Timeline of CD3A

- August 29-30: **EIC Detector Comprehensive Design Review** by DAC

- October 10-12: **DOE CD-3A Director's Review**
  - Folds in Design Review reports of DAC, MAC, Infrastructure Committee
  - Concentrates on CD-3A Long Lead Procurement Items
  - Detector Reviewers: Rik Yoshida (ANL), Gabriella Carini (BNL), Luciano Musa (CERN), Tim Whitlatch (JLab)

- November 14-16: **DOE CD-3A Independent Project Review**

The project is pursuing CD-3A for the collider and the detector now so that e.g. the ePIC magnet can be built.

Slides by Rolf & Elke at the ePIC general meeting – Friday 20 October

Comments:

- The detector group has made impressive progress since CD-1. A rather mature project management, for this stage, exists. International detector collaboration ePIC has been established and the project and the collaboration has good coordination.

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- Upfront discussion of risks of R&D not coming to a favorable conclusion, and mitigation plans in this case, should be more clearly documented and presented. Where appropriate, for example for the tracking detector, more detailed plans should be developed.

Recommendations:

- Quantify (time, cost, performance) and document, before CD-2, mitigation plans for the possibility that some R&D components will not meet expectations.
- Proceed to CD-3A.

Slides by Rolf & Elke at the ePIC general meeting – Friday 20 October

- Project News at https://indico.bnl.gov/event/20857/

CD-3A Director's Review – SC-3 Detector System

We do need to urgently follow up on the following comment

> "Upfront discussion of risks of R&D not coming to a favorable conclusion, and mitigation plans in this case, should be more clearly documented and presented. Where appropriate, for example for the tracking detector, more detailed plans should be developed."

for the CD-3A review in November

→ We started discussion with ePIC tracking WG conveners & tracking DSCs

→ Remember that this is ONLY a mitigation plan (a what-if scenario)

→ There is NO change to the current baseline layout of the tracker

Further Timeline:

Thursday 26th Tracking WG meeting first discussion of a possible backup solution and timeline to possible branching points.

Monday 30th Discussion in TIC meeting

Follow up meetings as needed

This is not a new topic – remember the summary of the CERN visit in April 2023 by ePIC leadership, Si tracking proponents, and project leadership

- Project News at https://indico.bnl.gov/event/20857/

Summary on ITS-3 ALICE –EIC SiC

Overall a very positive and successful meeting → clear goal to cooperate as much as possible in boundary conditions.

From ePIC general meeting of May 11

Main lessons learned and next steps

- ITS3 open to sharing their sensor design with EIC → necessary agreements will need to be put in place in the next month.
- ITS3 development made significant progress → received a lot of critical technical information to guide the next steps in R&D for both sensor and system design/integration of the ePIC SVT
- but there remains still some risk in the ITS development → ALICE team will need to remain focused on their requirements and timeline challenges

→ ITS3 welcomes/seeks partnership in development with EIC designers contributing to ITS3
→ Received extremely valuable input to overall schedule and workforce needs for EIC SVT

