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DOE/NASA CONTRACTOR REPORT

DOE/NASA CR-150742

SYSTEM INTEGRATION OF MARKETABLE SUBSYSTEMS
(Second Collection of Progress Reports)

Prepared by

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National Aeronautics and Space Administration
George C. Marshall Space Flight Center, Alabama 35812

For the U. S. Department of Energy



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MARKETABLE SUBSYSTEMS Second Collection of
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U.S. Department of Energy



Solar Energy

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SECTION A
MONTHLY STATUS REPORT
February 1978

I. MANAGEMENT

- o 28 technical documents were submitted to MSFC.
- o 13 Program Office Directives were generated within IBM to accomplish SIMS program objectives.

II. INTEGRATION PROGRAM

- o System 1A - All instrumentation rework for this site was completed by the end of January and no support was required for this system during February.
- o System 1B - The repaired air handler controller and remaining two control sensors were shipped to the Carlsbad site. All data collection temperature sensors have been calibrated and sent to the site. All sensors, except fuel oil flowmeters, have been shipped, as well as the SDAS. Provided consultation to the site contractor on control and instrumentation subjects.
- o System 2 - Revised pages for the text report were submitted to MSFC on February 15 in accordance with MSFC comments. An updated Spare Parts List was submitted to MSFC on February 14. All instrumentation changes were reflected in the release of an updated Data Collection Parts List. Coordinated with the MSFC site managers for the planned site visit to update the data collection instrumentation.
- o System 3 - The last test phase with the ASME storage tank has accumulated three days of solar collecting. Although more sunny weather data is desired, the test will be terminated in time to allow scheduled system delivery. Data collected on storage stratification supports the IBM response to RID 3-7 previously submitted and should allow MSFC sign-off. The Design Data Brochure was submitted to MSFC on February 13. The updated Spare Parts List was submitted on February 16.
- o System 4 - The three RSA (Remote Solar Assembly) bids were received and rejected because of high cost and schedule risk. Rock bed storage panels, special insulation pieces and the RSA structure were completed and delivered. All long lead bulk material was ordered with 70 percent delivered to date. Large items are being delivered directly to Wyle at the MSFC test area. Smaller items are being sent to Wyle as they are received at IBM. A revised Verification Plan was supplied to MSFC on February 22. The Design Description Drawing was submitted to MSFC on February 13. Final IBM review of the PIP (less site dependent sensors) was completed and submitted to MSFC. The IBM site engineer visited the four candidate sites with MSFC personnel. An ROM installation estimate was generated and informally discussed with MSFC and a performance prediction of the two leading sites was started.

- o Systems 5 and 6 - The IBM change proposal is awaiting MSFC action.

III. SITE DATA COLLECTION SUBSYSTEM

- o Additional J-Box Procurement - 33 of the 37 J-Boxes and associated cables were delivered in early February. The remaining four J-Boxes are awaiting piece parts and are expected to be delivered by mid March.
- o SDAS/OSM Spares - The Mod II Spares Contract was turned on and the procurement of piece parts for that effort has been started. Procurement of piece parts and fabrication of sub-assemblies for the Mod I and OSM Spares is continuing.
- o Additional Sensor Procurement - Sensor stock continues to enlarge as vendors shipment of temperature wells/probes and wattmeters are delivered for the most commonly used part numbers. The availability of modified sensors (fuelmeters, totalizers and gasmeters) continue to be a problem. We are attempting to modify a small number (3-5) of these special sensors to maintain a minimum stock inventory.

IV. CENTRAL DATA PROCESSING SYSTEM

- o Production Processing - Detailed measurement data and plots continue to be supplied for OTS sites. Solar data from all sites, including intrastate and those outside the 48 contiguous states, is being collected via an automatic data collection program and is being processed the same day by the Host computer. Data is also being collected from the SDAS Mod II boxes having 96 and 80 channel capabilities. Data from these boxes is being properly processed and plots are being created. Efforts are continuing to develop capabilities for processing seasonal analyses.
- o Data Evaluation - During the month of February CDPS printouts continued to be delivered to MSFC. Data for approximately ten sites are being distributed. At the end of March two sites will be removed from this automatic distribution, IBM 1A - Huntsville and Decade 80 - Tucson. This action is a planned step in the revised Data Evaluation Program.

During the month of February IBM delivered Automated Data Listings for the following five sites:

- o ELCAM - TEMPE
- o SEMCO - MACON
- o IBM 1A - HUNTSVILLE
- o SEMCO - LOXAHATCHEE
- o DECADE 80 - TUCSON

V. SYSTEM ANALYSIS

- o Analysis - Two Technical Directives remain open in the System Analysis area: (1) TD23 and (2) TD24. Efforts on both tasks have been stopped until the data evaluation issues are resolved. MSFC has concurred in this action.
- o Change Integration - The following routine tasks assigned to the change integration mission were accomplished:
 - Converted all Data Dissemination reports from SCIT to manual. All computer inputs to SCIT on Data Dissemination have stopped.
 - Finalizing plans to gather DRL information manually. We plan to terminate all SCIT effort with the Computer Laboratory by March 15, 1978.
 - Continuing to process the backlog of data dissemination material. Emphasis has been placed on Quarterly Reports.

VI. TEST FACILITY OPERATIONS

Solar Simulator

- o Thermal performance tests of the Solar Energy System solar collectors were initiated and completed.
- o Analyses were completed on the Life Sciences Collector and the test report was prepared.

Solar House

- o System control has been successfully established in the automatic winter mode.

Breadboard Test Facility

- o The first phase of System 3 testing, including the data analyses, was completed and the test report is in preparation. The prototype System 3 storage tank and heat exchanger were installed and Phase II testing activities were initiated.
- o Components of the System 4 equipment were delivered. These components are being assembled and installed for testing with the Remote Solar Assembly being located adjacent to the Test Article Building #1. Test procedures are being prepared with instrumentation selections and designations being made concurrently with the assembly process.

- o Static load tests of the Life Sciences Collector were completed. Thermal efficiency tests were performed in the Ying Collector under natural test conditions. A draft of the test report has been completed on the Ying Collector.
- o A test procedure was prepared for the Northrup Concentrating Collector. The complete Northrup Collector array with tracking mechanisms has been assembled. Performance tests will be initiated subject to weather conditions.
- o All instrumentation cabling for the Facility Building (4638) solar heating system has been completed. Facilities maintenance and repair activities and normal instrumentation and calibration functions were performed.
- o Weathering tests are continuing on Test Bed #4 with data being collected on a monthly basis.

VII. DATA PROGRAM

- o Site Personalization - The Operational Test Sites (OTS) currently number 45. Site personalization effort has progressed to hardware status as outlined in Table 1. Dates are completed (planned) with an "X" noted for completions prior to status month.

VIII. TECHNICAL DIRECTIVES

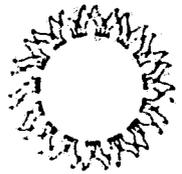
Word charts for the following Technical Directives active during February are attached:

<u>TD</u>	<u>Title</u>
23 (HOLD)	Solar Cooling - Baseline System Performance
24 (HOLD)	Collector Selection for Absorption Cycle
31	Site Selection Analysis for IBM Systems
46	Site Instrumentation and Personalization
47	Extension on change Integration Mission from October 3, 1977 to March 31, 1978

TABLE I
OTS HARDWARE STATUS

<u>SITE</u>	<u>Sensors Ordered</u>	<u>Sensors Shipped</u>	<u>J-Box Shipped</u>	<u>SDAS Shipped</u>	<u>SDAS On-Line</u>
DECADE 80	X	X	X	X	X
SEMCO-GA	X	X	X	X	X
SEMCO-FLA	X	X	X	X	X
ELCAM-TEMPE	X	X	X	X	X
WORMSER-SC	X	X	X	X	(3-78)
SEECO- EL RENO	X	X	X	X	X
FERN-LANSING	X	X	X	X	X
COLT-YOSIMITE	X	Feb	(3-78)	(3-78)	tbd
IBM-1A	X	X	X	X	X
IBM-2A	X	X	X	Feb	(3-78)
IBM-1B	X	X	X	Feb	(3-78)
CONTEMP-MANCHESTER	X	X	X	X	(3-78)
HONEYWELL-STILLWATER	X	X	X	X	Feb
HONEYWELL-NEW CASTLE	X	X	X	Feb	(3-78)
GE-NORMAL	X	X	X	X	(3-78)
CONTEMP-YORK	X	X	X	Feb	tbd
FERN-TUNKHANNOCK	X	X	X	Feb	Feb
SEECO-LINCOLN	X	X	X	X	(3-78)
ELCAM-SAN DIEGO	X	(3-78)	(3-78)	(3-78)	tbd
COLT-PUEBLO	X	X	X	Feb	Feb
GE-SPOKANE	X	(3-78)	(3-78)	(3-78)	tbd
GE-MILWAUKE	X	(3-78)	(3-78)	(3-78)	tbd

SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (HOLD-STATUS)

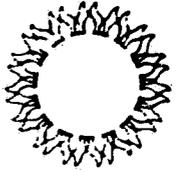


CONTRACT SCOPE

PROVIDE BASELINE SOLAR COOLING PERFORMANCE DATA FOR SINGLE FAMILY RESIDENCES

PRESENT STATUS

- CLIMATIC REGIONS FOR COOLING HAVE BEEN DETERMINED
- COMFORT CRITERIA HAVE BEEN ESTABLISHED
- GENERIC SYSTEM DESCRIPTIONS HAVE BEEN BASELINED
- RESTRUCTURING OF MINI-SHAC TO ACCEPT COOLING MODIFICATIONS HAS BEEN INITIATED
- EXPANDED SITE DEPENDENT CLIMATIC DATA HAS BEEN ASSEMBLED AND PRE-PROCESSED



SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (CONTINUED)

FUTURE ACTIONS

- DOCUMENTATION OF REGIONALIZATION AND GENERIC SYSTEMS
- COMPLETION OF MODIFICATION OF MINI-SHAC
- ADDITION OF EXPANDED CLIMATIC DATA TO MINI-SHAC DATA BASE
- INITIATE DEVELOPMENT OF PARAMETRIC DATA FOR PERFORMANCE CORRELATION

COLLECTOR SELECTION FOR ABSORPTION CYCLE COOLING -
TD NO. 24 (HOLD-STATUS)

CONTRACT SCOPE

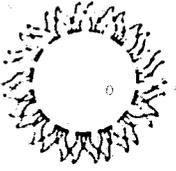
DETERMINE COLLECTOR TYPE FOR ABSORPTION CYCLE APPLICATIONS

PRESENT STATUS

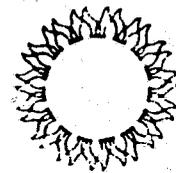
- INPUT GENERATOR CHARACTERISTICS FOR CONCENTRATING,
2 PANE SELECTIVE, 2 PANE NON-SELECTIVE
- UPDATED ECONOMIC ANALYSIS TOOLS TO INCLUDE IMPACT OF OPERATING
COST AND CONVENTIONAL EQUIPMENT PERFORMANCE

FUTURE ACTIONS

- VALIDATE TRANSIENT PERFORMANCE (SIMULATION)
- DETERMINE SYSTEM ECONOMICS



SITE SELECTION ANALYSIS FOR IBM SYSTEMS - TD NO. 31



CONTRACT SCOPE

- PROVIDE SITE SELECTION ANALYSIS FOR INITIAL SITE ASSESSMENT
- PROVIDE RECOMMENDATIONS FOR FINAL SITE SELECTION FOR 13 IBM DESIGNATED SITE LOCATIONS
- PROVIDE ONE TRIP FOR ONE IBM PERSON TO EACH OF THE 13 SITES

PRESENT STATUS

- THREE SITES ADDRESSED - TWO VISITED
 - CARLSBAD, N.M. (VISITED)
 - LARAMIE, WYOMING (VISITED)
 - TOGUS, MAINE

FUTURE ACTIONS

- COMPLETE SITE ASSESSMENT

SITE INSTRUMENTATION AND PERSONALIZATION - TD NO. 46

(THIS TD SUPERSEDES TD NO. 35)

CONTRACT SCOPE

- PERFORM SITE PERSONALIZATION ACTIVITIES FOR THE MSFC DIRECTED OPERATIONAL TEST SITE (OTS) INSTALLATIONS
 - INSTRUMENTATION DEFINITION
 - SDAS PERSONALIZATION
 - PERFORMANCE EQUATION MODIFICATIONS
 - J-BOX PERSONALIZATION
 - CDPS PERSONALIZATION
 - INSTALL AND CHECKOUT

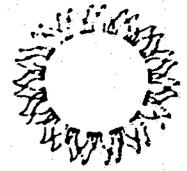
A-11

SITE INSTRUMENTATION AND PERSONALIZATION (CONTINUED)

PRESENT STATUS

- FORTY-FIVE OTS SITES ARE IDENTIFIED
- PERSONALIZATION ACTIVITY INITIATED FOR 22 SITES
- SENSOR SHIPMENTS
 - FIVE SITES COMPLETED DURING JANUARY
 - NO SITES PROJECTED FOR FEBRUARY
- J-BOX SHIPMENTS
 - ONE SHIPMENT DURING JANUARY
 - NO SHIPMENTS PROJECTED FOR FEBRUARY
- SDAS SHIPMENTS
 - FOUR SHIPMENTS DURING JANUARY
 - FOUR SITES PROJECTED FOR FEBRUARY
- SDAS INSTALLATION AND CHECKOUT
 - NONE INSTALLED IN JANUARY
 - SIX PROJECTED FOR FEBRUARY

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CHANGE INTEGRATION MISSION - TD NO. 47

CONTRACT SCOPE

- OPERATE BASELINE AND CHANGE MANAGEMENT SYSTEM ON BOTH PROGRAMMATIC AND TECHNICAL CHANGES FOR THE SOLAR HEATING AND COOLING PROJECT

PRESENT STATUS

- VARIOUS CHANGE INTEGRATION TASKS SUPPORTING THE SOLAR HEATING AND COOLING PROJECT OFFICE WILL BE PERFORMED NOT TO EXCEED 42 MAN-MONTHS IN THE TIME PERIOD OCTOBER 3, 1977 THROUGH MARCH 31, 1978.

SECTION B
MONTHLY STATUS REPORT

March 1978

I. MANAGEMENT

- o A total of 15 technical documents were submitted to MSFC.
- o A total of 21 Program Office Directives were generated within IBM to accomplish SIMS program objectives.

II. INTEGRATION PROGRAM

- o System 1A - Response to Installation Acceptance Review Action Items d, e, and g were submitted to MSFC on February 27, 1978. Revised pages for "Operation and Maintenance Manual SIMS Prototype System 1", IBM Report No. 7933628, were also submitted to MSFC.

The primary pump in the hot water loop failed March 9 and was replaced by the maintenance contractor on March 10. After the pump was removed, it was determined that a bearing had failed.

- o System 1B - Consulted with contractor in control system considerations and instrumentation installation. The IBM site engineer was at Carlsbad to identify and resolve system or instrumentation problems and to assist in installation and checkout of the SDAS. In addition support was supplied to MSFC during the Installation Acceptance Review of March 24.
- o System 2 - Engineer visited the Togus site to remove, calibrate, and reinstall sensors, and to install and activate SDAS. Site was brought to operational status and data collection started on March 5, 1978. Data to date indicates proper function of the system, although three minor instrumentation questions require resolution.
- o System 3 - Test report and FAR data package were both completed and delivered to MSFC on March 17, 1978. Formal Acceptance Review was held on March 31.
- o System 4 - All IBM procured hardware and bulk material was sent to Wyle early in the month. Major assembly tasks have been completed except for installation of insulation, collectors, siding and instrumentation (in process). Siding will not be installed until completion of initial functional tests. Design Data Brochure is 20% complete. An Underwriter Laboratory engineer will inspect the system early in to April to perform their initial system investigation. A study to environmentally protect the SDAS, if installed in the RSA is continuing. MSFC is recommending to DOE the Mississippi Power and Light dormitory building in Clinton, Mississippi as the preferred location for this system.

II. INTEGRATION PROGRAM (Continued):

- o Systems 5 and 6 - The IBM change proposal was approved and the resulting contract change received on 3/31/78.

