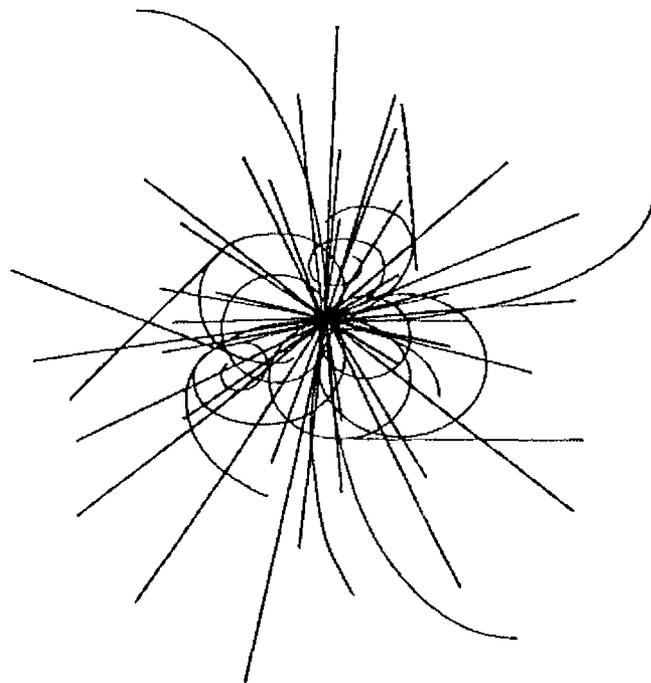


**SSC PROJECT**  
**MONTHLY PROGRESS**  
**REPORT**  
**JUNE 1990**



**SSC**

---

**LABORATORY**

# Table of Contents

Section	Page
Executive Summary .....	1
Technical Systems WBS 1.0.....	2
Accelerator Systems 1.1.....	2
Magnet Systems 1.2.....	2
Management and Support 1.2.1.....	2
HEB Magnets 1.2.2 .....	2
Collider Magnets 1.2.3 .....	2
Magnet Facilities Equipment and Tooling 1.2.4.....	11
Conventional Construction WBS 2.0 .....	13
Division Management & Administration 2.5.2.1.....	13
Major Studies 2.5.2.2.....	13
Design Criteria 2.5.2.3 .....	13
Configuration Mgmt & Interface Control 2.5.2.6.....	14
Geotechnical Program 2.5.2.8 .....	14
A-E/CM Selection & Contract Administration Support 2.5.2.10.....	15
SEIS Support 2.5.2.12.....	15
Project Management and Support WBS 3.0.....	16
Project Management 3.1 .....	16
Project Management Office 3.1.1 .....	16
Project Planning 3.1.2.....	16
Project Management and Reporting Systems 3.1.3.....	16
Engineering Standards 3.1.4.....	17
Environmental Affairs 3.1.5.....	17
Systems Engineering and Integration 3.2.....	17
Systems Engineering Management 3.2.1.....	17
SE Support to ASD 3.2.2 .....	18
SE Support to MSD 3.2.3 .....	18
SE Support to Physics 3.2.4 .....	18
R&D, Pre-Operations, & Administration & Support WBS 4.0.....	19
Research and Development 4.2.....	19
Accelerator R&D 4.2.1.....	19
Management Services 4.2.1.1 .....	19

LINAC 4.2.1.2 .....	19
LEB 4.2.1.3.....	19
MEB 4.2.1.4 .....	20
HEB 4.2.1.5 .....	20
Collider 4.2.1.6 .....	20
Magnet R&D 4.2.2.....	21
Fermilab 4.2.2.1 .....	21
Berkeley Lab 4.2.2.2.....	23
Superconducting Cable R&D 4.2.2.3.....	25
Brookhaven Lab 4.2.2.4.....	25
Project Administration and Support 4.3 .....	28
Administration Systems and Support 4.3.1 .....	28
Finance 4.3.2.....	28
Procurement 4.3.3 .....	29
Personnel 4.3.5 .....	30
Minority Affairs 4.3.7 .....	31
Project Technical Support 4.4 .....	32
Technical Support Management 4.4.1 .....	32
Facilities Engineering Services 4.4.2.....	34
Warehouse 4.4.3 .....	35
Fabrication Shops 4.4.4.....	36
General Computing 4.4.5.....	36
Design Support 4.4.6.....	38
Communications 4.4.7 .....	39
Engineering Support/Standards 4.4.8 .....	40
Metrology Labs 4.4.9.....	41
SSC Lab Directors Office 4.5 .....	42
Physics Research 4.6.....	42
Library Services 4.6.1 .....	42
Technical Information and Publications 4.6.2.....	42
Experimental Facilities 4.6.3 .....	43
Experimental Systems WBS 5.0.....	45
Experimental Systems R&D 5.1.....	45
Detectors 5.2.....	45
Lab Operations Support WBS 6.0.....	46
Physics Program Support 6.1.....	46

Division Office 6.1.1.....	46
Theory 6.1.2.....	46
Experimental Physics and Facilities 6.1.3.....	46
Computing and Data Analysis 6.1.4.....	46
Cost/Schedule Data.....	49
Milestone Status Reports.....	62
Meetings and Events.....	68

## Executive Summary

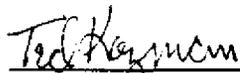
There were no tests of magnets at Fermilab in June because the SSC long magnet test program has been preempted by tests of low beta quadrupole magnets for the Tevatron. The low beta tests will continue until October, leaving a significant gap in the SSC's program.

We continue to refine the requirements for both surface and underground structures for the Prototype Installation Facility and the Accelerator Systems String Test Facility.

Major efforts in all Divisions were devoted to preparation for and participation in the Baseline Validation Review conducted by DOE on June 25-29.

Twelve Expressions of Interest (EOI) for research at the SSC were presented to the Program Advisory Committee (PAC) on June 7-8. The PAC sent questions to the spokesmen and the EOIs will be reviewed in more detail during the July meeting in Snowmass, CO.

As of June 30, the Laboratory had a total of 702 employees.



---

Ted Kozman  
Deputy Project Manager  
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**

The industry briefing for the Collider Dipole Magnet Draft RFP was held on June 8. Forty-five industry personnel from 18 industrial firms attended this briefing.

Industry, DOE and SSCL Project Management comments were incorporated into the RFP which was submitted on June 22 to the local DOE Project Manager for review and approval.

The integrated Magnet Product Acquisition Plan was submitted to local DOE Project Manager on June 26 for comments and approval.

Considerable effort was devoted to the preparation and dry-run of program status presentations in support of the DOE review held on June 25-29. Approximately 150 MSD personnel were involved in presentations and/or attending presentations. Subsequently, DOE comments were reviewed and clarifications provided where necessary.

Engineering supported the Magnet Systems Integration Meeting (MSIM) held at FNAL and action items generated during the MISIM are presently in work.

#### **HEB Magnets 1.2.2**

The primary activities in the HEB program revolved around preparation for the DOE review and the change to a 50mm dipole magnet. Based on this change the HEB program concentrated on the issues surrounding the concept of using the collider dipole as the HEB design. Work has progressed in thermal modeling; and, as a result, the beam tube requirements have been established based on the 50mm design. Mechanical reviews have been started to look at the effects of the 27.6mm of sagitta. The program will focus on testing that can be done using standard collider dipoles to answer questions such as the effects of bipolar operation.

#### **Collider Magnets 1.2.3**

##### ***Test***

There were no tests of magnets at Fermilab during June as the SSC long magnet test program has been pre-empted by tests of 'low beta' quadrupole magnets for the Tevatron. The low beta quadrupole tests have been scheduled by FNAL to continue until October, leaving a significant gap in the SSC program.

At BNL, tests of the 'cross flow' cooling scheme were made with magnet DD0020. Heater wires were mounted inside the bore tube and thermometers were mounted on the outside of the tube at five

locations along the length of the magnet. The heaters were powered at 20, 30, and 40 Watt levels to study the temperature rise and distribution along the magnet length. (The synchrotron radiation during collider operation will result in a heat load of about 2-3W/magnet; the higher powers used here are to ensure that the temperature rises can be reliably measured.)

The observed temperature rises were in good agreement with calculations: at 20W, the measured average rise was 57mK while the calculated value was 44mK. The worst case peak in temperature along the magnet length (perhaps due to a local 'hotspot' created by the heater wire contacting the bore tube) was about 200mK. Even in the worst case, the temperature rise scales to only 20mK which is well below the specification of 50mK.

While the temperature studies are very encouraging, further analysis of the 'cross flow' cooling scheme is continuing: studies of the pressure rise during quenching of a single magnet and of a string of magnets are needed.

Analysis of the quench-start location in full-length collider dipole magnet DD0027 continued. In its first test cycle, which started with conditioning at 3.5K to 6800A, the first two quenches (6817 and 6812A) originated in the pole turn of the upper inner coil, at about 11 meters from the feed end of the magnet. The fourth quench (6856A), originated in the return end section of the lower inner pole turn. The plateau quenches (6890A) originated in the feed end section of the lower inner coil pole turn, near the 'ramp-splice', where the inner and outer coils are joined.

During the second test period (following a thermal cycle), magnet DD0027 was quench tested at 4.35K without prior conditioning. The magnet exhibited significant training behavior, reaching a plateau on the sixth quench. The first three quenches (respectively, 6223, 6532, and 6448A) originated in the return end section of the lower inner coil pole turn. The next two quenches (6649 and 6386A) originated in the outer coil layer. The plateau quenches oscillated between the return end location and the 'ramp splice' location (probably depending on slight temperature differences between the feed and return ends of the magnet). It is worth noting that on this magnet, the inner coil strain gauges nearest the return end show unloading for currents greater than 5500A, while those in a collar pack nearer the feed end appear to be unloaded at currents greater than 6300A. However, the outer coil strain gauges did not exhibit unloading.

A new VAX account was created for the newly renamed MAGLIB subroutines to allow an easy access for all users. MAGLIB (formerly named DATALIB) is an object module library of routines useful for magnet calculations including materials properties and magnet characteristics such as predicted short sample currents and MITTs versus temperature calculations. The INTERFACE program (currently run with @user4:[MAGLIB.COM]INTERF.COM) was modified to run from any VAX account regardless of its privilege relationship to MAGLIB. Two new routines were added: VELO, for calculating the adiabatic propagation velocity of the normal zone, and AKAPTON\_LA, for calculating the thermal conductivity of Kapton H-film versus temperature. A detailed writeup of MAGLIB and its usage is given in MD-TA-157.

Development work for MTL instrumentation continues: the MassComp computer has been installed and put on the Ethernet. With assistance from Accelerator Systems Controls Group, the drivers for VME are now being installed. Additional lab signal synthesis equipment has been ordered. Requests for quotation for the voltage tap isolation amplifiers have been sent to Southwest Research Institute and Lars for review.

To better coordinate all aspects of the design and construction of the MTL, Mark Coles has been designated as the MTL Project Leader.

J. Tompkins spent a week at DESY examining the HERA cold test facility and discussing aspects of its layout, operation, and details of its instrumentation with members of the DESY staff. Dr. Rainer Meinke, head of the cold measurement facility, was extremely helpful in providing information as well as arranging meetings with the appropriate people. We are continuing these contacts and expect further cooperation with DESY in the development of our test facility.

A major reconfiguration and file clean-up on the Sun workstations has been undertaken and the latest version of the operating system, SunOS 4.1, has been installed. Version 4.1 differs from the old version in many subtle (and not so subtle) ways and has had a significant impact on the operation of our system: some software (including Sun products) is not yet compatible with version 4.1, causing a great deal of inconvenience. The official release of SyBase v4.0 has been installed (replacing our 'beta' test version). Specifically:

- SYBASE is installed and the databases are restored. Accounts have been reinstated but many need to be cleaned up.
- DNI is installed and working.
- Fortran v1.2 has been installed on our server, grumpy. Mail on grumpy and its clients has been configured so that users have one Email mailbox. The msgs utility has been installed to handle system messages.
- VTtool has been installed as a replacement for TE100 (Sun product), which doesn't work under v4.1. This is a vt-100 emulator for Sunview. GnuEmacs is installed. All clients are running V4.1 and the V4.1 documentation has arrived.

Work with the database, following reconfiguration of the system, included tests of access from the local Sybase 'Data Work Bench' to remote Sybase servers at the SSCL Accelerator Systems Division and at the Fermilab Magnet Test Facility. Users on our system are able to browse through databases on the other systems using the full interface capabilities of the 'Data Work Bench'. This is a first step towards a distributed database system.

A summary table of warm and cold measurements of geometric multipole coefficients from BNL short magnets has been added to the MagCom database.

## *QA*

The QA Group has staffed six out of seven SSCL support positions for the industrialization effort at Fermilab. A candidate for the single support position at Lawrence Berkeley Laboratory has been identified through recruiting efforts at LBL; however, the candidate must still be approved through the SSCL hiring process. Positions have been offered and accepted for MSD Safety Engineer and QA Group Inspection, Test and Safety Section Leader. Authorization was given to advance the hiring date of the QC Field Section Leader position to this fiscal year.

Floorplans for the QA area (Metrology Laboratory) in the MDL has been completed and passed to production for implementation in construction. Preliminary work on layout of the MAAS has begun.

Various procedures are under development: QA Audit and Performance Rating System; Inspection Planning; Source Inspection; Receipt Inspection; User Inspection; In-Process Inspection; Inspection, Test and Operating Status; Inspection Stamp Control; Control of Non-conforming Items; Use of

Discrepancy Reports; and Corrective Action Procedures. Most are in a very advanced form and undergoing second draft or final review. Most will have to be integrated into lab-wide service organizations currently under parallel development.

A listing of inspection, test and acceptance checks for the collider dipole magnet has been sent to several people for comment. This includes 95 electrical, 38 mechanical and twelve optical checks. The intent of this listing is that it would be made available to other labs and industry as a resource in the development of travellers.

Work has begun on specifications for cold mass skin welding process and welder qualifications for use by Fermilab.

We witnessed and accepted a weight test of a strongback which was commercially manufactured for the Production Group. Three support configurations were demonstrated. A safety review was conducted on the Magnet Evaluation Workshop. Another (follow-up) review was conducted on the MSD Metallurgical Laboratory and the first division-wide safety walk through was also conducted.

One waiver request was processed by QA Group in June. The request to not perform the final anneal on superconducting wire was granted, with the stipulation that other acceptance criteria still be met.

