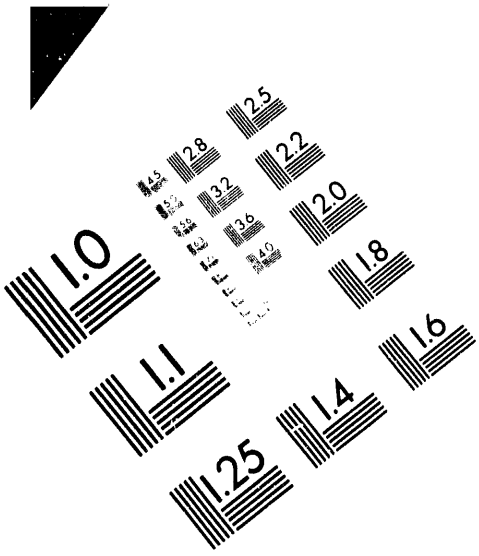
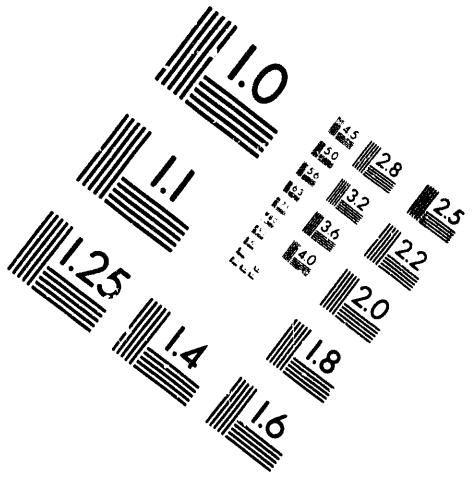
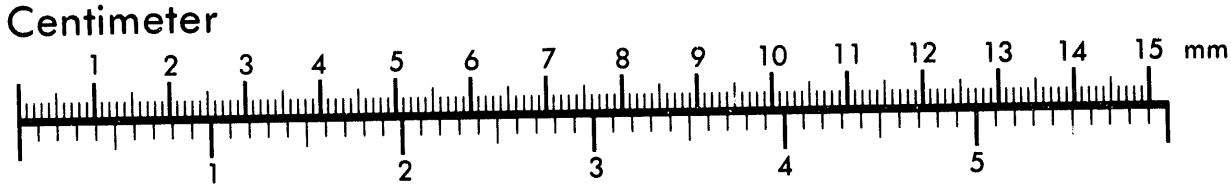


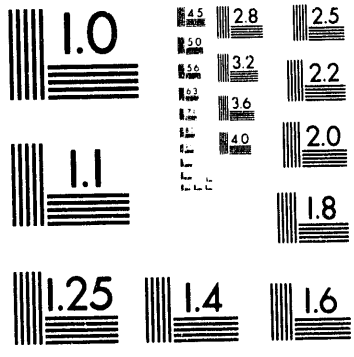
Association for Information and Image Management

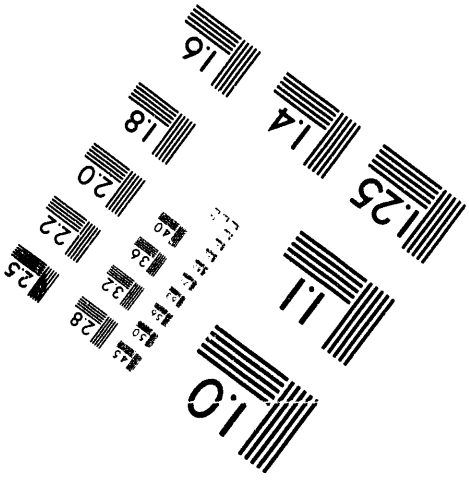
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