III. SITE DATA COLLECTION SUBSYSTEM

- o Additional J-Box Procurement - The remaining four J-Boxes were delivered in March, making a total of 37 delivered for the contract. This completes the contractual effort for delivery of the 37 additional units.
- o SDAS/OSM/Spares - The procurement of piece parts and subassemblies for the Mod II SDAS spares contract is in progress. Procurement of Mod I SDAS and OSM spares is continuing, with most effort completed. The effort to procure all Mod I SDAS, Mod II SDAS and OSM Spares is expected to continue for the next three months.
- o Additional Sensor Procurement - Sensor stock continues to enlarge as vendor shipment of temperature wells/probes and wattmeters are delivered for the most commonly used part numbers. All modified sensors (fuelmeters, totalizers and gasmeters) have been completed and shipped to the required sites. In addition a small number of these special sensors have been added to the stock inventory.

IV. CENTRAL DATA PROCESSING SYSTEM

- o Production Processing - Detailed measurement data and plots continue to be supplied for OTS sites. Solar data from all sites, including intrastate and those outside the 48 contiguous states, is being collected via an automatic data collection program and is being processed the same day by the host computer. Data is also being collected from the SDAS Mod II boxes having 96 and 80 channel capabilities. Data from these boxes is being properly processed and plots are being created. Efforts are continuing to develop capabilities for processing seasonal analyses.
- o Data Evaluation - During the month of March CDPS printouts continued to be delivered to MSFC. Data for approximately eleven sites are being distributed. At the end of March two sites were removed and three sites were added to this automatic distribution. These actions are planned steps in the revised Data Evaluation Program.

During the month of March IBM delivered Automatic Data Listings for the following three sites:

- o ELCAM-TEMPE
- o SEMCO-MACON
- o SEMCO-LOXAHATCHEE

During the month of March IBM delivered Monthly System Performance Reports for the following two sites:

- o IBM 1A - Huntsville
- o Decade 80 - Tucson

V. SYSTEM ANALYSIS

- o Analysis - Two Technical Directives remain open in the System Analysis area: (1) TD23 and (2) TD24. Efforts on both tasks have been stopped until the data evaluation issues are resolved. MSFC has concurred in this action.
- o Change Integration - The following routine tasks assigned to the change integration mission were accomplished:
 - Supported RID reviews on IBM FAR System 3, Houston Chemical, Honeywell-Kansas University.
 - Completed converting all reports to manual operation.
 - Continued to work on backlog of materials for dissemination to DOE with priority placed on past Quarterly Reports and Preliminary Design Review packages.

VI. TEST FACILITY OPERATIONS

Solar Simulator

- o Lamps on the Simulator were replaced as necessary and a new surface intensity contour map was prepared. Solar Energy Systems collector incident angle modifier evaluations were repeated to verify results from initial tests.

VI. TEST FACILITY OPERATIONS

Solar Simulator (Continued):

- o Preparations are being made to perform accelerated stagnation tests on several collectors for the State of California. These stagnation tests require that the ambient air temperature adjacent to the collector body be controlled to approximately 100°F. An enclosure has been designed and materials purchased to facilitate control of the ambient air temperature during the test program.

Solar House

- o Solar House thermal performance evaluations have been conducted using recent data and data from 1975. System performance comparisons are being documented to evaluate possible degradation effects over the time interval.

Breadboard Test Facility

- o The second phase of System 3 testing was completed and the data analyzed during the March reporting period. A report was prepared and issued to document System 3 testing results.
- o System 4 (Remote Solar Assembly) has been completely assembled and instrumented for evaluation. The test procedure for System 4 has been developed and issued. Preliminary systems and instrumentation checkout operations have been initiated.
- o Northrup Collector thermal efficiency and thermal response time tests have been completed. Tests are continuing to perform collector longitudinal axis incident angle modifier and the static load tests. Preconditioning exposure tests were completed on the Calmac collector in preparation for efficiency tests on the Solar Simulator. A test report on the Ying Collector thermal efficiency tests was issued.
- o Weathering tests on 14 collectors are continuing on Test Bed No. 4 with data being monitored and collected on a monthly basis. Facilities maintenance and repair activities and the normal instrumentation and calibration functions were also performed during March.

VII. DATA PROGRAM

- o Site Personalization - The Operational Test Sites (OTS) currently number 45. Site personalization effort has progressed to hardware status as outlined in Table 1. Dates are completed (planned) with an "X" noted for completions prior to status month.

VIII. TECHNICAL DIRECTIVES

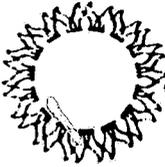
Word charts for the following Technical Directives active during February are attached:

<u>TD</u>	<u>Title</u>
23 (HOLD)	Solar Cooling - Baseline System Performance
24 (HOLD)	Collector Selection for Absorption Cycle
31	Site Selection Analysis for IBM Systems
46	Site Instrumentation and Personalization
47 (CLOSED)	Extension on Change Integration Mission from October 3, 1977 to March 31, 1978
58	Extension on Change Integration Mission from April 1, 1978 through September 30, 1978.

TABLE I
OTS HARDWARE STATUS

<u>SITE</u>	<u>Sensors Ordered</u>	<u>Sensors Shipped</u>	<u>J-Box Shipped</u>	<u>SDAS Shipped</u>	<u>SDAS On-Line</u>
DECADE 80	X	X	X	X	X
SEMCO-GA	X	X	X	X	X
SEMCO-FLA	X	X	X	X	X
ELCAM-TEMPE	X	X	X	X	X
WORMSER-SC	X	X	X	X	MAR
SEECO - EL RENO	X	X	X	X	X
FERN-LANSING	X	X	X	X	X
COLT-YOSIMITE	X	X	MAR	MAR	tbd
IBM-1A	X	X	X	X	X
IBM-2A	X	X	X	X	MAR
IBM-1B	X	X	X	X	(4-78)
COMTEMP-MANCHESTER	X	X	X	X	tbd
HONEYWELL-STILLWATER	X	X	X	X	X
HONEYWELL-NEW CASTLE	X	X	X	X	(5-78)
GE-NORMAL	X	X	X	X	(4-78)
CONTEMP-YORK	X	X	X	X	tbd
FERN-TUNKHANNOCK	X	X	X	X	MAR
SEECO-LINCOLN	X	X	X	X	MAR
ELCAM-SAN DIEGO	X	MAR	MAR	MAR	(5-78)
COLT-PUEBLO	X	X	X	X	X
GE-SPOKANE	X	MAR	MAR	MAR	(5-78)
GE-MILWAUKE	X	MAR	MAR	MAR	tbd

SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (HOLD-STATUS)

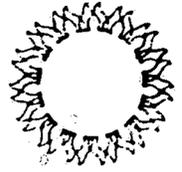


CONTRACT SCOPE

PROVIDE BASELINE SOLAR COOLING PERFORMANCE DATA FOR SINGLE FAMILY RESIDENCES

PRESENT STATUS

- CLIMATIC REGIONS FOR COOLING HAVE BEEN DETERMINED
- COMFORT CRITERIA HAVE BEEN ESTABLISHED
- GENERIC SYSTEM DESCRIPTIONS HAVE BEEN BASELINED
- RESTRUCTURING OF MINI-SHAC TO ACCEPT COOLING MODIFICATIONS HAS BEEN INITIATED
- EXPANDED SITE DEPENDENT CLIMATIC DATA HAS BEEN ASSEMBLED AND PRE-PROCESSED



SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (CONTINUED)

FUTURE ACTIONS

- DOCUMENTATION OF REGIONALIZATION AND GENERIC SYSTEMS
- COMPLETION OF MODIFICATION OF MINI-SHAC
- ADDITION OF EXPANDED CLIMATIC DATA TO MINI-SHAC DATA BASE
- INITIATE DEVELOPMENT OF PARAMETRIC DATA FOR PERFORMANCE CORRELATION

**COLLECTOR SELECTION FOR ABSORPTION CYCLE COOLING -
TD NO. 24 (HOLD-STATUS)**

CONTRACT SCOPE

DETERMINE COLLECTOR TYPE FOR ABSORPTION CYCLE APPLICATIONS

PRESENT STATUS

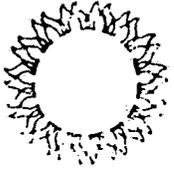
- **INPUT GENERATOR CHARACTERISTICS FOR CONCENTRATING,
2 PANE SELECTIVE, 2 PANE NON-SELECTIVE**
- **UPDATED ECONOMIC ANALYSIS TOOLS TO INCLUDE IMPACT OF OPERATING
COST AND CONVENTIONAL EQUIPMENT PERFORMANCE**

