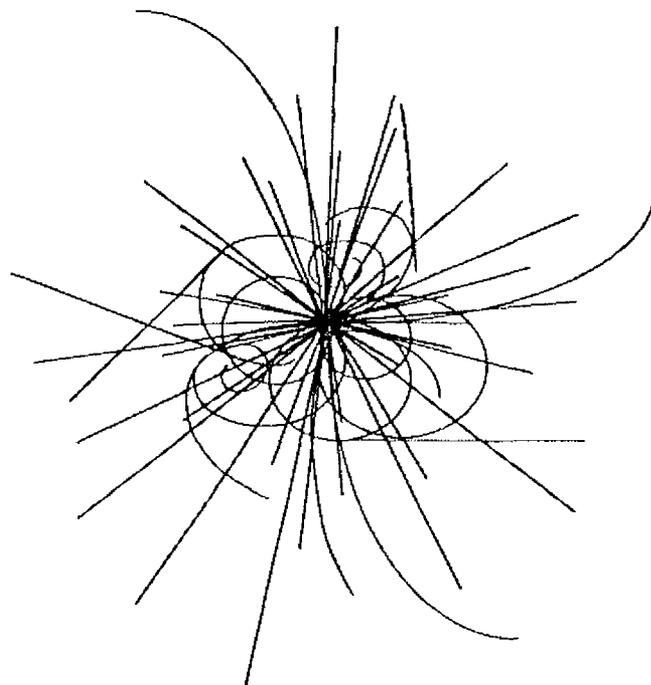


SSC PROJECT
MONTHLY PROGRESS
REPORT
JULY 1990



SSC



LABORATORY

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Executive Summary

Thirteen Expressions of Interest in research at the SSC were reviewed in detail by the Program Advisory Committee (PAC) at a meeting in Snowmass, Colorado on July 14-20. The PAC recommended that the initial SSC program have two large detectors aimed at high transverse momentum physics and suggested that the Laboratory issue a general call for Letters of Intent (LOIs) to propose such major detectors. At the next meeting of the PAC on December 13-15, 1990, these LOIs will form the basis for the allocation of funds for preparation of complete technical proposals.

The Collider Dipole Magnet Request for Proposal (RFP) was released to 21 industrial contractors on July 25. The due date for contractor proposals is September 10. The Magnet Evaluation Lab construction was completed on July 27 and equipment is being set up in the lab. A&E work began with PB/MK on the Magnet Development Lab.

Planning and programming were underway for many conventional facilities, including campus administrative and support buildings, the Accelerator Systems String Test (ASST, above ground, to be built in combination with the Magnet Test Lab), the Prototype Installation Facility (PIF, underground) structures, the LINAC and the LEB. Geotechnical exploration for the Collider was concluded in July with drilling along the PIF segment. On July 9, James Sanford was named interim leader of the Conventional Construction Division, replacing Robert Matyas.

The final draft SEIS was delivered to DOE on July 17 for approval and release to the public.

Two key procurement management posts were filled: Dick Russell (formerly at Sandia) is Director of Procurement, and Charles Dan (formerly at DOE) is Manager of Contract Policy and Analysis.

The 500 MIP computing resource RFP was released on July 20.

Thirty new employees joined the lab in July, bringing the staff population to 732. Recruiting efforts focused primarily on engineers and high energy physicists. For all openings, 1,371 resumes were received in July, and there were 374 open positions on July 31.



Ted Kozman
Project Manager (Acting)
SSC Laboratory

Technical Systems WBS 1.0

Accelerator Systems 1.1

(SEE SECTION 4.0 - R&D, PRE-OPERATIONS, AND ADMINISTRATION AND SUPPORT)

Magnet Systems 1.2

Management and Support 1.2.1

Support was provided in the preparation for formal design reviews of the FNAL short magnet development program and planning for the 50mm long magnet documentation development.

The Collider Dipole Magnet (CDM) Request for Proposal (RFP) was released to 21 industrial contractors on July 25. The due date for contractor proposals is September 10. Additional questions were received from industry relative to the draft RFP for the CDM development acquisition. Responses and clarifications were provided.

RFP preparation has been initiated for the acquisition of superconductor wire and cable. The conductor RFP is scheduled for release in August and an industry briefing will be scheduled prior to its release.

R&D program schedules are being prepared for implementation and tracking of the R&D activities.

The Magnet Systems Integration Meeting (MSIM) was restructured to provide added technical review and working sessions prior to the normal programmatic reviews. The MSIM was held at Lawrence Berkeley Laboratories (LBL) and attended by key members of the staff. Action items resulting from the meeting are being worked.

The Collider Quadrupole RFP is being developed and will be forwarded to Project Management in late August.

HEB Magnets 1.2.2

Work has begun on detailed scheduling of the program and should be completed in September.

The 2.5 micron conductor program has produced some strand. The quantity is insufficient to build a short magnet but is ample to produce cable. The cable will be allocated to various testing programs to begin establishing a performance data base.

Collider Magnets 1.2.3

Test

The long magnet test schedule is being revised to reflect the latest Fermi National Accelerator Laboratory (FNAL) and Brookhaven National Laboratory (BNL) test stand availability. Indications are that the desired testing can be accommodated.

Engineering

A formal design review was held for the FNAL 50mm Short Magnet on July 12. Minutes have been released which include the action items. A technical interchange meeting has been scheduled at FNAL for August 21 to review responses to and close out open action items. The FNAL 50mm Long Magnet Cryostat Preliminary Design Review (PDR) has been scheduled for August 22-23 at FNAL. A PDR for the 50mm Long Magnet Cold Mass will be scheduled for the first week in October at FNAL. Similar reviews are being planned for the BNL and LBL programs.

Magnetic Cold Mass Design and Analysis

The work on Minco heaters is continuing at BNL.

A summer intern student is nearly complete on developing a 3-D analytic magnetostatic coil end code which will be modified to perform field harmonic optimization for end effects.

A simple persistent current code is in development at SSC and the SSCMAG04 code will be migrated from LBL in August.

Mechanical Design and Analysis

Work is being completed on a 20mm collar CDM magnet design which, if proven, would provide more margin, the same transfer function, and more support for the coils. The yoke is a vertically split design with aluminum bars for lower warm prestress. Also, a report on the DSX201 aluminum bar vertically split yoke design has been completed. Plans are being developed for our future winding machine, collaring press, and workshop.

Several Collider Quadrupole Magnet (CQM) designs, including 40, 46, and 50mm designs, have been evaluated. One design has no wedges to permit faster construction.

A mechanical analysis of W6733H (DSX201) cross-section has been completed. Also, a bill of materials and drawings for short dipole magnets has been collected for use in dipole magnets constructed at SSC.

A preliminary thin end yoke design and finite element analysis is completed. It appears that the end shell thermal stress can be reduced by using a 0.7" thick thin yoke inserted at the end shell under skin. Material of the thin yoke must have a coefficient of thermal expansion close to the standard yoke.

Interconnect Region and Bus Assembly Design

Work continued on the CAD model of the cold mass to cold mass section of the interconnect region. The model is now 85% complete and we are modifying it to account for the change in bus slot radius necessitated by inclusion in the magnet of a "thin yoke" at the end of the magnet. The required change involved the routing of the magnet leads up to the bus slot.

A conceptual design for a connector that would fit in the interconnect region portion of the bus and modify the routing of magnet and bus cables was completed. The connector allows the use of generic magnets and still reduces the voltage across the dump resistors. We are currently talking to MIT about the connector detail design and the associated splices.

A member of the interconnect team spent two weeks in Europe visiting DESY, CERN, and the magnet manufacturing facilities at ABB. DESY and CERN both were very candid about their problems and how they would do things differently, as well as discussing their very impressive successes.

An ANSYS model of a sliding O-ring seal for possible use on the vacuum vessel was completed. The seal shows promise of deleting the large vacuum bellows currently used on the vessel.

Bids for the interconnect bellows have been received by Fermilab's purchasing. SSCL personnel have not had a chance to review these bids but initial reports are positive. We will probably have to ask the prospective vendors to make small changes in their proposed designs to satisfy all SSC requirements.

Materials Engineering

The insulation test fixture design has progressed to the point where preliminary copies of the drawings are being circulated for review. The temperature control and measurement components for this test fixture have been selected and listed on an official SSCL requisition form. However, since the load and displacement components (strain gauges and extensimeters) must still be selected, this requisition has not been processed. A finite element model of this test fixture design is being created using ANSYS.

A tour was taken of Commerce Grinding, a commercial grinding operation located in Dallas, to ascertain the manufacturing feasibility of the insulation test fixture.

An additional tour is being arranged to see an Electro Discharge Machining (EDM) vendor in the Dallas area and evaluate this manufacturing method for production of the insulation test fixture.

A large servo-hydraulic materials testing machine is a necessity for the insulation studies and steps are being taken to procure one. Several hours were spent at LBL discussing the hardware and software aspects of a particular MTS machine and testing system operated at LBL. It was decided to procure two identical machines if both cryogenic and ambient temperature testing were to be performed because of the large amount of time required to configure from one temperature range to another (4-5 day changeover). A RFQ is being drafted by the SSCL materials group.

Verbal approval was given to FNAL to perform thermal conductivity studies upon various conductor insulation schemes.

Information concerning a Strain Gauge Technology Workshop has been obtained from the Measurements Group, Inc. and plans are being made to send two of our engineering staff to participate in this class.

Engineering Laboratory

A conceptual design review was conducted for the short magnet test facility. The design review covered all operational nodes except the field measurements area. The major action item was to accelerate the development of a field measurement system so that it is available in April, 1991.

The development team working on the short magnet test facility met with representatives from the magnet test group and with the electronics group from the Accelerator Division. The groups are exploring the common requirements of all the various systems under development in an effort to

reduce redundant development work. The first meeting focused on the power supplies and the problem with power factor requirements levied by the power company. This issue will continue to be worked on but it is not likely that the operational power factor will be any better than 8. The present specifications being put together for the high current supplies were also examined for commonality.

Cable Test Facility Development

The Cable Test Facility dewar RFP is in its final stages of preparation and has been modified to include the requirement to build vessels to ASME code.

The swaged sample holders, which were redone with solid shims, are now under test at BNL and scheduled to be completed by the end of August with a report of the test results to follow. The remaining components, the sample test assembly and sample prep equipment, have not been worked on yet.

Short Magnet Test Facility

The Short Magnet Test Facility dewar requirements have been established and we have decided to pattern the design of the test station after that of CERN. Dimensions of the dewar are being developed in accordance with the model magnet size limitations set by the SSCL Magnet Division and a specification for the dewar system is under way. A list of all the parameters to be measured and monitored is being put together. Output types and levels from instruments need to be defined in order to tie them into the dewar node control bus.

The preliminary specification for the data acquisition node of the distributive control system for the short magnet test lab is being prepared based on the conceptual design review. This system is to be VME bus based consisting of four sub nodes, voltage tap digitizer, strain gauge digitizer, temperature monitor, and current monitor. The voltage tap digitizer is not an off-the-shelf product and will be a combination of in-house development and vendor supplied VME equipment modified to meet our needs. The strain gauges, temperature monitor, and current monitor can use off the shelf products with an in-house analog front end.

Cryostat Design

Determination of requirements for MTL feed-cans and return-cans for production magnet testing and R&D activities has begun. We participated in the definition of design requirements for 40mm to 50mm adapter hardware.

Design of the cryostat for the collider quadrupole magnet continues. Drawings of the inner and outer composite tubes of the reentrant post assembly were completed and post assembly drawing are in work. A contract was awarded to Materials Research & Engineering, Inc., Boulder, Colorado for load and thermal cycling tests of hardware corresponding to the support posts for the 40mm aperture dipole magnets. ANSYS modeling of CQM cryostat for dynamic analysis purposes was initiated.

Studies and tests of magnet support and cold mass alignment techniques and work on the stretched wire alignment technique continue at FNAL. A demonstration of the system at FNAL is scheduled for early August. Design and acquisition of components for the optical alignment bench at SSCL continues.

We continued advanced signal processing tests on the spectrum analyzing system. The system is yielding consistently reliable and accurate results. Development of an ANSYS model of the 40mm dipole was begun in order to permit comparison of experimental and analytical results from the magnet vibration program in support of model validation.

Work continued on conceptual design of thermal shield bridges and MLI interconnects. We improved the design of the thermal shields and staggered the 20K and 80K bellows in order to avoid interferences. Efforts to validate the Integrated Thermal Math Model for 40mm dipole magnets continue.

Quench Program

Work continues on development of a quench modeling program that will bring together more factors in the model than previously have been used.

Computer Aided Design System (CADS)

We created 3-D wireframes of component parts for the CQM Slide Cradle Assembly and 40mm Reentrant Post, and developed a 50mm magnet cross section.

The purchase requisition to permit microfilming of documents for the CDM RFP is in process. The MSD Optical Disk Acquisition Plan is being reviewed. Development of a CAD drawing depicting true cable positioning for the 50mm coil wrap is continuing. Detail drawings of the latest design for the CDM elliptical collar lamination have begun. Detail drawings of graphite tubes for the CQM Reentrant Post were begun. 3-D wireframe drawings of the Quad Slide Carriage are in process. Fifty drawings were sent to configuration management for review and comment by MSD Engineering, Production, Quality, etc. The preliminary drawings for the Curing and Compression Test Fixture were completed.

Work continues on the preliminary design of the Quad Reentrant Post and is approximately 85% complete. The preliminary design phase of the Quad Vacuum Vessel, which will include 2 separate designs has started.

We continued Dipole-to-Dipole Interconnect design effort and created a 3-D solid model.

We received 72 new drawings and forwarded them to Systems Engineering for distribution within MSD.

FNAL CAD Support

Work continues on Reentrant Posts (inner and outer tubes) and on vacuum vessel designs. 50mm Dipole Cryostat drawings were completed for the Vacuum Vessel Assembly, Post Support and Port Anchor Screw (Post).

Drawing development continues on the Inner and Outer 80 MLI Blankets and we completed design of Return End Clamp Assembly.