### ***Engineering***

Formal design reviews have been scheduled for the FNAL 50mm Short Magnet on July 12 and the FNAL 50mm Long Magnet on August 19-20. The Short Magnet review will be held at the SSCL and the Long Magnet review will be held at FNAL. Similar reviews are being planned for the BNL and LBL programs.

### **Magnetic Cold Mass Design and Analysis**

Eddy current and pressure forces during a magnet quench have been calculated for the beam tube and these appear to be acceptable for the present design of the beam tube.

Minco heaters are being evaluated for magnet quench heaters. They will be tested for insulation and resistance value under compression conditions at BNL.

Work is underway to link the end turn design on the code BEND to 3D TOSCA finite element runs and an analytical code being developed in house.

### **Mechanical Design and Analysis**

Initial test calculations run on ANSYS 4.4 a+ to model friction effects indicate that correct results are not obtained. Further work is being carried out including efforts to run on the LLNL code NIKE.

Modelling efforts to calculate effects of low modulus of Kapton at the pole and effect of unsymmetric coil modulus are under way.

Several attractive quadrupole magnet designs have been generated for the SSCL quadrupole effort and will be evaluated for actual build.

### Interconnect Region and Bus Assembly Design

A preliminary specification for the bellows testing to be performed at LTV has been prepared and is now being reviewed by members of the materials section. This testing will be performed to determine the lifetime distributions of representative bellows in order to write the specification and perform the necessary testing to ensure the desired SSC reliability.

Work continues on the bus work at MIT. They have proposed a concept based on a composite stabilizer of monolithic copper and braid. The monolithic copper provides quench protection while the braid provides an extended surface for stability.

### Materials Engineering

Work continues on the design of a fixture that will be used to perform curing studies and test the ability of various insulations to resist turn-to-turn shorts. Recent measurements at BNL on the insulation alternatives indicate that although the benefits of an all-Kapton insulation are not as great as earlier thought, there does appear to be some advantage in an all Kapton insulation compared to the present scheme in resisting turn-to-turn shorts.

### *Engineering Laboratory*

Work continues on the acquisition of equipment to set up the development laboratory. Emphasis has been placed on the need for a basic set of test equipment and workstations. The equipment received is in storage because the Magnet Evaluation Lab (MEL) facility is not yet ready.

The Cable Test Facility dewar RFP has been modified to include the requirement to build vessels to ASME code. It needs a document number and will then be ready to hand over to procurement. The next item to be pulled into the form of an RFP will be the current leads. The swaged sample holders, which were redone with solid shims, are now under test at BNL and scheduled to be completed by July 15 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.

The Short Magnet Test Facility dewar requirements have been established and we will pattern the design of the test station after that of CERN.

The dimensions of the dewar are being developed 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.

A review of the conceptual design for the Short Magnet test systems is being planned and will include all the operational nodes.

The problems created by the difficulty in hiring qualified engineers and the delay in occupying the MEL have caused a slip from Spring '91 to Fall '91 before the facility will be ready to test short magnets.

### ***Cryostat Design***

We performed studies of CQM cooling requirements as function of core inner diameter and beam tube outer diameter. We determined compatibility with CDM LHe mass flow, cell heat and pressure drop budgets, core temperature increase, and cell operating capability at increased luminosity.

Design of the cryostat for collider quadrupole magnet continues.

Studies and tests of magnet support and cold mass alignment techniques continue.

The first series of check-out measurements were successfully run using the vibration analysis equipment. We completed conceptual design for an optical alignment bench. An equipment list is being compiled and an adjustment mechanism design is in progress.

Work continues on the conceptual design of the thermal shield bridges and MLI interconnects.

### ***Quench Program***

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

### ***Computer Aided Design System (CADS)***

We continued development of CQM Cold Mass drawings and completed a redesign of the cradle.

Development of a solid model of the 50mm CDM wire wrap saddle was begun.

A new alignment support design has been started in support of prototype fabrication and testing effort.

Work began on MDL layout drawings.

We compiled data on CQM cryostat designs and developed a preliminary schedule for CQM CAD effort.

CDM cold mass drawings including Return End Spacer and Key were completed.

Alignment support design for use in fabrication of a prototype for testing with a full-size magnet continues.

Development of a CAD drawing which depicts the true cable positioning of coil wrap is continuing.

Piece part drawings for the CQM Reentrant Post and Supports were begun.

### ***Interconnect***

We continued work on the CDM Interconnect design and finished the End Plate CAD drawing. The model reflects the latest geometry and all component parts. Work began on metric fasteners and hardware to be added to the assembly.

Development of 50mm Interconnect Region designs continues and we created a preliminary Interconnect Drawing Tree. We attended an Interconnect Design Review meeting where unresolved issues and design questions were discussed with FNAL and MSD engineering personnel. An Interconnection Shields drawing was prepared.

Work continues on various interconnect designs (especially end leads assembly). We developed preliminary drawings and created a preliminary schedule for Interconnect CAD effort.

Preliminary drawings for the interconnect concept design were completed. We started detail parts for the Interconnect Mockup and continued work on a Drawing Tree.

### ***Tooling Design Support***

Support of Production Tooling effort continues. Drawings are being developed for the Skinning Press, Cable Tensioner, and Magnetics Stand Fixture.

We are developing the top assembly for the Coil Tensioner and check prints have been returned. 75% of the documentation for the Magnet Stand Fixture is complete. Drawings for the Skinning Press are in process; and drawings for the Twist Check Device, including cable, legs, and plates, and for the Coil Tensioner and the Collar Pack Removal are near completion. Release is expected next week. Drawings on the Cable Tensioner are near completion. Drawings of the Collar Pack Removal Fixture were completed.

Work was begun on Material Test Tooling Fixtures for coil curing and compression.

### ***Miscellaneous***

We performed an upgrade of the MSD CAD area; new workstations and software were installed. We reconfigured the existing workstations by upgrading to HPUX 7.0 and converted the total MSD design database from UGFM structure to HP native structure. The Plot Room was relocated. All work was accomplished with zero downtime.

Schedules for the Magnet Development Plan were developed in support of the DOE Review.

### ***Documentation and Control***

The RFP for the optical disk imaging system is in procurement.

New listings of drawings and specifications are available in Document Control (214-708-2097). The list now includes 614 FNAL drawings, 1361 BNL drawings, 463 drawings from LBL and 75 SSC specifications and documents. New specifications arriving this month include: Dipole Magnet Yoke/Shell Assembly, Dipole Elect Testing, and Interconnect Elect Diagram.

Work continues on the Drawing Development and Release Procedure. A draft copy of the flow chart is being circulated.

We incorporated comments to the Drawing Development Procedure in preparation for final review. The document will be presented at the July MSIM for comment by other labs.

We completed the cost comparison for the Optical Disk Imaging System acquisition plan and forwarded it to LTS to prepare documents for DOE approval.

Document Control now has 463 drawings from LBL. A listing is available from the Documentation Control Center, SSCL/MSD Building 1 (214-708-2097).

Work continues on the schedule for the Magnet Development Plan.

A specification was developed for the microfilming of MSD drawings and specifications due to be released to the CDM RFP vendors.

### ***FNAL CADS Support***

MSD CAD designers began work this week at FNAL. Areas of work include the CDM Cold Mass and Cryostat.

Two CAD designers travelled to FNAL to meet with CAD personnel and exchange technical data. Drawing and design efforts were reviewed and coordinated.

We continued work on a Vertically Split Lamination and began CAD drawings on 20K and 80K Blanket, Vacuum Vessel, and Reentrant Post.

Work continued on conceptual tooling drawings relating to the movement of the magnet assembly into the vacuum vessel. The 50mm Vacuum Vessel drawings completed included: Vacuum Vessel Port, Port Support, and Vacuum Vessel Section. Revised drawings were developed on the Vertical Split Yoke.

Drawings were developed on the Calibration Fixture for the transducers on the coil windings. We assisted FNAL on designs for a press fixture for the Calibration Fixture and continued work on drawings for the Cryostat Reentrant Post and 4K and 8K Center Discs.

### ***SYSTEMS ENGINEERING***

#### **Specifications/Analyses**

A revised version of the collider dipole magnet specification was drafted and provided to members of the MSD staff for coordination and comments. Direction was received to fill in all TBDs contained in the specification to the extent possible. This will allow a better understanding of magnet requirements by the vendors. Once the specification has been approved within MSD, it will be coordinated with Accelerator Systems Division. We plan to include the new document in the Collider Dipole Magnet RFP when it is released.

The second meeting of the superconducting magnet to spool piece Interface Control Working Group (ICWG) was conducted during the month. Minutes of the meeting were published and distributed to members of the group and other interested parties. Issues discussed related chiefly to electrical interfaces.

Work continued on the collider dipole magnet - spool piece interface control document (ICD). A copy of the document is being prepared for distribution to the MSD Engineering Group staff. Work on development of a specification tree for the Long Dipole Magnet was initiated. Specification trees for

the other superconducting magnets will also be developed and integrated with the one currently being worked.

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

Work continued on the collider quadrupole prime item development specification. A draft document was completed and is being forwarded to members of the engineering group for review. Plans call for completion of a preliminary specification by August 1.

In conjunction with development of the collider dipole and collider quadrupole magnet specifications, an effort to define applicability of the AMSE Boiler Codes was completed. A design analysis of the hardback for the temporary magnet test facility overhead crane was also accomplished.

A new effort to develop a critical item development specification (CIDS) for the collider dipole magnet interconnect region was initiated during the month.

### ***Reliability Engineering***

A reliability engineering briefing was developed and presented to the DOE subcommittee reviewing the superconducting magnet program.

Work continued on the failure mode, effects, and criticality analysis (FMECA). The report format for the FMECA was definitized and forwarded to the engineering staff for coordination.

Work on the Magnet Systems Division (MSD) reliability plan continues.

Reliability engineers spent time at FNAL during the month gathering information pertaining to system failures and other reliability data.

A study was completed which addressed the amount of accelerated life testing required for the collider dipole magnet. This study resulted in additional testing being specified in the Magnet Development Plan.

### ***Configuration Management***

Configuration management of engineering drawings was put in place with SE taking the responsibility for coordinating drawings input by the labs. The first drawing was circulated for review, using the new review and release procedure and sign-off form. A memo was sent to the labs soliciting their support in implementation of the drawing release procedure. As a result, drawings have begun to arrive at systems engineering for coordination within the division.

A draft Configuration Management Plan was reviewed by the MSD staff and comments were provided to the Project Management office. A copy of the plan will be incorporated into the Collider Dipole Magnet request for proposal.

## ***General***

Much time was spent by Systems Engineering during the month supporting efforts related to the DOE Cost Review. Systems Engineering began work in support of developing the RFP for superconducting cable.

### **Magnet Facilities Equipment and Tooling 1.2.4**

#### ***Magnet Evaluation Lab (MEL)***

MEL finish-out began on June 11 and is scheduled to be completed by July 23.

A safety review of the MEL was conducted June 8 and all identified issues are being addressed.

The following equipment and tooling was received for use in the MEL:

- 19-ton capacity strongback
- Three 60-foot long heavy duty assembly tables
- Collared coil support stands

Design of the model magnet coil winder tensioner is nearly complete, and a requisition has been submitted to procurement.

Design of the model magnet curing press heater/cooler system is in process and a requisition has been submitted to procurement.

Disassembly of DD0018 continued with the removal of the upper and lower shell halves and yoke blocks, the collared coil from the lower yoke, two collar packs from the return end; at which point the exposed coil end was cut off to allow for turn-to-turn hypot testing. The next two to three weeks will be spent attempting to isolate the shorts.

#### ***Magnet Development Lab (MDL)***

The layout for the MDL has been finalized and sent to the AE/CM.

Detailed design of the dipole collaring press is in process. Most of the structural members have been submitted to procurement to start the bidding process. Finite element analysis will be completed prior to placing an order for these parts.

A RFP for a Beam Tube Wrapper was prepared and approved. The RFQ is in process.

Samples of the skinning press connecting rods have been sent to Conam Inspection for verification of the strength of the machined threads, as the engineering drawing specification called for rolled threads.

Dour Metal of Belgium was visited in order to inspect the cable wrapping heads on the cable wrapping line.

The first tooling and prototype tryouts for the continuous 60-foot long cold mass skins is expected to take place at the vendor facility around mid-July, with delivery of the first product in August.

A conceptual design was completed for a device to determine the proper thickness of collar shim with immediate determination as to allowance for the strain gauges as they sit in the collar packs.

A fixture to mechanically measure the deflections of a collar pack under varying preloads was designed. The device will simulate coil preloads as the deflection of the collar is measured.

### ***LBL, FNAL and BNL Support***

We completed design of a coil end test fixture (hydraulic) and iterated 5M quad tooling designs as required.

Following a request from LBL for support on the development of controls for their 5M quadrupole tooling, we prepared a proposal for controls and data acquisition for the 5M curing press. LBL has reviewed and accepted the proposal. Initial procurement lists and wiring diagrams are now being prepared.

Design of a strain gauge calibration fixture and tooling for yoke compression for FNAL has been completed.

An investigation has been made to determine the major causes of coil size discrepancy of FNAL model magnets and the results have been presented to FNAL.

Specifications have been completed and reviewed on a TV weld monitoring system for the cold mass skin autowelder at FNAL. A RFQ is now in process. Delivery is expected to be approximately six weeks following receipt of an order.

Staffing for the dipole effort at FNAL continued with the addition of several new employees.

### ***Miscellaneous***

A model of a Collider Dipole production factory was developed to support the cost estimate. A similar model is being prepared for the Magnet Development Lab and will be used for optimization of the MDL factory layout.

Efforts leading to the development of a cable and short magnet test facility continue. The development plan and schedule include 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.

## **Conventional Construction WBS 2.0**

### **Division Management & Administration 2.5.2.1**

Input to the updated SCDR was completed. Planning and cost estimating activity continued in preparation for the DOE Review, at which 12 CCD people made presentations. Pre-design activities were completed for the Accelerator Systems String Test (ASST) and continued on the Prototype Installation Facility (PIF) and the Magnet Development Lab (MDL). Joint infrastructure planning with TNRLC continued. Pre-negotiations with the PB/MK team continued in preparation for award of the architect-engineer/construction manager (A-E/CM) contract.

Work continued on plans for interfacing CCD with the future SSC A-E/CM.

### **Major Studies 2.5.2.2**

#### ***Surface Transportation Study***

Transportation requirements were presented at the DOE Review.

