

**NSLS II**  
**Conventional Facilities Advisory Committee**  
**May 8 & 9, 2008**

The following is a report of the review conducted by the Conventional Facilities Advisory Committee for the NSLS II Project. It is organized according to the charge provided to the committee by the NSLS II Project.

*1. The NSLS-II CF organization and staffing including the plan for developing the construction management capability required for managing the GC.*

Now that the decision has been made by the project to directly manage the GC, it is important to fill the project vacancies for experienced construction engineers and inspectors as soon as possible. BNL typically performs their construction management, most recently on the completed nanotechnology facility. However, the assistant director for construction management is new to BNL and the construction engineer position has not been filled.

The presentation of the staffing plan and projected NSLS-II organization for the construction phase of the project lacked substance reflecting how the project will knit a newly assembled Construction Management Team and details of how the work will be managed. The NSLS-II presentation to the BES Review Team should address how the project proposes to integrate its own team, (Roles and Responsibilities) and the steps it will take to develop a positive working relationship with the GC. The plan to manage construction should be presented including alternatives to account for future changes in the funding profile or continuing resolutions. Also see item 7.f.

*2. The procurement and contractor outreach activities including the draft RFP and ongoing interactions with the pool of prospective bidders.*

A good effort has been made to attract and inform major general contractors of the upcoming RFP. Funding restrictions that impact the GC should be included in the RFP so the GC can use the information to develop his schedule.

*3. The design management activities, in particular the management of the A/E firm.*

Significant design changes have occurred since the completion of preliminary design. These changes have exhausted the project schedule float resulting in pressure on completion of the final design. In response, the project has now frozen the design and restricted communications with the A/E in order to allow them to focus on completion of the design. The project holds biweekly status meetings with the A/E, this is a good practice to continue during this important period of focused effort.

The schedule for the A/E to deliver the 50% design package on May 19 and the 100% complete package, with the exception of the LOB design, on August 25th will be very difficult to meet. This schedule should be monitored closely and reevaluated after receipt of the 50% design package. The quality of the 50% package will give a good indication of the A/E performance. Past experience suggests that such a driven design effort is likely to result in additional A/E costs and incomplete areas of design.

*4. The adequacy and quality of the cost estimates and schedules.*

The construction cost estimate by the A/E is approximately \$16M less than the construction estimate by the preconstruction support CM. NSLS should resolve this difference in the estimates at the 50% design stage to determine what estimate they are going to use as a baseline and submit a Baseline Change Proposal (BCP) to formally adjust the baseline.

The schedule is well developed and has a clear critical path identified. The schedule for construction is longer than required due to the funding profile. The design schedule is very tight and the current completion date should be reevaluated after receipt of the 50% design package.

*5. The plans for establishing the appropriate environment and incentives for the highest level of safety performance.*

A \$2M safety incentive package seems adequate for a project this size. A \$500K award at the end of a year presents the scenario that if a major incident were to occur in the first couple months of the project, the GC would not be in a position to be incentivized until the end of the 2<sup>nd</sup> year of construction. NSLS-II might wish to consider restructuring the safety incentive package to allow the GC to “Earn Value” based on hours worked without incident. Consider awarding the incentive award every 90 days. This would allow the GC/sub-contractors to resume working toward its Safety Incentive pool immediately following an occurrence. Deductions for safety violations proposed in the NSLS-II program would then be drawn from this accumulating award pool.

The work force should be able to relate to these two simple concepts and could recognize their personal contribution to the accumulation of the value of the incentive pool. Done this way contractor employees would be able to benefit from their own effort and a subcontractor with work of short duration would not be contributing their effort to a subcontractor that might have just started to work at the end of a semi-annual award cycle. The balance of the incentive budget could be awarded to the at the end of the project.