Work continues on the 20K Shield Slide Ring, Shield Extruded Helium Tube, Interconnect Bellows, Port Support, Foot Support Pad and Foot Support Gusset for the CDM cryostat.

Interconnect

Progress continues on the Interconnect design. Layouts were begun on the Domed Cap, End Plate and Beam Tube. The Assembly Lead End, Block Mounting, Terminal Quench Protector, and Plate Lead End drawings are 50% complete.

Work continues regarding shielding design concepts. A conceptual design for a 4-way connector is in process. Various models were generated for evaluation.

Tooling Design Support

We completed Compression Test Fixture Drawing M30-000082 and detail parts and began work on an alternate design.

The Calibration Fixture drawings were completed. A new design concept was created for the Press Fixture which is self-contained in order to keep the liquid helium from boiling over.

Drawings have been completed for the Cable Tensioner and the Cable Twist Devise drawings have been released.

We detailed parts for the Transducer Calibration Fixture and continued work on tooling requirements for assembly of Yoke Packs. Drawings for the Collaring Press are being developed.

Detail parts drawings of the Material Test Tooling Fixture are 90% complete and assembly drawings are in process. Revisions continue on the Alignment Support drawing.

Systems Engineering

Specifications/Analyses

Changes to the March 27 CDM specification were coordinated within the Magnet and Accelerator Divisions. The next revision to the specification is scheduled for completion in November.

A draft copy of the Interface Control Document was distributed to the Magnet Division staff during the month. Coordination of the Interface Control Working Group tasks and responsibilities was accomplished. The piping alignment tolerances are being evaluated.

Development of a draft specification tree for the Long Dipole Magnet was completed and we continue to finalize the specification tree.

Systems engineering began coordinating engineering guidelines, being developed by Project Management, within Magnet Systems Division.

The collider quadrupole prime item development specification has been coordinated within the Magnet and Accelerator Divisions. Comments are being reviewed and incorporated into the specification. Plans call for completion of a preliminary specification by August 24.

We have located possible expert consultation at Lockheed Missiles and Space Company, Research and Development Division (RDD), on the subject of pressure vessel codes. Members of MSD visited RDD's Palo Alto, CA, plant on July 26.

Systems Engineering has undertaken development of a magnet design application criteria table which will reflect the most stringent design requirements for individual magnets and facilitate selection of design criteria in those cases when one design is used in more than one magnet.

Reliability Engineering

A reliability engineering briefing was developed for presentation at the MSIM. The briefing will also be presented to the MSD staff to provide an overview of the magnet development reliability program.

Work on the failure mode, effects, and criticality analysis is 25% complete and work on the MSD reliability plan continues.

Work continued on the reliability allocation for the magnet system, resulting in what is believed to be an allocation that can be agreed upon.

Configuration Management

The MSD configuration manager reported this month. His first tasks will be to revise and implement the drawing review procedure, develop a specification review and release procedure, and develop the MSD Configuration Management plan.

We have established new guidance on the handling of dipole magnet engineering drawings. Only drawings of the FNAL long 50mm design will be reviewed and redlined by the MSD staff. All other drawings will be distributed to the staff for review only.

General

A major review of the systems engineering effort in the MSD took place on July 20. All areas were briefed including manning, tasks, schedules and several special interest items. Work continued on support to the superconductor RFP effort.

Magnet Facilities Equipment and Tooling 1.2.4

Efforts leading to the development of a cable and short magnet test facility continue. The development plan includes a discussion of the efforts leading to the prototyping and operation of a short sample cable test facility and a short magnet test facility. Assessment of the approach for procurement of a cabling machine and its location continues.

Magnet Evaluation Lab (MEL)

MEL finish-out construction was completed July 27. Equipment has been moved in and is being set up. Following the load test of the overhead crane on August 2, the facility will be operational.

The design of the first model dipole will be a clone of the FNAL magnet. This will enable SSC to procure materials for the magnets directly from FNAL, speeding up the procurement process and allowing production to begin earlier and at a reduced cost.

In the post-mortem of DD0018, the coil assembly was cut through six inches from the return end. DC Hipot tests were performed on all coils to check for turn-to-turn shorts. At 100 volts turn-to-turn,

two shorts were identified between turns 14 and 15, and turns 1 and 2 in the return end section of the lower inner coil. This agrees reasonably well with BNL's failure analysis report (SSC-N-681) based on impulse testing of the cryostated magnet. The section of the coil with the shorts will be taken to BNL for further analysis.

Magnet Development Lab (MDL)

Architect-Engineering (A-E) effort began on the MDL. Preliminary meetings were held with Parsons Brinkerhoff/Morrison Knudsen (PB/MK). Building design and technical criteria were altered to meet budget constraints and site selection was addressed. Weekly working group meetings have been scheduled, with the first meeting to be held August 1 to address the basic layout of the MDL building as developed by PB/MK. Input on peripheral shops will be presented to PB/MK at that time.

The MDL layout was placed on CAD and changes were incorporated to reflect the addition of model magnet tooling and equipment.

We modified, designed and completed the insertion/assembly table, guide blocks, slide plates, bridge table and vacuum vessel stand for the MDL cryostat assembly area.

The twelve connecting rods for the skinning press shipped out for independent testing of the cut versus rolled threads have all passed and been returned to the SSCL.

Parts for the 17M skinning press are being received and warehoused. LBL has requested a 20-foot section of this press for use on 5M quadrupole magnets and arrangements are being made to accommodate this request.

Mechanical design of the model magnet coil winder is complete. Requisitions were submitted August 6. The cable tensioner design is complete and most of the parts have been ordered.

The quadrupole model magnet collaring press will be patterned after the LBL design and, based on the desire to accommodate larger aperture magnets, minor design changes will be required.

Efforts continue to award a contract for design and fabrication of a 17M coil winder by mid-August, with an eight month delivery anticipated.

Designs for a coil transporter and cryostat strongback have been completed.

LBL, FNAL and BNL Support

We completed detail design of controls for the LBL 5M quadrupole curing press and ordered parts. Fabrication of the control system will begin August 6.

The design of collar assembly tooling and fabrication of heater strips for use on FNAL 40mm CDMs was completed.

An electrical test fixture for coil ends was designed and assembled at LBL. The fixture is used to check for turn-to-turn shorts with the coil ends loaded to typical operating mode stresses. Coils for QCC-401 passed this test.

A requisition is in process for G-10 parts for the outer coil lead end of the dipole for FNAL.

Development work began at FNAL on methods for building long (176 inch) yoke packs.

The composite material end clamp project for dipoles has been initiated at FNAL. Initial material specifications have been written, a sample fabricator selected and samples ordered.

Work continues on improvements to the automatic linear skin welding system at FNAL. Outside vendors' engineers were invited to FNAL to discuss features for system improvements.

The Hamar laser system was utilized at FNAL to measure the flatness of the lower beam on the collaring press. The system was simple to set up and operate, and produced measurements that appeared to be accurate and with enough quantitative detail for adequate interpretation.

Conventional Construction WBS 2.0

Conventional Construction Accelerator 2.1

Injector

Programming for the Linear Accelerator (LINAC) and LEB continues. Incorporated into this work was the beginning of detailed CAD modeling of the tunnel technical system structures and supporting systems. This work will help to clearly define functional requirements of the supporting conventional enclosures and systems.

Collider

Geotechnical exploration concluded in July with drilling activities conducted along the Prototype Installation Facility (PIF) segment of the collider alignment. Approximately 13 borings were drilled on approximately 2,000 foot centers from the northern rf shaft to the F-1 shaft. Five piezometers were installed and gas sampling was conducted in two borings. A high-resolution, shallow-penetration seismic reflection survey was also performed along the PIF alignment. A meeting will be scheduled in mid-August to interpret the results of seismic and drilling activities and follow-up work programmed as necessary.

Conventional Systems, Experimental 2.2

Input to the first draft of the Experimental System Resource Requirements Report was provided to the Physics Research Division. A report on the availability and cost of heavy lift system was completed, and a report on transporting large pieces of detectors from the Gulf of Mexico to Waxahachie, was completed.

Site and Infrastructure 2.3

Surface Transportation Study

Access route and bridge inventories are underway.

Utility Requirements

Authorization for the A-E/CM to begin work is being awaited. Two familiarization workshops were conducted with the A-E/CM staff.

Real Estate

FY91, Phase II—Work with TNRLC continued regarding acceptance of improvements on real estate to be acquired and conveyed to DOE.

Campus 2.4

Study continues on the design and construction of the Accelerator Systems String Test (ASST) facility now proposed in combination with the Magnet Test Laboratory (MTL). Programming requirements were clarified in greater detail for the structure's associated cryogenic systems, technical systems, and surface facilities. The ASST/MTL structure, as currently envisioned, will consist of a partial surface

structure approximately one-half kilometer in length, in which strings of magnets can be assembled and tested. It will share surface facilities for the PIF which will subsequently be utilized for the E-1 site to support the collider ring. Based upon cost modeling and personal safety issues, the envelope of the string was determined to match the 12-ft inside diameter of the tunnel. Site configuration of surface facilities is currently being analyzed for final schematic configuration. Square footages are being refined to programmatic levels for both facilities combined.

Input was provided to the Engineering Standards Committee.

Architectural space programming of nontechnical campus administrative and support facilities was initiated based upon the January, 1990 population baseline. Management of the consultant primarily takes the form of setting interviews in advance for SSC personnel and attending interviews to verify baseline data utilized. A first draft of this data has been submitted and is being revised to baseline population numbers and analysis of space impact.

A pre-master planning effort has begun, denoted as the west campus concept site plan which will be an in-house effort from which to launch the A-E/CM in master planning integrated with the initial build out of the E-1 site.

A-E/CM Selection & Contract Administration Support 2.5.1

A-E/CM progress during July comprised orientation and familiarization activities under the Cost Incurrence letter.

Division Management & Administration 2.5.2

Priority was given to pre-negotiation activities in preparation for A-E/CM contract negotiations with the PB/MK Team, and to developing the 180-day Letter Subcontract which was forwarded to DOE for approval. The PB/MK Team continued orientation and familiarization activities under the Cost Incurrence letter agreement. Workshops were commenced to facilitate data transfer from RTK and their subcontractors to PB/MK personnel, beginning with geotechnical and survey activities.

Conventional Construction Division (CCD) commenced an update of the Conventional Construction Procedural Guidelines, which were issued as an advance draft in May. Development of procedures was begun for establishing computer linkages (data, drawings, documents) between CCD and the A-E/CM, tied in with the emerging SSCL Document Control System.

Development of the West Campus Concept Plan continued, and CCD management review clarified the programmatic guidance for E-1 site facilities.

On July 9, Dr. James Sanford was named Interim Leader of the CCD, replacing Robert Matyas, consultant and previous Acting Head.

SEIS Support Management

CCD has attended meetings and provided responses to data requests from EAO for SEIS preparation. CCD performed review of the "proof" draft SEIS and provided comments to Project Management for transmittal to DOE.

SEIS Spoils Management

CCD continues response to questions through the EAO. Additional report copies were prepared internally for A-E/CM use.

Project Management and Support WBS 3.0

Project Management 3.1

Project Management Office 3.1.1

A great deal of July was devoted to wrapping up the June 25-29 Baseline Validation Review. Upon receipt of the Review Committee's draft report, comments were assimilated and transmitted to the DOE. T. Kozman and B. Williamson traveled to Washington on July 31 to meet with representatives of each of the three review committees (ER, ICE and HEPAP) to support the laboratory's cost estimate and discuss the variances in the three committees' findings. A meeting was also held in Dallas on July 14 with Deputy Secretary Henson Moore to discuss the overall estimate and schedule.

Project Planning 3.1.2

A large part of this group's effort was also spent responding to questions stemming from the June DOE Review. Both OSSC and the ICE team had detailed questions, and comments on the draft report of the Review Committee were provided to the Project Manager. A cost estimate errata list has been developed, and additional cost estimate comparisons, with supporting documentation, are being made. Work continues on developing the funding profiles to lower WBS levels, and the profiles for FY91 and FY92 were completed. Cost estimates for the ASST and PIF have been completed, and the group is continuing to prepare cost estimates for scenarios involving different locations for the experimental halls. We are also providing assistance to the Magnet Division in their schedule development for the MDL, MEL and Model Magnets.

Project Cost, Scheduling and Reporting Systems 3.1.3

R. Morse was named to head this group, formerly Project Management and Reporting Systems, on July 2. Bob came from the Sverdrup Corporation, and had been leading the scheduling effort for the lab in the CCD prior to joining Project Management.

Draft Cost/Schedule Control Systems (C/SCS) Guides and C/SCS Manuals were prepared, and DOE C/S performance measurement and cost reporting forms are being integrated into these documents. A draft Validation Plan is also in progress. Preparations began for the implementation of an interim C/S system PC server to be operational for FY91 while systems analysis and planning for a permanent system continues.

Engineering Standards 3.1.4

The Engineering Document Numbering System was submitted to the Project Manager for approval. A Document Control Working Group has been formed, which will have divisional representatives who will focus on Document Control, Engineering CAD, and Configuration Management issues. The first draft of the Engineering CAD Plan is complete, and is scheduled to be completed by October 1. Several documents, including Engineering Standards, Document Standards, QA Practices and the Requirements Notebooks, are now available on the PMO Server and available for laboratory-wide viewing. Configuration Management will also be added. Meetings were held with CCD and PB/MK to help define interfaces, and the Document Tracking database is being adjusted to accommodate both CCD's and PB/MK's needs.

Production work continues on the SSCL Quality Assurance (QA) video. The Project Management QA Plan was transmitted to laboratory Associate Directors with a request that their Quality Implementation Plans be submitted by September 1. This document will then be transmitted formally to DOE. The PB/MK QA Plan is in draft form and work continues with the CCD to review their overall QA philosophy and interfaces with the A-E/CM. Preparation of a document which addresses the issue of calibration of measuring and test equipment began this month. The DOE QA Manager met with the new SSC QA Manager.