#### ***Building Space Requirements***

Studies continued on space requirements. Since the January, 1990 presentation the population estimate has been reduced by 500 personnel. This has drastically altered space needs, which are being reanalyzed.

#### ***Utility Requirements***

Utility requirements were presented at the DOE Review.

#### ***Overall Site Development Plan***

Work with TNRLC continued regarding acceptance of improvements on real estate to be acquired and conveyed to DOE.

#### ***Vegetative Stabilization Program***

This site-specific study and design of revegetation/stabilization of SSC spoils disposal sites at service areas and east and west campuses will be primarily accomplished by a subcontractor who has not yet been selected.

### **Design Criteria 2.5.2.3**

We continue to refine programming requirements for both surface and underground structures for the PIF tunnel segment and the ASST facility. Sketches and CADD drawings continue to be developed which define the relationship of these structures with the collider ring alcoves, niches, shafts, and shaft connections. Magnet transport and delivery considerations required a 55-ft F shaft at E-7. Space requirements were defined well enough to allow for preliminary design of the PIF facilities. Preliminary design is being done by RTK with CCD providing the laboratory interface with RTK.

Work continued on updating the SCDR to represent the basis for the recommended cost estimates, and to finalize coordination with technical division requirements. The conceptual designs for the EMPACT and BCD detector halls were further developed. Alternative collision hall concepts were studied in an effort to reduce costs. Revised shaft sizes and configurations were included as well as reduced square footage in numerous building footprints.

Programming for the Linear Accelerator (LINAC) continued. Incorporated into this study was the relationship of the depth of LINAC to LEB, MEB, and HEB relative to radiation shielding needs. This analysis was completed and presented to Accelerator Division for their analysis and final determination.

Study continued on the design and construction of the ASST facility. Programming requirements were clarified in greater detail for the structure's associated cryogenic systems, technical systems, and surface facilities. The ASST structure, as currently envisioned, will consist of a 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 with exterior insulation and expansion joints at appropriate intervals expressed as concrete "boxes" which incorporate HVAC on top and egress on the sides. Site configuration of surface facilities was analyzed and returned to RTK with SSC input for final schematic configuration.

Input was provided to the new baseline scheduling effort and to the Engineering Standards Committee. Scheduling input took the form of estimating contract packaging for the collider tunnel construction contracts.

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 was submitted.

#### **Configuration Mgmt & Interface Control 2.5.2.6**

##### ***Interface Control***

The Conventional Construction Procedural Guidelines (Advance Draft) was submitted to DOE, in response to their request, on May 18.

#### **Geotechnical Program 2.5.2.8**

##### ***Program Oversight***

Geotechnical exploration resumed with drilling activities conducted along the PIF segment of the collider alignment. Borings are planned to be drilled on 2,000-foot centers from the northern rf shaft to the F-1 shaft. Additional borings may be required to provide details on structural features. A high-resolution, shallow-penetration seismic reflection survey is also being done along the PIF alignment.

### **A-E/CM Selection & Contract Administration Support 2.5.2.10**

The SSC Lab negotiating team continued pre-negotiation and fact-finding meetings during June. Planning commenced toward a 180-day URA-PB/MK letter subcontract to enable PB/MK to commence design work on priority tasks.

### **SEIS Support 2.5.2.12**

#### ***SEIS Support Management***

CCD has attended meetings and provided responses to data requests from EAO for SEIS preparation.

#### ***SEIS Spoils Management***

CCD continues response to questions through the EAO.

## **Project Management and Support WBS 3.0**

### **Project Management 3.1**

#### **Project Management Office 3.1.1**

The major effort for this month was the preparation for the June Validation Review by ER and others. Early during the month, dry runs of the formal presentations were held for project management. Some groups had several dry runs, with the final presentation incorporating the actual viewgraphs to be used. The formal presentations for the first day were printed prior to the review and distributed to the review committee as they entered the auditorium. All other presentations were distributed by group or by each speaker for inclusion in the notebooks. In addition to the printing and production, our staff coordinated the catering, transportation, and computer requirements for the subcommittee members.

Earlier in the month a presentation was made to the Townsend committee on the details of the estimate and schedule. These details were, for the most part, the same details presented in the printed documentation mailed on June 11. This presentation showed the data and management actions used in arriving at the cost details, contingency estimate, and management reserve. Additionally, we presented the management controls we have proposed in the latest draft of the Project Management Plan.

#### **Project Planning 3.1.2**

Funding profiles for the baseline case and several DOE options were developed in preparation for the Baseline Validation Review. The baseline case had construction completion and the start of experimental operations after 9 years. Option 1, which delayed the underground construction until after the successful completion of the magnet string test (by September 1992), had an overall construction schedule of ten years and 1/2 month. Option 2, which delayed all conventional construction until after the successful completion of the magnet string test, had an overall construction schedule of eleven years and one month (adds 25 months to the project schedule). The delay of the above ground facilities adds additional time to the schedule because the injector facilities are closely tied to the above ground work and we have an internal constraint that requires the commissioning of the various accelerators to be spaced by six months.

Since Option 2 was so detrimental to the housing of Laboratory personnel, we prepared an additional option (Option 3) which did not place any constraint on the initial plans for construction of above ground personnel and laboratory space. While Option 3 has the same overall construction time as Option 2, it did save approximately \$2 million in escalation for the early construction of these facilities. There is potentially an additional savings because of a reduction in the amount of leased space required, but this was not included in the estimated cost for Option 3.

#### **Project Management and Reporting Systems 3.1.3**

The first draft versions of the "Cost and Schedule Control Systems Manual", "Cost Account Manager's Guide", "Data Analysis Guide", and the "Project Manager's Guide" were completed and released within the Project Office for review. These will be reviewed within the next month or so and made consistent with the negotiated Project Management Plan. After review and changes, these guides will be released to the entire Laboratory for use in implementing the cost/schedule control system.

Preparation for the next C/SCSC Workshop, to be held on July 18, continued. Additional training plans have been developed to include the topic of Major Subcontract Administration and Performance Measurement Applications to meet the needs of those managers who are currently, or will be, involved with subcontracts and subcontractor data and reporting. Work continues in the preparation on the SSC Laboratory Quality Assurance video, with testing of potential narrators to begin during July.

#### **Engineering Standards 3.1.4**

Training on the document control system (interim version) with the various division personnel continued through the month. By the end of July most, if not all, of the drafting personnel will be trained in the document numbering system.

Work continued on the Quality Control Procedures for the Quality Assurance Manual. This work involved some people in the Magnet Systems Division since the plans and procedures will be incorporated into the CDM RFP. The Accelerator Systems Division will conduct interviews for the QA Group Leader position during July. Six QA Practices were submitted to the Project Management Engineering Standards Group for cleanup and inclusion on the project management server. The Quality Implementation Plan guide (which is an appendix in the QA Plan) will be made into a stand alone Engineering Guide and be incorporated into the Engineering Standards during July.

We met with the Publications Department concerning the document numbering system, mandated by DOE directives, they were using on Publication documents. In some cases these documents will also be included in the EDMS and therefore require two numbers. This will not be a problem since the EDMS database will handle two alternate numbers for sorting. A second meeting was held with PB/MK to discuss their use of the EDMS and DOCTRACK programs. These discussions will continue and will involve systems engineering so that configuration management documents can be read by PB/MK.

#### **Environmental Affairs 3.1.5**

In addition to preparation for the DOE Validation review the major effort has been working with ANL on the draft SEIS to include our current plans for the E1 site area. Based on earlier discussions, a meeting and workshop was held at ANL on June 27-29. From this work, a draft review working session for DOE/SSCL/ANL is planned for the On-site Project Office for the week of July 9. The goal of this meeting is to complete and correct the draft SEIS. As soon as this is completed we will begin planning for the public hearings and the draft will be sent to OSSC for Secretarial approval. We anticipate the complete printing and DOE Notice of Availability in early August.

#### **Systems Engineering and Integration 3.2**

##### **Systems Engineering Management 3.2.1**

The major effort this month was putting the finishing touches on the Technical Requirements Books for the DOE Validation Review. These notebooks were sent to all DOE Subcommittee chairmen on June 11, and were available in each subcommittee room during the review. These notebooks will be living documents during the course of the construction project and a draft procedure for managing them electronically on the project management server has been prepared.

Work also continued on draft guidelines for engineering standards. We completed the following guidelines: Configuration Status Accounting Procedure, Engineering Change Request Procedure, Human Factors Engineering, Value Engineering, SSCL Quality Guidelines, Generation and Maintenance of Quality Implementation Plans, Mechanical Engineering, Electrical Engineering, and Architectural Engineering. These drafts are no longer available in hardcopy as they are currently usable by everyone on the project management file server.

Additionally the guideline addressing the generation and maintenance of engineering guidelines, standards, and practices was revised to provide more details about the review and approval cycle at the project level. Text discussing the criteria to be used to decide which review/approval path will be taken was expanded.

### **SE Support to ASD 3.2.2**

Review of the Working Requirements Notebooks after they were distributed revealed some differences between the notebooks and the cost data. An errata package was prepared and distributed for the DOE review. The errors will be corrected when the notebooks are incorporated on the project management server for use electronically.

### **SE Support to MSD 3.2.3**

A revised version of the collider dipole magnet specification was completed and forwarded for coordination within the Magnet Systems Division. This document will be coordinated with the Accelerator Systems Division and was included in the final RFP for the collider dipole magnets. The Interface Control Working Group met for the second time to discuss the collider dipole magnet interface with the spool piece. The major elements discussed were the electrical interfaces. When the interfaces are completely defined, the draft interface control document will be generated.

### **SE Support to Physics 3.2.4**

A preliminary copy of the resource requirements report notebook was delivered to RTK for their pricing of facilities to support the experimental facilities. A second version of this notebook is being updated and refined for the original five Expressions of Interest. This copy will be presented to the Program Advisory Committee during the summer symposium at Snowmass, CO in July. Additionally, a draft list of options has been developed to meet the requirements of the Solenoidal Detector Collaboration (SDC) Information Handling System (IHS). The SSCL must propose the inter-operability standards and suggest a solution. A meeting was held with members of the Laboratory Technical Services Division to discuss requirements for an IHS. It was decided the SSCL will develop a system usable Physics Research and the SDC.

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

### **Research and Development 4.2**

#### **Accelerator R&D 4.2.1**

##### **Management Services 4.2.1.1**

A considerable amount of effort went into preparing viewgraphs and backup documentation for the Validation Review. The cost estimate for Accelerator Technical Systems was "baselined" on June 8. This was the cost estimate that was presented to the DOE Validation Review.

The draft version of the Site-Specific Conceptual Design Report went to the printer. We published the first version of the "Accelerator Working Requirements Notebook" and also contributed to the WBS Dictionary. These documents were sent to the review team members.

The following is a table summarizing people on-board for the past 6 months:

January 31	86	April 30	115
February 28	102	May 31	124
March 31	110	June 30	135

The rate of hiring has fallen behind our projections. We expected to have 157 people on board by the end of June.

Schedules were developed for the baseline and three options requested by the DOE. Commitment profiles were developed for all schedules using final costing data supplied by the divisions. Presentations of schedules and commitment profiles were made to the overview session and several working groups of the DOE during the Validation Review.

##### **LINAC 4.2.1.2**

Preparation for and presentations to the DOE review committee consumed much of the month. Two cost-saving design choices were adopted: (1) a 70MeV transition energy between the DTL and CCL; and (2) the rf power for the RFQ will be supplied by the klystron for the first DTL tank by using a high-power splitter and phase shifter. These two measures reduce the required number of high-power rf systems from 17 to 15 and replace 30MeV of DTL structure with much less expensive side-coupled structure. There does not appear to be any risk associated with the 70MeV CCL. The RFQ and the first DTL have identical beam-loading values, so their power split should remain constant during beam fluctuations. Feedback control to the klystron from only the RFQ should be adequate.

##### **LEB 4.2.1.3**

Alternate LEB lattices have been devised. One consideration in these designs is to keep far away from the transition at the end of the LEB Cycle. This is achieved by making  $V_T$  either very high or imaginary (i.e., negative compaction factor). Another aspect is the space-charge tune spread. To reduce the tune spread, circumferences are reduced; lattices with circumferences of 480 meters and

450 meters are devised. Analysis of these lattices is still in progress. These aspects of LEB were discussed in a workshop of experts at the SSCL on June 15.

#### **MEB 4.2.1.4**

The month was devoted to preparation for the June 25-29 DOE Review during which MEB design issues and cost estimates were discussed. The major topics of discussion in the accelerator physics subcommittees were transition energy, dipole magnet aperture, and slow resonant extraction. The cost estimate for the MEB technical components was also reviewed in detail. The technical discussions and cost reviews included the transfer systems between the LEB and MEB and between the MEB and HEB.

#### **HEB 4.2.1.5**

The main efforts for the HEB were the completion of the SCDR and the associated cost estimates, and the presentations given to the DOE Review Committee in the last week of the month.

Work did continue on the examination of the HEB aperture, on some details of the lattice design, and on plans to begin bipolar magnet measurements for the HEB-type dipoles.

#### **Collider 4.2.1.6**

Efforts this month concentrated on preparing for the DOE review held at SSCL during the week of June 25. Members of the Collider Group worked with DOE personnel to prepare agendas for various sub-committee meetings, primarily those concerned with accelerator physics issues. Talks were presented by Collider Group members on Collider and Injector design issues, particle tracking codes and results, correction magnet designs, decoupling schemes, demittance dilution, and other accelerator physics issues as well as on design and cost estimate details for correction magnets and survey and alignment issues. While the talks were conducted the first three days of the review, numerous other discussions were held during the last two days to answer questions and provide more details.

## **Magnet R&D 4.2.2**

### **Fermilab 4.2.2.1**

#### ***Dipole Cryostat***

Calibration runs have been completed on the instrumentation and measuring equipment for the Heat Leak Test Facility in preparation for 80K to 4.5K MLI measurements.

We received the first of seven prototype reentrant supports from SCI using the wound-in end concept. We tested this first unit to the same loads we currently use to qualify shrink fit assemblies. Tensile and compressive tests of the prototype reentrant supports from SCI were successful to 10,000 lb. The unit failed on the first bending cycle to 5,000 lb. The vendor has been advised of this failure and will presumably take it into account during development of the remaining units.

A design review for the cryostat and mechanical portion of the interconnect has been scheduled for August 15.

Three of the SSCL designers based at FNAL are developing detailed part and assembly drawings to support the 50mm cryostat program under the direction of FNAL design leaders.

