

SCHEDULING THE SSC CONSTRUCTION AS OF MARCH 1990*

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July 1990

* Presented at the International Industrial Symposium on the Super Collider, Miami Beach, Florida, March 14-16, 1990.

† Operated by the Universities Research Association, Inc., for the U.S. Department of Energy under Contract No. DE-AC02-89ER40486.

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ABSTRACT

The scheduling of the construction activities for the SSC Project involves two major concurrent emphases on design, construction, installation, and test. These two major activities include the completion of the construction project by the end of FY98 (108 months construction time) and industrially produced magnet tests by the end of FY92 (30-1/2 months from this point in time). Scheduling of the construction activities is further complicated by the fact that the baseline cost and schedule is still under review and negotiation with the Department of Energy and the currently anticipated funding for FY91 is somewhat less than originally requested. However, with the above limitations, the schedules presented herein are the most current at this time.

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1. NEAR TERM—MAGNET/ACCELERATOR SYSTEM TESTS

The highest priority objective of the near term schedule is the demonstration of a collider magnet system test in an underground section of tunnel by the end of FY92, preceeded by an aboveground system test. The construction of the facilities to perform these tests and fabrication of the technical components is based on the following assumptions:

1. Award AE/CM Contract-5/90,
2. Supplemental Environmental Impact Statement Record of Decision-11/90,
3. Award Cryogenics Systems Contract-7/90, and
4. Award Collider Dipole Magnet Contract-8/90. The overall near term schedule is shown in Figure 1.

The current ongoing activities shown are: bid preparation for the first cryogenics plants, supplemental environmental impact statement work, AE/CM negotiation and contract review, and preparation of the collider dipole magnet RFP. Additional ongoing activities (not shown) include: preliminary design of accelerator components (power supplies, quench protection, controls, spool pieces, correctors, etc.) and ongoing magnet design and development at SSCL, FNAL, BNL, and LBL. It is our intent that both the aboveground and belowground test will use industrial fabricated 50 mm magnets. In our present planning, the collider dipole magnet subcontractor will fabricate these magnets using FNAL (or other) tooling after witnessing FNAL construction and testing of their 50 mm full length magnet. During the same time period, the collider dipole magnet subcontractor will start the acquisition and setup of this prototype tooling. If successful, magnets can be built and tested using these facilities, they will also be used in the two aforementioned tests.

It is our desire that these tests provide an early string test demonstration of magnet operation along with other prototypical accelerator components. Additionally, these tests and their facilities will provide us with an early understanding of the behavior and interaction of the various accelerator components. With this understanding, the time required for sector tests, several years later, should be reduced.

2. LONG TERM—PROJECT CONSTRUCTION SCHEDULE

The long term schedule was presented to DOE in January 1990. This schedule is based upon 108 month construction time starting in FY90 (October 1, 1989). The overall construction schedule is shown in Figure 2. Three levels of milestones were reported at the same time to DOE for control purposes. These milestones and schedules are to be considered *preliminary*, pending DOE approval of the project baseline. Category 1 milestones are intended for project control by the Office of the Superconducting Super Collider (DOE/Headquarters), Category 2 milestones are intended for project control by the On-Site Project Office (DOE/Texas), and Category 3 milestones are intended for control by the SSC Laboratory. All of the project control milestones are currently being reviewed internally for consistency with low level WBS schedules. While the schedule and milestones should be considered preliminary, the general times and approximate dates are what we feel will be the project baseline approved later this year.

Table 1 shows the Category 1 milestones and Table 2 shows the Category 2 milestones. From these tables, the following observations of the near term activities can be made at this time:

- M1-1 — Completed on the original date,
- M1-2 — Completed for some activities on the original date,
- M1-3 — Completed on the original date,
- M1-4 — Conceptual design started,