Environmental Affairs 3.1.5

The SSC SEIS Policy/Comment Finalization meeting was held on July 10-12 in Dallas. All outstanding items were successfully resolved, and the Final Draft SEIS was hand delivered to DOE-HQ (EH & GC) on July 17 for their approval and release to the public. Internal comments on the final draft were pulled together and sent to DOE-CH on July 24, with a request that we be notified immediately if Argonne National Laboratory was not able to incorporate any of the requested changes. A comment resolution meeting was held August 2 with EH and GC. Several things have materialized which may impact the schedule of the completion of the SEIS and the ROD signing. Developments contributing to this setback include: a) the Secretary wants to review the document personally; b) a new EH-1 has been named, and the SEIS may be his first order of business; and c) C. Borgstrom (EH-25) has not yet reviewed the document and may have additional comments to be incorporated. The revised date for the public hearings may now be the second week of September, rather than the last week in August. The EA staff is continuing to work on the preparation of numerous environmental documents required for the laboratory. It was also decided that the entire surface area of the ring needs to be "pre-cleared" with respect to archaeological resources, and the SMU contract has been modified to include this work.

Systems Engineering and Integration 3.2

Systems Engineering (SE) Management 3.2.1

Meetings have been held to define the concept and approach of Interface Control Working Groups. These will be groups established to work out interfaces that technically cross divisional lines. The format of the groups and their approval levels was presented to the Associate Directors on August 7. The Configuration Management Plan is under revision and the new specification tree has been approved and will be included. A specifications notebook is being maintained, which includes specification trees, flow charts, facility areas, and outlines for the SSCL project/system/segment/element level specifications. Tables from the working requirements were made available on the PMO server for lab-wide access. Thirty-three engineering guidelines have also been drafted, with 26 available on the server.

SE Support to ASD 3.2.2

The specification for the corrector magnet superconductor wire has been revised, resulting in two separate specifications, each for one size of production wire. This will merge the technical requirements and test procedures from an international superconducting wire specification. The plan is currently under review by Accelerator Division management. The two drawings for the superconducting wire have been completed. A new draft of the Linac segment specification was also completed.

SE Support to MSD 3.2.3

Work on the CQM specification continued this month, and it will be included in the August 24 release of the Magnet Draft RFP. Magnet Division and SE staff visited the Lockheed Research and Development Division at Palo Alto, CA on July 26 to find engineering support in the area of pressure vessel codes as they apply to superconducting magnets. The SE staff also chaired a reliability engineering session on July 25 at LBL for the MSIM.

SE Support to Physics 3.2.4

A draft of the plan for the Solenoidal Detector Collaboration's information handling system is underway. The interim database for documents will be developed and maintained at LBL, with a prototype developed here for use upon its completion. This system will be developed jointly with Project Management and Physics Research, to ensure commonality and interoperability. A general collaboration meeting is scheduled for August 13-16. The resource requirements report was revised, incorporating changes resulting from the recent Snowmass meeting, and has been submitted for publication and distribution.

SE Support to CCD 3.2.5

The CCD portion of the SCDR has been updated, with coordination between this chapter and the Accelerator Division's portion of the document. The Working Requirements Notebook is being updated as well. A summary of the SE and Configuration Management function for the A-E/CM was completed, which was to be used during negotiations, and SE will participate in defining and documenting procedures relating to systems engineering within CCD.

R&D, Pre-Operations, & Administration & Support WBS 4.0

Management Services 4.2.1.1

The major concern this month was staffing plans and hiring. We believe about 250 people will have to be hired during FY91. There were 142 people on board as of July 31, and our goal is to hire about 50 more this fiscal year.

During June, the last month for which we have summary financial reports, purchase commitments were \$3,834K and outstanding requisitions for \$3,902K, which is approximately the same as last month. There were two major purchases: IPSC/860 Model 64 (Hypercube computer) for \$995K and superconducting wire for \$425K.

A milestone and activity list was compiled that detailed the Accelerator Division's activities required to support the ASST and the PIF. This list was used to generate a list of actions required by the group leaders. Scheduling personnel are now working with group leaders to generate detailed development schedules that support the project level milestones for ASST/PIF.

LINAC 4.2.1.2

The design of the side-coupled linac cavity shapes is progressing rapidly. The accelerating and coupling cells were first designed using SUPERFISH, with empirical allowance made for the effect of the coupling slot. The relative positioning of the cells and the coupling constant were estimated from an algorithm developed by LANL from experience on many past linacs. These are now being fine-tuned for all 66 tanks through three-dimensional simulations using MAFIA on the MFE Cray. Cold model prototypes will soon be used to verify these designs. The design of the bridge couplers is now being started using MAFIA. The magnetron source from Texas Accelerator Center was delivered July 19 and is being set up on the SSC linac test stand, with initial tests expected in early September. The power supplies and vacuum pumps have been received and the arc and gas pulsers are being fabricated at SSCL.

LEB 4.2.1.3

A scheme for blowing up the longitudinal committance and orienting the bunch for injection into MEB has been devised. The scheme involved shifting the synchronony phase to the unstable point (at about 49 ms and for about .5 ms) and bring it back. Smaller rings are still under consideration. Non-resonant acceleration schemes are being considered. Acceleration at 4 Hz, (i.e. longer acceleration time) which would reduce the peak Rf voltage, is being analyzed.

MEB 4.2.1.4

The design of the MEB is being reviewed to reduce its operational risk. A new lattice (90-degrees phase shift per cell) was developed that results in a transversely smaller beam and that moves the transition energy away from the injection energy. We are also studying the possibility of using a lattice with an imaginary transition energy and thereby avoid a transition jump. To obtain better quality magnets, the dipoles may also be limited to 1.6 Tesla.

HEB 4.2.1.5

Work on the HEB in July has progressed to an in-depth examination of the slow extraction scheme with a view to optimizing the extraction efficiency. Both 5cm and 7cm HEB dipole apertures are being studied.

A detailed report, SSCL-296, comparing the long-term dynamical aperture and the slow extraction schemes for the two dipole apertures has been under preparation, and is slated for publication by the end of August.

Collider 4.2.1.6

The Program Advisory Committee (PAC) meeting was held July 14-20. Collider group personnel prepared responses to the accelerator issues posed by the EOIs and participated in the meeting. Discussions continued throughout the month on synchrotron radiation intercept and vacuum issues. Magnet Systems Division engineers joined this effort. Progress was made on definition of survey and alignment requirements in preparation for a mini-workshop on this subject during August. A study was made of the impact of corrector coil diameter changes on corrector strength and distribution. Visiting Russian scientists from Protvino completed a first-pass analysis of energy deposition from beam loss in the collider; this study will be circulated as an SSCL report.

Magnet R&D 4.2.2

Fermilab 4.2.2.1

Dipole Cryostat

Test and development work begun during the 40mm cryostat program is proceeding on schedule. All of this work is applicable to the 50mm cryostat program.

Magnetic Measurements

No cold SSC long magnets occurred in July. Activity was limited to studies of performance of the mole and to long-range planning activities.

Long Magnet Fabrication

DC0202 cold mass arrived from BNL on July 11. Cryostating is not scheduled to begin until August.

Collaring Press

The upper and lower beam repairs of the collaring press were completed on July 10 and the press is now operational.

Dipole Cryostat

Heat leak measurements are being made on MLI blankets below 80K. By August 1 we should have our first measurement of MLI performance from 80K to 20K of a single 32-layer blanket operating at 10^{-6} torr.

We have received all seven prototype reentrant supports from SCI using the wound-in end concept and tests have been completed on the first of these assemblies. Tests on the remainder will take place early in August.

We received our order from ACPT of six composite tubes built to the current support post drawings, but with a modified fiber layup which will increase the shear modulus and thus the lateral stiffness of support post assemblies. These tubes will be assembled into support assemblies and tested for structural comparison with the current design.

We are actively working on the redesign of the SSC dipole cryostat to accommodate the 50mm aperture cold mass. Nearly all of the engineering, design, and drafting resources involved in SSC activities are related to this redesign effort.

Detailed design of most of the long lead items for the cryostat is nearly complete. This includes 80K and 20K shields, vacuum vessel, MLI, and support posts. Our goal is to have 80% of the cryostat parts on order by October 1.

An RFP has been prepared by Technical Support procurement to elicit bids from potential vendors for bellows to satisfy the test and production needs of the 50mm program. Bids are due back at the beginning of August.

Magnet Development

Testing of DS0310 is nearly complete. It began a warm-up from its second thermal cycle on July 31. The two ways in which DS0310 differs most from DS0309 and DS0308 are: its higher initial prestress (about 10 kpsi on its inner coils and 14 kpsi on its outer coils after yoking) and in the teflon tape applied to the outer surfaces of its coils.

There were two training quenches on the first cool down of DS0310 at about 6600 amps. The magnet then reached its 4.3K plateau of 6850 amps, which is about 225 amps above the calculated critical current for this magnet. The plateau quenches originated in the straight section of the upper inner pole turn on the side opposite the ramp splice. Three training quenches were required before the magnet achieved a plateau of about 7030 amps at 4.2K. At 3.8K the magnet behaved erratically, with 8 quenches at the apparent plateau value of 7500 amps, but with a number of quenches interspersed with these at values as low as 7200 amps.

A study of ramp rate dependence on the quench current and position was performed. The quench current was independent of ramp rate up to 50A/s, then fell about 100 amps from the plateau value at 75A/s. This is to be compared with the knee in the ramp rate dependence of DS0309 and DS0308 which was between 100 and 125A/s. The quench location for ramp rates above 50A/s was the upper inner ramp splice in DS0310 which was also the location for rates above 100A/s in DS0309 and DS0308. The reason for the discrepancy is not yet known and analysis continues.

Strain gauge runs were made to 6750 amps at 4.3K and 7400 amps at 3.8K; however, the inner coil gauges were not functioning during the latter run. This data is being analyzed. Harmonics measurements as a function of Z were taken at 500A and as a function of current at the center of the magnet. This data is also under analysis.

One training quench at 6809 amps was required after the second cool down before the plateau current was again reached at 4.3K. The plateau was reached without retraining. However the magnet again behaved erratically at 3.8K. Strain gauge runs were again made at 4.3 and 3.8K. The ramp rate study was repeated and confirmed the results obtained during the first cycle. Harmonic measurements were not repeated since the probe became damaged and could not be removed from the magnet for repairs while it was cold.

Long Magnet Fabrication

Cryostat Area

Magnet DD0028 had a vertical plane measurement completed on July 11.

Cold Mass Area:

Curing Press: Debugging of software for the hydraulic system continues and is expected to be completed by August 1.

Collaring Press: The upper and lower beam repairs of the press were completed on July 10. The system has been tested successfully to 10KPSI (operational limits are 8KPSI) and the press is now operational.

Winding Table: The next spool height adjusting cylinder has been installed and is working properly.

Coil Winding:

RCM #4 Inner #1 (17M1011) was wound and cured on July 3. This coil had to be backwound because a wedge was marked and installed wrong. Backwinding was done on July 10. This coil will be rewound and cured this week.

Practice coil (171XX1) was wound and cured on July 23. This coil will be a replacement for upper inner on PCM #2 which had a turn-to-turn short.

Coil Assembly and Collaring:

PCM #2 was reassembled and keying of collars in the collaring press was attempted on July 19. The collars did not completely close at the lead end; this was thought to be caused by the collared coil extending too far out of the press. The upper inner coil showed a turn-to-turn short. The short was not a result of either the coil/coil assembly or collaring procedure. This practice coil was the first produced with real ends. The 3 turns were damaged during the winding and curing process due to insufficient tension and lack of developed technique by the technicians. It was decided to disassemble the coil and replace the shorted coil. This assembly was ready to try keying again on July 30. The mold was relocated in the press to provide full press pressure to the lead end of the mold. The mold had previously been positioned with the lead end beyond the last set of hydraulic jacks. The repositioning corrected the problem and PCM #2 has now been keyed.

RCM #1 is completely assembled on a beam tube except for collar packs. Delays are being experienced in receiving correctly spot welded collar laminations from the vendor. This problem is being addressed and collaring is expected to begin the week of August 6.

Miscellaneous: The heater strips for all magnets through RCM #4 have been assembled.

SSC Short Model Program

DS0307 has been potted and sectioned. Cross sections have been measured by the inspection group to try to understand the discrepancy between predicted and measured coil prestress. The measurements are being analyzed.

DS0310 testing is taking place. Low temperature tests are currently being done. Testing will be finished by August 3. Some results are available.

DS0311 is wound and packaged. It will be collared on August 2 and complete by mid-August.

DS0312 is being used for collaring experiments, which are currently in process. The collaring experiments have four sections:

1. Determination of the correct shims;
2. Cross calibration of short and long collaring presses;
3. Determination of correct pole kapton for period adjustment; and
4. Determination of correct material to use for ground wrap slip plane (if any).

Section 2 will be completed during the last week in July. Results of these experiments are available. There are no plans to test DS0312 cold. Cold testing of this magnet is a possibility only if it survives the collaring experiments.

Vertically split 40mm yoke laminations have arrived and have passed inspection. The corresponding collar laminations should arrive soon.

50mm curing mold and mandrel parts are arriving and being inspected.

50mm design status:

- Coil cross section, insulated cable, wedge and ground wrap drawings have been released. Cross section is being revised to incorporate latest outer cable changes. These changes will not affect parts already released.
- Outer coil end parts were released and inner coil part design is underway.
- Preform is designed. Drawing of preform is released. Inner coil preform fixture is released. Outer coil preform fixture is being designed.
- End clamp design is nearing completion.
- Collar lamination drawing is released.
- Strain gauge pack part design is nearing completion.
- Yoke lamination drawing is complete.
- Skins have been tentatively fixed at .195 thick 316LN stainless.

Berkeley Lab 4.2.2.2

Superconductor and Cable

The aluminum tube sample holder experiment was repeated without the use of adhesives which appeared to have undergone excessive deformation in the initial experiment. The same four sets of samples were loaded into AL tubes with different thicknesses of shim material and compacted. These samples are being tested at BNL to evaluate their training behavior and the results will be reported next month.

A series of 30-strand inner cables were made using the same wire, but with (a) different keystone angles, and (b) different amounts of compaction. The keystone angle was varied in order to evaluate the effect on training behavior. Samples are at BNL awaiting short sample testing.