FUTURE ACTIONS

- **VALIDATE TRANSIENT PERFORMANCE (SIMULATION)**
- **DETERMINE SYSTEM ECONOMICS**

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SITE SELECTION ANALYSIS FOR IBM SYSTEMS - TD NO. 31



CONTRACT SCOPE

- PROVIDE SITE SELECTION ANALYSIS FOR INITIAL SITE ASSESSMENT
- PROVIDE RECOMMENDATIONS FOR FINAL SITE SELECTION FOR 13 IBM DESIGNATED SITE LOCATIONS
- PROVIDE ONE TRIP FOR ONE IBM PERSON TO EACH OF THE 13 SITES

PRESENT STATUS

- THREE SITES ADDRESSED - TWO VISITED
 - CARLSBAD, N.M. (VISITED)
 - LARAMIE, WYOMING (VISITED)
 - TOGUS, MAINE

FUTURE ACTIONS

- COMPLETE SITE ASSESSMENT

SITE INSTRUMENTATION AND PERSONALIZATION - TD NO. 46

(THIS TD SUPERSEDES TD NO. 35)

CONTRACT SCOPE

- PERFORM SITE PERSONALIZATION ACTIVITIES FOR THE MSFC DIRECTED OPERATIONAL TEST SITE (OTS) INSTALLATIONS
 - INSTRUMENTATION DEFINITION
 - SDAS PERSONALIZATION
 - PERFORMANCE EQUATION MODIFICATIONS
 - J-BOX PERSONALIZATION
 - CDPS PERSONALIZATION
 - INSTALL AND CHECKOUT

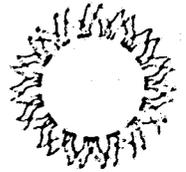
B-12

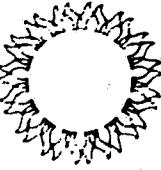
IBM

SITE INSTRUMENTATION AND PERSONALIZATION (CONTINUED)

PRESENT STATUS

- FORTY-FIVE OTS SITES ARE IDENTIFIED
- PERSONALIZATION ACTIVITY INITIATED FOR 22 SITES
- SENSOR SHIPMENTS
 - THREE SITES COMPLETED DURING MARCH
 - NO SITES PROJECTED FOR APRIL
- J-BOX SHIPMENTS
 - FOUR SHIPMENTS DURING MARCH
 - NO SHIPMENTS PROJECTED FOR APRIL
- SDAS SHIPMENTS
 - FOUR SHIPMENTS DURING MARCH
 - NO SITES PROJECTED FOR APRIL
- SDAS INSTALLATION AND CHECKOUT
 - FOUR INSTALLED IN MARCH
 - THREE PROJECTED FOR APRIL





CHANGE INTEGRATION MISSION - TD NO. 47

CONTRACT SCOPE

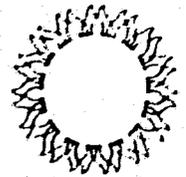
- OPERATE BASELINE AND CHANGE MANAGEMENT SYSTEM ON BOTH PROGRAMMATIC AND TECHNICAL CHANGES FOR THE SOLAR HEATING AND COOLING PROJECT

PRESENT STATUS

- VARIOUS CHANGE INTEGRATION TASKS SUPPORTING THE SOLAR HEATING AND COOLING PROJECT OFFICE WILL BE PERFORMED NOT TO EXCEED 42 MAN-MONTHS IN THE TIME PERIOD OCTOBER 3, 1977 THROUGH MARCH 31, 1978.
- TECHNICAL DIRECTION (NO. 58) EXTENDS EFFORT THRU SEPTEMBER 30, 1978. ALL EFFORTS AGAINST TD NO. 47 HAVE BEEN COMPLETED.

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CHANGE INTEGRATION MISSION - TD NO. 58



CONTRACT SCOPE

- OPERATE BASELINE AND CHANGE MANAGEMENT SYSTEM ON BOTH PROGRAMMATIC AND TECHNICAL CHANGES FOR THE SOLAR HEATING AND COOLING PROJECT

PRESENT STATUS

- VARIOUS CHANGE INTEGRATION TASKS SUPPORTING THE SOLAR HEATING AND COOLING PROJECT OFFICE WILL BE PERFORMED NOT TO EXCEED 4725 MANHOURS IN THE TIME PERIOD APRIL 1, 1978 THROUGH SEPTEMBER 30, 1978.

SECTION C

MONTHLY STATUS REPORT

April 1978

I. MANAGEMENT

- o A total of 12 technical documents were submitted to MSFC.
- o A total of 7 Program Office Directives were generated within IBM to accomplish SIMS program objectives.

II. INTEGRATION PROGRAM

- o System 1A - DHW pump was reversed with subsequent proper system operation. Examined system for proper summer mode operation. Found that bypass damper had not opened. Upon damper repositioning, system appeared to operate properly. During the latter part of April 21, weatherheads were removed from the system and insulated thermowell and duct fittings. Installed clear viewport at one back-pressure damper location to examine blade motion. No visual or audible evidence of blade hitting duct walls was found.
- o System 1B - Installed a replacement SDAS at the site and the contractor completed repair of duct leaks. The telephone company has been contacted to assist in solving the communication problem that still exists.
- o System 2 - Began review of daily site data from Togus. A resistor change at the J-Box changed the silicone loop flowmeter scale factor to avoid high flow data saturation.
- o System 3 - A documentation critique was received from MSFC. An addendum to RID 3-7 was prepared and submitted to supply DHW stratification test results. Stratification data from System 3 testing has been supplied to UAH to aid in their generation of a math model.

The IBM site engineer participated in a site survey trip in Wyoming. Of three sites visited, Glendo Springs was recommended to DOE by MSFC as the preferred location.

A test plan was prepared and delivered to Wyle for additional system testing to optimize collector control sensor mounting and storage tank outlet locations. This test plan is in response to FAR action items. Generation of the formal PIP has been started.

- o System 4 - Insulation, collectors and instrumentation installation was completed early in the month and system checkout began. Site data collection sensors were wired to the installed J-Box. A laboratory thermal test was performed on the SDAS (Mod II) to assess temperature problems caused by SDAS installation in the RSA. Results indicate need for forced air cooling and heater pad heating for reliable SDAS operation. Of the four-part test, the operational functional test phase has been completed and the DHW subsystem test

II. INTEGRATION PROGRAM (Continued):

phase started three days behind test schedule. Design modification of the RSA to allow SDAS installation and environmental control was started. The Design Data Brochure is 35 percent complete.

III. SITE DATA COLLECTION SUBSYSTEM

- o SDAS/OSM/Spares - The procurement of piece parts and subassemblies is continuing. This effort is expected to continue for at least the next three months, with delivery completion dependent upon the delivery of piece parts from vendors.

IV. CENTRAL DATA PROCESSING SYSTEM

- o Production Processing - Programs for creating detailed measurements and plots have been upgraded for more efficient operation. Detailed measurement data and plots continue to be supplied for OTS sites. Solar data from all sites, including intrastate and those outside the 48 contiguous states, is being collected via an automatic data collection program and is being processed the same day by the host computer. Data is also being collected from the SDAS Mod II boxes having 96 and 80 channel capabilities. Data from these boxes is being processed and plots are being created. Efforts are continuing to develop capabilities for processing seasonal analyses.
- o Data Evaluation - During the month of April CDPS printouts continued to be delivered to MSFC. Data for approximately eleven sites are being distributed.

During the month of April IBM delivered Automatic Data Listings for the following three sites:

- ELCAM-TEMPE
- SEMCO-MACON
- SEMCO-LOXAHATCHEE

During the month of April IBM delivered Monthly System Performance Reports for the following two sites:

- IBM 1A - Huntsville
- Decade 80 - Tucson

V. SYSTEM ANALYSIS:

- o Analysis - Two Technical Directives remain open in the System Analysis area: (1) TD23 and (2) TD24. Efforts on both tasks have been stopped until the data evaluation issues are resolved. MSFC has concurred in this action.
- o Change Integration - The following routine tasks assigned to the change integration were accomplished:
 - Submitted a Technical Contract Modification to MSFC on Airesearch
 - Completed 407 and 408 Collector Specification Update
 - Completed effort for adding updated performance specifications into contract records
 - Prepared the Solar Heating and Cooling Wiring Guide
 - Updated "S & E Review of Contractual and Data Items" on Solar Heating and Cooling
 - Total manpower has been reduced to four people and change integration mission tasks reassigned to present personnel.