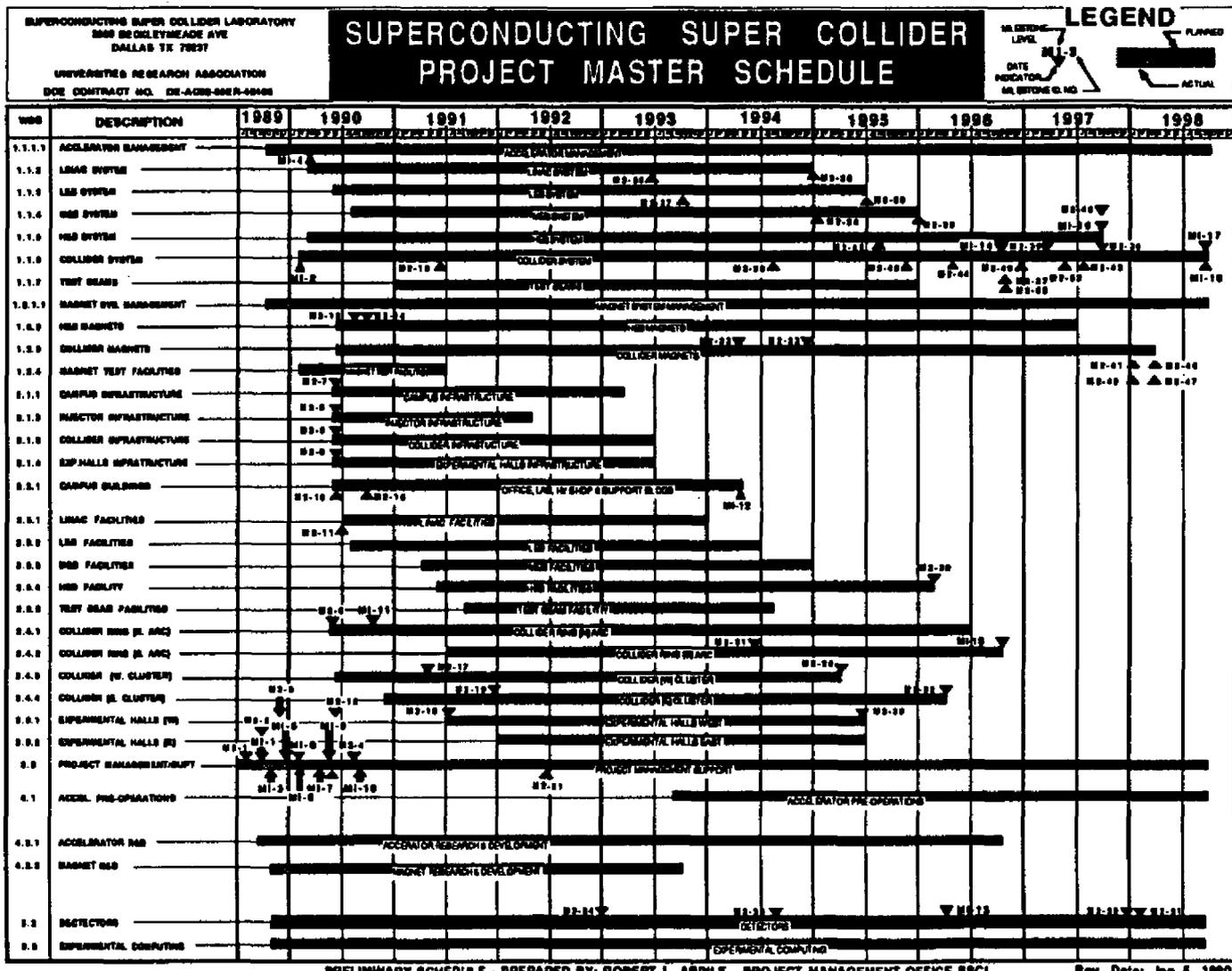


Figure 2. Overall long term construction schedule.

Table 1. Master Milestones/Category 1

WBS			Milestone
No.	No.	Title	Date
M1-1	3.1.1	PM	First DOE Semiannual Review Sep-89
M1-2	1.1.6	Collider System	Start Design Feb-90
M1-3	3.1.1	PM	Start Construction Project Oct-89
M1-4	1.1	Injection System	Start Design Mar-90
M1-5	3.1.1	PM	SCDR Issued Dec-89
M1-6	3.0	Footprint	DOE Approval Feb-90
M1-7	3.1.1	PM	Baseline Validation Complete May-90
M1-8	3.1.1	PM	PMP Approved By DOE Feb-90
M1-9	3.0	AE/CM	Award of Contract May-90
M1-10	3.0	SEIS	Record of Decision Sep-90
M1-11	2.4	Collider Ring	Start First Tunnel Construction Oct-90
M1-12	2.2	Campus Structures	Complete May-94
M1-14	1.1.6	Collider System	Complete Component Design Oct-96
M1-15	2.4	Collider Ring	Complete Conventional Construction Oct-96
M1-16	1.1	Injection Systems Operational	Sep-97
M1-17	1.1.0	Collider System	Complete Acceptance Tests Sep-98
M1-18	1.0	SSC Operational	Sep-98