Preparations are in progress for the 36-strand production series which will commence in mid-August. These preparations include practice cable runs, rebuilding of worn components, and a change over to metric units.

Quadrupole Magnets

One Meter Quadrupole Magnets

Our 1-meter model, QSC-402, is currently being collared. This is being done using a hydraulically expandable mandrel to position the coils fully into the collars before keying. Also the collaring is being done in two steps: the full length of the coils is brought to half the targeted pressure values, then to full pressure in a second operation; this is to avoid large stress concentrations in the coils between collared and uncollared sections of the magnet. Many of the parts from QSC-401, such as end clamps, end plates, splice plates and iron yokes, will be reused in QSC-402. Designs for these parts are being updated and new parts will be fabricated for QSC-403. The production and assembly techniques for these short magnets are being reviewed and modified as needed to simplify the work required to build the 5-meter quadrupoles. Completion of magnet QSC-402 is expected in the second week of August.

Quadrupole Analysis

A magnetic analysis study of 46mm bore quadrupoles has been carried out. The study included two possible collar designs: one with a 7mm collar which uses the yoke for partial support of the coils, and the other with a more conventional and conservative 20mm collar that is "free standing". With the thin collar we can achieve 209T/m ($\mu=\infty$ design, est. ~205 T/m with "real iron") at 6500A with 14.5% margin using the 36-strand cable. We made several cable designs with slightly varying strand diameters to achieve a better match to the dipole operating current; for example, a gradient of 205 T/m at 6500 A ($\mu=\infty$) with 15.5% margin is possible for the 20mm collar design if we use a 37-strand cable with 0.666mm diameter strands instead of the present 0.6477mm diameter strands (i.e. 0.0013" smaller).

Long Quadrupole Model OCC-401

All coils have been wound, cured, measured, and tested for shorts for this model. Coil dimensions are very good, better than ± 0.001 inch on inner coils and ± 0.002 on outer coils.

The coil assembly fixtures are complete and the inner coil assembly is started. Fabrication of components for the coil collaring press is 50% complete.

Orders have been placed for all tooling and magnet components for the yoking and skinning of the magnet. This includes the yoke laminations, skins, fiducial bars, and tooling to be used in the main press for clamping the assembly during welding.

Superconducting Cable R&D 4.2.2.3

A working group has been established to complete the RFP for the vendor qualification program. This RFP should be forwarded to Project Management for review by mid-August. The CBD announcement was sent out on July 20 and appeared on July 30.

Conductor delivery schedules are being maintained through the end of the pre-production CDMs. This has allowed the identification and resolution of a few potential minor schedule problems associated with magnets added to the program after conductor orders were placed. Sufficient conductor is presently being fabricated or being ordered to adequately cover the needs of the magnet industrialization program at FNAL and the associated R&D activities.

The first samples of 2.5 μ m conductor have been received from Furukawa. Cross-sections have been prepared in the Met lab. Bare filaments were evaluated using the LTV scanning electron microscope (SEM). The filament quality is quite good. The electrical properties which FEC reports are just below the present SSC specification for 6 μ m conductor. We consider this an encouraging start to the 2.5 μ m development program. The other vendors in the 2.5 μ m program will be supplying conductor before the end of September.

Bids for the Met lab SEM have been received and an order placed. The microscope will be delivered in mid-September, greatly enhancing SSCL capabilities.

The strand mapping program is nearing completion, and the final check for bugs is being done. This program will greatly simplify our current techniques and add a new dimension to our strand mapping capabilities.

We are preparing to ramp up for our 50mm cabling plans as we close out our responsibilities for 40mm material. 50mm practice cable has been fabricated and enough material for four short dipoles produced. Delivery of "real" strand is scheduled for the beginning of August.

Currently the 50mm cable is being fabricated at LBL. We expect NEEW to receive the tooling for 50mm Inner cable by mid-September.

Insulation Development Program

The insulation development program continues to investigate prime materials characterization; insulation system characterization; and insulation breakdown and short detection.

Brookhaven Lab 4.2.2.4

Long Magnets

DD0028 has been cryostated at FNAL and will be returned to BNL for cold testing. Contrary to June's report, installation of DC0201 in the Horizontal Test Facility continued throughout the month of July, with completion expected in the second week of August.

DC0202 was shipped to Fermilab during the week of July 9. The magnet will be cryostated at FNAL and returned to BNL for cold testing.

DC0203 collaring was completed during the week of July 2. Following warm measurements, yoke assembly operations occupied most of the remainder of the month. The magnet will be cryostated and cold tested at BNL with parts supplied by FNAL.

Shell welding was completed on DC0204, followed by leak checking, pressure tests, and installation of end plate bullets.

Coil assembly (2nd set) was completed on DC0205, followed by end gauging and preparations for collaring.

DC0206 continued to remain idle, awaiting outer cable. The magnet is to be cryostated and cold tested at BNL with parts supplied by FNAL.

Short Magnets

DSS019 and DSS020 were disassembled.

Initial testing of DSS021 continued this month, with excellent training performance and good multipoles.

DS0201 was installed, first in the top hat and then in the vertical dewar. This magnet is next in line for testing, after DSS021.

Coils for DS0202 (all-Kapton coil insulation) were wound and cured, and coil assembly took place at the end of the month.

Cable for DS0203 (all-Kapton) is being insulated.

Magnet Tooling and Equipment

Coils

Engineering work continues on long and short 50mm aperture coil tooling. Design work continues on mandrel lamination stacking fixtures, on long winding mandrels, and on long formblocks for 50mm tooling. A complete set of drawings for 50mm short tooling, as well as a complete set of PRs for said tooling, have been released to the central shops for purchasing.

Collars

With component parts for the collar tapered key insertion devices on hand, sub-assembly and assembly drawings were released to the assembly shop on July 11. Most hydraulic components are on order, except for a manifold for the side cylinders which, due to the high pressures involved (maximum 6000 PSI), has to be approved by S&EP before release to the shops for manufacturing.

Yokes

It was decided to maintain the original end plate thickness of 1.5 inches for the 50mm design, instead of using the proposed 1.0-inch thickness.

Bus Work

A induction heating unit and water cooler for the bus bar soldering fixture has been received from the vendor, Ledel Corporation; these components are now being incorporated into the overall fixture layout.

Testing and Measurements

Initial testing of 1.8-m dipole DSS021 took place this month. The magnet is of standard construction for comparison with previous magnets which had non-standard amounts of epoxy in the fiberglass of the outer coil insulation. It also has a trim coil.

The initial training of the magnet was excellent: one training quench to reach 6.6T and two to reach the 6.9T conductor limit at 4.35K, with no further training required before reaching the 7.4T conductor limit at 3.85K and 7.9T at 3.35K. Also, the multipoles were good, i.e., consistent with those measured in previous magnets.

Project Administration and Support 4.3

Administration Systems and Support 4.3.1

The principal accomplishment for Administration this month was the hiring of two top flight procurement management personnel. Dick Russell, former Director of Procurement and Materiel Management at Sandia National Laboratory, is the new Director of Procurement; and Charles Dan of DOE Procurement Policy is the Manager of Contract Policy and Analysis. With the addition of these key managers, we anticipate a rapid acceleration in the development of the Procurement organization. We also conducted a successful laboratory-wide performance appraisal process.

Increased emphasis is being placed on our support of recruitment and hiring of personnel, development of the FY91 budget system and structure, and MIS development.

Finance 4.3.2

The Budget Office made a presentation to laboratory management on July 11 based on the June financial reports. The presentation compared budgets to costs and commitments through June. This analysis will be reaccomplished for the next budget review scheduled for August 22. That same meeting will also include a presentation on overheads for FY91.

A complete analysis of the FY90 fringe rate was completed which resulted in lowering the FY90 fringe rate to 40%. Several meetings were held which resulted in general agreement as to the Work Breakdown Structure and the Chart of Accounts that will be opened in the budget system for FY91. A memo outlining the approach has been distributed for comments. Several system changes that will enhance the budget system for FY91 are underway as well as a new subcontract tracking system.

The Financial Information Systems' (FIS) July work effort included the following:

- Supported the design and implementation of the indirect cost accumulation and distribution system.
- Assisted MIS in setting up end-user menu access, thus increasing data security.
- Contributed heavily to new subcontract information system requirement specification.
- Established new long-term account number structure.
- Conducted advanced payroll conversion kick-off meeting, establishing milestones for testing and implementation. A preliminary conversion and test was made to identify problems for Deltek to correct.

The Accounting and Financial Control section accomplished the following objectives:

General

- Check versus cash survey was accomplished.
- OBS activity notification form was created.
- Designed retail sales forms and procedures for the sale of educational materials with External Affairs.
- Developed petty cash procedures and devised a new form.
- Implemented the new data backup and copy program.
- Current on bank reconciliations.
- Current on major billings.
- Completed performance appraisals and job descriptions.
- Developed a consultant travel policy implementation schedule.

Policy & Procedures

- Drafted a *Cost Account Change Policy and Procedure* which includes two new forms and instructions.

- Finalized procedures for paying conference registration fees and distributed a laboratory-wide memo.

Property Accounting

- Completed costing of the equipment in service which was obtained from the DOE Hereford, TX site.
- Determined costing for machine shop expenditures and furniture acquired from Hereford.

Payroll

- Developed a method to process EG&G timesheets at the same time regular timesheets are in the system.
- Completed 2nd Quarter 941 and forwarded to Fermilab.
- Completed Texas Unemployment Commission Quarterly Report.
- Completed California Quarterly Contribution Return.

Procurement 4.3.3

During July, the Procurement Department made awards totalling \$5,030,162 of which \$1,787,047 was to Small Business and \$453,205 was to Small Disadvantaged Business as defined in Public Law 101-101.

During July, Procurement took some good positive steps toward increasing its visibility on major acquisitions. Questionnaires were transmitted to all SSCL divisions requesting input for all FY90/91 anticipated actions \$100K and over. Feedback is currently being reviewed and analyzed to assist us in planning, staffing and other areas.

DOE review of the proposed Letter Subcontract with PB/MK is continuing. Barring unforeseen circumstances, award should take place sometime in mid-August.

Procurement participation in Outreach efforts continues, with three being held in the month of July.

Contact with DOE was extensive in July with respect to the formulation and publication of Procurement Standard Practices. We expect to have a plan completed early in August to coincide with the arrival of the new Director of Procurement. This plan will be submitted to DOE as requested in their July 27 letter.

Personnel 4.3.5

We coordinated 155 interviews with hiring managers this month. Thirty new employees joined the laboratory for a total employee population of 732. As of July 31, we have 374 open positions at the laboratory.

Recruiting activity was aimed largely at Engineering and High Energy Physics candidates through attendance at various high-tech job fairs nationwide. Our efforts at recruiting qualified women and

minorities in these and other fields were enhanced by our continuing participation at job fairs and conferences aimed at women and minorities. This month, the laboratory received 1,371 resumes.

The joint URA/EG&G supervisory training program concluded Phase I with the presentation of a course on Employer/Employee Relations. Sixty-one managers and supervisors attended these sessions and feedback from attendees was universally positive. The next session will cover Sexual Harassment Awareness (given to all SSCL employees), continuing training in EEO/Affirmative Action, and other courses aimed at ongoing development of supervisory skills.

The response rate on the laboratory's first round of performance appraisals has been excellent. Managers responded well under very tight deadlines imposed and the Personnel Department has already received a large majority of the appraisals. Overall quality and content of the appraisals were good. The successful results of this process now paves the way for annual salary-setting which will begin on schedule in early August.

Activity in the Travel area has increased significantly this month with the addition of travel requests from new subcontractors to the laboratory. The recommendations of the Travel Task Force have been implemented, with revised forms and procedures in place. Other activity in this area involved ongoing negotiations with air carriers for better foreign travel rates and the final publication and distribution of the SSCL Travel Manual to all divisions.

Minority Affairs 4.3.7

The Office of Minority Affairs continues its active role as participant and guest spokesperson in performing the SSCL's outreach to the business, civic and other interested organizations.

The Director of Minority Affairs:

- Conducted numerous meetings with potential vendors and participated as a speaker at the SSC vendor seminar in Houston, TX.
- Participated as presenter at the TAMACC State Convention in Victoria, TX, the National Education Association in Kansas City, MO, the Minority Business Development Agency Regional Conference, and the Texoma Contract Procurement Center in Sherman, TX.
- Participated in the Advisory Council Meeting held by the Association of Women Entrepreneurs of Dallas, Inc.
- Conducted an interview by the Dallas Post Tribune.

The Manager of EEO/AA participated in the gathering and completion of information for the quarterly report which was forwarded to the Office of Federal Contract Compliance Program (OFCCP) on July 16. He also attended the NAACP Conference in Los Angeles, and the National Urban League Conference in New York.

The OFCCP requested adverse impact information for minorities and women categories and a response is now being prepared.

Several meetings were held with URA/EG&G personnel divisions to plan future EEO Awareness Training and to determine what requirements EG&G committed for future EEO compliance reviews.

The Manager of SADBUC continues to review the projected implementation of set-aside procurement operating procedures.

Based on discussions between the Deputy Director of Procurement, the Director of Minority Affairs and the SADBUC Manager, we have instituted a procedure whereby this office reviews all purchase requisitions with a value greater than \$25,000.

The SADBUC Manager met with the Deputy Director of Procurement, Director of Minority Affairs and Manager for Procurement Information Systems to resolve the Electronic Bid Board project issue. The project is not feasible at this time and we will proceed to implement an alternate plan for notifying DBE vendors on RFPs.

The SADBUC Manager:

- Attended the SSCL pre-proposal conference relating to the purchase of supplies, services, and prices for the Physics and Detector Simulation Facility (Phase I).
- Attended a Minority Business Development Agency regional conference activity.
- Attended and made presentations at the Texoma Contract Procurement Center in Sherman and in Tyler, TX for the Tyler Area Chamber of Commerce.

We are reviewing and commenting on the Small Business and Small Disadvantaged Business plan submitted by PB/MK. Our response is due August 10.