VI. TEST FACILITY OPERATIONS

Solar Simulator

- o Stagnation tests were performed on three collectors for California. An enclosure was made to allow thermal control. Tests were run for Phase A and B and a report issued.
- o Solar Energy Systems collector has been tested and a report is forthcoming.

Breadboard Test Facility

- o System 3 has been modified to change the location of the collector inlet pipe and several sensors. Retest to evaluate this change is in process.
- o System 4 Pretests have been completed as have most of the evaluation tests. Inclement weather has delayed completion of these tests.
- o Northrup Collector efficiency tests are complete and a report will be generated this reporting period.

Breadboard Test Facility (Continued):

- o Weathering Tests continue on 16 collectors on Test Bed No. 4.
- o Normal Facilities Maintenance and Calibration functions continued during April.

VII. DATA PROGRAM

- o Site Personalization - The Operational Test Sites (OTS) currently number 45. Site personalization effort has progressed to hardware status as outlined in Table 1. Dates are completed (planned) with an "X" noted for completions prior to status month.

VIII. TECHNICAL DIRECTIVES

Word charts for the following Technical Directives active during February are attached:

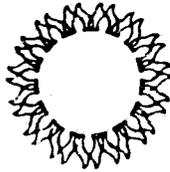
<u>ID</u>	<u>Title</u>
23 (HOLD)	Solar Cooling - Baseline System Performance
24 (HOLD)	Collector Selection for Absorption Cycle
31	Site Selection Analysis for IBM Systems
46	Site Instrumentation and Personalization
58	Extension on Change Integration Mission from April 1, 1978 through September 30, 1978.

TABLE I

OTS HARDWARE STATUSAPPROVED INSTRUMENTATION PLAN

<u>SITE</u>	<u>Sensors Ordered</u>	<u>Sensors Shipped</u>	<u>J-Box Shipped</u>	<u>SDAS Shipped</u>	<u>SDAS On-Line</u>
DECADE 80	X	X	X	X	X
SEMCO-GA	X	X	X	X	X
SEMCO-FLA	X	X	X	X	X
ELCAM-TEMPE	X	X	X	X	X
WORMSER-SC	X	X	X	X	X
SEECO - EL RENO	X	X	X	X	X
FERN-LANSING	X	X	X	X	X
COLT-YOSIMITE	X	X	X	X	(6-78)
IBM-1A	X	X	X	X	X
IBM-2A	X	X	X	X	X
IBM-1B	X	X	X	X	APR
COMTEMP-MANCHESTER	X	X	X	X	tbd
HONEYWELL-STILLWATER	X	X	X	X	X
HONEYWELL-NEW CASTLE	X	X	X	X	(6-78)
GE-NORMAL	X	X	X	X	APR
CONTEMP-YORK	X	X	X	X	tbd
FERN-TUNKHANNOCK	X	X	X	X	X
SEECO-LINCOLN	X	X	X	X	X
ELCAM-SAN DIEGO	X	X	X	X	(5-78)
COLT-PUEBLO	X	X	X	X	X
GE-SPOKANE	X	X	X	X	(6-78)
GE-MILWAUKE	X	X	X	X	tbd
AIRESEARCH-HOUSTON	X	(6-78)	(5-78)	(5-78)	tbd

SITE SELECTION ANALYSIS FOR IBM SYSTEMS - TD NO. 31



CONTRACT SCOPE

- PROVIDE SITE SELECTION ANALYSIS FOR INITIAL SITE ASSESSMENT
- PROVIDE RECOMMENDATIONS FOR FINAL SITE SELECTION FOR 13 IBM DESIGNATED SITE LOCATIONS
- PROVIDE ONE TRIP FOR ONE IBM PERSON TO EACH OF THE 13 SITES

PRESENT STATUS

- THREE SITES ADDRESSED - TWO VISITED
 - CARLSBAD, N.M. (VISITED)
 - LARAMIE, WYOMING (VISITED)
 - TOGUS, MAINE

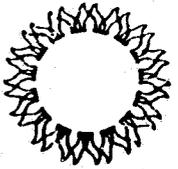
FUTURE ACTIONS

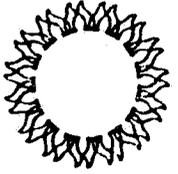
- COMPLETE SITE ASSESSMENT

SITE INSTRUMENTATION AND PERSONALIZATION (CONTINUED)

PRESENT STATUS

- FORTY-FIVE OTS SITES ARE IDENTIFIED
- PERSONALIZATION ACTIVITY INITIATED FOR 23 SITES
- SENSOR SHIPMENTS
 - NO SITES COMPLETED DURING APRIL
 - NO SITES PROJECTED FOR MAY
- J-BOX SHIPMENTS
 - NO SHIPMENTS DURING APRIL
 - ONE SHIPMENT PROJECTED FOR MAY
- SDAS SHIPMENTS
 - NO SHIPMENTS DURING APRIL
 - ONE SITE PROJECTED FOR MAY
- SDAS INSTALLATION AND CHECKOUT
 - TWO INSTALLED IN APRIL
 - ONE PROJECTED FOR MAY





SITE INSTRUMENTATION AND PERSONALIZATION - TD NO. 46

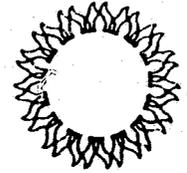
(THIS TD SUPERSEDES TD NO. 35)

CONTRACT SCOPE

- PERFORM SITE PERSONALIZATION ACTIVITIES FOR THE MSFC DIRECTED OPERATIONAL TEST SITE (OTS) INSTALLATIONS
 - INSTRUMENTATION DEFINITION
 - SDAS PERSONALIZATION
 - PERFORMANCE EQUATION MODIFICATIONS
 - J-BOX PERSONALIZATION
 - CDPS PERSONALIZATION
 - INSTALL AND CHECKOUT

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CHANGE INTEGRATION MISSION - TD NO. 58



CONTRACT SCOPE

- OPERATE BASELINE AND CHANGE MANAGEMENT SYSTEM ON BOTH PROGRAMMATIC AND TECHNICAL CHANGES FOR THE SOLAR HEATING AND COOLING PROJECT

PRESENT STATUS

- VARIOUS CHANGE INTEGRATION TASKS SUPPORTING THE SOLAR HEATING AND COOLING PROJECT OFFICE WILL BE PERFORMED NOT TO EXCEED 4725 MANHOURS IN THE TIME PERIOD APRIL 1, 1978 THROUGH SEPTEMBER 30, 1978.

SECTION D
MONTHLY STATUS REPORT

May 1978

I. MANAGEMENT

- o A total of 17 technical documents were submitted to MSFC.
- o A total of 16 Program Office Directives were generated within IBM to accomplish SIMS program objectives.

II. INTEGRATION PROGRAM

- o System 1A - Completed the study of heat pump leakage to rock storage with the conclusion that a damper will be added to the system. Two neoprene replacement back-pressure dampers are scheduled for delivery by the end of June and will be installed by August 1978.

Submitted to MSFC on May 2 the response to Action Item C (predicted versus actual system performance) from the Installation Acceptance Review. The only remaining Action Item is completion of UL investigation.

- o System 1B - An electrical problem causing DHW pump malfunction was corrected by the contractor. A failed telephone coupler (evidently damaged by a lightning strike) was replaced thus correcting a data communication problem. The site visit of May 22-24 to finalize installation acceptance activities resulted in the following actions:

- Found bad air handler controller; ordered a replacement unit.
- Removed weatherheads and insulated probes.
- Mapped air flow in ducts, although more effort is required.
- Measured ducts for back-pressure damper size; however, results disagree with National Park Service.

The next site visit is scheduled for June 19.

II. INTEGRATION PROGRAM (Continued):

- o System 2 - Review of daily site indicates that the fix to the silicone flow meter and the related software scale factor change are satisfactory. Data collection continued during the month.

