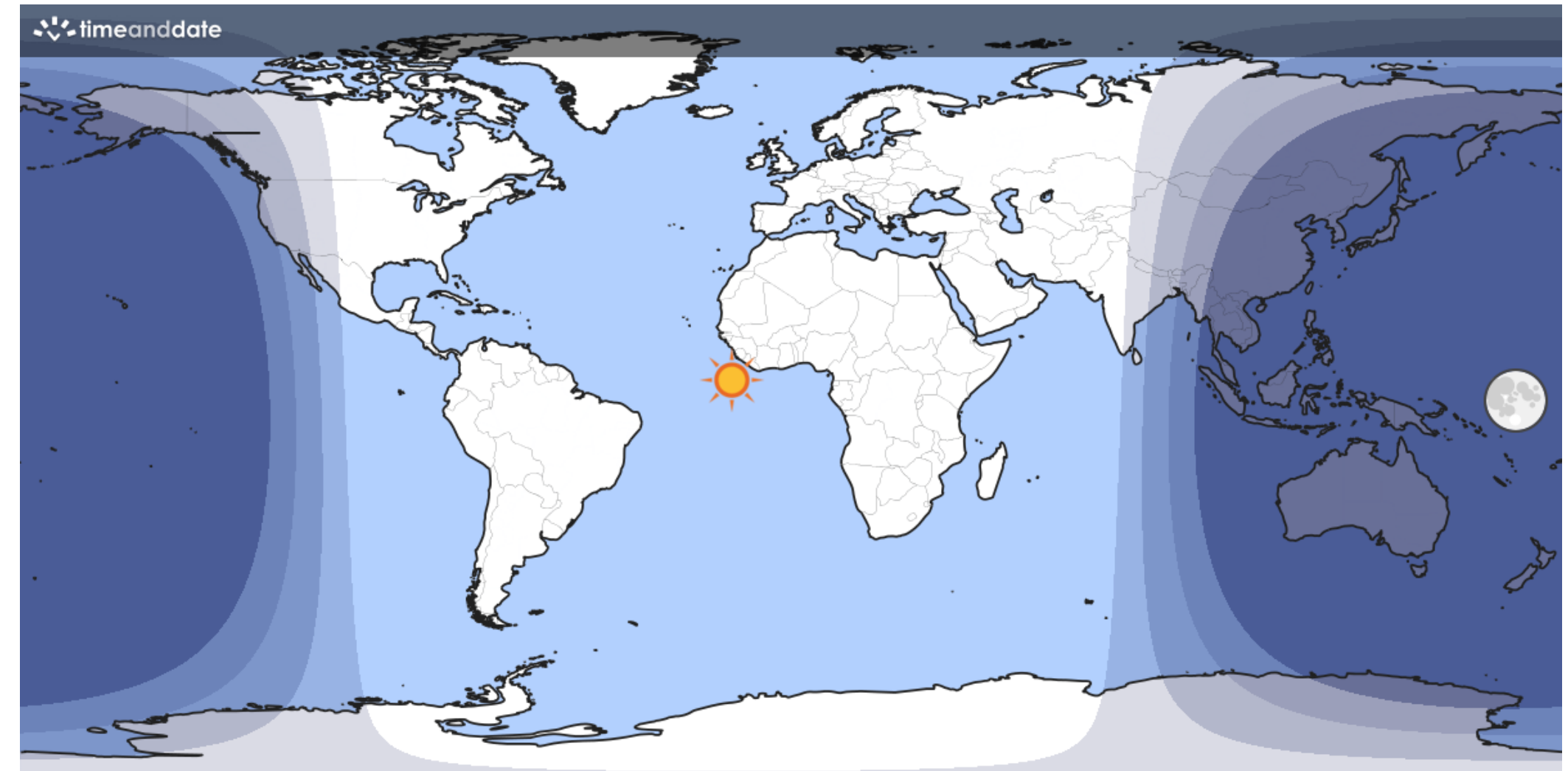


Welcome to R&D Day

Thomas Ullrich
R&D Day (Zoom)
March 25, 2024

<https://indico.bnl.gov/event/22388/>



6:00 West Coast US
9:00 East Coast US
13:00 UK
14:00 Central Europe
18:30 India
21:00 Beijing/Taiwan
22:00 Japan/S Korea