We have completed writing specifications for all interconnect bellows. An RFP is being prepared by Technical Support procurement to elicit bids from potential vendors for bellows to satisfy the test and production needs of the 50mm program.

#### ***Magnetic Measurements***

There was no cold testing of long dipoles performed during June. SSC activities at MTF were limited to preventive maintenance on the SSC magnet test stands, upgrade efforts on thermometry, and improvements to the quench heater power supply system for greater reliability. MTF personnel also performed inspections on DD0028 in preparation for later testing.

#### ***Magnet Development***

Tests of DS0309 have been completed. On the second cooldown there was one "retraining" quench at 4.3 K, approximately 70 A below plateau but well above the SSC operating current. The "mini-life test" was completed successfully. In this procedure the magnet was ramped 500 times between 2000A and 6500A to test the integrity of the coil insulation directly against the laminations. No problems were observed. The magnet has been warmed to room temperature and removed from the dewar. DS0310, which is identical in construction to DS0309 except for 3 and 2 mils more pole shim on the inner and outer coils respectively, is being readied for test. It is scheduled to be cooled down in the first week in July.

Several assembly experiments are being planned. DS0312 will be used as a vehicle for understanding the collaring procedures in detail. It will be assembled and disassembled many times with different collaring tooling configurations, using both the short and long presses. It will also be collared with and without lubricating slip-planes between the inner and outer coils and between the coils and collars and with varying pole shim. A short segment of yoke and skin will be assembled with multiple strain

gages on the skin to measure in detail the skin tension through assembly, cooldown and disassembly. Two assemblies are planned, with and without a low friction coating applied to the skin.

### ***Long Magnet Fabrication***

#### **Cryostat Area:**

Assembly DD0028 will be finished and ready for MTF on June 29. It has yet to be determined if this magnet will be tested by Fermilab or BNL.

The stretch wire alignment stand is still being modified.

#### **Cold Mass Area:**

Curing Press: Hoses were rerouted on the 10-jack system to allow the lower beam to come up straighter. Software to support the hydraulic system still needs debugging and should be completed in early July.

Collaring Press: Additional strengthening of both upper and lower beams is in process. Mock-ups of the proposed fix have been satisfactorily tested, and the work should be completed by the second week of July.

Winding Table: Rework of the spool height adjuster is in process and should be completed by mid-July. This has not hindered the ability to continue the coil winding.

#### **Coil Winding:**

RCM#2 Inner #2 (17M1008) was rewound and cured on 6/20. All coils are complete for RCM#2.

RCM#3 Inner #1 (17M1009) was wound and cured on 6/5.

RCM#3 Outer #1 (17M2009) was wound and cured on 6/8.

RCM#3 Inner #2 (17M1010) was wound and cured on 6/12.

RCM#3 Outer #2 (17M2010) was wound on 6/28 and will be cured on 6/30. This will complete all coils for RCM#3.

RCM#4 Inner #2 (17M1012) was wound and cured on 6/26.

#### **Coil Assembly and Collaring:**

PCM#2 pre-collared assembly is being disassembled and autopsied to determine if there was a problem which would not allow the mold and press to fully close. All collar packs and insulation have now been removed. Information is needed on pole tip shimming before reassembly can begin.

RCM#1 is still waiting for pole shim information to complete pre-collaring assembly. Collar laminations for this coil were received on June 25 and are being stacked into packs.

Voltage taps on RCM#2 have been applied to inner coil #2. Further assembly of this coil cannot take place until RCM#1 is complete.

### Yoke and Skinning

PCM#1 skins were completed on June 25. The Cold Mass skin, yoke packs, and coil assembly have now been installed in the yoke press and measurements of the skin-to-key gaps are taking place. Welding of the assembly in the press was completed on June 30.

### SSC Short Model Program

DS0307 is being potted and sectioned.

DS0309 testing has been completed and results are available.

DS0310 is complete and is currently being prepared for testing which is expected to take place during the first week of July. It has teflon applied to the coils as a slip plane.

DS0311 is wound and packaged and will be completed during July and cold tested. The collaring experiments originally planned for this magnet will now be done with magnet DS0312.

DS0312 coils are wound. This magnet will be used for all the collaring experiments that had been planned for DS0311. It will resolve several problems related to magnet collaring. The teflon vs. no teflon slip plane experiments done with magnet DS0307 will also be duplicated with DS0312. A complete procedure describing all collaring experiments to be done with this magnet is available.

Grouped, developable surface end parts have been received for 40mm outer coils and used in magnet DS0312. Sample coils have also been wound, potted and sectioned with these parts. Knowledge gained from winding with these parts has been used to improve the 50mm design.

### **Berkeley Lab 4.2.2.2**

### ***Superconductor and Cable***

Samples of wide cable for the 50mm dipole design were made with some changes in dimensions to improve the coil winding properties. The critical current values for these cables have been measured at BNL. The critical current degradation for the inner cable is 1.7% and for the outer cable is 4% (both of which are within the allowance for degradation in SSC cable). Thus, the parameters for the new wide cable are established, and only small changes, if any, should be necessary from this point. Activity during the next several months will involve fabrication of practice cable, as strand becomes available, and performing some maintenance on the cabling machine in preparation for the 36-strand production runs commencing in August.

### ***Quadrupole Magnets***

#### 1m Quadrupole models

QC-1, the 1-meter model SSC quadrupole, was tested from June 1 through June 25. This test series was very successful with the first 4.3K quench occurring at 6800A, well above the 6500A operating level. The plateau quench value of 7970A was reached on the eleventh quench, and 7389A on the

third quench. Very little ramp rate sensitivity was observed, even up to 2000 A/sec. Magnetic measurements were made at 4.3K to 6600A. The field quality is excellent, the 12-pole central field is less than a unit at operating current.

After warm-up to room temperature, the first retraining quench at 4.3K was 7367A. The plateau value of 7973A was reached on the fourth quench.

After a second warm-up to room temperature, the first retraining quench at 4.3K on the third cooldown was 7910A and the plateau value for this series of 7950A was reached on the second quench.

Helium II operation at 1.8K then commenced with the first 1.8K quench at 8740A. 9903A was reached on the sixth quench. Magnetic measurements were obtained to 9650A.

Multipole decay measurements at 4.3K are planned at the end of the run.

### One Meter Quadrupole Magnets

The coils for our second 1-meter model magnet (QSC-401) are complete, the inner coils are assembled, and the outer coils are currently being assembled. Collaring should commence the second week of July, and magnet completion should be near the end of July. To confirm the success of QC1, this magnet will be assembled very similarly to our first quad model and several parts from this first magnet will be reused (end plates, splice plates, and iron yokes). This model will also be used to refine some of the planned assembly techniques to be used on the long quad magnet QCC-401.

### Long Quadrupole Models

Five coils have been wound and cured. The last three of these are slated for assembly into our first long model, QCC-401. Coils dimensions seem to be very uniform.

The coil assembly fixtures are 90% complete. Detail drawings for the coil collaring press are 90% complete and fabrication of components should start shortly.

Design of the magnet yoke alignment system is continuing and approximately 60% complete. This includes design of the yoke, skin, fiducials, and tooling to be used in the main press for clamping the assembly during welding. The main press is designed for coil curing; for skin welding, the limited space requires that welding be done by hand in short increments. Orders have been placed for yoke and skinning tooling laminations, skins, and fiducial bars.

### *Analysis*

#### Dipole

A magnetic "end" design was done for the 50mm dipole magnet under construction at Fermi Lab. The "end" has a magnetic length of 67.5mm and allowed harmonics that integrate to zero.

#### Quad

The "ends" of quadrupole QC have been redesigned. The new design is a small modification of the existing "ends". The new design, however, was done using the new end-program "bend" that

produces 3-dimensional geometry of end parts. This way N.C. can be used for manufacturing end pieces.

### **Superconducting Cable R&D 4.2.2.3**

Major activities of the month centered on the preparation of the statement of work for the vendor qualification program and the preparation of the presentations associated with the DOE review. A working group has been established to complete the preparation of the RFP for the vendor qualification program. This RFP should be complete by mid-July. The CBD announcement will be sent out in early July.

Responsibility for maintaining the schedule for conductor deliveries to the magnet programs at the other national laboratories has been assigned to Dennis Christopherson. At the present time 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 and the associated R&D activities.

The RFP for the 36-strand cabling machine has been sent to procurement to begin the process of acquiring a second cabling machine for our use in support of the 50mm program. The CBD announcement will be sent out in early July.

The first samples of 2.5 $\mu$ m conductor have been received from Furukawa. Cross sections have prepared in the Met Lab. The filament quality is quite good. The electrical properties which FEC reports are just slightly below the present SSC specification for 6 $\mu$ m conductor. We consider this an encouraging start to the 2.5 $\mu$ m development program. The remaining vendors in the 2.5 $\mu$ m program will be supplying conductor before the end of FY90.

The bids for the SEM have been received and an order will be placed in early July. The microscope, which will be delivered in 6-10 weeks after the order is placed, will greatly enhance the SSCL's capabilities.

### ***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***

Tests on 17m dipole DD0020 were completed this month, as described under Test and Measurements. Subsequently, the magnet was removed from the Horizontal Test Facility.

Installation of DC0201 in the Horizontal Test Facility was completed in the third week of June.

DC0202 received end plate bullets, and then underwent interconnect assembly operations. The last week of June was devoted to warm measurements, final checks, and preparations for shipment to FNAL for cryostating.

Coil assembly for DC0203 was completed in mid-June; end gauging came next, with collaring under way by the end of the month.

Collar assembly was completed on DC0204; warm measurements were performed, followed by yoke assembly with shell welding in progress by the end of the month.

Coil assembly for DC0205 began during the week of June 18, with end gauging under way late in the following week.

DC0206 remained idle, awaiting outer cable.

### ***Short Magnets***

Tests on 1.8m dipole DSS020 were finished in June, where upon the magnet was removed from the vertical dewar.

Vertical tests on DSS021 were under way in mid-June.

Yoke assembly was completed on DS0201, followed by shell welding, end plate bullets and dressing of voltage tap leads. This magnet is next in line for top hat mounting.

DS0202 saw cable insulation and awaits further insulation from Dupont.

Yoke containment parts for DSA207, the first short magnet with 50mm aperture, are under way in the Laboratory shops. Work continued on design of the 50mm coil midplane and pole surface Kapton ironing fixtures, on coil end design and coil assembly drawings, on inner coil centerpost end design, and on 50mm coil compression gauge drawings. The design of solid end spacers for said inner coils was completed and design started on laminated end spacers. Design of the 50mm lead ramp laminations was completed, as were creased Kapton insulation drawings. Work also continued on the strip heater for 50mm magnets, already designed. (For DSA 207 the strip heater's role will simply be that of a mechanical shim).

### ***Magnet Tooling and Equipment***

#### **Coils**

Engineering work continues on long 50mm aperture coil tooling; laminations have been ordered for the inner and outer mandrel and formblocks. Approximately 90% of short 50mm tooling drawings have been released to the shops.

#### **Yokes**

Tooling fabrication for constructing 40mm magnets using quarter-inch laminations has been largely completed, with only some installation details remaining. A draft of a 50mm short magnet yoke-assembly procedure has been prepared, and tooling requirements for assembly of a long 50mm yoke are under examination.

## **Superconductor**

### **Cable Procurement**

The SSC inner cable promised for June delivery arrived and has been inspected. SSCL has reviewed a questionable area (cable sharp bend test) and approved the cable for use. This cable should allow the completion of the short DS0200 series magnet program for this year.

### **Cable Tooling**

A parts list has been drafted and a purchase order released for most of the "off the shelf" hardware for the wrapping line project. The drawings for non-standard hardware (bearing brackets, tensioner brackets, etc.) are 85% complete and will be released for fabrication in early July. The floating rollers for the new wrapping machines are 95% complete in the Central Shops. The estimated completion date for full assembly is July 20.

All inspection tooling for incoming cable for the 50mm program has been released to the shops for fabrication.

### **Miscellaneous**

In addition to the wrapping line's lump detector (still awaiting assignment of a designer), the detectors for both coil winding machines are also being upgraded. Once revised, the detectors will be able to accommodate the wider cable to be used in the 50mm program.

The adhesive-coated Kapton for short magnet DS0202 arrived and has been inspected; insulation of the cable should be completed shortly. A complete inventory of all cable within the Cable Task Force Group was completed and the storage area reorganized.

### **Tests and Measurements**

Tests on 17m dipole DD0020 were completed this month. A complete set of magnetic field measurements were made at 2 tesla with moles B1 and D1. Also, the magnet was measured at room temperature with mole D1. This was the first time mole D1, with its transport system, was used for measurements. Both mole and transport performed well. Based on a preliminary analysis, the magnet's field quality was good. By the end of the month, DD0020 was removed from the test stand and DC0201 set in place.

Tests on 1.8m dipole DSS020 were also finished in June. Testing this month focused on determining the quench plateau for the trim coil. The trim coil's performance exceeded the SSC design requirements.

Room temperature measurements were made on 1.8m dipole DS0201 and 17m dipole DS0204 at the collared stage. Also, 17m dipole DC0202 was measured at the cold mass stage prior to shipment to Fermilab.

## **Project Administration and Support 4.3**

### **Administration Systems and Support 4.3.1**

DOE was notified of the need for release of additional authorized funds in order to maintain a minimum operating reserve of 30 days.

We are assessing actions required to effect a smooth FY90 closeout and transition to FY91.

The selections for key management positions in Procurement are close to completion.

### **Finance 4.3.2**

Preliminary plans have been developed for the fiscal year-end closing and opening processes. The financial system's capabilities have been assessed and discussions started with MIS personnel on the new Laboratory commitment tracking system, on-line reporting, and FY91 Chart of Accounts.

The Budget Office continues to refine the FY90 Re-forecasted Budgets. There was no monthly budget review in June because of the DOE Cost & Schedule Review, but one is planned for July 11. The remaining budgets for both Staff Services and Physics Networking were transferred to Laboratory Technical Services to reflect those organizational changes. A draft of the laboratory's accounting procedures for indirect costs was completed and submitted for management review. The Budget Office, along with Financial Information Systems, is developing the FY91 Chart of Accounts that will facilitate financial reporting by laboratory Work Breakdown Structure as well as Organizational Breakdown Structure. Budget Office personnel met with Procurement to outline a year-end close approach as it relates to procurements which span fiscal years.