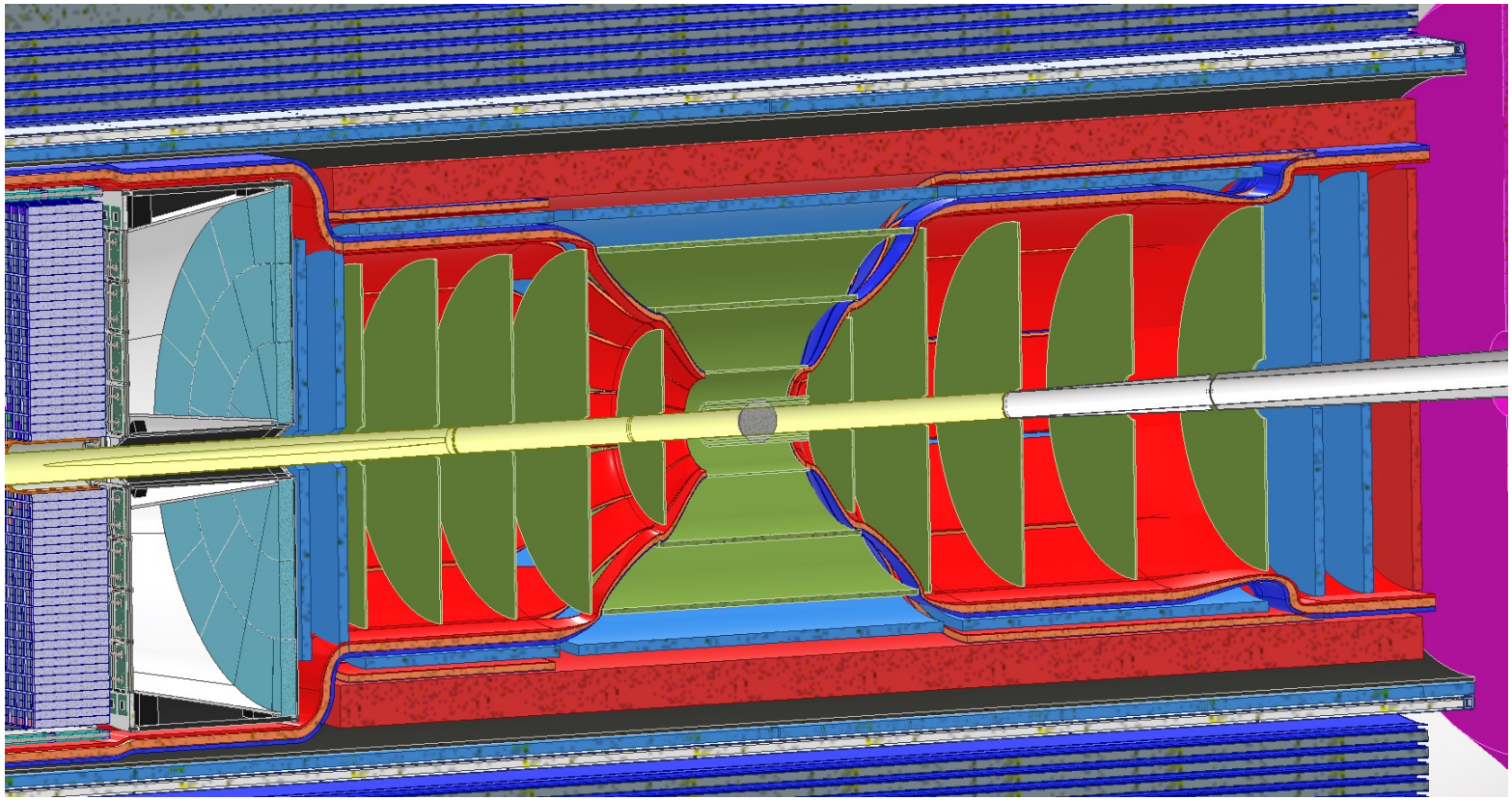
Example: relation between schedule for ITS3 ER2/ER3 submission and evaluation and the EIC/LAS development schedule → adjust our schedule to give more time for the sensor modifications and the schedule and integrate lessons learnt from ITS3

→ ITS3 suggests we put in place a backup plan as our workforce is still growing, and the overall EIC SVT schedule is aggressive

- All the inputs are currently folded in an updated plan by the EIC SVT team

Updates will be presented in the respective ePIC meetings (TIC & TWG) by the SVT team