 **Jefferson Lab**

 **Brookhaven**
National Laboratory

Project R&D FY22-FY24

FY22	
ID	R&D Subject
eRD101	mRICH
eRD102	dRICH
eRD103	hpDIRC
eRD104	Service reduction
eRD105	SciGlass
eRD108	Cylindrical MPGD Planar MPGD
eRD110	Photosensors
eRD111	Si-Tracker/no sensors
eRD112	AC-LGAD

9 projects \$1,300,800
27 institutions

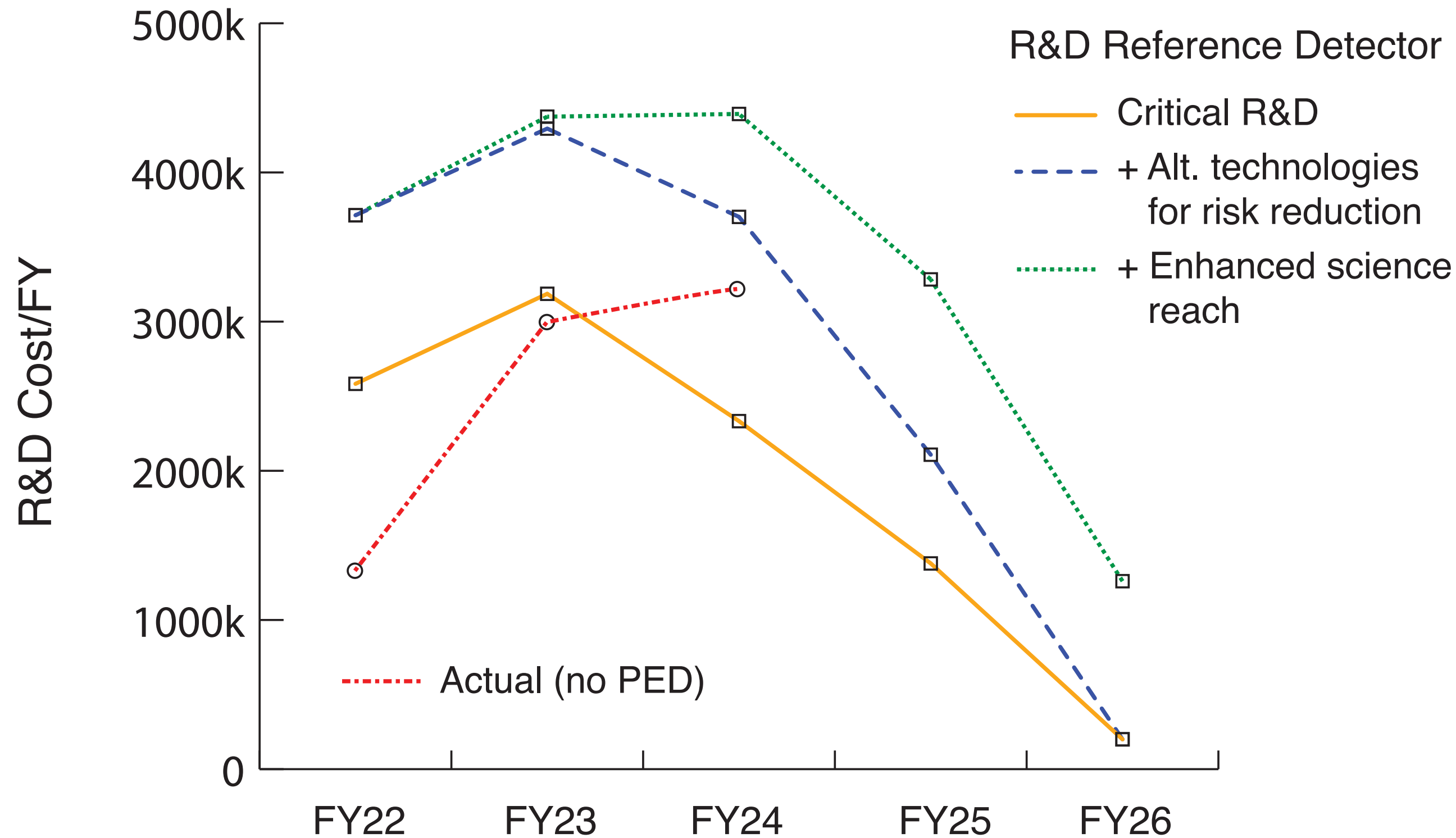
FY23	
ID	R&D Subject
eRD101	mRICH
eRD102	dRICH
eRD103	hpDIRC
eRD104	Service reduction
eRD105	SciGlass
eRD106	Forward EMCAL
eRD107	Forward HCAL
eRD108	MPGDs
eRD109	ASICs/Electronics
eRD110	Photosensors
eRD111	Si-Tracker/no sensors
eRD112	AC-LGAD
eRD113	MAPS sensors (ITS3)