The Accounting and Financial Control Section accomplished the following objectives:

- Completed detailed specifications for the solicitation package of banking services and submitted them to DOE.
- Evaluated methods and offered recommendations for providing financing to the A-E/CM subcontractor.
- Completed all bank reconciliations for the travel, payroll and operating accounts.
- Identified a method for using lab-wide E-mail.
- Responded to petty cash audit findings and began documentation of petty cash policies, procedures and forms.
- Reconciled property accounts.
- Distributed revisions to the Policies and Procedures manual and revised draft of "Travel Advances for Non-URA Employees".
- Streamlined input to TRACS by discontinuing the entering of unnecessary trip information.

The Financial Informations Systems (FIS) Section's effort consisted of the following:

- Continued to analyze and test the results from the subcontractor accrual program now in production.
- 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.
- Created user specifications, adding purchase order commitment tracking and reporting by fiscal year.
- Created user specifications for linking purchase orders and requisitions for easier tracking.

FIS goals for July are:

- To finalize the cost account structure for FY91, balancing the needs of the Laboratory against the limitations of Deltek.
- To assist MIS in finalizing the specifications for a subcontractor procurement and accounting system separate but integrated with Deltek.
- To design user specifications for purging old records from Deltek's live files.
- To thoroughly test Deltek's advanced payroll module and establish an upgrade schedule.

### Procurement 4.3.3

Many high-dollar procurements were worked during June, two of which are the A-E/CM procurement and the Cryogenics procurement. For the A-E/CM procurement, high-level meetings were held the week of June 25 between DOE and URA. URA presented a detailed review that covered methods to administer the A-E/CM, status of the proposed Letter Subcontract, status of the cost proposal review, discussions of terms and conditions and other procurement matters. The Cryogenics procurement is scheduled to receive final technical reviews in mid-July, with award tentatively scheduled for September 20.

Meetings were held with technical personnel to discuss present and future workload. Various major procurements where the requisitions are either complete or near completion include the following, along with a rough estimate of cost:

LINAC Prototype Development	\$2.9M
Cable Winding Machines	\$950K
CAD/CAM Workstations	\$1.5M
Spool Pieces for Correction Magnets	\$500K
500 Million Instructions Per Second System (MIPS)	\$900K
Miscellaneous Telecommunication Equipment	\$1M

During June, the Procurement Department made awards totaling \$4,848,180, of which \$850,271 (18%) was made to small businesses and \$412,634 (9%) was made to small disadvantaged businesses as defined in PL 101-101, Section 301(a).

Procurement participation in public outreach and public information seminars remains active. On June 29, Procurement attended a seminar in Shreveport, Louisiana as requested by U.S. Representative McCrery's office and on June 4 we also participated in a seminar in Dallas as requested by U.S. Representative Bryant.

Interviews with potential procurement manager candidates took place during June and are near conclusion. Two openings, the Director of Procurement, and the Manager of Project Procurement, are being filled. Recommendations are being written by the Interim Director of Procurement and will be forwarded to the Associate Director of Administration for review and selection.

We continued to draft and release (to Procurement personnel) various Temporary Office Instructions (TOIs). These TOIs are being issued to provide immediate uniformity and consistency in our methods, pending approval and implementation of formal procedures.

Organizational changes were made within Procurement during June. All Memorandum Purchase Orders (Inter-DOE) and Utility Subcontracts were transferred from Contracts (Mr. Lee Graw) to Jim Linkous. Bill Slaughterbeck, Subcontract Administrator, has been transferred from General Subcontracting to Magnet Subcontracting.

In mid-June, Procurement formed a committee for the purpose of establishing small-dollar purchase procedures. This committee will provide recommendations to implement procedures whereby small-dollar orders (i.e., \$2500 and under) can be rapidly placed without undue delay. Committee members include representatives from Accounting, Warehousing and other appropriate departments.

A highly respected ADP consultant presented a 3-day seminar covering both technical and contractual matters. The seminar was well received by all participants.

#### **Personnel 4.3.5**

We coordinated 90 interviews with hiring managers this month. Seventy-seven new employees (29 were interns) joined the Laboratory for a total employee population of 702. As of June 30 we have 338 open positions at the Laboratory.

June was a month of greatly increased recruiting activity. Our recruiters attended numerous hiring conferences throughout the country, many of which focused on recruiting women and minority candidates in all disciplines. We mounted a major open house hiring session exclusively for SSCL in Shreveport, Louisiana which drew over a hundred potential candidates. As a result of our continuing recruiting efforts, we processed 1,090 resumes this month.

Our joint URA/EG&G supervisory training program is continuing with well-attended classes in Performance Appraisals and EEO/Affirmative Action. Feedback on the courses has been very positive. We begin Employee Relations training in early July, with make-up sessions in EEO/Affirmative Action also scheduled.

In late June, the SSCL Performance Appraisal program was successfully implemented with the mailing of forms and instructions to each Division. All Performance Appraisals are to be completed in late July in preparation for annual salary-setting in the fall.

Distribution of the URA Employee Handbook was completed in June and final copies of the URA/SSCL Personnel Policy and Procedure Manual are due back from the printer on July 2.

As a result of the recent re-organization which brought Travel Services into the Personnel Department, we convened the Travel Task Force made up of representatives from each SSCL Division. The Task Force met weekly throughout June and several changes are being made to forms and procedures to improve service in this area.

Representatives from Department of Energy, Industrial Relations from both Chicago Operations and Washington Headquarters visited the Personnel Department to review our EEO/Affirmative Action program and our compensation program. These meetings were very productive and have paved the way for more effective day-to-day interaction in meeting the Laboratory's goals and objectives in these areas.

#### **Minority Affairs 4.3.7**

The Office of Minority Affairs continues its active role as participant, presenter and guest spokesman in performing the SSC Lab's outreach to the business, civic and other organizations who are interrelating to the SSC Lab. The Director of Minority Affairs conducted several meetings with various vendors who are interested in doing business with the SSC Lab. He participated as speaker at several vendor seminars including Eastfield College, and the Hispanic Chamber of Commerce, Odessa, TX. A meeting was held to explain how the summer youth intern program will be administered and to select the interns from a pool of eligible students. The Office of Minority Affairs agreed to select one intern.

The Manager of EEO/AA participated in several meetings held with URA and EG&G personnel to determine which level of direction EEO training would take and to determine what aspects of EEO/AA should be covered in the training. The EEO training materials have been completed in draft form and now are being edited. A meeting was held with DOE officials and URA/EG&G personnel to discuss ideas and responsibilities concerning EEO and SADB. Their main discussion was geared towards linking the community colleges and high schools' curriculums for math and science education with the SSCL. We conducted three EEO Awareness Training classes for managers and supervisors and conducted a briefing for DOE regarding personnel, EEO/AA and compensation. This briefing presented an overview of the relationship between Personnel and Minority Affairs. The EEO/AA manager attended a meeting held in Baltimore, MD, with the past President of NAACP to discuss employment and economic development opportunities available at the SSCL and he spoke with the National Director of Economic Development who stated that the NAACP would be supportive of the SSC subcontracting opportunities to small, disadvantaged and women owned businesses. A meeting was held in New York with the National Urban League's Director of Business Development, Director of Housing and Community Development, Vice President of Human Resources Development, and the Director of Special Projects and Economic Development. The meeting was to acquaint the National Urban League with the SSC, and to seek their support for the SSCL's small, disadvantaged and women owned business program, and to acquaint them with the various employment opportunities. The EEO/AA manager also attended the Society of Women Engineers (SWE) Annual Conference held in New York where meetings were held to discuss employment opportunities and the subcontracting opportunities for women owned businesses. The SSC extensive outreach efforts were explained. The President of SWE stated that SWE would give the SSC Lab its support.

The Manager of SADB met with Procurement and Travel Department personnel in conjunction with the Tramex Travel Agency to review travel procedures. The SADB Manager participated in several

meetings as a member of the Travel Department Task Force which is charged with the responsibility for reviewing and upgrading present SSC travel procedures.

The SADB manager:

- Participated in a pre-proposal conference seminar on the Supercollider Dipole Magnet RFP draft.
- Attended a meeting with the Manager of Subcontracting for Magnet Systems to discuss some problems that were created as a result of not including some SDB participation clauses in the Magnet Dipole RFP. Correct wording was accepted and written into the RFP.
- Met with SSC Procurement and Staff Services personnel in conjunction with the cafeteria contractor to review and discuss operations and procedures for improving services. Evaluation indicates that the SDB contractor is providing adequate services.
- Met with a review committee to evaluate the SDB women owned security contract and a report is forthcoming.
- Participated with the Manager of Subcontracting and Accelerator Systems in reviewing several DBE vendor presentations on their company's capabilities.
- Participated in a two-day Oklahoma Minority Supplier Development Council Trade Fair where representatives of this office made presentations on the SSC Lab and business opportunities available to the business community.
- Attended an advisory committee meeting of the Dallas/Ft. Worth Minority Business Council Construction Assistance Center. The purpose of the advisory committee is to assist minority contracting firms to develop their potential for doing business in major contracting projects.

The office continues to receive a large number of SB/DB capability statements and conducts meetings with vendors and procurement personnel.

#### **Project Technical Support 4.4**

##### **Technical Support Management 4.4.1**

DOE Review Committee presentations on Technical Support cost/planning/schedules were conducted. Recommendations from the Committee included improvements in staffing for Protective Services, particularly ES&H support, and General Computing. Planning is underway to make these improvements. Presentations were also made to explain those project related costs that were not a part of the accelerator construction, but expected future operating costs associated with commissioned or completed systems and facilities. Also included were costs associated with physics research that was not directly connected to the construction of the accelerator.

We continue to have extraordinary time taken in obtaining leases for interim office and laboratory space. Hopefully, now that the DOE Project Office has been consolidated in Texas, better communications and liaison will naturally increase efficiencies.

Plans have been made to assume operating responsibility for land and buildings taken by TNRLC for the SSCL.

## ***Staff Services***

### **Central Files**

We coordinated with SSCL records management on finalizing the central files color coding system, equipment, subject numbering system, accession numbering system, funds availability and start-up timing.

Meetings were held with representatives from the Federal Records Center in Ft. Worth to discuss policies/procedures involved in retirement, retention and archive storage of SSCL documentation.

Development of a Central Files Entry Card was completed and a purchase requisition was placed.

Meetings were held with computer operations to discuss computing needs for Central Files. Dbase, DAtabase, and Foxbase were studied. It was decided the vax-based Powerhouse system will best serve Central Files' needs for now.

### **GSA/Lease Vehicles**

Streamlining of the GSA/lease vehicle function continues and some of the improvements are: rapid return of D&M lease vehicles; greatly improved bill coding and payment with SSCL accounts payable and D&M leasing; user friendly key master file; data base consolidation and review; design and implementation of new vehicle request form; provision of emergency information for lease vehicles; posting of space and entry signs in GSA parking area; and implementation of a lease vehicle preventive maintenance program.

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

A needs survey was accomplished and the results are being analyzed. We are working with GSA to develop a fleet of vehicles that is economically balanced and meets lab needs.

### **Food Service/Special Events**

The catering/food service for DOE was completed on July 1. The week went exceptionally well and lines lasted no longer than 8-10 minutes. We are contacting a Health and Safety consultant to assure our compliance with Ellis County health inspection requirements.

### **Facility Support**

A trip was made to Hereford, TX to coordinate the transfer of office set-ups and a Canon copier to Fermilab for the Magnet Division.

Preliminary budget figures for FY91-98 were completed and submitted for review.

Convenience copier procedures and DOE reporting requirements were reviewed with Joe Drago, Joe Freeman (DOE) and Ed Engebretsen.

Safety concerns regarding support service workers (safety shoes and a truck with a lift or ramp) were reviewed.

Purchase requisitions were submitted for the additional furniture and equipment necessary to furnish Buildings 2 and 3 and to transfer all furniture and modular components from Hereford, TX to Dallas.

#### Medical Office

The Health Center opened on June 11 and a total of 68 health care visits occurred during the month.

Approximately 75% of the medical supplies and equipment have been received and a security alarm was installed in the Health Center.

An overview of up-coming "Wellness" presentations was presented by Dr. Gafford.

The FY91 budget was turned in for approval.

Health files are being set up for EG&G and URA employees.

#### Mail Room

Our mail volume continues its steady rise, with approximately 65,000 pieces being handled each month.

SSCL service-related improvements accomplished this month were receipt of a third class mail bulk rate permit, and a first class bulk rate presort plug and permit.

#### Security

The DOE Security/Safeguard Procedures were reviewed, the access control system was updated and periodic patrols are being made in the SSCL parking lots.

We coordinated with Facilities on security requirements for Bldg. #2 - Magnet test area, and security requirements for leased warehouse space in DeSoto were evaluated.

A proposal to develop a private security force is being prepared.

We chaired a performance evaluation meeting with Contract Guard Service and Procurement.

Budget projections for FY91-98 were completed and are being reviewed.

#### **Facilities Engineering Services 4.4.2**

The Laboratory currently has 193,630 square feet of interim office, laboratory, shop, and warehouse space. The status of additional interim space planned for FY90 includes:

- 8,440 SF, Provident Bank Building - The lease agreement was signed and finish-out construction was completed June 29, with systems furniture installation scheduled for July 2. All work is scheduled to be completed by July 9.

- Parking Lot - Awaiting DOE approval.
- 12,700 SF, Stoneridge Building #2 - DOE approval was received, the lease signed, and finish-out construction begun. Estimated completion of construction is the week of July 16 and installation of systems furniture is scheduled for July 20.
- 40,000 SF, Parkerville Rd. Warehouse - Received DOE approval the last week of June. We expect to sign the lease and complete finish-out work the first 10 days of July. Estimated occupancy date is July 12.

The status of additional interim space planned for FY91 includes:

- 47,119 SF, Stoneridge Building #3 - The lease package was forwarded to DOE June 8 and we are awaiting approval.
- 180,000 SF, Ellis County - A Solicitation for Offers was issued, but postponed because we anticipate the start of the first permanent building on site in August.

Action continues or was initiated on several projects. Included are:

- Assisting in the development of criteria for the Magnet Development Laboratory to be located on the permanent site.
- Continued finish-out of the high bay area in Stoneridge Building #4 for Accelerator Division laboratories.
- Continued reconfiguration of systems furniture to optimize space utilization.
- Development of specifications for portable modular offices for the warehousing and incoming inspection functions.
- Began the finish-out construction of 5,600 SF in Stoneridge Building #2 for the Magnet Evaluation Laboratory.
- Redefined the programmatic requirements for the additional 12,700 SF in Stoneridge Building #2 to include additional laboratory space for the Magnet Division.
- Evaluated existing improvements on the permanent site. Retention of three structures was recommended.
- Initiated a plan to provide temporary modular offices on the permanent site.
- Plans were initiated to provide for the operations and maintenance of facilities on the permanent site.