A SDAS intermittent tape problem occurred on May 26 and Wyle personnel accomplished the repair which was a tape head electrical failure.

The Installation Acceptance Review is scheduled for June 15.

- o System 3 - All special testing (control sensor location and storage outlet location studies) was completed with results used to change locations of the collector control sensor and the tank outlet port. Revised versions of the Performance Specification, Performance Test Report, Design Data Brochure, System Description Drawing, IPC Certification and Sunworks Collector Hardware Report were completed and delivered to MSFC on May 31. A letter containing responses to all FAR Action Items was also submitted. The Installation Design Review is scheduled for June 29.
- o System 4 - A special test to evaluate an alternate control scheme utilizing differential controls in lieu of the original absolute control was implemented and tested. These differential controllers are being incorporated into the design in place of the absolute units. The turbine ventilator was installed on the RSA roof. Installation of the west siding and SDAS has been postponed until the pebble bed storage is emptied. The Design Data Brochure is completed and final changes/corrections are being made.

An Underwriters Laboratory representative visited the IBM facility to review the system design and to inspect the hardware located at the MSFC test facility. Initial indications are that no UL concerns exist except for auxiliary heating equipment located in series with the solar system.

The Mississippi Power and Light Training Center site in Clinton, Mississippi has been approved by DOE.

IBM has requested a change date of delivery and FAR meeting from June 16 to June 23 to allow for additional reviews. The Installation Design Review will be held in July.

III. SITE DATA COLLECTION SUBSYSTEM

- o SDAS/OSM Spares - The subassembly build cycle is continuing at the vendor. Most Mod I SDAS and OSM spares subassemblies have been completed and work is in progress on the Mod II SDAS Spares. The effort is expected to continue for the next two months, with delivery completion dependent upon the delivery of piece parts from the vendor. Spares inventory has maintained all field replacement efforts.

IV. CENTRAL DATA PROCESSING SYSTEM

- o Production Processing - Detailed measurement data and plots continue to be supplied for OTS sites during May. Solar data from all sites, including intrastate and those outside the 48 contiguous states, is collected via an automatic data collection program and is processed by the host computer. Currently data is being collected from 16 OTS systems.
- o Data Evaluation - During the month of May CDPS printouts continued to be delivered to MSFC. Data for approximately twelve sites are being distributed.

During the month of May IBM delivered Automatic Data Listings for the following site:

- IBM-1A Huntsville

During the month of May IBM delivered Monthly System Performance Reports for the following four sites:

- Elcam-Tempe
- Decade 80 - Tucson
- Semco - Loxahatchee
- Semco-Macon

V. SYSTEM ANALYSIS

- o Analysis - Two Technical Directives remain open in the System Analysis Area: (1) TD23 and (2) TD 24. Efforts on both tasks have been stopped until the data evaluation issues are resolved. MSFC has concurred in this action.

V. SYSTEM ANALYSIS (Continued):

- o Change Integration - In addition to the normal routine mission tasks, the following special activities were performed:
 - Prepared document "Published Solar Heating and Cooling Documentation" which contains a listing with abstracts of all solar heating and documentation that has been published.
 - Prepared a technical contract modification for IBM effort.
 - Assisted in preparing and publishing of two Solar Energy Documents.
 - Incorporated additional data in the Operational Test Site Status Report.
 - Assisted in preparing a Verification/Certification Report for Calmac.

VI. TEST FACILITY OPERATIONS

Solar Simulator

- o GE collector is in process of testing on the simulator.
- o Calmac collector tests, interrupted during the California Collector stagnation tests, were resumed and completed.

Breadboard Test Facility

- o System 3 retest complete after modification to change the location of the collector inlet pipe and several sensors.
- o System 4 has completed all phases of test. Retest, utilizing a differential controller has been completed. Test report has been generated and integrated into IBM's Test Report.
- o Solargenics Collector Test setup complete and tests are started.
- o Weathering tests continue for 18 collectors on Test Bed No. 4.

Breadboard Test Facility (Continued):

- o Evaluation tests were performed on two Yazaki absorption cooling units and cooling tower.
- o Normal Facilities Maintenance and Calibration functions continued during May.

VII. DATA PROGRAM

- o Site Personalization - The Operational Test Sites (OTS) currently number 45. Site personalization effort has progressed to hardware status as outlined in Table 1. Dates are completed (planned) with an "X" noted for completions prior to status month.

VIII. TECHNICAL DIRECTIVES

Word charts for the following Technical Directives active during May are attached:

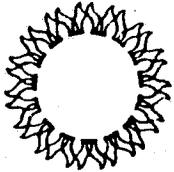
<u>TD</u>	<u>Title</u>
23 (HOLD)	Solar Cooling - Baseline System Performance
24 (HOLD)	Collector Selection for Absorption Cycle
31	Site Selection Analysis for IBM Systems
46	Site Instrumentation and Personalization
58	Extension on Change Integration Mission from April 1, 1978 through September 30, 1978

TABLE I

OTS HARDWARE STATUS
APPROVED INSTRUMENTATION PLAN

<u>SITE</u>	<u>Sensors Ordered</u>	<u>Sensors Shipped</u>	<u>J-Box Shipped</u>	<u>SDAS Shipped</u>	<u>SDAS On-Line</u>
DECADE 80	X	X	X	X	X
SEMCO-GA	X	X	X	X	X
SEMCO-FLA	X	X	X	X	X
ELCAM-TEMPE	X	X	X	X	X
WORMSER-SC	X	X	X	X	X
SEECO - EL RENO	X	X	X	X	X
FERN-LANSING	X	X	X	X	X
COLT-YOSIMITE	X	X	X	X	(7-78)
IBM-1A	X	X	X	X	X
IBM-2A	X	X	X	X	X
IBM-1B	X	X	X	X	X
COMPTMP-MANCHESTER	X	X	X	X	tbd
HONEYWELL-STILLWATER	X	X	X	X	X
HONEYWELL-NEW CASTLE	X	X	X	X	(6-78)
GE-NORMAL	X	X	X	X	X
CONTEMP-YORK	X	X	X	X	tbd
FERN-TUNKHANNOCK	X	X	X	X	X
SEECO-LINCOLN	X	X	X	X	X
ELCAM-SAN DIEGO	X	X	X	X	May
COLT-PUEBLO	X	X	X	X	X
GE-SPOKANE	X	X	X	X	(6-78)
GE-MILWAUKE	X	X	X	X	tbd
AIRESEARCH-HOUSTON	X	(6-78)	May	May	(10-78)
AIRESEARCH-LAWRENCEBURG	X	(6-78)	(6-78)	(6-78)	(8-78)
AIRESEARCH-ALLAIRE	X	(6-78)	(6-78)	(6-78)	(8-78)

SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (HOLD-STATUS)

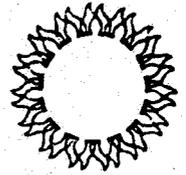


CONTRACT SCOPE

PROVIDE BASELINE SOLAR COOLING PERFORMANCE DATA FOR SINGLE FAMILY RESIDENCES

PRESENT STATUS

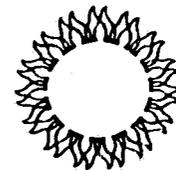
- CLIMATIC REGIONS FOR COOLING HAVE BEEN DETERMINED
- COMFORT CRITERIA HAVE BEEN ESTABLISHED
- GENERIC SYSTEM DESCRIPTIONS HAVE BEEN BASELINED
- RESTRUCTURING OF MINI-SHAC TO ACCEPT COOLING MODIFICATIONS HAS BEEN INITIATED
- EXPANDED SITE DEPENDENT CLIMATIC DATA HAS BEEN ASSEMBLED AND PRE-PROCESSED



SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (CONTINUED)

FUTURE ACTIONS

- DOCUMENTATION OF REGIONALIZATION AND GENERIC SYSTEMS
- COMPLETION OF MODIFICATION OF MINI-SHAC
- ADDITION OF EXPANDED CLIMATIC DATA TO MINI-SHAC DATA BASE
- INITIATE DEVELOPMENT OF PARAMETRIC DATA FOR PERFORMANCE CORRELATION



COLLECTOR SELECTION FOR ABSORPTION CYCLE COOLING - TD NO. 24 (HOLD-STATUS)