Project Technical Support 4.4

Technical Support Management 4.4.1

Staff Services

Central Files

Presentations were conducted to introduce, and train, administrative personnel to the requirements for document flow to central files. Categories of documents to be maintained in central files were identified. The list is not all inclusive and will be updated later.

Central Files Coding/Shelving Progress

Twenty five documents have been coded and shelved. The process is time consuming due to the requirement for secondary subject coding during the logging process but should speed up as we become more familiar with the procedure.

GSA/Lease Vehicles

A vehicle availability status board was developed.

Editing and development of the GSA/Lease vehicle policy and procedure manual continues, with a "working draft" published for use.

Emergency packets have been developed and installed in the commercially leased vehicles.

The FY91 order/letter request was presented to Purchasing on July 24 and we are awaiting DOE approval/coordination.

Mail Room

We studied a proposal for a new mail route system for the E-1 site.

Mail room expansion continues.

Facility Support

All inventory located at Hereford, Texas, was transferred to the DeSoto Parkerville Road Warehouse. We are now working with a Stone & Webster representative and the moving company to resolve damage claims.

The reconfiguration of the Physics, Project Management, Directorate, and Laboratory Technical Services (LTS) Division cubicles in Building 4 was finished.

We completed coordination of the DOE expansion at the bank building and coordinated placement of hard-office furniture and chairs into the new area of Building 2. We distributed a cover memo and policy for distribution of freestanding furniture.

Medical Office

Laboratory equipment was received for EG&G pre-employment physicals and Dr. Minton was on-site for three days for pre-employment physicals. Health records have been set up on all EG&G and URA employees.

EG&G pre-employment physicals are planned to be done on site beginning in August.

Security

The feasibility of placing a camera on Building 4 was studied and security requirements for the Magnet Division were reviewed.

The access control system was updated and a procedure for issuing vendor badges was implemented.

We meet with Fort Knox Security and SSCL Procurement for the monthly evaluation and reviewed the SOP draft.

A vehicle registration program has begun. A data base of SSCL employees' license plate numbers is being developed.

Technology Transfer Office

A 58-page technology transfer questionnaire from the General Accounting Office was completed and returned.

Copies of the federal laws, regulations, DOE orders, and executive orders pertaining to technology transfer were obtained, studied, and placed in a reference file.

Work continued on a "white paper" outlining the contributions to date of high energy physics, and the expected contributions of the SSC, to technology and the U.S. economy.

Several meetings were held with group leaders and other SSCL staff to identify ongoing or potential interactions with industry and state/local government bodies.

Facilities Engineering Services 4.4.2

During July an additional 61,140 square feet of interim space was added to the laboratory's inventory. Included were:

- 8,440 SF, Provident Bank Building - Office space occupied by the DOE.
- 12,700 SF, Stoneridge Building 2 - Approximately 9,450 square feet of office space for the General Computing, Management Information Systems (MIS), and Communications Groups of the LTS Division. The remaining 3,250 square feet is laboratory space for the Magnet Division.
- 40,000 SF, Parkerville Rd. - Warehouse space for the Materiel and Logistics Services Group of the LTS Division. The space was nearly full by the end of the month. The need for additional warehouse space will again be addressed the early part of August.

The laboratory's inventory of interim office, laboratory, shop, and warehouse space now totals 254,770 square feet.

The DOE approval of the lease for the parking lot west of Stoneridge Building 4 was received and a ground breaking ceremony was held on July 25. Construction is scheduled for completion August 30.

Conditional approval by the DOE of the lease for the 47,119 square feet in Stoneridge Building 3 was received the last week of July. Finish out construction is scheduled to begin August 2 with furniture installation scheduled for mid-September. The space is primarily programmed as office and laboratory space for the Physics Research Division.

Action continues or was initiated on several projects, including:

- Assist with the development of criteria for the MDL to be located on the permanent site.
- Continued finish out of the high bay area in Stoneridge Building 4 for Accelerator Division laboratories, including:
 - the construction of a small cooling tower building. Construction is scheduled to be completed August 29.

- a building to house a small welding shop. Bids are being solicited for construction to start early in August.

- development of specifications for a small raw material storage building. A purchase requisition will be forwarded to Procurement the first week in August.

- development of drawings and a cost estimate for upgrading the power to this area. The decision to proceed is expected early in August.

- Continued reconfiguration of system furniture to optimize space utilization.
- Developed specifications for portable modular offices for the warehousing and incoming inspection functions. We assisted Procurement in a search for minority vendors and solicitation of bids will be made in August.
- Development of criteria and specifications for additional finish out of 3,250 square feet of space in Stoneridge Building 2 for additional laboratory space for the Magnet Division.
- Evaluated existing improvements on the permanent site for possible retention.
- Completed a plan to provide temporary modular offices on the permanent site.
- Planning continues for providing for the operations and maintenance of facilities on the permanent site.
- Developing criteria for a computerized total facilities management system.
- Developing specifications and cost estimate for additional fencing to enclose the growing GSA vehicle fleet as well as the new parking lot west of Stoneridge Building 4.
- Developing criteria and cost estimate for installing an exit in the west wall of Stoneridge Building #4.

Warehouse 4.4.3

An additional 40,000 sq ft of warehouse space was leased on Parkerville Road in DeSoto, Texas in July, located approximately 4.5 miles from the SSC Campus. The warehouse is being used for bulk storage, such as furniture and magnet components. Fifteen truckloads of furniture from the abandoned Nuclear Waste Repository project near Hereford, Texas has been stored in the warehouse, using about 90% of available space. Plans are underway for additional warehouse space.

The 1990 property inventory has been completed. Over 95% of the property in each of several categories was located during the initial wall-to-wall inventory using the newly implemented bar code system and clean-up of shortage items is underway. Reporting to DOE will be in October, with an inventory cut-off date of August 31.

Video tapes of warehousing activities are being prepared for use in safety, quality assurance, and warehouse training programs. Distribution of the *Materiel Management Standards Manual* was made in July.

Fabrication Shops 4.4.4

Progress in July included the final specifications for the interim shops equipment. Purchase requisitions were prepared for submission to purchasing. The space lease has been signed and build out is scheduled to begin in early August.

We are revisiting the schedule for shops activation based on the accelerated schedule for the MDL and the MTL.

The addendums for the Shops Management Plan from each division are scheduled to be submitted in early August. These will give us further guidance in specifying our shops activities and capabilities.

General Computing 4.4.5

Staffs from the General Computing and Communications groups relocated to Building 2 in response to the tremendous growth in number of personnel being integrated into the laboratory. This move was accomplished with minimal disruption in service to users throughout the SSCL.

Computer Operations

Databases for hardware and software maintenance tracking have been developed for all supported systems including microsystems (MACs, PCs), VAXs, SUNs, Silicon Graphics, and assorted workstations. The data has been entered on all systems except the MACs (currently in progress).

VMS Systems

A Beta release of DEC's LANworks software has been installed for evaluation on SSCVX1 and several MAC workstations. The X-window client software on the MACs enables the MAC user to use X-Windows on any server while retaining use of the MAC software. The X applications is designed to increase user productivity on the VMS and UNIX systems. VMS MAIL is much easier to manage from the window environment. A full online VMS documentation set that is accessed only from an X-Window application, called Bookreader, is available. Other online documentation will be added as it becomes available.

A primary consideration for this tool is the intense learning curve for users and support personnel. The MAC software is not simple to install and the execution of the X-Window applications will need to be well documented before they can be implemented throughout the SSCL. The amount of memory needed to support X with good response is above the normal 5 MBs on the standard SSC MAC IICX configuration. The impact of added traffic on the LAN has not been evaluated.

VMS tuning efforts were continued on detached processes and batch queue parameters resulting in a lower overall page fault rate on both clusters. A new directory structure was created for the VAXes to simplify the storage of backup procedures, logfiles and listings. Digital Equipment Corporation provided a system patch for the VMS backup utility that included a bug-fix as well as significant performance benefits.

UNIX Systems

There were several problems associated with the installation of the new Silicon Graphics server in Physics Research. The new operating system release, V3.3, had a known bug--not identified in the

release notes--that kept it from reading backup tapes created by the previous release of the operating system. A patch created by SGI was networked to SSC and implemented. There were also hardware failures on the SCSI bus interface to the 8mm tape drive. Simultaneously, the SGI systems that was on loan to SSC also experienced hardware problems caused by incompatible rev levels on components and a faulty ethernet controller. The new release of the operating system does solve the NFS compatibility problem between the SGI and the IBM workstation.

Networking

A significant troubleshooting effort was undertaken to locate the source of an apparent network hardware failure. The symptoms were fatal to both VAXclusters and caused extensive error reports on the UNIX systems. The problem, which occurred three times in one week, resulted in several hours of downtime during prime work hours. An ethernet controller on SSCVX1 was replaced but did not improve the condition. Despite the use of borrowed network monitor, the cause of the failure was not determined. Recent information received from ESNET sources may indicate that the problem was caused by a change in the DECNET software for VMS 5.3 in preparation for DECNET Phase V in combination with the DEC LANworks software beta test. The investigation will continue in concert with DEC and local communications support.

SSC DECNET nodes were moved into a new DECNET area number. The changeover, which users were notified of in advance, required an unscheduled reboot of all VAXcluster nodes. The relatively few number of user phone calls can be attributed to the high level of TCP/IP usage in the SSC wide-area network.

Technical Support

The means of acquisition for the Relational Database Management System has been changed from a fully competitive procurement involving the issuance of an RFP to a desktop procurement. The new procurement method will be a GSA schedule buy using a limited competitive desktop evaluation as the basis for selection. This evaluation is complete and a clearance document has been prepared for submission to DOE for final approval.

As part of the long range MIS plan, the proposal for a formal project in the MIS area was presented to the laboratory Project Managers. Their concurrence was obtained and initial organization activities initiated.

Initial systems analysis is complete for the sub-contracts and commitments & accruals activities of the laboratory. A proposed conceptual design for revamping the standard purchasing/finance reporting functionality was reviewed. This design was tentatively accepted pending detailed cost and schedule estimates.

MIS Support

There were 55 active projects and tasks supported this month, of which 14 were completed. Five completions were internal MIS tasks which affects laboratory-wide projects and applications support. Nine completions were related to user specific requests; three of these were not originally initiated by a service request.

MIS administrative tasks included continued work on the change control policy and procedure and completion of employee performance appraisals.

The Powerhouse Production and Test Data Dictionaries are complete and are now in production. Seven programmers analysts have completed intermediate Powerhouse training and version 6.0 update training. Acquisition of the Powerhouse software is complete.

URA Finance found data errors in running month-end job summary reports. While it was a user error on the custom program, the Deltek code should have had error checking for valid data.

Deltek submitted an upgrade proposal to add five additional simultaneous users for EG&G and provide on-going support. Since this proposal was determined to not be cost-effective, MIS will provide assistance to set up Powerhouse reporting for EG&G. This should help reduce the number of simultaneous users who need to access Deltek for reporting.

MIS completed the batch file transfer process for Powerline. Powerline personnel fixed problems in their code. URA Finance is evaluating the impact of the changes and enhancements. They have approved the request for MIS support. The MIS portion was successfully cutover to production.

MIS analysts formed a committee composed of interested groups to begin defining document control needs and integration issues for laboratory-wide activities related to Engineering Configuration Management, Records Management, Document Control, and Technical Publications control.

ADP Planning, Standards and Procedures

Approval was received from DOE for the following acquisition proposals:

- Doc. No. 6235-L90-012: CAD System for Physics Research Division
- Doc. No. 6235-L90-013: CAD/CAE System for Conventional Construction Division
- Doc. No. 6235-L90-015: Relational Database Management System to support MIS for the SSCL

The following documents have been transmitted in final form to DOE for review:

- Doc. No. 6235-L90-016: Optical Disk System for Magnet Systems Division
- Doc. No. 6235-L90-017: EE Workstation for Accelerator Division
- Doc. No. 6235-L90-019: UNIX Server for SSCL Computer Operations
- Doc. No. 6235-L90-020: CAD Peripherals for LTS Division
- Doc. No. 6235-L90-021: Data Communications Network Expansion for the SSCL
- Doc. No. 6235-L90-023: Amendment to Plan #6235-L90-04 for Magnet Systems Division

Acquisition plans have been prepared in draft form for submission to Procurement:

- Doc. No. 6235-L90-024: Supercomputer for Accelerator Division
- Doc. No. 6235-L90-025: Cryogenic Simulation/Collider Ring Systems for Accelerator Division

Guidance and support was given to the Computer Acquisition Working Group who were tasked with preparing the RFP for the 500 MIPS Detector Simulation Facility. The RFP was issued on July 21 and a pre-bid conference is scheduled to be held for all interested offerers on August 3.

The call for input to the SSCL Strategic Plan, Long Range Plan and and FY91/92 Short Range Plan was issued to all divisions. At kick-off meeting instructions were distributed for preparation and submission of the data. These plans will detail all estimated hardware, software and services

requirements that exceed \$25K for the next two fiscal years. The plans from each division will be compiled into an overall Laboratory report which will be submitted to DOE by September 1 for their review and approval. It is intended that this plan will be in place for the new fiscal year and it should greatly reduce the approval turn around time compared the acquisition plan process presently in place.

The response for the laboratory's projected use in FY91 of the NERSC facilities is currently being coordinated. Present requirements indicate a request for computer time for the Accelerator and Physics Research Divisions. This outside computing resource is a vital element in augmenting the limited ADP resources of the SSCL.

User Services

In the User Support area, installation of Magnet Division QuickMail proceeded at a rate of 15 per month. QuickMail installations for Project Management and LTS divisions were completed.

Mac virus findings have decreased, but have not been completely eliminated

A special request to install four Mac IICx machines for the DOE SSC Project Office in Germantown, Maryland was met.

Membership in the recently established SSCL Mac User Group is increasing steadily; the result, in part, to response to the "Computing & Communications Corner" insert to the *SSC Bulletin*.

Design Support 4.4.6

Administration

The Laboratory Standards Committee is considering final revisions to part and document numbering standards which are still pending release for laboratory-wide use.