#### **Warehouse 4.4.3**

The annual inventory of controlled property will begin July 9 and continue through August. The date of record will be August 31, 1990 with reports due to DOE by October 15. Summer employees have been hired to assist with the peak work load since new material handling activity remains high.

The Parkerville Warehouse will be occupied in July and will add 40,000 SF of miscellaneous temporary storage space. The 10,000 SF in Stoneridge #2 will be retained for offices and campus related activities such as receiving, distribution, stores, and equipment control.

#### **Fabrication Shops 4.4.4**

Several meetings of the SSCL Shop Steering Committee were held this month. Using the Laboratory Technical Services Shop Management Plan as a guide, a shops requirement document was prepared for review by the Associate Directors.

Cost data and layouts were completed for the Interim Shops at Stoneridge. These items are scheduled to be reviewed in early July and, upon approval, the equipping of these facilities will begin in September, 1990.

#### **General Computing 4.4.5**

##### ***Technical Support***

Database selection and procurement as part of the integrated software tools strategy continues. The RFP for the relational database was reviewed with DOE in Chicago. DOE requested to review the RFP prior to its issuance to the vendors. This has resulted in a 4-week delay due to scheduling problems. Personnel from General Computing and Purchasing have been working to prepare the formal bid proposal package so that, as soon as DOE approval is received, the RFPs can be sent out. The new expected release date for the RFP is in mid-June.

Work continues with the MIS Strategic Implementation Program long-range project. The MIS Services contract acquisition proposal and statement of work have been transmitted to Purchasing. We are currently in the review and edit cycle prior to issuing an RFP for these services. This activity is approximately one week behind schedule. General Computing has formed a team of systems analysts to coordinate and drive the long-term MIS implementation project. This team has begun work in two areas; specifically, procurement and document control.

##### ***MIS Software Support***

All DOE approvals for the Powerhouse acquisition are complete and a purchase order issued this month. Final preparations are being made to implement the new Powerhouse Data Dictionary since the dictionary security issues have been resolved. Five additional personnel attended the Introduction to Powerhouse training course to bring the total of trained employees to seven.

In the DELTEK security and menu screens, User Identification Code (UIC) problems have been rectified and the Digital Command Language (DCL) access screen has been changed. Several meetings were held to discuss progress from last month's meetings regarding DELTEK Advanced Payroll. A quote was received from DELTEK for \$3500 which will allow Personnel to use Advance Payroll while URA PAYROLL remains on the current payroll module. The DELTEK Receipt Accrual project was completed and the request is closed.

A draft of the Applications Development Plan was completed and is in the last stages of review.

The sub-contractor tracking project is complete and was put into production. There is a Phase II accrual modification which will also be complete sometime this month.

The conversion of the invoice tracking capability to the Powerhouse production dictionary is completed and has been put into production.

The final revised specification for pre-printed time sheets has been received and work has begun.

The Travel Profile Traks project is complete; however, it will be held back from final production until the production dictionary is on line. The automated batch transfer for the bank file was completed and tested, and it will be put into production this month.

The Publications Log System was completed, though several enhancements will be made during the month. In addition, much progress has been made on the analysis work for the Technical Publications Systems.

A service request has been received from the legal department and Project Management for on-line management reports. Work on this requirement is scheduled to begin in July.

### *User Services*

Almost 200 pieces of software were processed. Considerable interest has been expressed regarding the Fileguard software whose recent use highlights problems associated with uninformed copying of software. Because the package is initialized, if it is installed on one machine and the disk is shared, the disk will create problems with the system folder on the second system.

Additional memory for the Novell server has increased the memory access for the Open Plan users.

Training representatives worked in conjunction with the User Support/Management and Technical group leaders to update the User Services portion of the General Computing Management Plan.

### *ADP Planning, Standards and Procedures*

Approval was received from DOE for the following acquisition proposals:

Doc. No. 6235-L90-006: Apollo HEP Software Development System for Physics Research Division

Doc. No. 6235-L90-007: Software Development Tool for the SSCL, Laboratory Technical Services

Doc. No. 6235-L90-010: Silicon Graphics File Server and Sun Workstation for Physics Research

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

Doc. No. 6235-L90-014: Implementation Plan for 500 MIP Major Item of Equipment (>\$1 Million)

Doc. No. 6235-L90-015: Relational Database Management System to Support MIS for the SSCL

The following acquisition plans have been prepared in draft form for submission to Procurement:

Doc. No. 6235-L90-016: Optical Disk System for Magnet System Division

## **Design Support 4.4.6**

### ***Administration***

Staffing services for other divisions included interviewing designer and drafter candidates for Accelerator Systems and Physics Research Divisions. One designer came on board in support of Accelerator Systems and two additional candidates were identified for hiring. The technical review committee is now evaluating qualifications of these candidates.

The Laboratory Standards Committee is considering final revisions to part and document numbering standards. These standards should be released for Lab-wide use in July.

Much effort was spent preparing and presenting information for the SCDR held the last week in June. In addition, work continued on the management plan for the Design Support organization and on long-range planning for CADS.

### ***CAE/CAD Operations and Support***

Operational support of CAD systems consists of data backup services, central plotter support, system configuration, system security, and software maintenance.

Two new plotter/printers were evaluated this month. One, an electrostatic plotter from Raster Graphics, appears to be a fine plotter but is limited to "D" size output. The other machine is from Tektronix. It is an "A" size printer/plotter that may fill our need for color screen copies for presentations.

We will acquire within 90 days additional magnetic storage and memory for the Intergraph server in order to facilitate data storage and peripheral support requirements.

Work continues on the CAD implementation plan that describes the SSCL CAD environment and resource needs for the near and long term. This plan will also include CAD/Data Management System interfaces.

Evaluation of EE CAE/CAD systems continues. The Calay solution was investigated this month and one member of the evaluation committee attended the DAC conference in Florida where he had the opportunity to witness the operational performance of several potential systems. This concludes the first round of evaluations. A committee meeting will be held soon and the list of potential vendors is expected to be cut to two - four finalists. Further evaluations will be held aimed at implementation of the selected system by fall of this year.

### ***Design Drafting Support***

Interviews were conducted to identify additional designers and drafters for the Support organization. One designer was hired and will report to work the first week in July. One potential drafter candidate has been identified and her qualifications are currently being evaluated by the technical review committee.

One designer and one drafter from the Design Support Organization (DSO) currently support Accelerator Systems Division (ASD) personnel on a full-time basis. These individuals are assisting ASD engineers and designers with corrector, magnet, and spool piece design and drafting efforts. One DSO drafter is working full-time in support of the Physics Research Division detector configuration effort. Other drafting work is being done in support of the Administrative Services Division and the Facilities Engineering Group.

### ***Technical Data Management and Reproduction***

Evaluations of potential database management software systems continue. The Infomanager system from McDonnell Douglas Corp., a new system not yet complete, was previewed. Prime/Computer vision will present an overview of the Electronic Data Management system product during July.

A purchase requisition has been submitted for the acquisition of an engineering drawing production-level copier. It is expected this machine will be on-line in late August. Reproduction requests continue to increase as drawing production rises. Beginning in July, our reproduction clerks will begin to assign drawing numbers to individuals in the Physics Research and LTS divisions. This effort could be expanded to include number assignments for all Laboratory documents if the initial experiment is a success.

### **Communications 4.4.7**

June marked the end of the first year that communications and networking resources have been in operation at the SSC Laboratory's temporary facility in Dallas. When personnel were first situated in the Stoneridge complex, the group inherited a 25 station "key" system with only 15 telephone lines available throughout all of the buildings and no means of establishing network connectivity. One year later, the following resources have been acquired, developed or otherwise implemented:

- Over 700 telephones on-line in five separate buildings
- More than 600 pairs of wires available for use to the local Central Office
- A fiber-optic hub which goes directly to the local Central Office
- The Laboratory's own telephone prefix in the 214 area code
- Five T-1 circuits for wide-area network connectivity.
- Video teleconferencing to LBL and FNAL
- An extensive Local Area Network with over 800 nodes

A program to replace leased digital telephones with analog sets has been completed. This will significantly reduce the current lease costs for temporary telephone service.

Preparations have begun for some level of occupancy of the E-1 area. The initial installations will be in existing structures.

The Local-Area Network was restructured to help isolate some of the high volume Ethernet traffic within the computer room.

The communications and networking system for the finish-out of the Desoto bank has been completed and is operational.

#### **Engineering Support/Standards 4.4.8**

##### ***Tasks Completed During June***

###### **Drawing Formats**

Minor changes were made to the SSC Laboratory Drawing Formats Procedure.

###### **Engineering Documents and Equipment Part Numbers**

Revised to clarify the intended methods of use. Due to critical need of these two procedures, they will be released for use by engineering even though final approval has not been issued. The instructions for applying numbers to documents and parts were also prepared.

The Software Libraries and Repositories Procedure was submitted to Project Management for review. It establishes the requirements and responsibilities for the formal release, storage, distribution, change authorization, and changes to software developed at or for the collider. These procedures also include the software for programming firmware (programmable devices) and software used in the operation of the collider and the support equipment.

##### ***Procedures in Process***

###### **Drawing Breakdown Structure**

Establishes the requirements for documentation which will provide a drawing breakdown structure for the collider, peripherals, and support equipment. This can be accomplished by a computerized top-down breakdown or a series of engineering family trees.

###### **Change Authorization**

Describes the use of the Engineering Change Notice (ECN) and the responsibility for its processing from initiation to implementation. The ECN provides a uniform method for submitting engineering changes to released documentation. An approved ECN conveys effectivity and rework instructions to manufacturing facilities, installation personnel, procurement and other affected operations.

###### **Drafting Manual**

Project Management changed the Drafting Manual in June. The current plan is to have two manuals. The first manual will consist of special instructions and SSC Laboratory Guides and Standards describing the differences between standard industry practice and the SSC operation.

The second manual is a purchased manual from Genium Publishing Corporation titled "Modern Drafting Practices and Standards Manual." Unless noted in the manual described above (special instruction), drafting practices will be defined by this manual.

In June, the following instructions were prepared:

- (1) **Part Numbers** - Provides information on obtaining and using part numbers. This includes general information pertaining to part number assignment for detail parts, assemblies, component specifications and other types of engineering documentation.
- (2) **General Tolerances** - Details how to specify general tolerances for metric dimensions without using individual specified tolerances.
- (3) **Letter Heights and Fonts** - Contains instructions for the type of letters and fonts to be used on drawing and engineering documents.

#### Other Activities

Discussions were held on the requirements for a Material Requirement Planning system or Material Control System. How material will be controlled has not been resolved and discussion will continue.

A representative from B. G. Jackson and Associates, presented material on documentation handling systems, and a representative from Ask Computer Systems Inc. gave a briefing on available software modules.

#### **Metrology Labs 4.4.9**

##### *Tasks Completed During June*

#### Receiving Inspection, Calibration and Repair Labs

Working standards for the Calibration/ Repair Lab have been ordered and some equipment has been received. Limited calibration of measuring and test equipment (M&TE) should begin in July.

Standard Operating Procedure drafts defining Quality Assurance, Laboratory Clerk, and Laboratory Technician responsibilities were completed.

The first draft of a Calibration Interval Adjustment System was developed to ensure that all M&TE entered into the Calibration Recall System is assigned the appropriate calibration interval.

Design requirements for a modular room temporary location for incoming Inspection/Calibration and Repair Lab were completed and sent to procurement.

Steps were taken to begin working with Accounting on the DELTEK system to ensure that all M&TE requiring a quality assurance check for initial acceptance in the receiving area is flagged on the purchase orders.

#### Metrology Laboratory

Draft Standard Operating Procedures on Quality Assurance and Laboratory Operations were completed and are being evaluated.

Design specifications for the permanent Metrology Lab on campus are being evaluated to ensure that all building design criteria are incorporated.

We discussed combined work areas in Building 3 with the Magnet Test Facility/Manufacturing Group. This area will include a calibration area, test equipment spares area, and an engineering prototype design area.

Contact was made with both the National Institute of Standards and Technology (NIST) and the National Conference of Standards Laboratories (NCSL) to receive calibration and metrology information provided by these professional organizations.

We received several MIL-STD, ANSI, and OSHA publications concerning calibration and metrology labs and set up a reference file for these publications.

#### **SSC Lab Directors Office 4.5**

Twelve Expressions of Interest (EOI) in research at the SSC were presented to the Program Advisory Committee (PAC) on June 7-8. The PAC sent questions to the spokesmen, with written answers due in July. The EOIs will then be reviewed in more detail by the PAC in a week-long meeting to be held in Snowmass, Colorado.

The Scientific Policy Committee met on June 14-15 and was briefed by members of the Directorate on developments since December. Several topics were discussed, the principal one being how to determine the initial mix of experiments at the collider.

A major review of the baseline design, cost and schedule of the project was held on June 25-29. Members of the Directorate and other staff members made presentations to three separate review groups numbering about 90 people in various plenary and parallel sessions. Two of the review groups were from DOE and the third was a HEPAP subpanel convened at the request of the DOE.

#### **Physics Research 4.6**

##### **Library Services 4.6.1**

A new account was established with National Standards Association, which is an excellent, less expensive source for acquiring military documents.

Interviews were conducted for the Serials Librarian position.

The entire library work area was rearranged and four additional work stations were installed.

##### **Technical Information and Publications 4.6.2**

The DOE, Headquarters and Chicago, review of the Technical Information and Publications department's operations included a discussion of printing activities relating to duplicating facilities, convenience copiers, and the graphics department's camera requirements.

We supported the DOE review of the Laboratory by producing approximately 890,000 impressions for both presentation materials and DOE summaries. Part of the documentation requirements were produced utilizing UNICOR prison printing facilities.

In support of the Student Intern program, Technical Information and Publications is utilizing three students who are assigned to Report Coordination, Graphic Services, and Editorial Services.

We are assisting with the preparation of the script and production of video tapes for Quality Assurance and Safety. These tapes will be utilized primarily as an introduction for new employees.

A Forms Control department has been established to design, number, develop, inventory and distribute forms.