13 projects \$2,999,805
29 institutions

FY24	
ID	R&D Subject
eRD102	dRICH
eRD103	hpDIRC
eRD104	Service reduction
eRD107	Forward HCAL
eRD108	MPGDs
eRD109	ASICs/Electronics
eRD110	Photosensors
eRD111	Si-Tracker/no sensors
eRD112	AC-LGAD
eRD113	MAPS sensors (ITS3)
eRD114	pfRICH
eRD115	Imaging Calorimeter

11 projects \$3,207,900
25 institutions

Plans and Evolution



Note that the **Generic R&D Program** takes care of alt. technologies for risk reduction and enhanced science reach

Original R&D Planning (8/2021)

- **FY22**
 - ▶ delays due to CR for 1/2 y
 - ▶ shortcoming in funding
- **FY23**
 - ▶ play catchup
 - ▶ add eRD113 (MAPS) and eRD106, eRD107 (Fwd Cal)
 - ▶ start to inject PED
- **FY24**
 - ▶ eRD101, eRD105, eRD106 completed
 - ▶ eRD114 (bEMCal) added
 - ▶ Recent: Shortcoming in R&D funding will require more PED

EIC Schedule Matters for R&D

Taken from Elke and Rolf, EIC Project News, 2/2/2024

CD-3A/3B:

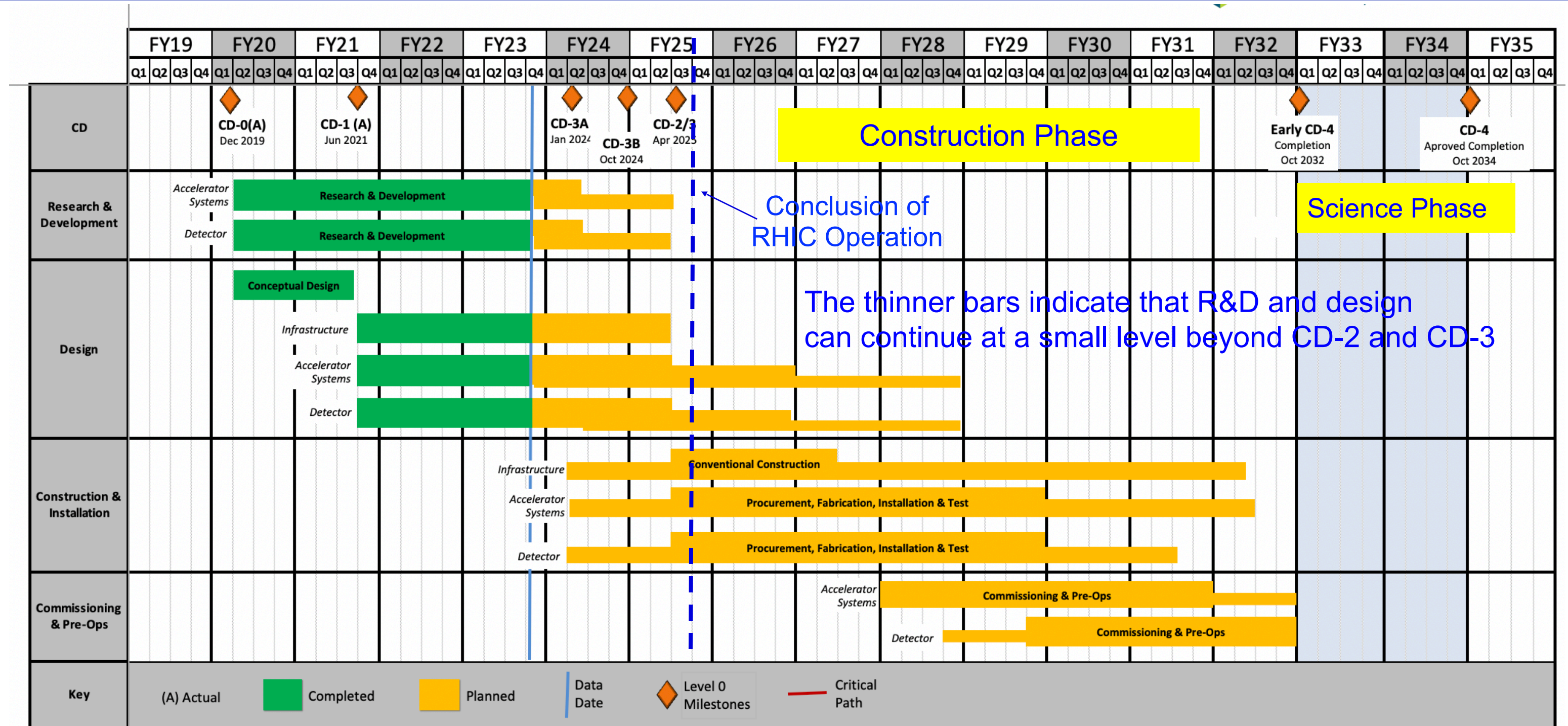
Approve start of long-lead procurements
 CD-3A items passed final design review
 All interfaces related to them are frozen
 Waiting for ESAAB meeting for authorization

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	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

