

**Charge for the Director's CD-1 Review
of the
DECam Project
July 25-26, 2006**

Project overview:

The Dark Energy Survey (DES) is a 5000 sq. deg. imaging survey to be conducted using a new camera on the CTIO Blanco 4m telescope. The primary scientific goal of the DES is to constrain dark energy cosmological parameters using multiple techniques.

The DES is divided into two projects. One component covers the construction of the new instrument, DECcam, the second covers the management of the data that the instrument will produce. Fermilab is leading the instrument project and NCSA is leading the data management project.

History:

The DES originated in response to an NOAO Announcement of Opportunity (AO) for a partnership with NOAO in which 30% of the telescope time on the CTIO Blanco 4m was offered in exchange for a new instrument. In Dec. 03 the DES collaboration formed and in March 04 DES submitted a proposal to the Fermilab Physics Advisory Committee (PAC). The PAC found the science compelling. A Director's review was held June 7- 8, 2004. Following the June PAC meeting, the Fermilab Director gave DES Stage 1 approval.

In July 04 DES submitted the updated DES proposal to NOAO in response to the AO. A technical committee (the Blanco Instrumentation Review Panel – BIRP) appointed by NOAO reviewed the proposal in Aug. 04 and in Sept. 04 recommended that NOAO accept the proposal. The Director of NOAO approved the proposal and advised DES to develop a Memorandum of Agreement. A draft of this agreement has been prepared and reviewed by the directors of Fermilab, NOAO and NCSA.

Scope:

The scope of this review is DECcam. Fermilab is the lead institution on the project to construct DECcam and the majority of the project funding will hopefully be provided by DOE. Since the time of the BIRP review DES has been adding collaborators who can make significant cash or in-kind contributions that would reduce the potential DOE project costs, with a goal that approximately one third of the project equipment costs will be funded by non-DOE funds. The current funding plan includes funding from DOE and funding of in-kind contributions by the United Kingdom(PPARC), Spain(CSIC), and several universities from non-DOE funds.

The DECcam project as a whole is managed at Fermilab. R&D for the project is proceeding using funds from both DOE and non-DOE sources.

Approval of CD-1 by DOE is based on a Conceptual Design Report (CDR) for the project. The project scope and preliminary baseline range for the cost and schedule are to be defined at this point in the project. The committee should answer the following questions regarding the scope of DECam: Are the scientific requirements sound and clearly stated? Have these scientific requirements been translated into appropriate technical specifications that are clearly stated and documented? Can the design be built? Does the design meet the technical specifications? Is it a reasonable design? Does the conceptual design meet the project's objective (mission need)?

Some additional documents that support the CD-1 determination are a Preliminary Project Execution Plan (PPEP), a Preliminary Project Management Plan (PPMP), Acquisition Strategy, Preliminary Hazard Analysis (PHA) report and Draft Risk Management Plan. The technical part of the review will focus on the conceptual design of the DECam. It will determine whether these designs meet the requirements and specifications and whether the designs are sound. The cost, schedule and scope ranges are usually based on an initial set of documentation such as the following: WBS – Work Breakdown Structure, WBS Dictionary, BOE – Basis of Estimate documentation, risk and contingency analyses, RLS – Resource Loaded Schedule, and time phased funding and cost profiles. The committee is asked to review each of these items, for quality, completeness, and accuracy. The committee should determine whether appropriate ES&H measures have been and are being taken into account. Furthermore, the committee is asked to review and assess the quality of and comment on the additional formal project management documentation (PPEP, PPMP, PHA and RMP) required for CD-1 approval.

Additionally, the committee is to review and comment on Project's response and actions taken with respect to the recommendations from the Director's Preliminary Review of DECam in June 2004 and from the Blanco Instrumentation Review Panel (BIRP) Review. Constructive comments on presentation content, format, and style are also requested.

Finally, the committee should present findings, comments, and conclusions at a closeout meeting with DECam, Fermilab, NCSA and NOAO management and provide a written report soon after the review.

Expectations for a Successful CD-1 Review

Attachment 1

- ❖ Completed Conceptual Design Report: It should
 - Document the science requirements to be met,
 - Describe technical solutions that are likely to meet the science requirements,
 - Provide a credible estimate of the cost range and associated supporting information to justify the cost range,
 - Present a credible schedule duration which shows how long it will take to complete design and construction,

- ❖ Project team in place: The team should be capable of carrying the design forward to a baseline.
 - A qualified project management team should be in place,
 - The scientists, engineers, and other personnel needed to complete the design have been identified and made available,
 - Project roles and responsibilities are clearly defined,
 - There is a plan to complete the R&D needed for the design and resources to implement the plan have been identified.

- ❖ Other required documentation for CD-1:
 - Preliminary Project Execution Plan (PPEP) which addresses all required elements of the PEP at a preliminary level.
 - Details can be completed at CD-2 when the final PEP is approved.
 - A Risk Management Plan that describes the method for managing technical risk, budget risk, and schedule risk,
 - An Acquisition Plan that identifies procurement strategies, including critical make vs buy decisions that have been evaluated in conjunction with scope definition,
 - If a Preliminary Project Management Plan (PPMP) will be used to supplement the PEP then a draft should also exist at a similar level of detail.
 - Preliminary Hazard Analysis Report which identifies major safety issues and conceptual solutions to mitigate these issues.