Procedures for patent review between the General Counsel and DOE/Chicago Patent Attorney have been established and implemented.

### **Experimental Facilities 4.6.3**

The Experimental Facilities Group assembled a presentation for the DOE review in June. The topics covered included the following:

1. Staffing - L. Cornell and N. Norman
2. Detector surface building requirements - T. Thurston
3. Detector hall requirements - D. Etherton
4. Control room requirements - K. Morgan
5. Detector utility requirements - M. Hecht
6. Test beams - F. Stocker and H. Fenker
7. Schedules and funding profiles - D. Etherton

Overall the plan in support of detectors appears comprehensive, but many problems remain. Not all of the funding issues are clearly understood at this time; test beams require a great deal of design work; surface facilities in the baseline design cover only a fraction of the need expressed in the Expressions of Interest; and the detector hall construction and its dependance on local geology is not yet fully understood. Nevertheless, a great deal of progress has been made in the last year.

A draft of the Resource Requirements Report (RRR) was sent to the spokespersons of the five major detector groups. Some work was also included on the small detectors. Of the fourteen groups that submitted Expressions of Interest, about half have had time to consider their resource requirements. For this edition of the RRR we will therefore concentrate on the detectors we know most about, and catch up with the rest in the next year, pending recommendations from the PAC.

A summary of overall costs for the major detectors is being assembled. This will include the cost of the detector, conventional facilities, cryogenics, gas systems, staff, and any other costs that would be associated with the detector. This should give the Laboratory an overview of the complete costs to build any given detector. In conjunction with this, work is going on at RTK to get an estimate of the costs of the underground detector halls.

A workshop was held in June to determine the requirements for the detector groups for document control; an ability to transmit documents, including engineering drawings, between engineering centers; and the need for a Technical Information Center. The issues are very broad and complex, but some progress was made toward achieving an agreement on the requirements.

The Experimental Facilities Group worked with the SDC collaboration during June to further address the issues of detector assembly and hall requirements for a detector with an octagonal muon steel configuration. Work was also carried out on the System Engineering requirements for SDC.

We have been working with Lab Tech Services to develop and implement a plan for shop space for the Physics Research Division. The shops would be located in Building #3, and would include a space for liquid argon calorimeter work. The need for this space is becoming critical, since the liquid argon module should arrive in Dallas in August.

## **Experimental Systems WBS 5.0**

### **Experimental Systems R&D 5.1**

Planning continued for the Symposium on Detector R&D for the SSC to be held October 15-18, 1990 in Fort Worth, Texas. To date, we have received about 250 pre-registration forms, with many from outside the US. About 150 people responded to the call for abstracts with a written text, and another 50 stated their interest to present a talk. The organization of the sessions and selection of session chairmen have begun. World Scientific was selected to publish the Symposium proceedings.

Discussions between the Texas National Research Laboratory Commission (TNRLC) personnel and Laboratory personnel were held to announce the distribution of the subsystems detector R&D funding to be provided by the State of Texas, and to set up a funding mechanism. The principal investigators from the twelve universities receiving funds have been notified. They must now submit a "Request for Assistance" form to the TNRLC which provides a detailed budget and the scope of work. The latter item will be sent to the Laboratory and to the members of the TNRLC detector R&D review committee for concurrence.

In order to provide continuity in FY91 funding for the detector R&D program, it was mutually agreed upon by DOE/OSSC and the Laboratory 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, it was agreed to send a delegation of DOE and Laboratory personnel to visit four National Laboratories and review their progress to date and their funding requests for FY91. These visits, scheduled for July 24-27, will provide a basis for providing the first quarter funding. Adjustments for the final FY91 funding will then be made after receipt of progress reports in September from each Subsystems project, and review by the International R&D Review Committee in October and the Program Advisory Committee (PAC) in November.

### **Detectors 5.2**

The Expressions of Interest were presented publicly at the meeting of the PAC on June 7-8, 1990. On June 9 the PAC met in executive session to consider what they had heard and read, and to draw up questions for the proponents on the technical issues raised, as well as the cost, schedule, and physics capabilities represented in the Expressions of Interest. These questions were forwarded to the collaborations and are to be answered by the next meeting of the PAC in Snowmass, Colorado on July 14 - 20. The Laboratory remained in contact with the collaborations on various specific topics related to the questions posed by the PAC and to input for the Resource Requirements Report through the month.

## **Lab Operations Support WBS 6.0**

### **Physics Program Support 6.1**

#### **Division Office 6.1.1**

The May accounting reports were distributed to the task managers so they could closely review outstanding purchase orders and requisitions.

A long range plan for divisional staffing, and more specifically that for Experimental Facilities (WBS 4.6.3), was prepared and presented at the DOE review. This included the costing algorithm as applied to the staffing profile.

Most of the Division Office's time in early June was dedicated to support of the Program Advisory Committee's public hearings of the Expressions of Interest held June 7-8, and the remainder of the month was spent in preparation for the June 25-29 DOE Review.

Work continued on the Detector Safety Review Report and on a Resource Requirements Report for the major detector groups submitting Expressions of Interest to the Lab.

Dr. Henry Kasha, Yale University, joined us for a one year Guest Scientist appointment.

#### **Theory 6.1.2**

The Conference on New Topics in Electroweak Physics ended on June 1, with approximately 40 attendees from outside the SSCL. Several theorists stayed on as visitors to the Laboratory through most of the month of June.

#### **Experimental Physics and Facilities 6.1.3**

Procurement action involving the acquisition of material and equipment for the Experimental Physics Laboratory at the SSCL is underway and being coordinated with the Procurement and Finance Departments.

#### **Computing and Data Analysis 6.1.4**

##### ***Milestone Reached***

Computer Operations achieved a milestone this month when the original VAX system (SSCVX1) celebrated its first birthday. Since May 1989, the 30 user accounts have grown to more than 900 users on the Scientific and Administrative VAXes as well as a subset of those on the UNIX systems.

The first employees, who were located in Bldg. 1, used a computer room slightly larger than a closet which held SSCVX1, Communications/PBX equipment and a stream of AT&T employees. Since then, Computer Operations has moved into the UNIX world and provides support for Physics Research and other UNIX resources as well as VAX/VMS. Available compute power in centralized VAX resources has increased from 4 MIPs to 34 MIPs with an additional 40 MIPs on the Silicon

Graphics fileserver for Physics Research. Data storage capabilities have grown from 5 Gb to more than 20 Gb of central storage with several more Gigabytes planned in the near future for the proposed detector simulation system and other general purpose computers.

### *VAX Systems*

A new System Manager/Programmer who has several years of strong VMS experience and who has specialized in performance management joined Computer Operations. He will provide general VMS support as well as a backup function for the Administrative VAX System Manager and will be cross-trained on the UNIX operating system.

Some general tuning techniques were exercised on both VAXes this month. A reorganization of data files and programs, as well as some changes in the user's authorization records, has improved I/O performance on the Administrative VAX (SSCAD1). Sysgen and pagefile changes have been made on the Scientific VAX (SSCVX1) to counteract the adverse effects of increasing ANSYS and other analysis code usage. Other changes include moving ANSYS users to less crowded disk drives and modifying batch queue characteristics to reduce process paging. All VMS systems are currently running VMS 5.3.

### *UNIX System Management*

Computer Operations personnel continue their efforts to increase the level of knowledge of the UNIX operating system by attending classes and participating in a national UNIX users group (USENIX). One area of special concern on the UNIX system is in the lack of an adequate backup/archival utility. Operations and Accelerator Controls are undertaking a joint effort to evaluate and procure a software package that will scale to the level required by proposed system configurations.

A new SPARCstation was installed and a proposal is currently being drafted for DOE review which requests a Laboratory UNIX general-purpose system.

### *Physics Support*

In the System Development Group's (SDG) continuing support of the 500 MIP acquisition project, the Cooperative Processes Software (CPS) has been chosen for use as the process level distributed computing software. A new hire, who has joined the group to support the CPS software, will spend three weeks at Fermilab as part of an informal agreement with that laboratory. While learning the system, this representative will assist Fermilab with CPS support and on porting the software to some new platforms.

The SDG initiated the process to obtain a UNIX source license from AT&T for the 500 MIP acquisition project. The source will be used as the system documentation. Some of the Silicon Graphics workstations have been upgraded to IRIX 3.3 which supports several features required for the 500 MIP project. The first release of Network Queuing Software has been obtained from COSMIC to be ported to one of the Silicon Graphics workstations, and eventually all of the workstations involved in the 500 MIP project.

In the effort to integrate Macintosh personal computers with the Silicon Graphics file server, an X Window-based calendar tool has been developed and demonstrated. Orders have been placed for additional memory and additional copies of the X Window software for group secretaries to allow them to coordinate the calendar schedules of Computation & Data Analysis.

Version 198 of the CERN Library is being installed on the RISC System/6000.

*Networks*

The Laboratory domain name service has been moved from a SUN sparcstation (SUNOVA) to SSCNET, a MicroVAX 3200 running VMS. The second meeting of the nameserver working group was held to divide up efforts based on specific operating systems.



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

<b>COST PERFORMANCE REPORT - BY WBS</b>												
						REPORT PERIOD		FROM: 05-27-90	\$ IN 000'S			
								TO: 07-01-90				
		CURRENT PERIOD				CUMULATIVE TO DATE				<b>**FY90</b>		
		BCWS	BCWP	ACWP	VARIANCE	BCWS	BCWP	ACWP	VARIANCE	BAC	LRE	VARIANCE
					SCHEDULE COST				SCHEDULE COST			
	<b>WBS ITEM</b>											
	<b>1.1.1 ACCEL. MGMT. &amp; SUPPORT</b>	3	3	3	0 0	205	205	205	0 0	2,400	2,400	0
	<b>1.1.2 LINAC</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>1.1.3 LEB</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>1.1.4 MEB</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>1.1.5 HEB</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>1.1.6 COLLIDER</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>1.1.7 TEST BEAMS</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>TOTAL 1.1 ACCELERATOR SYSTEMS</b>	3	3	3	0 0	205	205	205	0 0	2,400	2,400	0
	<b>1.2.1 MANAGEMENT &amp; SUPPORT</b>	1,252	1,252	1,252	0 0	2,730	2,730	2,730	0 0	7,873	7,873	0
	<b>1.2.2 HEB MAGNETS</b>	0	0	0	0 0	0	0	0	0 0	0	0	0
	<b>1.2.3 COLLIDER MAGNETS</b>	1,728	1,728	1,728	0 0	7,482	7,482	7,482	0 0	14,043	14,043	0
	<b>1.2.4 MAGNET FAC EQUIPTOOLING</b>	0	0	0	0 0	0	0	0	0 0	6,200	6,200	0
	<b>TOTAL 1.2 MAGNET SYSTEMS</b>	2,980	2,980	2,980	0 0	10,212	10,212	10,212	0 0	28,116	28,116	0
	<b>TOTAL 1.0 TECHNICAL SYSTEMS</b>	2,983	2,983	2,983	0 0	10,417	10,417	10,417	0 0	30,516	30,516	0

**\*\*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: 05-27-90												
TO: 07-01-90												
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	0	0	0	0	0	0	0	0	
2.1.2 LINAC	0	0	0	0	0	0	0	0	0	0	0	
2.1.3 LEB	0	0	0	0	0	0	0	0	0	0	0	
2.1.4 MEB	0	0	0	0	0	0	0	0	0	0	0	
2.1.5 HEB	0	0	0	0	0	0	0	0	0	0	0	
2.1.6 COLLIDER	0	0	0	0	0	0	0	0	0	0	0	
2.1.7 TEST BEAMS	0	0	0	0	0	0	0	0	0	0	0	
<b>TOTAL 2.1 CONV. CONSTR. ACCEL.</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
2.2.1 WN REGION	0	0	0	0	0	0	0	0	0	0	0	
2.2.2 WS REGION	0	0	0	0	0	0	0	0	0	0	0	
2.2.3 EN REGION	0	0	0	0	0	0	0	0	0	0	0	
2.2.4 ES REGION	0	0	0	0	0	0	0	0	0	0	0	
2.2.5 SUPPORT FUNCTIONS	0	0	0	0	0	0	0	0	0	0	0	
<b>TOTAL 2.2 CONV. SYS. EXPERIMENT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

\*\*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: 05-27-90													
TO: 07-01-90													
CURRENT PERIOD					CUMULATIVE TO DATE					**FY90			
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
2.3.1 PRIMARY, OFFSITE	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3.2 PRIMARY, ONSITE	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3.3 SECONDARY	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 2.3 SITE/INFRASTRUCTURE</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.4.1 CENTRAL LAB/OFFICE AREA	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4.2 MAGNET LABORATORY	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4.3 ACCELERATOR FACILITIES	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4.4 ENVIRONMENT HEALTH FACIL.	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 2.4 CAMPUS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.5.1 AE/CM	263	263	263	0	0	263	263	263	0	0	3,000	3,000	0
2.5.2 CCD MANAGEMENT	740	740	740	0	0	11,853	11,853	11,853	0	0	15,794	15,794	0
<b>TOTAL 2.5 CONV. CONST. MGMT.</b>	<b>1,003</b>	<b>1,003</b>	<b>1,003</b>	<b>0</b>	<b>0</b>	<b>12,116</b>	<b>12,116</b>	<b>12,116</b>	<b>0</b>	<b>0</b>	<b>18,794</b>	<b>18,794</b>	<b>0</b>
<b>TOTAL 2.0 CONVENTIONAL CONST.</b>	<b>1,003</b>	<b>1,003</b>	<b>1,003</b>	<b>0</b>	<b>0</b>	<b>12,116</b>	<b>12,116</b>	<b>12,116</b>	<b>0</b>	<b>0</b>	<b>18,794</b>	<b>18,794</b>	<b>0</b>

