DOE ICR and IPR – Post-mortem

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PIP-II Tuesday Meeting
19 December 2017

In partnership with:
India/DAE
Italy/INFN
UK/STFC
France/CEA/Irfu, CNRS/IN2P3
Two reviews + two meetings over last two weeks

• DOE Independent Cost Review – Dec 5-7
  http://www-bd.fnal.gov/PIP-II/reviews/2017_ICR/2017_ICR.html

• IIFC – Dec 7-8
  https://indico.fnal.gov/event/15886/

• European Collaboration Meeting – Dec 11

• DOE Independent Project Review – Dec 12-14
  https://web.fnal.gov/project/piptech/SitePages/DOE%20Independent%20Project%20Review%20of%20PIP-II%20for%20CD-1,%20Dec%2012-14,%202017.aspx

• Closeout report available at:
  https://web.fnal.gov/organization/OPSS/Projects/PIPII/_layouts/15/start.aspx#/SitePages/DOE%20CD-1%20Review%20of%20PIP%20II%2c%20December%2012-14%2c%202017.aspx
Recommendaions Prior to CD-1

• Conventional Facilities
  – Review escalation rates for construction including input from local construction industry prior to CD-1
  – Review staffing requirements and update EDIA budgets as necessary prior to CD-1
  – Verify that the schedule includes milestones for confirmation of the technical requirements that precede the planned initiation of the CF design by CD-1

• ESH
  – Prepare the CD-1 required Environmental Compliance Strategy consistent with existing programs and documentation.
    • Environmental Evaluation Notification Form (EENF) transmitted to Fermi Site Office (FSO) (August, 2017) addresses some aspects
Recommendations Prior to CD-1

**Cost and Schedule**
- Finalize and incorporate in-kind contributions adjustments into BOE cost book and P6 resource loaded schedule prior to CD-1 ESAAB.

**Project Management**
- Before CD-1, increase upper end of the CD-1 cost range to +30%.
- Before CD-1, update the project documentation as required.
- Before CD-1, identify to OHEP and the FPD an experienced Project Manager with significant DOE O 413.3B/SC project delivery experience.
- Before CD-1, establish a project-wide R&D plan with clearly defined steps for retirement of technical risks.
- Before CD-1, and to guide preliminary design, document for the project team a firm definition for subsystem characteristics which satisfy the proposed project KPPs.
- Upon completion of pre-CD-1 recommendations, proceed to CD-1.
Recommendations for Next Six Months

• RF Systems
  – Consider a common specifications document for the four (SSR1, SSR2, LB650, HB650) SSA types so common controls, firmware and hardware are used as much as possible.
  – Within six months, document which systems will not support CW operation initially.

• Accelerator Support Systems
  – Interface documentation: before April 2018 complete interface documents which cross L3 or which cross collaboration boundaries, and by June 2018 complete all other interface documents so that project scope is well defined.

• Cost & Schedule
  – Assign properly trained (cost/schedule/change control) Control Account Managers within six months of this review.

• Project Management
  – Within 6 months develop a staffing plan to address key project needs in Procurement, Level 2 Management, ESH&Q, and Project Controls.
Recommendations before CD-2

• RF Systems
  – Prior to CD-2, specify the number of cavities of each type that will be held in reserve (or the gradient overhead that will be available).
  – Prior to CD-2, specify and document the minimum required MTBF of the RF sources, which may require the SSAs to have redundant power supplies and transistors.
  – Prior to CD-2, develop a long term maintenance plan with collaborators and a spares strategy (avoiding obsolesce) for the RF sources.
  – Develop a more detailed fallback plan if the desired cavity resonance stability cannot be achieved. In particular, prior to CD-2, specify the minimum RF and cryo duty factors that would likely ensure stable operation, and verify that these duty factors can be achieved in the baseline design if needed.
Recommendations before CD-2

• Accelerator Support Systems
  – Spares: Before CD-2, prepare a spares strategy plan document detailing what spares are needed, how this determination is made, what spares are included in project scope, and what spares are deferred for operations
  – Engineering development: Before CD-2, prepare a written plan detailing what engineering development needs to be done before designs which are sure to meet specifications can be completed, and how and when this development will be done.
  – Down select injection girder design before CD2
  – Review intensity limits in booster, recycler and main injector before CD2
  – Continue to develop needed system interface documents, and integration of document milestones in P6 (refers to Test Infrastructure)
Recommendations before CD-2

• SRF and Cryo
  – Define operational gradient margin and cryomodule maintenance strategy to meet the performance specification of 90% reliability with only 8 weeks of maintenance per year by CD-2.
  – Develop documentation (‘packing-list’) requirements (esp. pressure safety and electrical) to be included in external interface documents six months prior to CD-2.
  – Convene an external review to address expediting the SSR2 prototype and advancing an LB650 prototyping effort by CD-2.
Recommendations before CD-2

• ESHQ
  – Continue NEPA process/strategy as briefed, and complete in accordance with a schedule that supports CD-2.
    • DOE NEPA Compliance Officer/Site Office Manager approved approach, Aug. 2017
  – Perform an overall document review for consistency and integration across programs and project functions prior to CD-2.
  – Per project documents, include Quality Assurance processes and oversight for international and domestic providers that mitigate risks in the baseline for procurements.