CONTRACT SCOPE

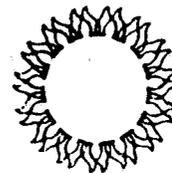
DETERMINE COLLECTOR TYPE FOR ABSORPTION CYCLE APPLICATIONS

PRESENT STATUS

- INPUT GENERATOR CHARACTERISTICS FOR CONCENTRATING,
2 PANE SELECTIVE, 2 PANE NON-SELECTIVE
- UPDATED ECONOMIC ANALYSIS TOOLS TO INCLUDE IMPACT OF OPERATING
COST AND CONVENTIONAL EQUIPMENT PERFORMANCE

FUTURE ACTIONS

- VALIDATE TRANSIENT PERFORMANCE (SIMULATION)
- DETERMINE SYSTEM ECONOMICS



SITE SELECTION ANALYSIS FOR IBM SYSTEMS - TD NO. 31

CONTRACT SCOPE

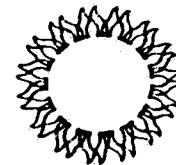
- PROVIDE SITE SELECTION ANALYSIS FOR INITIAL SITE ASSESSMENT
- PROVIDE RECOMMENDATIONS FOR FINAL SITE SELECTION FOR 13 IBM DESIGNATED SITE LOCATIONS
- PROVIDE ONE TRIP FOR ONE IBM PERSON TO EACH OF THE 13 SITES

PRESENT STATUS

- THREE SITES ADDRESSED - TWO VISITED
 - CARLSBAD, N.M. (VISITED)
 - LARAMIE, WYOMING (VISITED)
 - TOGUS, MAINE

FUTURE ACTIONS

- COMPLETE SITE ASSESSMENT



SITE INSTRUMENTATION AND PERSONALIZATION - TD NO. 46

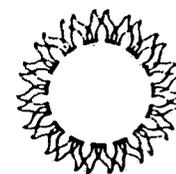
(THIS TD SUPERSEDES TD NO. 35)

CONTRACT SCOPE

- PERFORM SITE PERSONALIZATION ACTIVITIES FOR THE MSFC DIRECTED OPERATIONAL TEST SITE (OTS) INSTALLATIONS
 - INSTRUMENTATION DEFINITION
 - SDAS PERSONALIZATION
 - PERFORMANCE EQUATION MODIFICATIONS
 - J-BOX PERSONALIZATION
 - CDPS PERSONALIZATION
 - INSTALL AND CHECKOUT

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IBM

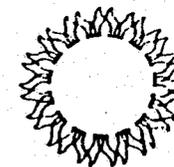


SITE INSTRUMENTATION AND PERSONALIZATION (CONTINUED)

PRESENT STATUS

- FORTY-FIVE OTS SITES ARE IDENTIFIED
- PERSONALIZATION ACTIVITY INITIATED FOR 23 SITES
- SENSOR SHIPMENTS
 - NO SITES COMPLETED DURING MAY
 - THREE SITES PROJECTED FOR JUNE
- J-BOX SHIPMENTS
 - ONE SHIPMENT DURING MAY
 - TWO SHIPMENTS PROJECTED FOR JUNE
- SDAS SHIPMENTS
 - ONE SHIPMENT DURING MAY
 - TWO SITES PROJECTED FOR JUNE
- SDAS INSTALLATION AND CHECKOUT
 - ONE INSTALLED IN MAY
 - TWO PROJECTED FOR JUNE

CHANGE INTEGRATION MISSION - TD NO. 58



CONTRACT SCOPE

- OPERATE BASELINE AND CHANGE MANAGEMENT SYSTEM ON BOTH PROGRAMMATIC AND TECHNICAL CHANGES FOR THE SOLAR HEATING AND COOLING PROJECT

PRESENT STATUS

- VARIOUS CHANGE INTEGRATION TASKS SUPPORTING THE SOLAR HEATING AND COOLING PROJECT OFFICE WILL BE PERFORMED NOT TO EXCEED 4725 MANHOURS IN THE TIME PERIOD APRIL 1, 1978 THROUGH SEPTEMBER 30, 1978.

SECTION E

MONTHLY STATUS REPORT

June 1978

I. MANAGEMENT

- o A total of 15 technical documents were submitted to MSFC.
- o A total of nine Program Office Directives were generated within IBM to accomplish SIMS program objectives.

II. INTEGRATION PROGRAM

- o System 1A - The Automated Data Listing for May was submitted. An additional site tenant was asked to run water to increase DHW usage. The two neoprene replacement back-pressure dampers were received on June 30 and installation will be completed by August 1978.

Completed assessment of the UL proposal plan and presented the results to MSFC.

- o System 1B - Installed new controller and supported the Installation Acceptance Review (IAR) during site visit on June 19, 1978. Investigation of the apparently electrically overloaded controller resulted in returning the controller to the vendor for repair.
- o System 2 - Supported IAR at Togus, Maine on June 15, 1978, at which time MSFC accepted the system installation. Added a sun shield to the city supply temperature probe. The system continued to operate properly during June. The Monthly Performance Report was submitted for May.
- o System 3 - Submitted the revised Verification Plan to MSFC on June 8, completing all IBM FAR Action Items. Supported the Preliminary IAR at Cheyenne, Wyoming on June 29, 1978.
- o System 4 - Submitted FAR/Acceptance Data Package to MSFC on June 12 and MSFC accepted the system at the FAR/Acceptance meeting on June 23, 1978. Resulting documentation Action Items and RID's are being addressed. MSFC transportation people have reviewed transportability requirements without problem identification.

Also submitted on June 12 were the Test Report and the Design Data Brochure.

III. SITE DATA COLLECTION SUBSYSTEM

- o SDAS/OSM Spares - The subassembly build is continuing at the vendor. Approximately 80-85 percent of the subassembly work is completed. The majority of the remainder of the work should be completed in July. The delivery of piece parts will dictate the final delivery of all subassemblies.

All effort is projected to be completed by the end of August.

IV. CENTRAL DATA PROCESSING SYSTEM

- o Production Processing - Detailed measurement data and plots continue to be supplied for OTS sites during June. Solar data from all sites, including intrastate and those outside the 48 contiguous states, is collected via an automatic data collection program and is processed by the host computer. Currently data is being collected from 16 OTS systems.
- o Data Evaluation - During the month of June CDPS printouts continued to be delivered to MSFC. Data for approximately fourteen sites are being distributed.

During the month of June IBM delivered Automatic Data Listings for the following June sites:

- IBM-1A Huntsville
- Wormser
- Fern-Tunkhannock

During the month of June IBM delivered Monthly System Performance Reports for the following four sites:

- Elcam-Tempe
- IBM-Togus
- Semoc-Loxahatchee
- Semco-Macon

V. SYSTEM ANALYSIS

- o Analysis - Two Technical Directives remain open in the System Analysis Area: (1) TD23 and (2) TD24. Efforts in both tasks have been stopped until the data evaluation issues are resolved. MSFC has concurred in this action.
- o Change Integration - In addition to the normal routine mission tasks, the following special activities were performed:
 - Prepared a technical contract modification on the General Electric Contract.
 - Assisted in the publication of SHC-3096, Operational Test Site Performance Data User's Guide
 - Assisted in the publication of SHC-3097, Instrumentation Installation Guidelines
 - Assisted in the preparation and publication of a Solar Collector testing document, SHC-3098.

VI. TEST FACILITY OPERATIONS

Solar Simulator

- o Thermal performance and stagnation tests were initiated on the General Electric evacuated tube solar collector. The stagnation tests require evaluation with two separate cover materials which will be provided by the manufacturer in early July.
- A proposal for modifying the Solar House was submitted to MSFC.

Breadboard Test Facility

- o System 3 - Temperature probes are being installed in the storage tank to preclude this being a field task.
- o System 4 - A pyrometer bracket has been installed on the RSA. A test report addendum, discussing results of differential control scheme, is being finalized.
- o Solargenics Collector - Outside thermal efficiency tests were completed
- o LOF Collector - Static load tests were performed and results are recorded in the LOF test report addendum.

Breadboard Test Facility (Continued):

- o Northrup Collector - The report on the outdoor thermal performance tests has been prepared and distributed.
- o Weathering tests on 18 collector units continue on Test Bed No. 4 with data being monitored and recorded on a monthly basis.
- o Normal Facilities Maintenance, repair activities and normal instrumentation functions continued during June.