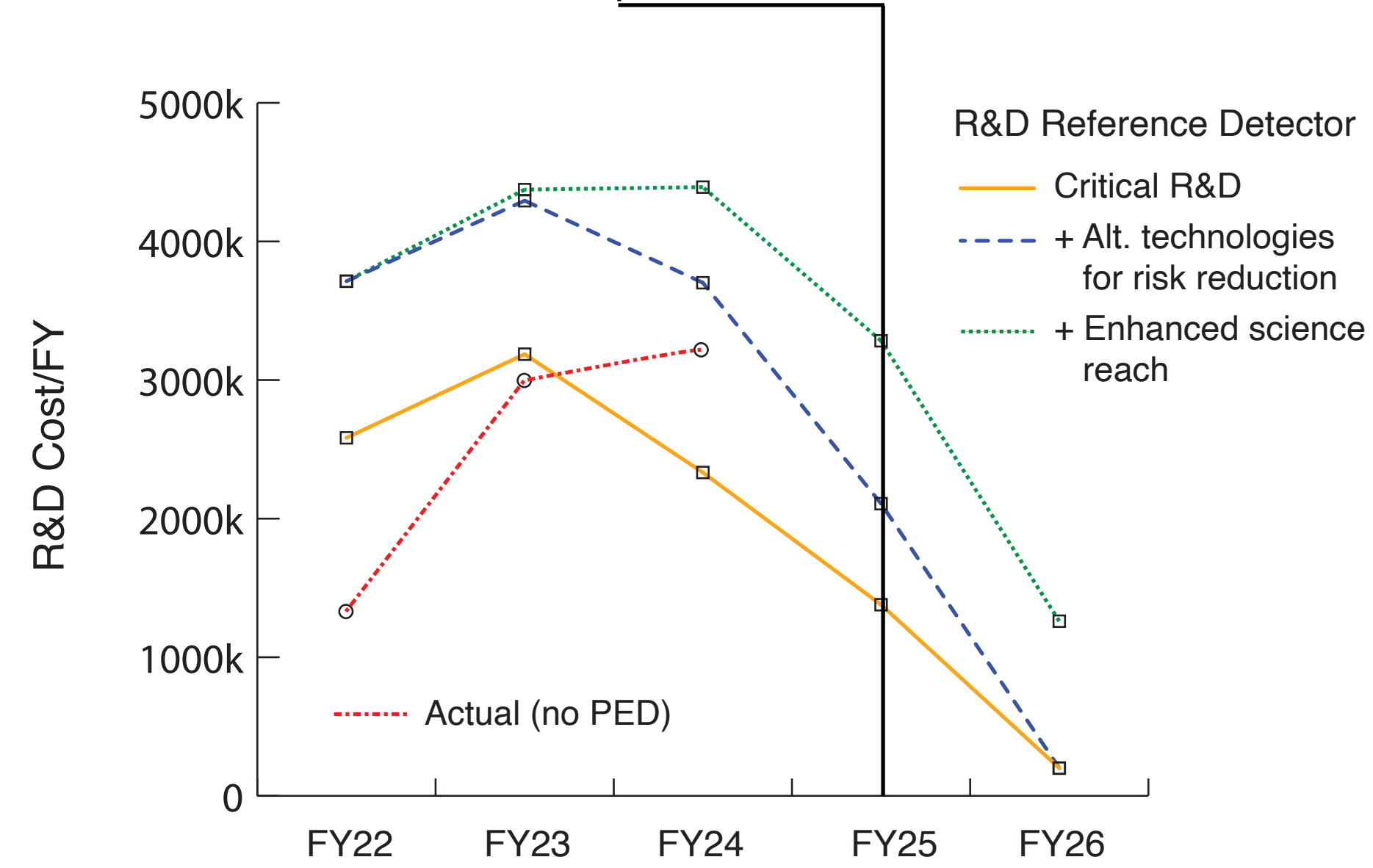
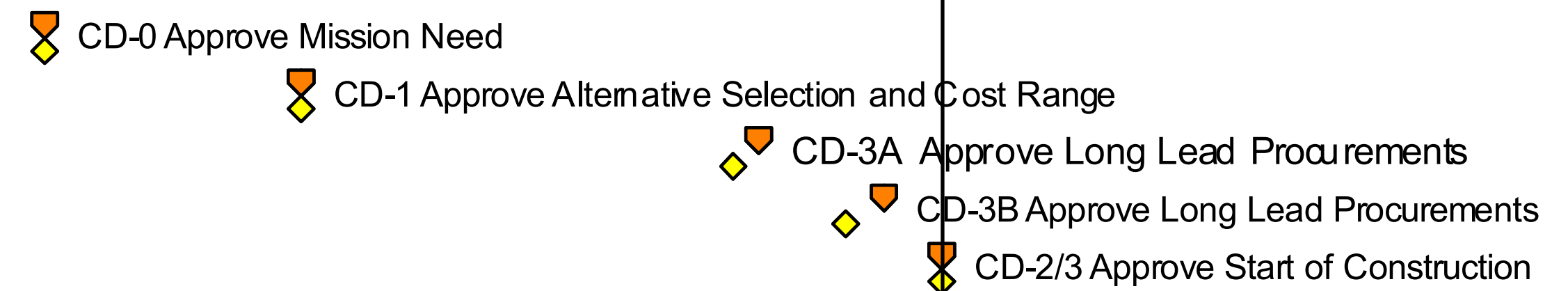
Speculation based on EIC accelerator project status, on still uncertain FY24 and FY25 budget scenarios, and projected RHIC FY24 run:

- 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.

What's Next?