ADP requirements are being identified for input to the SSCL Strategic Plan and FY91/92 Short-Range Plan. Work also continues on the Project Design Support Management Plan.

CAE/CAD Operations and Support

In the search for a reliable color screen copier, problems were found with the Tektronix unit during evaluation so another device from Seiko is being evaluated. Additional magnetic disk capacity is on order for the Intergraph server to provide sufficient file storage for laboratory-wide Intergraph backups and file management. UNIX workstations for the system manager and database support person, which will facilitate CAD system operation and support activities, are expected in-house in August.

Preliminary ECAE/CAD system evaluations are complete and the committee is writing a system specification and justification documentation to begin competitive procurement of the initial system.

Technical Data Management and Reproduction

Evaluations of potential database management software systems continue. The Electronic Data Management System from Prime/Computervision Corporation was recently previewed. This is a new system and appears to contain most of the elements expected to be required in the system ultimately

acquired. Presentations of this type are being witnessed by representatives from Project Management, LTS and other divisions.

Vendor proposals to supply an engineering drawing reproduction system are being evaluated. Award of a contract is expected soon and the equipment should be installed by the end of September.

Communications 4.4.7

Networking and telephone services were installed in the expanded areas at the Provident Bank Building. This effort included establishing an Appletalk connection to TNRLC.

Two Appleshare file servers were installed to support the recruiting and library groups in the Stoneridge campus.

Preliminary evaluation of the means to provide communications to the planned E1 area has begun.

Engineering Support/Standards 4.4.8

Tasks Completed During June

The SSCL procedures for the Document Numbering System and the Part Numbering System were modified to clarify the intended methods of use.

The instructions for applying numbers to documents and parts were prepared in June; minor changes were made and the instructions have been given to the Project Management Office for comments.

The primary drafting manual *Modern Drafting Practices and Standards Manual* will be purchased from Genium Publishing Corporation. Twelve manuals ordered in July will be issued to the Engineering Design Support managers.

The appendix on letter heights and fonts was completed.

Procedures Completed and Submitted to Program Management for Review

The *Change Authorization* and *Engineering Change Notice Procedures* were submitted to Project Management.

Procedures in Process

The *Drawing Breakdown Structure* will establish the requirements for documentation that will provide a drawing breakdown structure for the collider, peripherals, and support equipment.

Other Tasks

- Continued efforts with General Computing and Design Services personnel on the Material Requirement Planning or Material Control System requirements.
- Attended several presentations on creating a total documentation control database system.

SSC Lab Directors Office 4.5

Thirteen Expressions of Interest (EOIs) in research at the SSCL were reviewed in detail by the PAC at a meeting in Snowmass, Colorado on July 14-20. The PAC's principal recommendation concerned large detectors aimed at high transverse momentum physics. The PAC recommended that the initial SSC program have two such detectors with complementary as well as overlapping strengths. One of these should have as broad a range of capabilities as possible and the other should complement it by emphasizing particular areas, for example, muon detection and calorimetry.

The PAC asked the laboratory to issue a general call for Letters of Intent (LOI) to propose such major detectors. The laboratory will issue such a call, and at the next meeting of the PAC on December 13-15, these LOIs will form the basis for the allocation of funds to support the preparation of complete technical proposals.

The committee also recommended that substantial funds be reserved for smaller experiments and unexpected opportunities. It argued that consideration of a collider experiment on B-physics should be deferred in view of the expected considerable evolution of this field during the next few years.

A member of the Directorate attended the first meeting of a group assembled by ER to provide technical input to a DOE safety order specific to accelerators. ER plans to write the order by early next year.

An Emergency Preparedness Plan was approved for implementation.

A brochure, entitled *Environment and the Superconducting Super Collider*, has been prepared in order to answer some of the most commonly asked questions about the safety of the SSC.

Physics Research 4.6

Library Services 4.6.1

The library has begun distributing a "preprints received" list electronically as well as in print. In July a total of 458 preprints were received and 10 new institutions started sending us their preprints. We have requested preprints from another 312 institutions world-wide and soon expect to have an extremely comprehensive current collection. We have been able to reduce the backlog of preprint processing.

The Records Manager provided records management training for more than 80 laboratory staff. She also participated in the setting up of central files, assisted with space planning, developed procedures and job descriptions, and a uniform record index system was set up for them to use. The first issue of the Lab Records Management Newsletter was sent out. We completed the preliminary indexing of 53 boxes of archival materials.

We have joined AMIGOS, a library consortium which provides access to national cataloging and interlibrary loan databases, and have been able to purchase library materials at a discount through them. We have also arranged access to the Research Libraries Information Network and to DIALOG, a vendor of over 250 online databases. Access to these online systems will now allow us to provide current information on topics or citations being researched.

The Library Manager and the Head of Technical Services examined the integrated library system being installed at FNAL Library. A partial shipment of shelving was received and installed. Our space problems are becoming critical and we will work on possible solutions next month.

Technical Information and Publications 4.6.2

Technical Information & Publications received a one year direct deal printing contract through the GPO, with A&E Products of Houston, Texas for the period July 1, 1990 to June 30, 1991.

The Manager of Technical Information & Publications met with UNICOR, Washington to discuss printing contracts and a visit was made to the UNICOR facility at Petersburg, VA with a DOE representative in attendance.

We continue to support the Visual Media Services group in preparing video tapes for Safety, Quality Assurance, BAR Coding, and a general introduction for new personnel working in Materials.

The SCDR and Executive Summary have been submitted for final publishing.

Experimental Facilities 4.6.3

The Resource Requirements report was completed and sent to Technical Publications for editing and reproduction. The report serves as a resource document for technical data on the detectors described in the EOIs. It was used as the technical basis for estimating the cost of detector conventional construction requirements. The report was also available to the Physics Advisory Committee for its deliberations at Snowmass.

Progress was made on completing the report of the Detector Safety Panel. A recruiting effort was started to find an appropriate person to head up a detector safety section.

The Experimental Facilities group continued to develop a magnet steel design for the SDC detector with assistance from RTK in Oakland, California.

Work continued on developing plans for the Liquid Argon Calorimeter laboratory. These plans are being developed in conjunction with an overall plan to provide for small laboratory space for detectors in the next few years. Work is also going on with regard to detector design for particle identification in test beams. This work is being done commensurate with the development and design of an SSC test beam area with the help of the Accelerator Division.

A program has begun to develop a design for providing utilities to the detectors. In particular, water and power distribution systems in the detector halls are being developed. Cryogenic systems for detectors are being designed based heavily on the SSC and injector cryo system designs. Another general utility that the laboratory will have to provide deals with detector gas systems, and a general system that will be applicable to all detectors is being developed.

Experimental Systems WBS 5.0

Experimental Systems R&D 5.1

Members of the Physics Research Division (F. Gilman, R. Stefanski and T. Dombeck) attended parts of the Snowmass particle physics meeting in Colorado and continued with the PAC meeting that followed on July 14-20. After deliberations, the PAC recommended that three of its members (J. Sandweiss, V. Luth and A. Smith) be observers at the next meeting of the International Detector R&D Committee where funding of the Subsystems R&D projects for FY91 will be reviewed. This meeting is scheduled for October 19-20 at the SSCL (immediately following the Detector R&D Symposium in Fort Worth, Texas). Augmenting the R&D Committee in this way will allow continuity between the review process of the proposed physics program being considered by the PAC, and the detector technologies that are being tested in the subsystems R&D program.

A meeting of the TNRLC R&D review committee, also held at Snowmass on July 21, was attended by F. Gilman and T. Dombeck. Draft documents of a "call for proposals," and guidelines for the preparation of proposals were discussed. It was recommended that the TNRLC should consider proposals requesting \$0.2M to \$2.0M per year, and extend the call for proposals to include foreign institutions from countries that make substantial contributions to the SSC. Also discussed was the "Request for Assistance" form specifying a detailed budget and the scope of work for the universities selected to receive Texas support this year in the subsystems R&D program. Presentations were made by proponents representing consortia of institutions from five potential proposals for future Texas funding.

In order to provide continuity in FY91 funding in the detector R&D program, the DOE/OSSC and the SSCL agreed to identify an amount of "bridging funds" that would be provided to universities and national laboratories in the first quarter that would allow projects begun in FY90 to continue. To implement this and to make recommendations for adequate levels of funding, a delegation of personnel from DOE/OSSC, DHEP, and the SSCL, visited BNL, Argonne National Laboratory (ANL), FNAL and LBL to review their progress to date in their respective R&D projects and review their funding request for FY91. The visits took place July 24-27, and a report recommending \$2.5M be distributed to the national laboratories for continuation of their R&D projects was prepared for DOE consideration.

Detectors 5.2

The SSC PAC met at Snowmass, Colorado on July 14-20 to consider the initial EOIs in research at the SSC.

Fourteen EOIs in research at the SSC were received by the laboratory in May and one was received later. One of the EOIs was merely an indication of the author's intention to submit a later proposal. The spokesman for another EOI indicated that he would later submit a request for R&D support under the SSC subsystems R&D program. Twelve EOIs were presented orally to the PAC at a public meeting held at the SSCL on June 7-8. The PAC appointed a subcommittee to study each EOI in detail and to communicate with the proponents in order to clarify possible misunderstandings. The PAC then prepared a list of questions for each EOI and these were sent to the proponents. The EOIs and the responses to questions were considered at the July meeting.

In its deliberations the PAC devoted its major efforts to the EOIs needing the longest lead times. Its report is thus dominated by discussion and analysis of those EOIs. Proponents of other EOIs, and scientists not yet involved in the SSC, should understand that this implies no lack of interest in smaller or more specialized experiments. It was the sense of the PAC, and it is the policy of the SSCL, that the entire community should be encouraged vigorously to become involved in the SSC program now, either by joining some of the coalescing large collaborations or by forming new collaborations in the future.

The PAC had strong and clear advice for the laboratory concerning the scope and content of the initial experimental program at the SSC:

“The committee feels that a healthy initial program requires two detectors with complementary as well as overlapping strengths that address the physics at high p_T . This is needed to provide for independent checks of results and for the competition and breadth that will ensure effective exploitation of the potential of the SSC. It is also important that as broad as possible a community of physicists has the opportunity to pursue research at the laboratory. These goals will be effectively served by having two distinct major detectors ready to do experiments at the turn-on of the accelerator. The laboratory should treat the two approved proposals as having equal importance and priority.

One of the detectors should have as broad a range of capabilities as possible. We recognize that such a detector inevitably cannot achieve the best levels of performance in all areas. Thus, we recommend that the other detector should have precise charged particle tracing in a magnetic field, charged lepton identification, flavor-tagging capabilities, and hermetic calorimetry. The more specialized detector should emphasize both robust muon detection and calorimetry.”

The PAC's principal recommendation concerned the high p_T detectors; it asked the SSCL to issue a general call for LOIs for major detectors that would fit within the framework of the two-detector program outlined above. The PAC sought to make it clear that it felt that any group should be welcome to submit such an LOI, whether or not it had participated in an EOI. These LOIs would form the basis for decisions at the next meeting of the PAC on December 13-15 that will address the allocation of support for the preparation of complete technical proposals. (In order to allow sufficient time for preparation of the LOIs, the committee has postponed its previously scheduled November meeting.) The PAC indicated that it will be especially concerned with the ability of the major collaborations to carry out the program envisioned in their proposals, particularly with regard to their technical strengths and experience.

Lab Operations Support WBS 6.0

Physics Program Support 6.1

Division Office 6.1.1

The Division Office supported physics staff and the Directorate in connection with the PAC meeting June 16-21, in Snowmass, Colorado. Copies of the Resource Requirements Report were finalized and made available to members of the PAC along with various documents including copies of the SCDR, Executive Summary, EOIs, PAC questions, and responses from proponents.

Cross-training continued among support staff to enhance technical and administrative skills, ensure consistent availability of necessary skills and provide a broader base of knowledge throughout the division office in anticipation of the rapid growth in Experimental Physics and Facilities planned for the remainder of the year.

Annual performance reviews were distributed to the group leaders and processed through the division office. Division office staff participated in various meetings with the Travel Department, Personnel, and representatives of all the divisions, regarding interfacing and simplification of travel procedures and/or forms; with Procurement and Personnel regarding Guest Scientist procedures and personnel policies; and various lab personnel regarding document and records management.

The June cost actuals from Deltek were distributed to the task managers including the outstanding purchase orders and requisitions being indicated for a closer review.

Preliminary budgeting and cost account planning for FY91 has begun. The baseline budgets presented in the June DOE review will be incorporated.

Theory 6.1.2

Discussions and communications continued with various theorists concerning long-term visits next year to the SSCL. It is hoped that several theorists will be in residence at any one time through the year, with many more coming to several workshops on special topics.

Experimental Physics and Facilities 6.1.3

Several new experimental physicists arrived this month. Preparations continued for the set up of laboratory and shop space for detector work by this fall. Work in calorimetry, electronics, and tracking is planned to have begun by that time.

Computing and Data Analysis 6.1.4

Physics Support

The Computer Acquisition Working Group support for the 500 MIP resource procurement project culminated with the mailing of the RFP to potential offerers on July 20. An initial Benchmark suite was given to interested vendors at the Pre-Bid Conference held at the laboratory on August 3. A

project management plan for the implementation of all physics software on the 500 MIP computer resource has been initiated. New versions of the PYTHIA and JETSET Physics Monte Carlo programs were installed and included in the 500 MIP benchmark.

Version 198 of the CERN Library was installed on the recently acquired IBM RISC System/6000, however, problems with the Silicon Graphics files server made installation of the library difficult. Version 1.32 of the code management software CMZ was installed on VAX/VMS, and will soon be installed on all UNIX platforms in use for physics software support (i.e., Apollo, Sun, DEC and IBM RISC/6000). A guide to accessing the CERN Program Library on the SSC Computer Facility is ready for distribution.

The recently delivered Apollo DN10000, which has performed flawlessly with its new operating system, will serve as a beta-test for the new compiler to be released by H-P/Apollo.