VII. DATA PROGRAM

- o Site Personalization - The Operational Test Sites (OTS) currently number 45. Site personalization effort has progressed to hardware status as outlined in Table 1. Dates are completed (planned) with an "X" noted for completions prior to status month.

VIII. TECHNICAL DIRECTIVES

Word charts for the following Technical Directives active during June are attached:

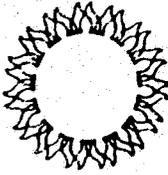
<u>TD</u>	<u>Title</u>
23 (HOLD)	Solar Cooling - Baseline System Performance
24 (HOLD)	Collector Selection for Absorption Cycle
31	Site Selection Analysis for IBM Systems
46	Site Instrumentation and Personalization
58	Extension on Change Integration Mission from April 1, 1978 through September 30, 1978

TABLE I

OTS HARDWARE STATUSAPPROVED INSTRUMENTATION PLAN

<u>SITE</u>	<u>Sensors Ordered</u>	<u>Sensors Shipped</u>	<u>J-Box Shipped</u>	<u>SDAS Shipped</u>	<u>SDAS On-Line</u>
DECADE 80	X	X	X	X	X
SEMCO-GA	X	X	X	X	X
SEMCO-FLA	X	X	X	X	X
ELCAM-TEMPE	X	X	X	X	X
WORMSER-SC	X	X	X	X	X
SEECO - EL RENO	X	X	X	X	X
FERN-LANSING	X	X	X	X	X
COLT-YOSIMITE	X	X	X	X	(8-78)
IBM-1A	X	X	X	X	X
IBM-2A	X	X	X	X	X
IBM-1B	X	X	X	X	X
COMPTEMP-MANCHESTER	X	X	X	X	(7-78)
HONEYWELL-STILLWATER	X	X	X	X	X
HONEYWELL-NEW CASTLE	X	X	X	X	(8-78)
GE-NORMAL	X	X	X	X	X
CONTEMP-YORK	X	X	X	X	tbd
FERN-TUNKHANNOCK	X	X	X	X	X
SEECO-LINCOLN	X	X	X	X	X
ELCAM-SAN DIEGO	X	X	X	X	X
COLT-PUEBLO	X	X	X	X	X
GE-SPOKANE	X	X	X	X	June
GE-MILWAUKE	X	X	X	X	tbd
AIRESEARCH-HOUSTON	X	June	X	X	(10-78)
AIRESEARCH-LAWRENCEBURG	X	(7-78)	(7-78)	(7-78)	(10-78)
AIRESEARCH-ALLAIRE	X	(7-78)	(7-78)	(7-78)	(10-78)

SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (HOLD-STATUS)

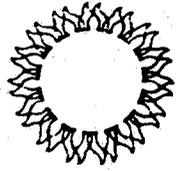


CONTRACT SCOPE

PROVIDE BASELINE SOLAR COOLING PERFORMANCE DATA FOR SINGLE FAMILY RESIDENCES

PRESENT STATUS

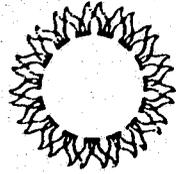
- CLIMATIC REGIONS FOR COOLING HAVE BEEN DETERMINED
- COMFORT CRITERIA HAVE BEEN ESTABLISHED
- GENERIC SYSTEM DESCRIPTIONS HAVE BEEN BASELINED
- RESTRUCTURING OF MINI-SHAC TO ACCEPT COOLING MODIFICATIONS HAS BEEN INITIATED
- EXPANDED SITE DEPENDENT CLIMATIC DATA HAS BEEN ASSEMBLED AND PRE-PROCESSED



SOLAR COOLING - BASELINE SYSTEM PERFORMANCE - TD NO. 23 (CONTINUED)

FUTURE ACTIONS

- DOCUMENTATION OF REGIONALIZATION AND GENERIC SYSTEMS
- COMPLETION OF MODIFICATION OF MINI-SHAC
- ADDITION OF EXPANDED CLIMATIC DATA TO MINI-SHAC DATA BASE
- INITIATE DEVELOPMENT OF PARAMETRIC DATA FOR PERFORMANCE CORRELATION



COLLECTOR SELECTION FOR ABSORPTION CYCLE COOLING - TD NO. 24 (HOLD-STATUS)

CONTRACT SCOPE

DETERMINE COLLECTOR TYPE FOR ABSORPTION CYCLE APPLICATIONS

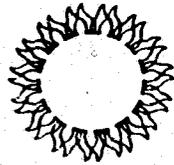
PRESENT STATUS

- INPUT GENERATOR CHARACTERISTICS FOR CONCENTRATING,
2 PANE SELECTIVE, 2 PANE NON-SELECTIVE
- UPDATED ECONOMIC ANALYSIS TOOLS TO INCLUDE IMPACT OF OPERATING
COST AND CONVENTIONAL EQUIPMENT PERFORMANCE

FUTURE ACTIONS

- VALIDATE TRANSIENT PERFORMANCE (SIMULATION)
- DETERMINE SYSTEM ECONOMICS

SITE SELECTION ANALYSIS FOR IBM SYSTEMS - TD NO. 31



CONTRACT SCOPE

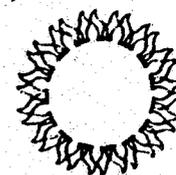
- PROVIDE SITE SELECTION ANALYSIS FOR INITIAL SITE ASSESSMENT
- PROVIDE RECOMMENDATIONS FOR FINAL SITE SELECTION FOR 13 IBM DESIGNATED SITE LOCATIONS
- PROVIDE ONE TRIP FOR ONE IBM PERSON TO EACH OF THE 13 SITES

PRESENT STATUS

- THREE SITES ADDRESSED - TWO VISITED
 - CARLSBAD, N.M. (VISITED)
 - LARAMIE, WYOMING (VISITED)
 - TOGUS, MAINE

FUTURE ACTIONS

- COMPLETE SITE ASSESSMENT



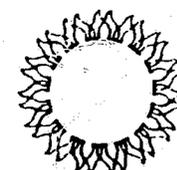
SITE INSTRUMENTATION AND PERSONALIZATION - TD NO. 46

(THIS TD SUPERSEDES TD NO. 35)

CONTRACT SCOPE

- PERFORM SITE PERSONALIZATION ACTIVITIES FOR THE MSFC DIRECTED OPERATIONAL TEST SITE (OTS) INSTALLATIONS
 - INSTRUMENTATION DEFINITION
 - SDAS PERSONALIZATION
 - PERFORMANCE EQUATION MODIFICATIONS
 - J-BOX PERSONALIZATION
 - CDPS PERSONALIZATION
 - INSTALL AND CHECKOUT

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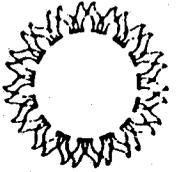
SITE INSTRUMENTATION AND PERSONALIZATION (CONTINUED)

PRESENT STATUS

- FORTY-FIVE OTS SITES ARE IDENTIFIED
- PERSONALIZATION ACTIVITY INITIATED FOR 25 SITES
- SENSOR SHIPMENTS
 - ONE SITE COMPLETED DURING JUNE
 - TWO SITES PROJECTED FOR JULY
- J-BOX SHIPMENTS
 - NO SHIPMENTS DURING JUNE
 - TWO SHIPMENTS PROJECTED FOR JULY
- SDAS SHIPMENTS
 - NO SHIPMENT DURING JUNE
 - TWO SITES PROJECTED FOR JULY
- SDAS INSTALLATION AND CHECKOUT
 - ONE INSTALLED IN JUNE
 - ONE PROJECTED FOR JULY



CHANGE INTEGRATION MISSION - TD NO. 58



CONTRACT SCOPE

- OPERATE BASELINE AND CHANGE MANAGEMENT SYSTEM ON BOTH PROGRAMMATIC AND TECHNICAL CHANGES FOR THE SOLAR HEATING AND COOLING PROJECT

PRESENT STATUS

- VARIOUS CHANGE INTEGRATION TASKS SUPPORTING THE SOLAR HEATING AND COOLING PROJECT OFFICE WILL BE PERFORMED NOT TO EXCEED 4725 MANHOURS IN THE TIME PERIOD APRIL 1, 1978 THROUGH SEPTEMBER 30, 1978.

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