EIC Schedule

02/02/2024

CD-3A:

Approve start of long-lead procurements
CD-3A items passed final design review
All interfaces related to them are frozen
Waiting for ESAAB meeting for authorization

CD-2:

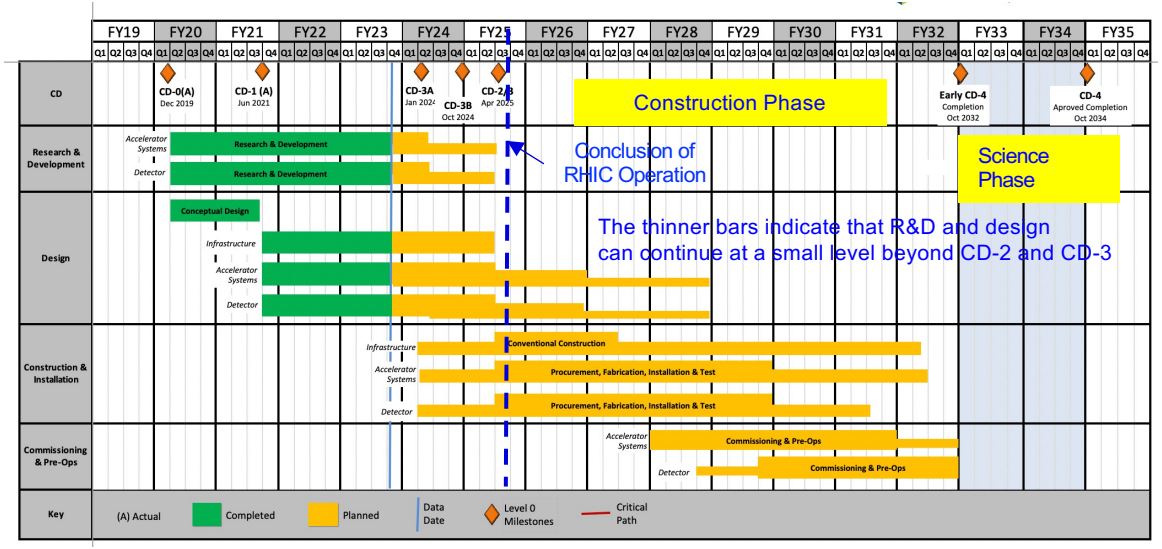
Approve prelim. design for all subdetectors
Design Maturity: >60%
Need “pre-”TDR (or draft TDR)
Baseline project in scope, cost, schedule

CD-3:

Approve final design for all subdetectors
Design Maturity: ~90%
Need full TDR

EIC Critical Decision Plan

CD-0/Site Selection	December 2019 ✓
CD-1	June 2021 ✓
CD-3A	January 2024
CD-3B	**October 2024**
CD-2/3	**April 2025**
early CD-4	October 2032
CD-4	**October 2034**



Speculation based on EIC accelerator project status, on still uncertain FY24 and FY25 budget scenarios, and projected RHIC FY24 run:

- CD-3B Approval Dec. 2024
- RHIC operations conclude at end of FY25, in September 2025
- CD-2/3 Approval Dec. 2025, Possibility of CD-3C as needed.

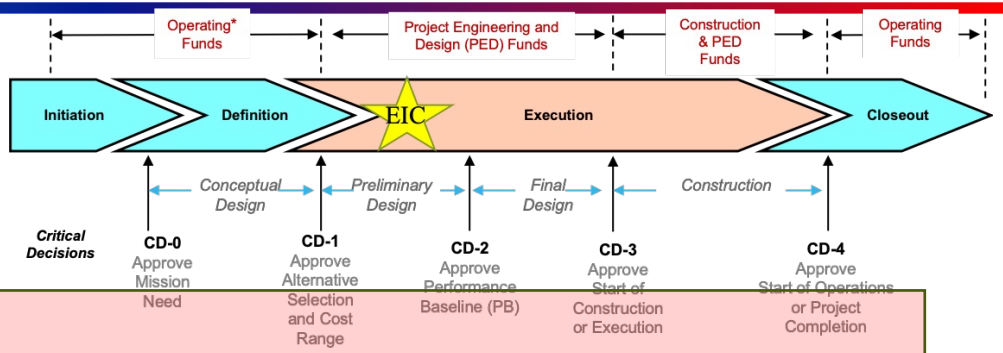
Design Review 2024 Plans – Updates in Blue