Support for graphics metafiles have been initiated. A newly created utility (FRMETA) to convert a GKS metafile into an output file for a specific workstation type was released for use on SSCVX1 and the command language definition file. GRAFPAK-CGM will be added to GRAFPAK-GKS.

Negotiations are being conducted with the technical library to have the computer science librarian work on a permanent basis with the main library while receiving input from the PSS group.

A script to package the benchmark suites into a UNIX tar file for consolidation with other tar files has been distributed to potential offerers wanting to bid on the 500 MIPS computer acquisition.

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE	SCHEDULE	COST	BCWS	BCWP	ACWP	VARIANCE	BAC	LRE	VARIANCE
1.0 TECHNICAL SYSTEMS	1,277	1,277	1,277	N/A	N/A	11,694	11,694	11,694	N/A	N/A	29,009	29,009	N/A
2.0 CONVENTIONAL CONSTRUCTION	1,706	1,706	1,706	N/A	N/A	13,822	13,822	13,822	N/A	N/A	18,779	18,779	N/A
3.0 PROJECT MGMT. & SUPPORT	338	338	338	N/A	N/A	5,227	5,227	5,227	N/A	N/A	8,646	8,646	N/A
4.0 R&D, PRE-OPS, ADMIN.& SUPPT	6,422	6,422	6,422	N/A	N/A	70,384	70,384	70,384	N/A	N/A	103,341	103,341	N/A
5.0 EXPERIMENTAL SYSTEMS	0	0	0	N/A	N/A	268	268	268	N/A	N/A	330	330	N/A
6.0 LAB OPERATIONS SUPPORT	408	408	408	N/A	N/A	4,776	4,776	4,776	N/A	N/A	7,392	7,392	N/A
TOTAL DIRECT COSTS	10,151	10,151	10,151	N/A	N/A	106,171	106,171	106,171	N/A	N/A	167,497	167,497	N/A
MANAGEMENT RESERVE											8,986	8,986	
TOTAL	10,151	10,151	10,151	N/A	N/A	106,171	106,171	106,171	N/A	N/A	176,483	176,483	N/A

**BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD						CUMULATIVE TO DATE						**FY90	
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
1.1.1 ACCEL. MGMT. & SUPPORT	3	3	3	N/A	N/A	208	208	208	N/A	N/A	2,400	2,400	N/A
1.1.2 LINAC	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
1.1.3 LEB	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
1.1.4 MEB	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
1.1.5 HEB	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
1.1.6 COLLIDER	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
1.1.7 TEST BEAMS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 1.1 ACCELERATOR SYSTEMS	3	3	3	N/A	N/A	208	208	208	N/A	N/A	2,400	2,400	N/A
1.2.1 MANAGEMENT & SUPPORT	215	215	215	N/A	N/A	2,945	2,945	2,945	N/A	N/A	8,982	8,982	N/A
1.2.2 HEB MAGNETS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
1.2.3 COLLIDER MAGNETS	1,059	1,059	1,059	N/A	N/A	8,541	8,541	8,541	N/A	N/A	17,627	17,627	N/A
1.2.4 MAGNET FAC EQUIP/TOOLING	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 1.2 MAGNET SYSTEMS	1,274	1,274	1,274	N/A	N/A	11,486	11,486	11,486	N/A	N/A	26,609	26,609	N/A
TOTAL 1.0 TECHNICAL SYSTEMS	1,277	1,277	1,277	N/A	N/A	11,694	11,694	11,694	N/A	N/A	29,009	29,009	N/A

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SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
2.1.1 SUPPORT FUNCTION	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.1.2 LINAC	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.1.3 LEB	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.1.4 MEB	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.1.5 HEB	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.1.6 COLLIDER	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.1.7 TEST BEAMS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 2.1 CONV. CONSTR. ACCEL	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.2.1 WN REGION	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.2.2 WS REGION	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.2.3 EN REGION	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.2.4 ES REGION	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.2.5 SUPPORT FUNCTIONS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 2.2 CONV. SYS., EXPERIMENT	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A

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SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LFE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
2.3.1 PRIMARY, OFFSITE	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.3.2 PRIMARY, ONSITE	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.3.3 SECONDARY	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 2.3 SITE&INFRASTRUCTURE	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.4.1 CENTRAL LAB/OFFICE AREA	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.4.2 MAGNET LABORATORY	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.4.3 ACCELERATOR FACILITIES	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.4.4 ENVIRONMENT HEALTH FACIL.	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 2.4 CAMPUS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
2.5.1 AE/CM	608	608	608	N/A	N/A	871	871	871	N/A	N/A	3,000	3,000	N/A
2.5.2 CCD MANAGEMENT	1,098	1,098	1,098	N/A	N/A	12,951	12,951	12,951	N/A	N/A	15,779	15,779	N/A
TOTAL 2.5 CONV. CONST. MGMT.	1,706	1,706	1,706	N/A	N/A	13,822	13,822	13,822	N/A	N/A	18,779	18,779	N/A
TOTAL 2.0 CONVENTIONAL CONST.	1,706	1,706	1,706	N/A	N/A	13,822	13,822	13,822	N/A	N/A	18,779	18,779	N/A

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SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD						CUMULATIVE TO DATE						**FY90	
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
3.1.1 PROJECT MGMT. OFFICE	90	90	90	N/A	N/A	1,155	1,155	1,155	N/A	N/A	1,478	1,478	N/A
3.1.2 PLANNING	34	34	34	N/A	N/A	977	977	977	N/A	N/A	1,750	1,750	N/A
3.1.3 PMRS	30	30	30	N/A	N/A	671	671	671	N/A	N/A	1,046	1,046	N/A
3.1.4 ENGINEERING STANDARDS	39	39	39	N/A	N/A	144	144	144	N/A	N/A	622	622	N/A
3.1.5 ENVIRONMENTAL AFFAIRS	47	47	47	N/A	N/A	819	819	819	N/A	N/A	1,250	1,250	N/A
3.1.6 OFFICE OF TECH. DIRECTOR	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 3.1 PROJECT MANAGEMENT	240	240	240	N/A	N/A	3,766	3,766	3,766	N/A	N/A	6,146	6,146	N/A
3.2 SYSTEMS ENGINEERING	98	98	98	N/A	N/A	1,461	1,461	1,461	N/A	N/A	2,500	2,500	N/A
TOTAL 3.0 PROJ. MGMT. & SUPPORT	338	338	338	N/A	N/A	5,227	5,227	5,227	N/A	N/A	8,646	8,646	N/A

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SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS														
REPORT PERIOD										FROM: 07-01-90			\$ IN 000'S	
										TO: 07-29-90				
WBS ITEM	CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE	
				SCHEDULE	COST				SCHEDULE	COST				
4.1 ACCELERATOR PRE-OPS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A	
4.2.1 ACCELERATOR R&D	1,675	1,675	1,675	N/A	N/A	15,492	15,492	15,492	N/A	N/A	25,893	25,893	N/A	
4.2.2 MAGNET R&D	2,868	2,868	2,868	N/A	N/A	29,729	29,729	29,729	N/A	N/A	43,111	43,111	N/A	
TOTAL 4.1/4.2 PRE-OPS/RES. & DEV	4,543	4,543	4,543	N/A	N/A	45,221	45,221	45,221	N/A	N/A	69,004	69,004	N/A	

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SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS												
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S
										TO: 07-29-90		
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90		
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE	BCWS	BCWP	ACWP	VARIANCE	BAC	LRE	VARIANCE	
				SCHEDULE COST				SCHEDULE COST				
4.3.1 ADMIN SERVICES MGMT.	236	236	236	N/A N/A	2,150	2,150	2,150	N/A N/A	2,946	2,946	N/A	
4.3.2 ACCTG. & FINANCE	106	106	106	N/A N/A	1,727	1,727	1,727	N/A N/A	1,972	1,972	N/A	
4.3.3 PROCUREMENT & CONT.	129	129	129	N/A N/A	2,182	2,182	2,182	N/A N/A	2,593	2,593	N/A	
4.3.4 TRAVEL SERVICES	11	11	11	N/A N/A	159	159	159	N/A N/A	209	209	N/A	
4.3.5 HUMAN SERVICES	126	126	126	N/A N/A	2,025	2,025	2,025	N/A N/A	2,073	2,073	N/A	
4.3.6 STAFF SUPPORT SERVICES	-15	-15	-15	N/A N/A	942	942	942	N/A N/A	1,012	1,012	N/A	
4.3.7 MINORITY AFFAIRS	24	24	24	N/A N/A	284	284	284	N/A N/A	456	456	N/A	
4.3.8 INTERNAL AUDIT	0	0	0	N/A N/A	0	0	0	N/A N/A	0	0	N/A	
TOTAL 4.3 LAB ADMN. & SUPPORT	610	610	610	N/A N/A	9,408	9,408	9,408	N/A N/A	11,200	11,200	N/A	
* adjustment due to surcharge offset from warehouse stores												

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
4.4.1	102	102	102	N/A	N/A	1,090	1,090	1,090	N/A	N/A	1,607	1,607	N/A
4.4.2	122	122	122	N/A	N/A	3,525	3,525	3,525	N/A	N/A	4,274	4,274	N/A
4.4.3	106	106	106	N/A	N/A	726	726	726	N/A	N/A	1,010	1,010	N/A
4.4.4	13	13	13	N/A	N/A	93	93	93	N/A	N/A	599	599	N/A
4.4.5	97	97	97	N/A	N/A	2,307	2,307	2,307	N/A	N/A	3,378	3,378	N/A
4.4.6	58	58	58	N/A	N/A	479	479	479	N/A	N/A	1,054	1,054	N/A
4.4.7	121	121	121	N/A	N/A	1,026	1,026	1,026	N/A	N/A	2,357	2,357	N/A
4.4.8	30	30	30	N/A	N/A	244	244	244	N/A	N/A	449	449	N/A
4.4.9	14	14	14	N/A	N/A	93	93	93	N/A	N/A	247	247	N/A
4.4.10	0	0	0	N/A	N/A	0	0	0	N/A	N/A	10	10	N/A
4.4.11	100	100	100	N/A	N/A	181	181	181	N/A	N/A	458	458	N/A
TOTAL 4.4 LAB TECH. SUPPORT	763	763	763	N/A	N/A	9,764	9,764	9,764	N/A	N/A	15,443	15,443	N/A

**BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BM WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S	
										TO: 07-29-90			
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
4.5.1 DIRECTORATE	64	64	64	N/A	N/A	948	948	948	N/A	N/A	1,210	1,210	N/A
4.5.2 EXTERNAL AFFAIRS	17	17	17	N/A	N/A	468	468	468	N/A	N/A	564	564	N/A
4.5.3 LEGAL SERVICES	39	39	39	N/A	N/A	304	304	304	N/A	N/A	349	349	N/A
4.5.4 RESEARCH & TECH. ASSMT.	0	0	0	N/A	N/A	1	1	1	N/A	N/A	0	0	N/A
4.5.5 USERS OFFICE	18	18	18	N/A	N/A	221	221	221	N/A	N/A	253	253	N/A
4.5.6 ENVIRON. HEALTH & SAFETY	27	27	27	N/A	N/A	424	424	424	N/A	N/A	502	502	N/A
4.5.7 PLANNING	13	13	13	N/A	N/A	271	271	271	N/A	N/A	343	343	N/A
4.5.8 INTERNAT'L. COORDINATION	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 4.5 LAB DIRECTORATE	178	178	178	N/A	N/A	2,637	2,637	2,637	N/A	N/A	3,222	3,222	N/A
4.6.1 LIBRARY SERVICES	112	112	112	N/A	N/A	762	762	762	N/A	N/A	1,218	1,218	N/A
4.6.2 TECH. INFO. & PUBLICATIONS	30	30	30	N/A	N/A	727	727	727	N/A	N/A	1,019	1,035	N/A
4.6.3 EXPER. FACILITIES ADMIN.	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 4.6 PHYSICS RESEARCH	142	142	142	N/A	N/A	1,489	1,489	1,489	N/A	N/A	2,237	2,237	N/A
4.7 PRIME CONTRACTORS FEES	186	186	186	N/A	N/A	1,865	1,865	1,865	N/A	N/A	2,235	2,235	N/A
TOTAL 4.0 R&D,PRE-OPS,ADMIN/SUP	6,422	6,422	6,422	N/A	N/A	70,384	70,384	70,384	N/A	N/A	103,341	103,341	N/A

**BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										\$ IN 000'S			
FROM: 07-01-90													
TO: 07-29-90													
CURRENT PERIOD						CUMULATIVE TO DATE					**FY90		
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
5.1.1 GENERIC R&D	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
5.1.2 MAJOR DETECT. & SUBSYST.	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
5.1.3 APPROVED EXPER. R&D	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 5.1 EXPER. SYST. R&D	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
5.2 DETECTORS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
5.3 EXPER. SYS. COMPUTERS	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	N/A
TOTAL 5.0 EXPERIMENTAL SYSTEMS	0	0	0	N/A	N/A	268	268	268	N/A	N/A	330	330	N/A

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COST PERFORMANCE REPORT - BY WBS												
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S
										TO: 07-29-90		
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90		
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE	BCWS	BCWP	ACWP	VARIANCE	BAC	LRE	VARIANCE	
				SCHEDULE COST				SCHEDULE COST				
6.1.1 PHYSICS ADMIN/SUPPORT	66	66	66	N/A N/A	626	626	626	N/A N/A	857	857	N/A	
6.1.2 PHYSICS THEORY	14	14	14	N/A N/A	42	42	42	N/A N/A	356	356	N/A	
6.1.3 EXPER. PHYSICS	104	104	104	N/A N/A	1,929	1,929	1,929	N/A N/A	2,983	2,983	N/A	
6.1.4 COMPUTING & DATA ANALYSIS	224	224	224	N/A N/A	2,179	2,179	2,179	N/A N/A	3,196	3,196	N/A	
6.1.5 ACCELERATOR PHYSICS	0	0	0	N/A N/A	0	0	0	N/A N/A	0	0	N/A	
TOTAL 6.1 PHYSICS PROG. SUPPORT	408	408	408	N/A N/A	4,776	4,776	4,776	N/A N/A	7,392	7,392	N/A	
6.2 LAB OPERATIONS OVERHEAD	0	0	0	N/A N/A	0	0	0	N/A N/A	0	0	N/A	
6.3 ACCELERATOR OPERATIONS	0	0	0	N/A N/A	0	0	0	N/A N/A	0	0	N/A	
TOTAL 6.0 LAB OPS. SUPPORT	408	408	408	N/A N/A	4,776	4,776	4,776	N/A N/A	7,392	7,392	N/A	

**BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT 2 (BY OBS)

COST PERFORMANCE REPORT - BY OBS															
REPORT PERIOD											FROM: 07-01-90				
											TO: 07-29-90				
CURRENT PERIOD all funds						CUMULATIVE TO DATE OPERATING					CUMULATIVE TO DATE EQUIPMENT				
OBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE	
				SCHEDULE	COST				SCHEDULE	COST				SCHEDULE	COST
D - DIRECTORATE	364	364	364	N/A	N/A	0	0	0	N/A	N/A	60	60	60	N/A	N/A
B - PROJECT MANAGEMENT	339	339	339	N/A	N/A	0	0	0	N/A	N/A	0	0	0	N/A	N/A
A - ACCELERATOR SYSTEMS	1,680	1,680	1,680	N/A	N/A	13,848	13,848	13,848	N/A	N/A	1,646	1,646	1,646	N/A	N/A
C - CONVENTIONAL CONSTRUCTION	1,706	1,706	1,706	N/A	N/A	415	415	415	N/A	N/A	0	0	0	N/A	N/A
T - TECHNICAL SERVICES	763	763	763	N/A	N/A	0	0	0	N/A	N/A	2,652	2,652	2,652	N/A	N/A
G - ADMINISTRATIVE SERVICES	612	612	612	N/A	N/A	0	0	0	N/A	N/A	331	331	331	N/A	N/A
P - PHYSICS RESEARCH	547	547	547	N/A	N/A	5,088	5,088	5,088	N/A	N/A	1,445	1,445	1,445	N/A	N/A
M - MAGNET SYSTEMS	4,140	4,140	4,140	N/A	N/A	15,524	15,524	15,524	N/A	N/A	765	765	765	N/A	N/A
TOTAL SSC LABORATORY	10,151	10,151	10,151	N/A	N/A	34,875	34,875	34,875	N/A	N/A	6,899	6,899	6,899	N/A	N/A

SSC LABORATORY - CONTRACT #DEACO289ER40486 - FORMAT 2 (BY OBS)

								\$ IN 000'S	
CUMULATIVE TO DATE CONSTRUCTION					TOTAL	**FY90			
BCWS	BCWP	ACWP	VARIANCE		COSTS	BAC	LRE	VARIANCE	
			SCHEDULE	COST					
4,443	4,443	4,443	N/A	N/A	4,503	5,457			
5,226	5,226	5,226	N/A	N/A	5,226	8,646			
208	208	208	N/A	N/A	15,702	28,293			
13,406	13,406	13,406	N/A	N/A	13,821	18,779			
7,112	7,112	7,112	N/A	N/A	9,764	15,443			
9,073	9,073	9,073	N/A	N/A	9,404	11,200			
0	0	0	N/A	N/A	6,533	9,958			
24,929	24,929	24,929	N/A	N/A	41,218	69,721			
64,397	64,397	64,397	N/A	N/A	106,171	167,497			

**BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

MAJOR SUBCONTRACTORS												
REPORT PERIOD										FROM: 07-01-90		\$ IN 000'S
										TO: 07-29-90		
CURRENT PERIOD						CUMULATIVE TO DATE				FY 90		
	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE	BAC	LRE	VARIANCE
			SCHEDULE	COST					SCHEDULE	COST		
CONTRACT												
BROOKHAVEN LAB - MAGNETS	1,594	1,594	1,594	N/A	N/A	14,456	14,456	14,456	N/A	N/A	19,956	
FERMILAB - MAGNETS	899	899	899	N/A	N/A	12,289	12,289	12,289	N/A	N/A	18,256	
LBL - MAGNETS	374	374	374	N/A	N/A	3,962	3,962	3,962	N/A	N/A	4,900	
LOCKHEED	100	100	100	N/A	N/A	1,310	1,310	1,310	N/A	N/A	2,370	
RTK	600	600	600	N/A	N/A	10,726	10,726	10,726	N/A	N/A	13,151	
HARC/TAC	175	175	175	N/A	N/A	2,232	2,232	2,232	N/A	N/A	2,777	
AE/CM	608	608	608	N/A	N/A	871	871	871	N/A	N/A	3,000	
SUBTOTAL	3,742	3,742	3,742	N/A	N/A	44,975	44,975	44,975	N/A	N/A	61,410	
SSCL/OTHER	9,092	9,092	9,092	N/A	N/A	50,771	50,771	50,771	N/A	N/A	115,073	
TOTAL	12,834	12,834	12,834	N/A	N/A	95,746	95,746	95,746	N/A	N/A	176,483	

**BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

Report of a Management Condition Yellow

Our analysis of year to date costs and projections of costs and commitments for the CCD revealed a fiscal year-end cost variance of about \$1.4 million.

The Project Management Office is working with the A-E/CM and CCD to examine this variance and we will take all appropriate action. There are adequate management reserves to cover the variance.

A report on our findings will be provided with next month's report.

SSC PROJECT

STARTUP (NEAR TERM) MILESTONES

<u>MIL NO.</u>	<u>WBS NO.</u>	<u>MILESTONE DESCRIPTION</u>	<u>COMPLETION DATE</u>			<u>COMMENTS</u>
			<u>ORIGINAL PLAN</u>	<u>CURRENT PLAN</u>	<u>ACTUAL</u>	
1	2.0	AE/CM Criteria	3/89		4/89	
2	2.0	Start Geotech	5/89		6/89	First Phase Complete
3	3.0	SE/I RFP Issued	6/89		6/89	
4	2.0	Footprint Fixed	8/89		8/89	
5	3.0	SE/I Contract Award	8/89		10/89	
6	3.0	First Draft PMP Issued To DOE	8/89		8/89	Subject of Semi Annual Review
7	4.0	DOE Approval To Proceed With In-House Design For Early Critical A-E/CM Activities	8/89		8/89	Official 10/2
8	2.0	Land Acquisition Footprint Specification Documentation Complete	8/89		9/89	
9	1.0	MIP RFP	9/89		5/90	Draft
10	3.3	Key Finance Staff Hired	9/89		9/89	
11	2.0	First Tunnel Section Location Set	9/89		9/89	
12	1.0	Tunnel Cross Section Defined	9/89		10/89	
13	3.0	First DOE Semi Annual Review	9/89		9/89	

SSC PROJECT

STARTUP (NEAR TERM) MILESTONES

<u>MIL NO.</u>	<u>WBS NO.</u>	<u>MILESTONE DESCRIPTION</u>	<u>COMPLETION DATE</u>			<u>COMMENTS</u>
			<u>ORIGINAL PLAN</u>	<u>CURRENT PLAN</u>	<u>ACTUAL</u>	
14	3.3	SSCL Accounting System In WBS Format Shown in August Monthly Report	9/89		11/89	In October Report
15	3.3	Deltek Accounting System Operational	9/89		9/89	October 1 Initialization
16	3.3	Key Procurement Staff Hired	9/89		9/89	All Key Positions Filled
17	3.3	Procurement Policies Procedures Manual Complete and Issued	9/89		9/89	Submitted To DOE-CH For Review And Approval
18	3.3	Deltek Purchasing Module Operational	9/89		9/89	
19	3.4	SSCL Vax Delivered	9/89		10/89	
20	3.1	PMRS Software Installed and Tested	9/89		9/89	
21	3.1	Eng. Mgmt. System Plan - Final Draft Issued	9/89		4/90	
22	2.0	First SEIS Draft Issued	10/89		10/89	
23	2.0	AE/CM Contract	10/89		5/90	
24	3.1	PMRS Implementation Complete	10/89		10/89	Software Implementation
25	3.4	MIS Hardware Operational	10/89		10/89	
26	3.1	Config. Mgmt. Plan Complete	10/89		1/90	
27	3.4	Draft Document Control Plan Issued	10/89		10/89	

SSC PROJECT

STARTUP (NEAR TERM) MILESTONES

<u>MIL NO.</u>	<u>WBS NO.</u>	<u>MILESTONE DESCRIPTION</u>	<u>COMPLETION DATE</u>			<u>COMMENTS</u>
			<u>ORIGINAL PLAN</u>	<u>CURRENT PLAN</u>	<u>ACTUAL</u>	
28	2.6	AE/CM-SSC Performance Objectives & Syst. Requirements Revisions Complete	10/89		5/90	Draft
29	3.0	Issue First Funding Directive	10/89		10/89	
30	3.0	First C/SCS Report Test	10/89		11/89	October Data
31	1.0	Collider Dipole Criteria Established	10/89		4/90	
32	3.0	Initial Baseline Issued	11/89		5/90	
33	3.1	First Monthly Report With Automated PMRS	11/89		11/89	Test CPR
34	3.1	Baseline Cost Estimate Complete	11/89		1/90	
35	3.2	SEMP Approved and Issued	11/89		2/90	
36	3.1	PMP - Final Draft Issued	11/89	8/90		
37	3.1	Key QA Staff Hired	11/89		1/90	
38	3.5	ES&H Management Plan	11/89	8/90		
39	3.5	ES&H Final Draft Issued	11/89	8/90		
40	3.1	SSC WBS/WBS Dictionary Complete and Issued	11/89		5/90	
41	1.0	Prototype Dipole Specification Complete	11/89		3/90	
42	1.0	Magnet Criteria Complete	11/89		3/90	

SSC PROJECT

STARTUP (NEAR TERM) MILESTONES

<u>MIL NO.</u>	<u>WBS NO.</u>	<u>MILESTONE DESCRIPTION</u>	<u>COMPLETION DATE</u>			<u>COMMENTS</u>
			<u>ORIGINAL PLAN</u>	<u>CURRENT PLAN</u>	<u>ACTUAL</u>	
43	3.3	Deltex Procurement Interface Pgrm Imp	12/89		2/90	
44	3.1	Configuration Mgmt Policy Statement Issued	12/89		2/90	
45	3.4	Document Control Policy Statement Issued	12/89		1/90	
46	2.6	CCD-Procedures Manual Second Draft Issued	12/89		3/90	
47	3.0	Supplemental Site Specific CDR Issued	12/89		12/89	
48	3.0	Start Baseline Validation	1/90		1/90	
49	3.1	QA Policies and Procedures Complete	1/90		5/90	Draft
50	3.1	QA Data Base Requirements Document Issued	1/90		5/90	
51	2.1	AE/CM-Complete Near Term Work Auth Packages	1/90		5/90	
52	4.0	First Land Tract Available	1/90		7/90	
53	1.0	Award Magnet Prototype Contract	1/90	10/90		
54	2.0	Award MTL/MDL Fac Cold Test Fabrication Contract	1/90	9/90		
55	3.3	Final AAAP Approved and Issued	2/90	8/90		
56	3.1	DOE/CSCSC Readiness Review	2/90	2/91		Determined by DOE

SSC PROJECT

STARTUP (NEAR TERM) MILESTONES

<u>MIL NO.</u>	<u>WBS NO.</u>	<u>MILESTONE DESCRIPTION</u>	<u>COMPLETION DATE</u>			<u>COMMENTS</u>
			<u>ORIGINAL PLAN</u>	<u>CURRENT PLAN</u>	<u>ACTUAL</u>	
57	3.1	PMP Approved and Issued	2/90	8/90		
58	2.6	CCD-Procedures Manual Issued	2/90		5/90	Preliminary
59	3.0	Baseline Validation Complete	2/90	8/90		
60	4.0	Supplemental Environmental Impact Statement Issued	2/90	11/90		
61	2.0	A-E/CM On Board	2/90		6/90	

SSCL - MASTER MILESTONE STATUS REPORT

As Of: August 17, 1990

NO.	MIL LEVEL	WBS NO.	TITLE		* BASELINE PLAN	CURRENT PLAN	ACTUAL
M1-1	1	3.1.1	PM	First DOE Semiannual Review	Sep-89		Sep-89
M1-2	1	1.1.6	Collider System	Start Design	Feb-90		Feb-90
M1-3	1	3.1.1	PM	Start Construction Project	Oct-89		Oct-89
M1-4	1	1.1	Injection System	Start Design	Mar-90		Jun-90
M1-5	1	3.1.1	PM	SCDR Issued	Dec-89		Dec-89
M1-6	1	3.0	Footprint	DOE Approval	Feb-90		Mar-90
M1-7	1	3.1.1	PM	Baseline Validation Complete	May-90	Aug-90	
M1-8	1	3.1.1	PM	PMP Approved By DOE	Apr-90	Aug-90	
M1-9	1	3.0	AE/CM	Award of Contract	Jun-90		May-90
M1-10	1	3.0	SEIS	Record of Decision	Sep-90	Nov-90	
M1-11	1	2.4	Collider Ring	Start First Tunnel Construction	Oct-90	Dec-90	
M1-12	1	2.2	Campus Structures	Complete	May-94		
M1-14	1	1.1.6	Collider System	Complete Design	Oct-96		
M1-15	1	2.4	Collider Ring	Complete Conventional Construction	Oct-96		
M1-16	1	1.1	Injection Systems Operational		Sep-97		
M1-17	1	1.0	Collider System	Complete Acceptance Tests	Sep-98		
M1-18	1	1.0	SSC Operational		Sep-98		

* BASELINE VALIDATION SCHEDULED FOR COMPLETION JULY, 1990.

MEETINGS/CRITICAL EVENTS

<u>Date</u>	<u>Meeting Subject</u>	<u>Participants</u>	<u>Location</u>
Oct 16-18	R&D Symposium	350	Fort Worth, TX
Oct 19-20	R&D Committee	30	SSCL
Nov 30 - Dec 1	Machine Advisory Committee	25-30	SSCL
Dec 13-15	Program Advisory Committee	30	SSCL
Dec 14-15	Scientific Policy Committee	25	SSCL