Having the contractual ability to impose financial penalties for high consequence safety violations is a good idea. \$5000 per identified condition certainly will capture the Contractors’ attention. Many programs decide to impose progressive penalties. NSLS-II might wish to reconsider or make sure that the GC is clearly aware of the potential for the

fine. The NSLS-II project should develop a clear explanation of the penalties, to explain the consequences of specific safety violations to the workers in their initial orientation and periodically throughout the project evolution.

*6. The options for managing the contractor site access and safety training to ensure an efficient process that meets BNL requirements.*

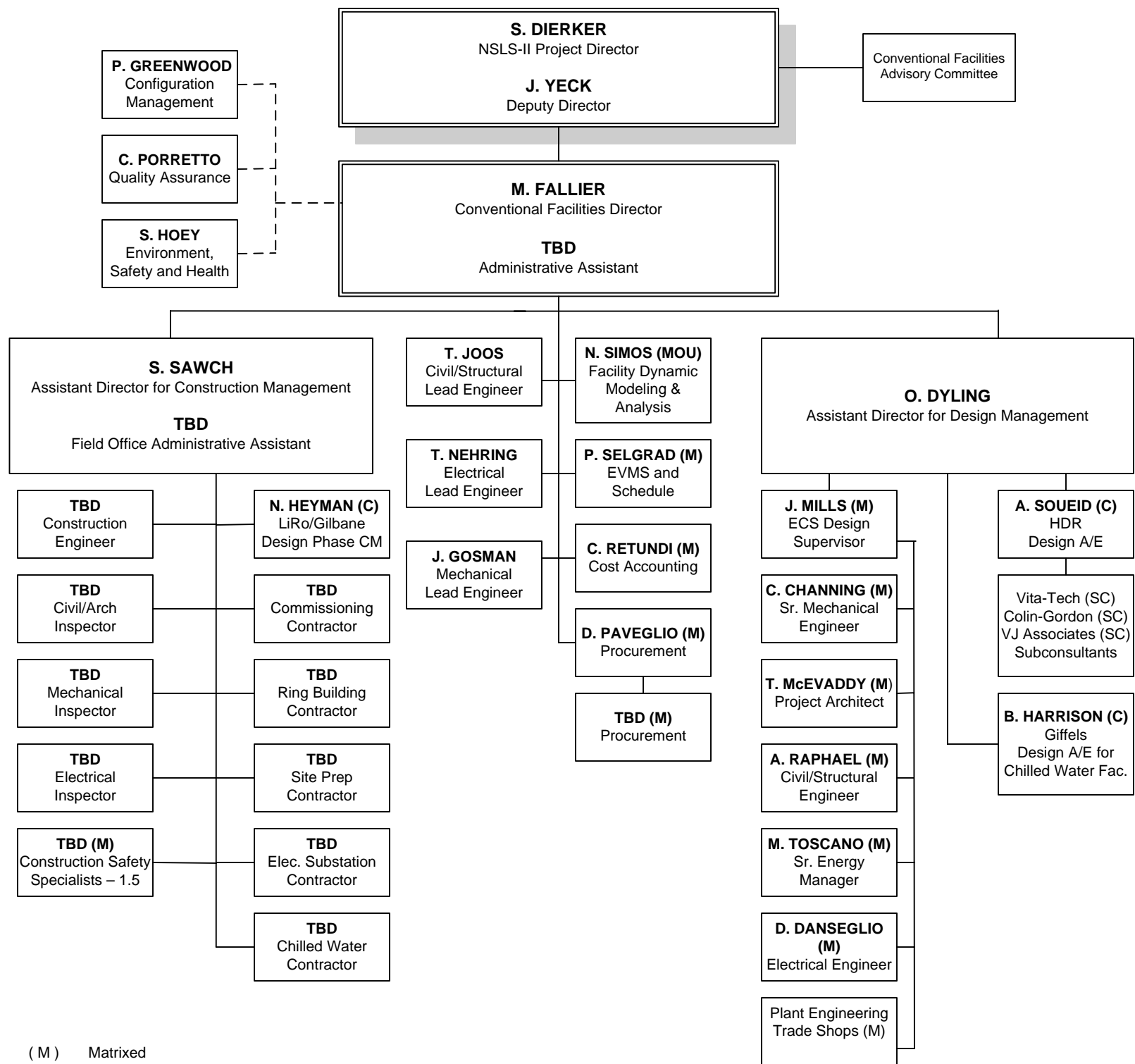
The project team is planning to use the main gate for construction access. This appears to be the best approach and is based on previous experience with large construction projects at BNL. They do have a backup plan to use the South Entrance if problems develop using the main gate.