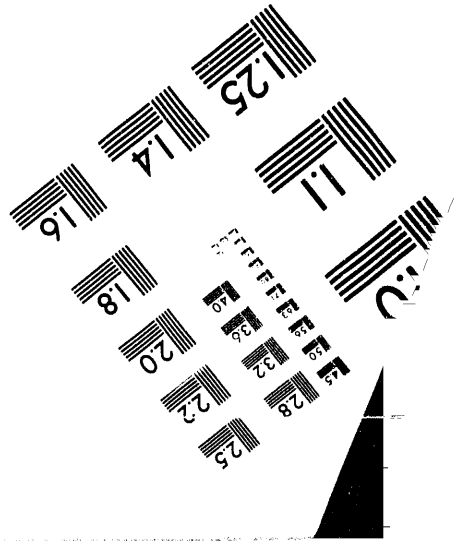
301/587-8202











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Industry Participation in the SSCL Installation Program*

F. Spinos

Superconducting Super Collider Laboratory†
2550 Beckleymeade Ave.
Dallas, TX 75237

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†Operated by the Universities Research Association, Inc., for the U.S. Department of Energy under Contract No. DE-AC35-89ER40486.

INDUSTRY PARTICIPATION IN THE SSCL INSTALLATION PROGRAM

Frank Spinos

Superconducting Super Collider Laboratory*
2550 Beckleymeade Ave.
Dallas, TX 75237

INDUSTRIAL PARTICIPATION

The uncertainties of funding levels or cancellation makes involvement in controversial programs a hazardous business for any industrial organization and effectively eliminates small corporations from the competition.

Corporate Executive Board decisions to allocate bid and proposal money are usually made with the understanding that the corporate investment would be returned along with some profit in the out years. Their major concern is the real possibility that additional funds will be required to support the bid team beyond the original projected date of contract awards. Experience has shown that awards are usually one to two years later than the projected award dates.

American industry has complained that the National Laboratories have not made an attempt to transfer state of the art technology to the industrial sector. It has always been industry's position that both the laboratories and industry would be better served if the scientific breakthroughs were accomplished as a partnership. The SSC program is concentrating on using industry at the outset of each facet of the program to make the best use of the technical talent resident in both sectors.

EXAMPLES OF NATIONAL LABORATORY INDUSTRIALIZATION

Portrayed below are two large programs conducted at separate National Laboratories in the past decades. They are examples of two distinctly opposite approaches to bringing a major high energy physics device on line within the cost and schedule goals of the Department of Energy (DOE).

Fermi National Accelerator Laboratory (FNAL) is an example of a program where industry was brought on board to fill voids in the personnel and construction expertise. In general, industry was not involved in design recommendations or solutions.

FNAL has been in operation for over twenty years during which time the concentration has been on the building and operation of the Tevatron, one of the worlds major accelerators. The majority of the technical development, design and manufacture of the various accelerator components were accomplished by FNAL staff personnel. Generally the direction and approval of the manufacturing techniques, procurement policies, installation practices and commissioning were provided by the physicists responsible for the function of the machine.

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The fusion experiment at the Princeton Plasma Physics Laboratory (PPPL), started in the early 1970's, is an example of a program where the transfer of the developing technology to American industry was a specific aim of the program.

Industry participation was evident from the beginning of the program when many industrial teams bid on the design and construction of the fusion reactor. The DOE chose to award and control the conventional construction of the laboratory office building and the cells for the machine and the utilities. PPPL retained the fabrication of the large poloidal coils and certain of the vacuum components since there were already staffed coil and vacuum shops on the Princeton campus. Physics requirements and design performance parameters were provided by the PPPL staff. Oversight of the program was maintained by the PPPL and DOE management on site.

The benefit to the program became obvious as various problems were encountered. The resources of the major subcontractors became available immediately as a problem surfaced. Expertise in properties of materials, structural test laboratories and geodesy were easily accessed as the need arose without the need for additional procurement actions.