Current layout - Summary



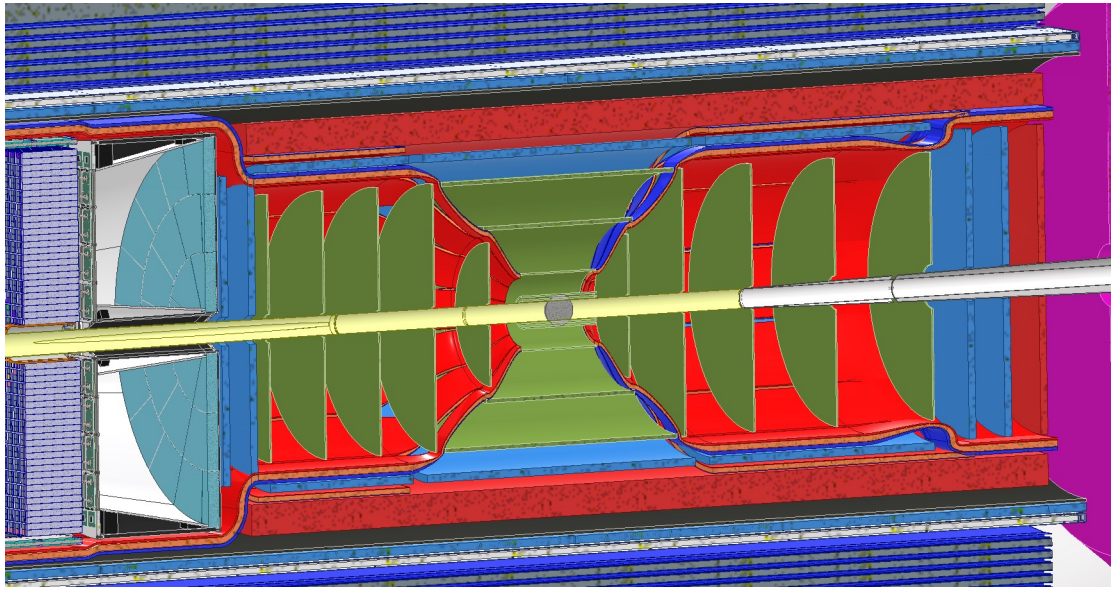
SVT:

- L0, L1, L2 (inner barrel) are based on the ITS3 sensor with suitably redesigned mechanics and services for EIC purposes
- L3, L4 are EIC Large-Area Sensor, forked off from the ITS3 development
- 5 EIC LAS-based disks on either side of the IP

Outer tracker:

- MPGD and AC-LGAD based barrel layers complement L0-L4;
- MPGD disks on either side of the IP complement the forward and backward SVT disks

Envisioned layout - assumptions



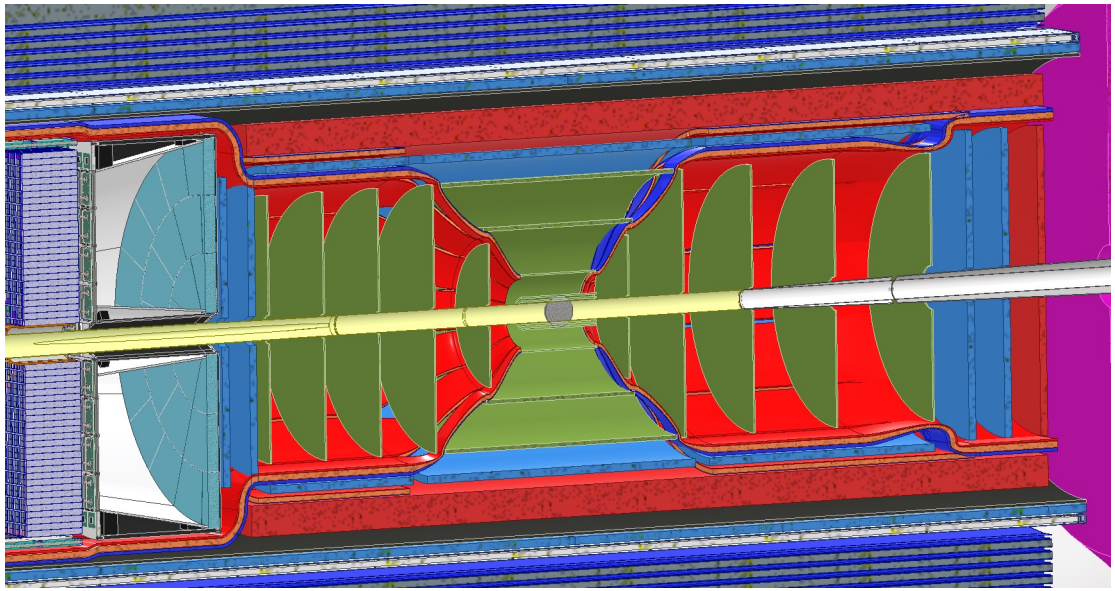
- Two “what if” branchpoints:
  1. ITS3 technology works with a timeline compatible with the EIC project but the LAS fork-off has a delay which makes the time line incompatible with EIC project time lines
  2. ITS3 technology for vertex and sagitta layers works but there is a delay which makes time lines incompatible with EIC project time lines