EIC Full Detail Schedule - 03.08.2024

	Start	Finish	19	2020	2021	2022	2023	2024	2025	2026	2027	2028
				FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
6.L1 Level 1 Milestones	19-Dec-2019	17-Dec-2035										
L1_010	CD-0 Approve Mission Need	19-Dec-2019 A										
L1_020	CD-1 Approve Alternative Selection and Cost Range	29-Jun-2021 A										
L1_030	CD-3A Approve Long Lead Procurements	29-Mar-2024										
L1_040	CD-3B Approve Long Lead Procurements	23-Dec-2024										
L1_050	CD-2/3 Approve Start of Construction	30-Apr-2025										
L1_090	CD-4 Approval Early Completion	16-Nov-2033										
L1_100	CD-4 Approve Start of Operations or Project Completion	17-Dec-2035*										



- R&D will wind down by the end of this FY and it is essential we complete the required milestones **before Critical Decision-2** ("Approve Performance Baseline") which we anticipate in 2025. The recent President's Budget only has minimal *Other Project Cost* funds indicated for FY25 which signals the completion of the R&D phase.
- We understand some of the Si- and ASICs-related engineering readiness runs may go longer and we will seek paths to accommodate.

Contracts, Invoices, Procurement, ...

- R&D funding is handled via contracts with either BNL or Lab
- Delays from Project/DOE side
 - ▶ Inter-Entity Work Order (IEWO) was originally needed for inter-lab contracts > \$1M. This changed late last year. It is now mandatory for > \$0. This required some adaption and delays.
 - Mostly BNL - all inter lab contracts go through BNL
 - Example: eRD115/ANL: submitted 11/27/2023, in place 2/13/2014
 - getting better with this now
- Delays from institutional site
 - ▶ SoW: struggling with a clear outline of deliverables and associated payments
 - ▶ Invoices with too little information (e.g. “Materials ... \$8,251”)
 - ▶ Procurement needs detailed information to pay
 - ▶ Need to follow what was in SoW & budget-sheets
 - Examples: travel that is not in budget but charged, salaries over agreed amount
- Need to work close with procurement on both sides
- Please act when I write to you about issues: bills are not paid otherwise

R&D Day Agenda

EIC Detector R&D Day, March 25, 2024

R&D	Title	Duration (incl. discussion)	Time Start	Time End
Welcome / Introduction		15m	9:00	9:15
eRD103	hpDIRC	30m	9:15	9:45
eRD112	AC-LGAD/ToF	30m	9:45	10:15
eRD102	dRICH	30m	10:15	10:45
Break		20m	10:45	11:05
eRD108	MPGDs	30m	11:05	11:35
eRD109	ASICs/FEEs	30m	11:35	12:05
eRD104, eRD111, eRD113	SVT	60m	12:05	13:05
Break		30m	13:05	13:35
eRD110	Photosensors	30m	13:35	14:05
eRD106	Fwd EMCal	30m	14:05	14:35
eRD107	Fwd HCal	30m	14:35	15:05
eRD115	Barrel EMcal	30m	15:05	15:35
Adjourn			15:35	

Looking Back and Forward

- For many years the R&D program was for many groups the sole source of funding and played an important role in engaging the community and drawing them into the EIC project. Even if limited in their funding capabilities they have been instrumental to get where we are now.
 - ▶ 2011 - 2021 Generic R&D
 - ▶ 2022 - 2025 Project R&D
- We are now looking at a transition from R&D to PED funding and then construction. This requires close collaborations of ePIC DSCs with project management but especially with L3/CAMs for the daily business.
- The 2nd generic R&D Program will take care of looking at alternative technologies or improvements to technologies used in ePIC for future upgrades to reduce risk and enhance our science reach.

Take Away Message

- Call for FY25 proposals will come in May with potential deadline in July 1
- Main message is we wind down the R&D moving to CD-2
 - ▶ Si- and ASICs-related engineering might run longer
- DAC Meeting follows soon to get an early start into FY25 (the last)

Let's get started with the meeting