The project team is developing alternatives to provide access training and badging offsite or near the main gate because they have realized the difficulties with using the existing on-site training office.

*7. Other Comments from the committee;*

- a) The committee recommends that the planned formal Value Engineering (VE) study during the final design be eliminated. One formal VE study was completed during the preliminary design with good results and the A/E, CM and project team continue to look for additional cost saving items.
- b) The job fair was an excellent way to attract qualified candidates to fill project staff vacancies.
- c) Risk Analysis using a Monte Carlo analysis with updated risks should be completed prior to the EIR and IPR this fall.
- d) The revised CF organization chart (attached) more clearly defines the roles of the Assistant Director of Design Management and the Assistant Director of Construction Management. Furthermore, it was important to indicate the GC attachment to the project.
- e) In the course of the design development considerable attention has been given to the needs of the experiments. In particular the beam line lengths have now been extended to 66m from 60m. This led to a widening of the ring building by 3m. Furthermore the beam high has been increased to 1.2m. Both of these changes will enhance the capability of the research program although it has increased the cost of the ring building. In view of the tight overall schedule, it is recommended that further changes to the experimental facilities be limited to essential items.
- f) Construction of the facility will require a detailed plan for the phased construction with occupancy staged to match the requirements of the construction and installation of the accelerator and other project needs. Beneficial occupancy of segmented portions of the experiment hall and occupancy of the RF and booster

- will require that these buildings be completed to a level sufficient to provide minimum heating and cooling, fire protection, ventilation, and other miscellaneous building facilities. A detailed plan delineating the phasing and the level of completion of each building and segment must be provided to the contractors as part of the bid package.
- g) A lesson learned from the NIF project during the 2000 Baseline Review was the recognition of the need to establish such a standardized approach to planning and coordination of work execution. Once Ed Moses directed that every person (Direct Hire and Contractor) who was to perform work on the project would attend a work planning workshop; the productivity and safety performance on the project improved measurably. NSLS-II should consider such a process to standardize expectations of the new team being assembled.
  - h) More planning should be completed regarding availability and phasing of utility feeds required to support the staged construction. A list of utilities, if any, provided by Brookhaven should be provided to the contractor. The contractor should be given some direction or guidelines regarding temporary utilities that he will have to provide as part of the facility construction with special emphasis on start up activities such as system fill and purge.
  - i) Issues regarding transfer of operation of completed portions of the facility to Brookhaven's maintenance staff should be defined. Is the Project or the Laboratory to take responsibility for maintenance and materials required for operation? If the project assumes responsibility for maintenance, the division responsible should be identified. It would be advisable to matrix into the project at this time a representative from Brookhaven's maintenance group to provide review and support for both design and operation.
  - j) The design and procurement of the DI (process) water system needs more development. Specifically the project must decide if it intends to build, own, and maintain these systems or if they will be leased. If leased, would this necessitate a separate procurement by the project or will the contractor be tasked to obtain this lease with provisions to transfer to Brookhaven at the conclusion of the construction project.
  - k) Consideration should be given to the current requirement for the water quality of the process chilled water system. This system is basically performing a general HVAC cooling function for fan coil type applications for both power supplies and future user hatches. A well maintained standard chilled water system would provide a water quality level sufficient to meet the needs of this system. The added construction and future maintenance cost of applying a DI water specification does not appear to be justified.



( M )    Matrixed  
 ( MOU ) Memorandum of Understanding  
 ( C )    Contractor  
 ( SC )   Subcontractor