- Approach is to <u>always</u> keep path to ITS3-based current layout open
  - Keep money and labor spent on any alternative limited → no R&D, no redesign
  - Keep subdetector and service volumes consistent with current ITS3-based layout → *ensure easy upgrade path to ITS3 solution*
  - Accept initial reduced tracking performance → go to ITS3 solution asap

Proposed branchpoint solutions

Branchpoint 1: ITS3 technology works with a timeline compatible with the EIC project but the LAS fork-off has a delay which makes time lines incompatible with EIC project time lines

- Replace all ITS3 based disks with MPGD disks → 7 MPGD disks on each side
- outer ITS-3 layers L3&L4 get replaced with MPGD barrel detectors

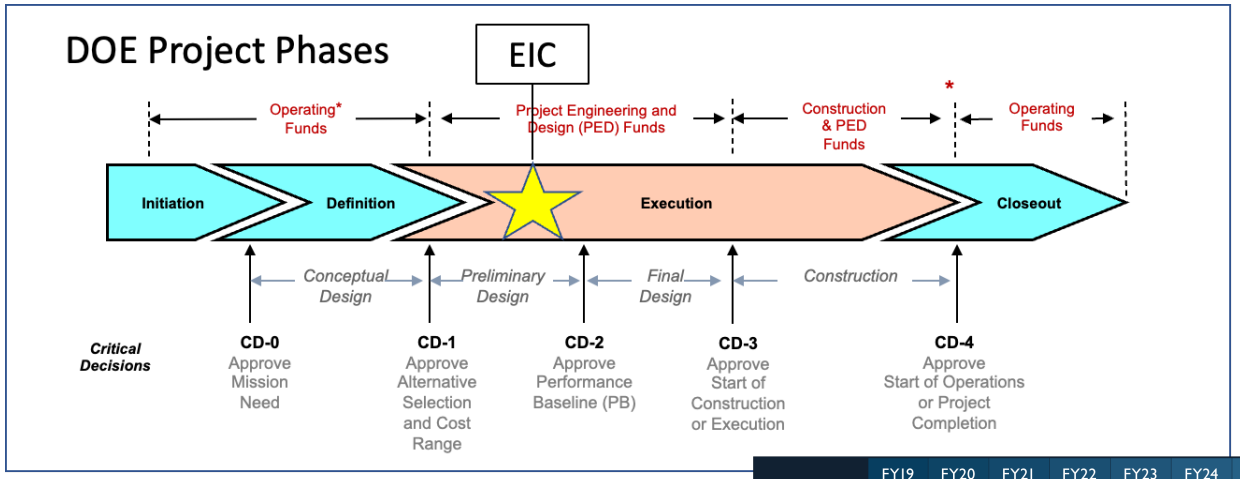


Branchpoint 2: ITS3 technology for vertex and sagitta layers works but there is a delay which makes time lines incompatible with EIC project time lines

- L0, L1 and L2 layers get replaced with ITS2 solution as is right now and used for ALICE and sPHENIX
- Replace by 2 or 3 ITS2 layers pending what fits in the subdetector and service volume
- Replace all ITS3 based disks with MPGD disks → 7 MPGD disks on each side
- outer ITS-3 layers L3&L4 get replaced with MPGD barrel detectors

Task ahead is to develop this mitigation plan outline into an actual plan; some items needed soon, others by CD-2

CD3A



CD-0, Mission Need Approved	December 2019
DOE Site Selection Announced	January 2020
CD-1, Alternative Selection and Cost Range, Approved	June 2021
CD-3A, Long Lead Procurement	**January 2024**
CD-2/3, Performance Baseline/Construction Start	**April 2025**
RHIC Shut Down	**June 2025**