Table 2. Master Milestones/Category 2

No.	WBS No.	Title	Milestone	Date
M2-1	3.1.1	PM	Issue First Draft PMP	Aug-89
M2-2	3.1.1	PM	Award SE&I Contract	Oct-89
M2-3	3.1.1	PM	First C/SCSC Test Report Issued	Nov-89
M2-4	3.1.1	PM	First Land Tract Available	Aug-90
M2-5	2.1.3	Collider Infrastructure	Start Design	Jun-90
M2-6	2.4	Collider Ring	Start AE/Design	Jun-90
M2-7	2.1.1	Infrastructure	Start Campus Infrastructure Design	Jun-90
M2-8	2.1.2	Infrastructure	Start Injector Infrastructure Design	Jun-90
M2-9	2.1.4	Infrastructure	Start Exper Halls Infrastructure Design	Jun-90
M2-10	2.2.1	Campus Labs/Offices	Start AE/Design	Jun-90
M2-11	2.3	Injector Facilities	Start Design	Jul-90
M2-12	3.1.1	PM	Ready for C/SCSC Validation	Jun-90
M2-13	1.2.3.1	Collider Dipole Magnets	Award Preproduction Contract	Aug-90
M2-14	1.2.3.2	Collider Quad Magnets	Award Preproduction Contract	Sep-90
M2-15	2.2	Camp Hv Wks/Shops/Sup. Bldgs	Start AE/Design	Sep-90
M2-16	1.1.6	Collider Components	Start Fabrication	Jun-91
M2-17	2.4.3	Collider Ring	Start Construction West Cluster Tunnel	May-91
M2-18	2.5	Experimental Facilities	Start AE/Design	Jul-91
M2-19	2.4.4	Collider Ring	Start Construction East Cluster Tunnel	Dec-91
M2-20	1.1.2	LINAC	Complete Fabrication	Jun-93
M2-21	3.1.1	PM	Land Acquisition Complete	Jun-92
M2-22	1.2.3.1	Collider Dipole Magnets	Start Production	Apr-94
M2-23	1.2.3.2	Collider Quad Magnets	Start Production	Nov-94
M2-25	2.4.3	Collider Ring	Complete Construction West Cluster Tunnel	Apr-95
M2-26	1.1.2	LINAC Operational		Jan-95
M2-27	1.1.3	LEB	Complete Fabrication	Oct-94
M2-28	1.1.3	LEB Operational		Jun-95
M2-29	1.1.6	Collider System	Complete Acceptance Test Sector A	Aug-94
M2-30	1.1.6	Collider System	Complete Acceptance Test Sector B	Mar-97
M2-31	2.4	Collider Ring	Complete AE/Design	Jun-94
M2-32	2.4.4	Collider Ring	Complete Construction East Cluster Tunnel	Mar-96
M2-34	1.1.4	MEB	Complete Fabrication	Jan-95
M2-35	1.1.4	MEB Operational		Jan-96
M2-36	1.1.6	Collider System	Complete Acceptance Test Sector K	Sep-97
M2-37	1.1.6	Collider System	Complete Acceptance Test Sector C	Oct-96

Table 2. (cont)

WBS			Milestone	
No.	No.	Title		Date
M2-38	2.3	Injector Facilities	Complete Construction	Feb-96
M2-39	2.5.2	Experimental Facilities	Complete Construction	Jun-95
M2-40	1.1.5	HEB	Complete Components Fabrication	Aug-95
M2-41	1.2.3.1	Collider Dipole Magnets	Complete Fabrication	Jan-98
M2-42	1.2.3.2	Collider Quad Magnets	Complete Fabrication	Jan-98
M2-43	1.1.6	Collider System	Complete Acceptance Test Sector J	Jul-97
M2-44	1.1.6	Collider System	Complete Acceptance Test Sector H	Apr-96
M2-45	1.1.5	HEB Operational		Sep-97
M2-46	1.2.3.1	Collider Dipole Magnets	Complete Installation	Mar-98
M2-47	1.2.3.2	Collider Quad Magnets	Complete Installation	Mar-98
M2-48	1.1.6	Collider System	Complete Acceptance Test Sector D	Nov-95
M2-49	1.1.6	Collider System	Complete Acceptance Test Sector F	Dec-96
M2-52	1.1.6	Collider System	Complete Acceptance Test Sector E	May-97
M2-53	1.1.6	Collider System	Complete Acceptance Test Sector G	Oct-96

- M1-5 — Preliminary draft issued as schedule,
- M1-6 — Now anticipated in March,
- M1-7 — No change in schedule,
- M1-8 — Now anticipated in May 1990,
- M1-9 — No change in schedule,
- M1-10 — Now anticipated in November 1990,
- M1-11 — Currently under review, will be later,
- M2-1 — Completed on schedule,

- M2-2 — Completed on schedule,
- M2-3 — Completed on schedule,
- M2-4 — No change in schedule,
- M2-5 — No change in schedule,
- M2-6 — No change in schedule,
- M2-7 — No change in schedule,
- M2-8 — No change in schedule,
- M2-9 — No change in schedule,
- M2-10 — No change in schedule,
- M2-11 — No change in schedule,
- M2-12 — No change in schedule,
- M2-13 — No change in schedule,
- M2-14 — No change in schedule, and
- M2-15 — No change in schedule.