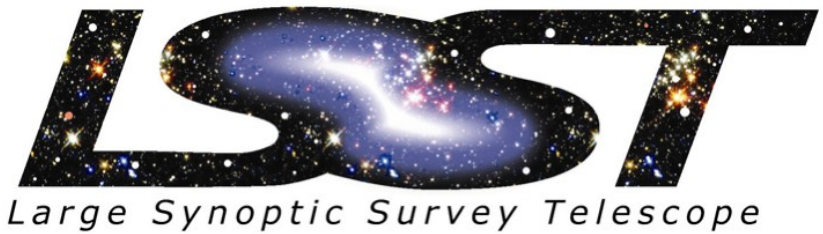
Camera PDR/CD1 Planning

19 September 2008



K. Fouts

Preliminary Planning

Large Synoptic Survey Telescope

Timing

- **NSF PDR may be in the Mar 09 timeframe**
- **DOE CD1**
  - **When DOE budgets are known (?)**
- **Presentations by each Camera Subsystem Manager (by WBS)**
  - **Camera Management**
  - **System Engineering**
  - **Safety and Environmental**
  - **Performance Assurance**
  - **Camera Calibration**
  - **Camera Utilities**
  - **Camera Body and Mechanisms**
  - **Camera Sensor Raft Modules**
  - **Camera Optical Components**
  - **Camera Control System**
  - **Camera Cryostat**
  - **Camera Electronics**
  - **Corner Raft**
  - **Camera I&T**

NSF Definition of Preliminary Design

NSF utilizes the conventional definition of preliminary design as used by project managers;

- A site specific design defining all major subsystems and their interconnections,
- A level of design completeness that allows final construction drawings to proceed,
- Cost estimating based on construction bidding to proceed, and bottom-up estimates of cost and contingency.

Preliminary design usually has a specific meaning within a particular industry or discipline, and NSF adopts that meaning most appropriate to each particular project, as defined in the Project Development Plan.

NSF Preliminary Design Review Components (1 of 2)

- Refinement of the research objectives and priorities of the proposed facility;
- Update of the description of the required infrastructure, site-specific design, definition of interconnections of all major subsystems;
- Environmental assessments or Environmental Impact Statement (if necessary);
- Bottoms-up budget and contingency estimates, presented using a WBS structure and supported by a WBS dictionary defining the scope of individual elements;
- Updated construction schedule;
- Implementation of a Project Management Control System and inclusion within the preliminary design of resource loaded schedule;
- Updated risk analysis, including time dependent factors. The preliminary design budget will be the basis for the NSF budget request to Congress if the project successfully emerges from the Preliminary Design/Readiness phase. Costs and risks must be projected forward to the anticipated award date for construction funds;

NSF Preliminary Design Review Components (2 of 2)

- **Demonstration that key technologies are feasible and can be industrialized if required;**
- **Definition of budget and schedule needed to go from preliminary design to final design (updated PDP);**
- **Plans for management of the project during construction, including preliminary partnership arrangements and international participation, oversight of major sub-awards and subcontracts, organizational structure, and management of change control**
- **Estimates for future operating costs of the camera.**

DOE CD1 Components (1 of 2)

Large Synoptic Survey Telescope

- **Camera Subsystem Level**
- **Subsystem Objectives**
  - Physics parameter analyses and simulation data for the subsystem
- **Requirements, Flow-down Analysis, Interface Control**
  - Physics, engineering, and construction requirements allocation to the subsystem
  - Subsystem functions and requirements—detail and definitions of subsystem functions and requirements to support start of preliminary design and for value engineering.
  - Applicable codes and standards for design, procurement, and construction
  - Preliminary interface control documents for subsystem
- **Risk Management—fold into project Risk List**
  - Problems and concerns for subsystem development phase
  - Identify key risks for subsystem and mitigation strategies. Assessments of likelihood of occurrence and probable impact, with mitigation plans
  - Show tie between risk and cost/schedule contingencies.
- **Development Plans**
  - Reliability, maintainability, and availability requirements
  - Trade studies completed and planned
  - Test methods
  - Alternative analysis—"assess whether the alternative selection process evaluates a full range of appropriate attributes for each alternative….Assess whether the decision analysis process for recommending a preferred alternative is reasonable and comprehensive."
  - Description of recommended alternative and synopsis of development activities
  - Performance parameters
  - Test and acceptance criteria
  - Conceptual design drawings
  - Readiness assessment
  - Vulnerability assessment
  - Subsystem block and functional diagrams
  - Draft subsystem architecture

DOE CD1 Components (2 of 2)

- **Integrated Safety and Environmental Management—fold into project PHA**
  - Identify all key hazards in the subsystem and corresponding safety structures, systems, and components needed to be incorporated into the preliminary design.
- **Preliminary Project Execution Plan—fold into project PEP**
  - WBS dictionary, including subsystem end-item deliverables
  - Baseline schedule—with critical paths for subsystem identified and contingency
  - Baseline cost including contingency, management reserves, and bases of estimates
  - Resources needed for PED phase, including budget, staffing, and support contracts
  - Condition assessment for facilities, if the project is upgrading existing facilities
  - Planned major procurements and long-lead items

Conclusion

- Complete requirement definition and flow down to Camera Subsystems.
- Implement a risk management tool. Identify and begin tracking risks at the project level.
- Focus on development of an integrated schedule and plan
- Update WBS's and Cost
- Good news is, we've got some time to plan for a successful PDR/CD1 but we need to start now.