02/22/2024

- Design Reviews
  - ✓ **PDR2: IR Integration and Auxiliary Detectors – February 12, 2024 – main emphasis on baseline choices and progress**
  - PDR1: Tracking Detectors – **March 20-21, 2024** – main emphasis on baseline tracking layout, if we are on track and plans
  - PDR2: Electronics/DAQ – May 2024? – continuation of PDR1 to ensure we are on track and show progress
  - PDR: Integration, Infrastructure and Installation – Summer/Autumn 2024? – includes detector support structures
  - PDR2: Particle Identification Detectors – Summer 2024?
  - PDR2: Barrel EM Cal – Summer/Fall 2024 – emphasis on mechanical design & AstroPix readiness
  - FDR: Backward & Forward EM Calorimetry, Barrel & Forward HCAL – Fall 2024
  - PDR2: Polarimetry – timescale TBD (but before CD-2)
  - FDR for any potential CD-3B scope: Magnet Power Supply, perhaps VTRx+/lpGBT, perhaps magnet steel – see NOTE
  - FDR Magnet Power Supply – Spring 2024; Magnet Steel perhaps Summer 2024; VTRx+/lpGBT add ½ day to electronics/DAQ PDR2
- Detector R&D Day – **March 25** – check R&D progress and outlook to FY25
- DAC-Meetings 2024 under planning:
  - ~April 2024: Project Status, Baseline Detector, International Engagement, Detector R&D progress (expect 1+ day)
  - ~August 2024: Detector R&D annual review (expect 2 days) – deadline for submission July 1, 2024
- Next ePIC Computing & Software review by host labs – Late Summer 2024?

NOTE: CD-3B for detector will include continuation phases for SiPMs, SciFi, PbWO4, Forward HCAL. Further scope has to be known essentially now and needs FDRs.

Design Maturity



What does 60% design maturity roughly mean:

1) One matured from a conceptual design (CD-1) to a preliminary design (CD-2)
2) There can still be open E&D questions but no showstoppers
3) One needs to have detailed knowledge that one can define the cost and schedule
4) The review committee can judge that one will be able to address those open questions by the projected time of CD-3.

What does 90% design maturity roughly mean:

1) The design matured to final (CD-3), i.e., there are no open E&D questions
2) One can still do design detailing and producing drawings to accompany procurements
3) One can still do design validations as found needed during the vendor construction process; for vendor design-build contracts such as the detector solenoid one can still do design updates as needed.

What does this actually mean for us?

- There is no real urgency with having a pfRICH beam test in Spring 2024 **at all**
  - The coming year can be better spent to test the components separately on a bench …
  - … and be better prepared for beam tests in 2025+

- Reality check, anyway
  - Only two months left between now and May 1st, but no Fermilab 2024 schedule is available
  - No HRPPDs performance scans can start at BNL until at least end of March
    - Yet four out of five tiles were produced already, and we will know quite something from JLab tests by then
  - HGCROC3 ASIC backplane production is delayed either
    - Yet V0 iteration FPGA bare boards were shipped from HK yesterday (and a first one will be assembled next week)
  - *The two (HRPPDs & ASICs) will not see each other on a bench at least until beginning of April*
- EIC Project can only provide funding for “must have” beam tests
  - Beam test budget needs to be substantially increased (DOE Lab employee salaries!)
    - Hard to justify an “emergency” beam test, given a risk with it being potentially too short (and potentially inconclusive)

Therefore, plans for 2024 / 2025 and beyond

- 2024: activities towards CD-2 and a pre-TDR
  - Vessel and mirror PEDs, aerogel bench tests, HGCROC3 ASIC backplane construction
  - HRPPD bench tests at JLab/BNL/INFN/UoG/Yale, Argonne B-field campaign, INFN ageing studies, etc
  - All sorts of modeling and geometry optimization for CD-2 purposes

- 2025: activities towards CD-2/3 and a TDR
  - Cosmic ray test stand at BNL (?)
  - Beam test #1 in Spring 2025
    - A “partial chain” test with HGCROC3 analog frontend (a proof of principle run; aerogel / mirrors / HRPPDs)
  - All sorts of remaining modeling and PED work (including services) for CD-3 purposes

- 2026+
  - Beam test #2 (**once EICROC electronics is available**)
    - A full chain test (a final word on pi/K separation, imaging+timing performance at once, etc)