\*\*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: 05-27-90													
TO: 07-01-90													
WBS ITEM	CURRENT PERIOD					CUMULATIVE TO DATE					**FY90		
	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
3.1.1 PROJECT MGMT. OFFICE	132	132	132	0	0	1,063	1,063	1,063	0	0	1,500	1,500	0
3.1.2 PLANNING	108	108	108	0	0	940	940	940	0	0	1,783	1,783	0
3.1.3 PMRS	3	3	3	0	0	642	642	642	0	0	1,072	1,072	0
3.1.4 ENGINEERING STANDARDS	47	47	47	0	0	107	107	107	0	0	641	641	0
3.1.5 ENVIRONMENTAL AFFAIRS	51	51	51	0	0	770	770	770	0	0	1,250	1,250	0
3.1.6 OFFICE OF TECH. DIRECTOR	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 3.1 PROJECT MANAGEMENT</b>	<b>341</b>	<b>341</b>	<b>341</b>	<b>0</b>	<b>0</b>	<b>3,522</b>	<b>3,522</b>	<b>3,522</b>	<b>0</b>	<b>0</b>	<b>6,246</b>	<b>6,246</b>	<b>0</b>
3.2 SYSTEMS ENGINEERING	193	193	193	0	0	1,364	1,364	1,364	0	0	2,500	2,500	0
<b>TOTAL 3.0 PROJ. MGMT. &amp; SUPPORT</b>	<b>534</b>	<b>534</b>	<b>534</b>	<b>0</b>	<b>0</b>	<b>4,886</b>	<b>4,886</b>	<b>4,886</b>	<b>0</b>	<b>0</b>	<b>8,746</b>	<b>8,746</b>	<b>0</b>

\*\*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: 05-27-90								
					TO: 07-01-90								
CURRENT PERIOD						CUMULATIVE TO DATE						**FY90	
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE	SCHEDULE COST	BCWS	BCWP	ACWP	VARIANCE	SCHEDULE COST	BAC	LRE	VARIANCE
4.1 ACCELERATOR PRE-OPS	0	0	0	0	0	0	0	0	0	0	0	0	0
4.2.1 ACCELERATOR R&D	2,295	2,295	2,295	0	0	13,817	13,817	13,817	0	0	26,130	26,130	0
4.2.2 MAGNET R&D	2,503	2,503	2,503	0	0	26,861	26,861	26,861	0	0	41,800	41,800	0
<b>TOTAL 4.1&amp;2 PRE-OPS/RES. &amp; DEV</b>	<b>4,798</b>	<b>4,798</b>	<b>4,798</b>	<b>0</b>	<b>0</b>	<b>40,678</b>	<b>40,678</b>	<b>40,678</b>	<b>0</b>	<b>0</b>	<b>67,930</b>	<b>67,930</b>	<b>0</b>

\*\*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: 05-27-90														
TO: 07-01-90														
CURRENT PERIOD					CUMULATIVE TO DATE					**FY 90				
BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE		
			SCHEDULE	COST				SCHEDULE	COST					
WBS ITEM														
4.3.1	ADMIN SERVICES MGMT.	126	126	126	0	0	1,650	1,650	1,650	0	0	2,858	2,858	0
4.3.2	ACCTG. & FINANCE	199	199	199	0	0	1,621	1,621	1,621	0	0	2,016	2,016	0
4.3.3	PROCUREMENT & CONT.	231	231	231	0	0	2,051	2,051	2,051	0	0	2,681	2,681	0
4.3.4	TRAVEL SERVICES	24	24	24	0	0	147	147	147	0	0	215	215	0
4.3.5	HUMAN SERVICES	182	182	182	0	0	1,898	1,898	1,898	0	0	2,120	2,120	0
4.3.6	STAFF SUPPORT SERVICES	140	140	140	0	0	955	955	955	0	0	1,303	1,303	0
4.3.7	MINORITY AFFAIRS	40	40	40	0	0	260	260	260	0	0	465	465	0
4.3.8	INTERNAL AUDIT	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 4.3 LAB ADMIN. &amp; SUPPORT</b>		<b>934</b>	<b>934</b>	<b>934</b>	<b>0</b>	<b>0</b>	<b>8,528</b>	<b>8,528</b>	<b>8,528</b>	<b>0</b>	<b>0</b>	<b>11,612</b>	<b>11,612</b>	<b>0</b>

\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

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

COST PERFORMANCE REPORT - BY WBS													
REPORT PERIOD										FROM: 05-27-90		\$ IN 000'S	
										TO: 07-01-90			
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	155	155	155	0	0	988	988	988	0	0	1,827	1,827	0
4.4.2	168	168	168	0	0	3,403	3,403	3,403	0	0	4,231	4,231	0
4.4.3	82	82	82	0	0	620	620	620	0	0	964	964	0
4.4.4	19	19	19	0	0	80	80	80	0	0	132	132	0
4.4.5	411	411	411	0	0	2,210	2,210	2,210	0	0	3,239	3,239	0
4.4.6	78	78	78	0	0	421	421	421	0	0	1,294	1,294	0
4.4.7	95	95	95	0	0	905	905	905	0	0	2,351	2,351	0
4.4.8	40	40	40	0	0	214	214	214	0	0	504	504	0
4.4.9	66	66	66	0	0	79	79	79	0	0	146	146	0
4.4.10	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4.11	81	81	81	0	0	81	81	81	0	0	0	0	0
<b>TOTAL 4.4 LAB TECH SUPPORT</b>	<b>1,195</b>	<b>1,195</b>	<b>1,195</b>	<b>0</b>	<b>0</b>	<b>9,001</b>	<b>9,001</b>	<b>9,001</b>	<b>0</b>	<b>0</b>	<b>14,688</b>	<b>14,688</b>	<b>0</b>

\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

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

<b>COST PERFORMANCE REPORT - BY WBS</b>														
REPORT PERIOD											\$ IN 000'S			
FROM: 05-27-90														
TO: 07-01-90														
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	103	103	103	0	0	884	884	884	0	0	1,235	1,235	0
4.5.2	EXTERNAL AFFAIRS	47	47	47	0	0	452	452	452	0	0	575	575	0
4.5.3	LEGAL SERVICES	35	35	35	0	0	266	266	266	0	0	305	305	0
4.5.4	RESEARCH & TECH. ASSMT.	0	0	0	0	0	1	1	1	0	0	65	65	0
4.5.5	USERS OFFICE	25	25	25	0	0	202	202	202	0	0	239	239	0
4.5.6	ENVIRON. HEALTH & SAFETY	63	63	63	0	0	397	397	397	0	0	516	516	0
4.5.7	PLANNING	33	33	33	0	0	258	258	258	0	0	323	323	0
4.5.8	INTERNAT'L. COORDINATION	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 4.5 LAB DIRECTORATE</b>		<b>306</b>	<b>306</b>	<b>306</b>	<b>0</b>	<b>0</b>	<b>2,460</b>	<b>2,460</b>	<b>2,460</b>	<b>0</b>	<b>0</b>	<b>3,258</b>	<b>3,258</b>	<b>0</b>
4.6.1	LIBRARY SERVICES	70	70	70	0	0	650	650	650	0	0	1,365	1,365	0
4.6.2	TECH. INFO. & PUBLICATIONS	66	66	66	0	0	696	696	696	0	0	1,035	1,035	0
4.6.3	EXPER. FACILITIES ADMIN.	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 4.6 PHYSICS RESEARCH</b>		<b>136</b>	<b>136</b>	<b>136</b>	<b>0</b>	<b>0</b>	<b>1,346</b>	<b>1,346</b>	<b>1,346</b>	<b>0</b>	<b>0</b>	<b>2,400</b>	<b>2,400</b>	<b>0</b>
4.7	PRIME CONTRACTORS FEES	186	186	186	0	0	1,678	1,678	1,678	0	0	2,235	2,235	0
<b>TOTAL 4.0 RAD, PRE-OPS, ADMIN/SUP.</b>		<b>7,555</b>	<b>7,555</b>	<b>7,555</b>	<b>0</b>	<b>0</b>	<b>63,691</b>	<b>63,691</b>	<b>63,691</b>	<b>0</b>	<b>0</b>	<b>102,123</b>	<b>102,123</b>	<b>0</b>

\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

SSC LABORATORY - CONTRACT #DEACO259ER40486 - FORMAT I (BY WBS)

COST PERFORMANCE REPORT - BY WBS												
REPORT PERIOD											\$ IN 000'S	
FROM: 05-27-90												
TO: 07-01-90												
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	0	0	0	0	0	0	0	0	
5.1.2 MAJOR DETECT. & SUBSYST.	0	0	0	0	0	0	0	0	0	0	0	
5.1.3 APPROVED EXPER. R&D	0	0	0	0	0	0	0	0	0	0	0	
<b>TOTAL 5.1 EXPER. SYST. R&amp;D</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
5.2 DETECTORS	0	0	0	0	0	0	0	0	0	0	0	
5.3 EXPER. SYS. COMPUTERS	0	0	0	0	0	0	0	0	0	0	0	
<b>TOTAL 5.0 EXPERIMENTAL SYSTEMS</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>0</b>	<b>268</b>	<b>268</b>	<b>268</b>	<b>0</b>	<b>330</b>	<b>330</b>	<b>330</b>	

\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

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

<b>COST PERFORMANCE REPORT - BY WBS</b>													
						REPORT PERIOD		FROM: 05-27-90		\$ IN 000'S			
									TO: 07-01-90				
		CURRENT PERIOD				CUMULATIVE TO DATE						<b>**FY90</b>	
WBS ITEM	BCWS	BCWP	ACWP	VARIANCE		BCWS	BCWP	ACWP	VARIANCE		BAC	LRE	VARIANCE
				SCHEDULE	COST				SCHEDULE	COST			
<b>6.1.1 PHYSICS ADMIN/SUPPORT</b>	101	101	101	0	0	560	560	560	0	0	871	871	0
<b>6.1.2 PHYSICS THEORY</b>	28	28	28	0	0	29	29	29	0	0	356	356	0
<b>6.1.3 EXPER. PHYSICS</b>	334	334	334	0	0	1,824	1,824	1,824	0	0	2,748	2,748	0
<b>6.1.4 COMPUTING &amp; DATA ANALYSIS</b>	279	279	279	0	0	1,955	1,955	1,955	0	0	3,667	3,667	0
<b>6.1.5 ACCELERATOR PHYSICS</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 6.1 PHYSICS PROG. SUPPORT</b>	742	742	742	0	0	4,368	4,368	4,368	0	0	7,642	7,642	0
<b>6.2 LAB OPERATIONS OVERHEAD</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>6.3 ACCELERATOR OPERATIONS</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL 6.0 LAB OPS. SUPPORT</b>	742	742	742	0	0	4,368	4,368	4,368	0	0	7,642	7,642	0

**\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL**

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

COST PERFORMANCE REPORT - BY OBS												
REPORT PERIOD										FROM: 05-27-90		\$ IN 000'S
										TO: 07-01-90		
CURRENT PERIOD					CUMULATIVE TO DATE					**F Y90		
	BCWS	BCWP	ACWP	VARIANCE	BCWS	BCWP	ACWP	VARIANCE	BAC	LRE	VARIANCE	
			SCHEDULE	COST			SCHEDULE	COST				
OBS ITEM												
D - DIRECTORATE	492	492	492	0	0	4,138	4,138	4,138	0	0	3,493	
B - PROJECT MANAGEMENT	534	534	534	0	0	4,886	4,886	4,886	0	0	8,746	
A - ACCELERATOR SYSTEMS	3,550	3,550	3,550	0	0	16,752	16,752	16,752	0	0	28,530	
C - CONVENTIONAL CONSTRUCTION	1,003	1,003	1,003	0	0	12,116	12,116	12,116	0	0	18,794	
T - TECHNICAL SERVICES	1,195	1,195	1,195	0	0	9,001	9,001	9,001	0	0	14,688	
G - ADMINISTRATIVE SERVICES	934	934	934	0	0	8,528	8,528	8,528	0	0	11,612	
P - PHYSICS RESEARCH	895	895	895	0	0	5,982	5,982	5,982	0	0	10,372	
M - MAGNET SYSTEMS	4,231	4,231	4,231	0	0	34,343	34,343	34,343	0	0	69,916	
<b>TOTAL SSC LABORATORY</b>	<b>12,834</b>	<b>12,834</b>	<b>12,834</b>	<b>0</b>	<b>0</b>	<b>95,746</b>	<b>95,746</b>	<b>95,746</b>	<b>0</b>	<b>0</b>	<b>168,151</b>	

\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

SSC LABORATORY - CONTRACT #DEACO288ER40486 - MAJOR SUBCONTRACTORS

MAJOR SUBCONTRACTORS												
REPORT PERIOD										FROM: 05-27-90		\$ IN 000'S
										TO: 07-01-90		
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	1,887	1,887	1,887	0	0	12,862	12,862	12,862	0	0	19,956	
FERMILAB - MAGNETS	1,276	1,276	1,276	0	0	11,390	11,390	11,390	0	0	18,256	
LBL - MAGNETS	319	319	319	0	0	3,588	3,588	3,588	0	0	4,900	
LOCKHED	202	202	202	0	0	1,227	1,227	1,227	0	0	2,370	
RTK	476	476	476	0	0	10,127	10,127	10,127	0	0	11,917	
HARC/TAC	250	250	250	0	0	2,059	2,059	2,059	0	0	2,772	
AE/CM	264	264	264			264	264	264	0	0	3,000	
<b>SUBTOTAL</b>	<b>4,410</b>	<b>4,410</b>	<b>4,410</b>	<b>0</b>	<b>0</b>	<b>41,253</b>	<b>41,253</b>	<b>41,253</b>	<b>0</b>	<b>0</b>	<b>60,171</b>	
SSCI/OTHER	8,424	8,424	8,424	0	0	54,493	54,493	54,493	0	0	107,980	
<b>TOTAL</b>	<b>12,834</b>	<b>12,834</b>	<b>12,834</b>	<b>0</b>	<b>0</b>	<b>95,746</b>	<b>95,746</b>	<b>95,746</b>	<b>0</b>	<b>0</b>	<b>168,151</b>	

\*\*BAC REFLECTS FY90 BUDGET ONLY PENDING BASELINE APPROVAL

## SSC PROJECT

STARTUP (NEAR TERM) MILESTONES

MIL NO.	WBS NO.	MILESTONE DESCRIPTION	COMPLETION DATE			COMMENTS
			ORIGINAL PLAN	CURRENT PLAN	ACTUAL	
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

MIL NO.	WBS NO.	MILESTONE DESCRIPTION	COMPLETION DATE			COMMENTS
			ORIGINAL PLAN	CURRENT PLAN	ACTUAL	
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	7/90		
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	Detek 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	8/90		
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	7/90		
58	2.6	CCD-Procedures Manual Issued	2/90		5/90	Preliminary
59	3.0	Baseline Validation Complete	2/90	7/90		
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: July 18, 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	Jul-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 1-3	Program Advisory Committee	30	SSCL
Nov 30 - Dec 1	Machine Advisory Committee	25-30	SSCL
Dec 14-15	Scientific Policy Committee	25	SSCL