"...System Safety Plan"
DOE/SF/10539-03	(STMPO-290)	"Hazard Analysis..."
* DOE/SF/10539-04	(STMPO-291)	"Phase II Manufacturing Plan (Revision 2)"
DOE/SF/10539-05	(STMPO-292)	"Software/Firmware Functional Requirements..."
* DOE/SF/10539-06	(STMPO-293)	"System Description Document..."
DOE/SF/10539-07	(STMPO-294)	"Heliostat Stimulator Operator's Manual"
DOE/SF/10539-08	(STMPO-295)	"Operations Instructions, Heliostat Field..."
* DOE/SF/10539-09	(STMPO-296)	"Maintenance Instructions, Heliostat Field..."
DOE/SF/10539-10	(STMPO-297)	"...Functional Test Report"
DOE/SF/10539-11	(STMPO-298)	"Supplemental Spares Plan..."
* DOE/SF/10539-12	(STMPO-299)	"Software/Firmware Design Specification..."
DOE/SF/10539-13	(STMPO-300)	"Control System Theory of Operation"

One copy of each document, accompanied by a SAN Form 70 prepared by the Project Office (on the basis of Attachment 1, the Contractor's Patent Certification as submitted May 3, 1982), is provided for SAN/OPC review and clearance. The fabrication and maintenance materials indicated in the above list by an asterisk should be reviewed in the light of the two disclosures filed with Attch. 1, as well as the Martin Marietta Dockets 81YD16, -24, and -25, claimed as developed outside the scope of the contract in Attch. 2, MMC letter of November 10, 1982. Please return the "feedback" copies of the Form 70's to this office; the clearance copies of the documents themselves may be returned to Mr. Mike Lopez, SAN/FGS.

Two copies of each document, accompanied by a completed DOE Form RA-426, are submitted for archiving and announcement by the DOE Technical Information Center and for forwarding to the National Technical Information Service.

- Attchs.: 1. Martin Marietta Ltr. 5/3/82
- 2. Martin Marietta ltr. 11/10/82


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

Encls.: 13 Documents w/transmittal forms

- cc: Mike Lopez, DOE/SAN (FGS)
- Don Holz, DOE/SAN (ISEA)
- Mary Soderstrum, Burns & McDonnell



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/10539-01 (STMPO-288)
Date of Report October 1980
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

- Document Title:
"Quality Assurance Plan for 10 MWe Phase II"
- 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.

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:
- 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
5. This document is being submitted, but no review has been made of this document for possible inventive subject matter.
6. Remarks: See Martin Marietta letter ~~XX80X84~~ 5/3/82 ^ for Patent Certification

Reviewing/Submitting Official: Name (Print/Type) S. D. Elliott, Jr., Director,
Title DOE Solar One Project Office
Signature *S. D. Elliott* Date 10 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 _____

U.S. DEPARTMENT OF ENERGY

DOE AND MAJOR CONTRACTOR RECOMMENDATIONS FOR
ANNOUNCEMENT AND DISTRIBUTION OF DOCUMENTS

See Instructions on Reverse Side

1. DOE Report No. DOE/SF/10539-01 (STMPO-288)	2. Contract No. DEAC03-80SF10539	3. Subject Category No. UC-62
--	-------------------------------------	----------------------------------

4. Title
"QUALITY ASSURANCE PLAN FOR 10 MWe PHASE II"

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.

f. Other (Specify) Archive/issue on request e. to those listed in item 13 below.

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 10

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 _____ Date _____

S. D. Elliott, Jr.

MAY 10 1984



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/10539-01 (STMP0-288)
Date of Report October 1980
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

- Document Title:
"Quality Assurance Plan for 10 MWe Phase II"
- 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.

- 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:
 - 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: See Martin Marietta letter ^{5/3/82} ~~1/30/84~~ for Patent Certification

Reviewing/Submitting Official: Name (Print/Type) S. D. Elliott, Jr., Director
 Title DOE Solar One Project Office
 Signature *S. D. Elliott* Date 10 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 *L. E. Carnahan*

M. Lopez, SAN
LGE
5/21/84
 Date Mailed 5/21/84