SSCL INSTALLATION PROGRAM PHILOSOPHY

The Universities Research Association (URA) determined that a cooperation with industry similar to that of other recent large projects like the TFTR experience would be the key to a successful program and that only major corporations would have the depth of technical skills, financial resources and facilities to manage a program of the scope and complexity of the SSC installation program.

The three compelling reasons for selecting only major industrial organizations were as follows: First is the varied resource pool required of the selected organizations. Skills ranging from program management to warehouse control will be required. The availability of large numbers of experienced personnel in each skill category will be especially important. Secondly, there will not be enough time for the selected subcontractor to hire, train and develop a task team drawing from the open market from the time of the award to the beginning of critical path activity. Finally, the ability of the subcontractor to fund the costs of a major proposal and the initial costs of getting started.

The definition of a major subcontractor as the prime to the URA was never intended as a barrier to companies of lesser size. Specific instructions were provided to the bidders that defined the goals of the URA as they applied to small, disadvantaged businesses as well as minority and women owned businesses. Teaming with other small or medium sized businesses was also encouraged. The result, as will be evident in further discussion, was the receipt of proposals in which a number of industrial teams were formed.

Implementation of the Solicitation

The Commerce Business Daily notice was posted late in 1991 inviting industrial contractors to participate in the installation program. Approximately forty industrial concerns attended the bidder's conference.

Immediately following the publication of the announcement the SSCL received visits from the corporate heads of many major companies. It was surprising that companies whose existing contracts were counted in billions of dollars would be committed to winning the installation subcontract whose final value would be a fraction of what was their business norm. Discussions that revolved around that point revealed that the business climate was such that winning a billion dollar award was no assurance that the program would remain viable. In fact, they cited examples of programs where millions of bid and proposal dollars were spent winning a particular award which was canceled prior to the recovery of any of the expended dollars. Although industry felt that the jeopardy of fiscal year funding placed them in a poor position, it was necessary to actively pursue contracts of this type and size.

At the time of the briefing, the superconducting magnet procurements had been awarded to General Dynamics, Westinghouse and Babcock and Wilcox. The magnet technology transfer program had been started at FNAL and at Brookhaven National Laboratory where a number of superconducting dipole magnets were under construction by the magnet subcontractor personnel. The SSCL was confident that there was sufficient definition of the configuration of the Collider Storage Ring Arc sections to permit a full description of the installation requirements. The attendees

were given a full briefing of the arc section requirements as well as defined in the Statement of Work that accompanied the solicitation.

The program was further expanded shortly after the briefing to include all of the installation activities for the Linear Accelerator (LINAC), Low Energy Booster Ring, Medium Energy Booster Ring, High Energy Booster Ring and the remaining areas of the Collider Storage Ring even though some of the ring configurations were not fully defined.

The bidders were instructed to provide proposals, based on the information available, to include the approach envisioned for the management of the program, the transportation and handling systems suggested and the existing planning programs that could be applied to the program.

The solicitation had indicated that the SSCL would award two to four study subcontract awards of $500,000 each during which the subcontractors would receive a thorough technology transfer. The terms of the solicitation required that each of the subcontractors place a full time representative at the SSCL who would interact on a daily basis with the SSCL Installation Manager as well as with each other. The goal was to develop certain key specifications and installation concepts that would be included in the second phase definition.

Subcontract Activity

Four proposals were received in answer to the solicitation. Three were accepted by the SSCL based on evaluation criteria scoring. The selected subcontractors were: Bechtel International Corporation, Brown and Root Corporation and Martin Marietta Corporation. Subtier contractors to the three prime subcontractors noted above included General Dynamics, Westinghouse, Lockheed, Science Applications International, Belding, the University of Texas at El Paso and FATA Automation.

A program kick off meeting was held to establish the ground rules that would govern the interaction between the URA Management and the representatives of the selected subcontractors. The rules were designed to ensure that all three subcontractors would be provided equal access to all available information and still guard the proprietary data of each.

The essence of the working arrangement was the daily interaction between the subcontractor representatives at the SSCL and the URA Installation Manager. The representatives of each of the subcontractors were invited to all meetings that contained information relative to the installation program. There were times when one or another were unable to attend. We did not attempt to hold a separate briefing to guard against the possibility that additional information might have been passed on to a single subcontractor.

The three subcontractors came to an agreement that individual meetings were to be permitted when discussions of a proprietary nature were desired. It was agreed to rely on the veracity of the URA Installation Manager to ensure that only proprietary information was discussed in the private meetings.

Technical meetings were arranged to permit the various subcontractor associates to participate. Many meetings had twenty or more subcontractor representatives in attendance; question and answer sessions were always held en mass. Documentation was provided to each subcontractor using transmittal sheets which were signed as evidence that the documents had been received. Records of the meeting attendees and the receipt of documents have been retained on file.

Working Relationships

The relationship that was established between the three subcontractor representatives and the lead personnel at the SSCL soon matured to a point where the group was able to differentiate between those items that needed to be established for the good of the program and those that could be retained by each subcontractor as discriminators in the competition.

The complex issue of determining the most cost effective tunnel transportation system was addressed in many common meetings. The group was able to establish the type of power to be used to drive the tunnel transport system, the methods of conveyances needed for transporting both components and personnel and the tunnel floor finish requirements. These decisions permitted the conventional construction contracts to be awarded with confidence that the installation requirements had been thoroughly investigated. Technical information meetings were held on a very intensive

schedule over a four month period after which the subcontractors began the formalization of their individual approaches to the installation effort.

Phase I Report / Presentation

The fifth month was devoted to the preparation of the final subcontractor reports and presentations to the SSCL and DOE personnel. The requirement for the presentation was initiated to provide each subcontractor the opportunity to describe their preferred installation process. The flaw in that thinking was that each subcontractor had reservations about divulging all of their program developments for fear that the information would be of use to their competition.

Those reservations resulted in presentations that gave the impression that the propositions were not well thought out when in reality the missing information was intentionally left out. Evaluations of all three subcontractors' presentations were essentially the same; ranging from poor to barely acceptable. There were some bright spots in each of the presentations and reports. Whether intentional or the fact that a particular subject was of particular interest, each report contained at least one item that was well addressed. This led to the implementation of a "Bridge Task" program which was designed to further refine the specifics of the installation program. These refinements were implemented to provide ongoing funded tasks for the subcontractors to amplify the requirements of specific technical systems.

It became obvious that there would be some delay in the issuance of the second phase solicitation for the actual installation of the components. We selected specific tasks to be accomplished by each of the three Phase I subcontractors. The tasks assigned were for the further development of databases, a more specific set of requirements for the tunnel transportation system, activity to prepare cable definition, a specific plan for receiving and handling materials being received from overseas suppliers and the design of a magnet stand for the Medium Energy Booster dipole magnets.

The formal reports and presentations that were scheduled at the end of a two month performance period were given to the URA, the DOE and the other two installation subcontractors. This resulted in a further leveling of the competitive field since considerable more detail was included in each bridge task. The results of the bridge tasks were incorporated into the Phase II Installation Solicitation that was to be released for bid in the first quarter of 1993.

DOE Policy Changes

Additional perturbations to the planned issue date for the Request for Proposal (RFP) resulted from the changes in the procurement regulations as they apply to subcontracts in excess of twenty five million dollars. The Acquisition Plan, the Solicitation and the recommendation for the subcontract award must now be approved by the Secretary of Energy. This policy will, in all likelihood, add time to the procurement process.

Response to the Solicitation

One of the major advantages of industrial participation in the preparation of the solicitation was that we were able to reduce the response time for the proposal. It is our intention to provide a formal draft to the three bidders at the same time that the document is sent to the Secretary of Energy. We expect that the DOE approval will take thirty days. Once approved, the released RFP will be provided to the bidders with a thirty day response time stipulation.

DATE
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9/21/93
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