ePIC TDR engagement – The context, a quick reminder

- TDR contributions requested from ePIC anticipated by PM at the ePIC meeting in Warsaw (July 2023)

- SP-office elaborated a **proposal for ePIC engagement in the TDR effort**, discussed and enriched with :
  - Coordinators
  - CC management
  - EB

- Proposal **presented to the Collaboration at the general meeting on December 1**, 2023
  - In view of a more ample discussion at the ePIC meering in January 2024

- At the ePIC meeting:
  - **Planning for the ePIC TDR** (in the plenary sessions)
  - Workfest "**Software & Sim TDR Readiness**", then reported in the plenary sessions

TDR – structuring the effort (slides shown at the ePIC meeting in Jan. 2024)

TDR

- **PM Serves as the "managing editors" for the ePIC Contributions to the EIC TDR**

- **TDR Chapter 2**
  - ***Holistic detector performance*** (short form)
    - The TC Office acts as "editor"
    - Organized/supervised by CC WG conveners
  - ***Physics performance and science reach*** (short form)
    - The ACs acting as "editors"
    - The Physics WGs as subgroups for text drafting

- **TDR Chapter 8**
  - ***Detector description and basic performance***
    - Project CAMs/Collab. DSL's acting as "co-editors" for their sections
    - The DSCs provide studies, material, text, etc.
  - ***Software, Analysis and Data Preservation***
    - Project CAMs and SCCs acting as "editors"
    - The electronics/DAQ CC WG and the software WGs

ePIC publications

- **ePIC SP-Office serves as the "managing editors" for the ePIC publications**

- **ePIC Physics Performance Publication:**
  - ***Holistic detector performance*** (extended text)
    - The TC Office acts as "editor"
    - Organized/supervised by CC WG conveners
  - ***Physics performance and science reach*** (extended text)
    - The ACs acting as "editors"
    - The Physics WGs as subgroups for text drafting

- **ePIC Detector Publication**
  - ***Detector description and basic performance***
    - DSL's acting as "editors" for their sections
    - The DSCs provide studies, material, text, etc.
  - ***Software, Analysis and Data Preservation***
    - SCCs acting as "editors"
    - The electronics/DAQ CC WG and the software WGs for text drafting

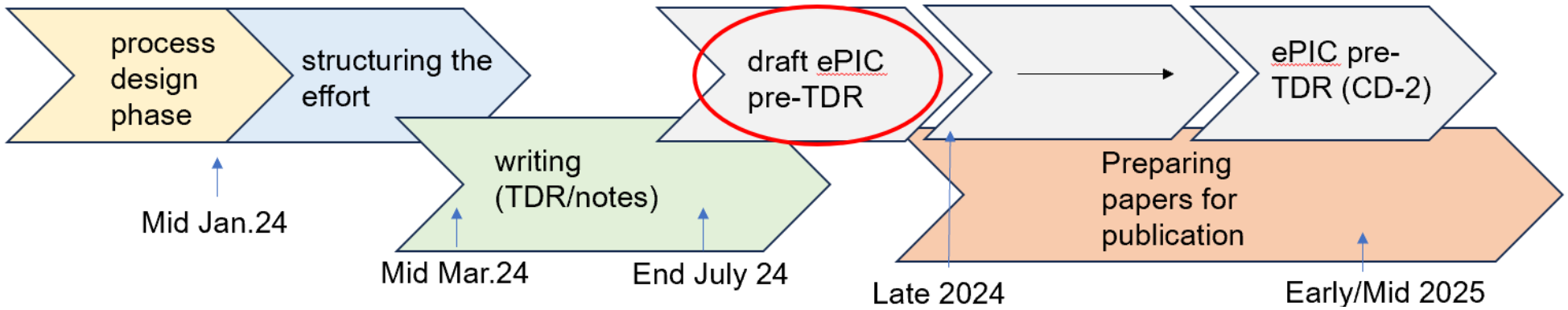
ePIC TDR engagement — The strategy in a nutshel

TDR Strategy and Publications

- In 2024 the ePIC collaboration will produce:
  - The ePIC contributions to the EIC TDR
    - The EIC TDR is the top priority
      - Chapters on *Physics Goals and Requirements* and *Experimental Systems*
      - Not just the document, but the simulations and detector R&D that form the basis
      - Requires close cooperation between the collaboration and the project!
- An ePIC Detector Design paper:
  - Derived and expanded from the *Experimental Systems* TDR chapter
- An ePIC Physics Performance paper:
  - Derived and expanded from the *Physics Goals and Requirements* TDR chapter
- Both to be published in a scientific journal (such as NIMA, JINST, or PRC)
- These publications will serve as a focus in developing the ePIC Membership and Publication policies.

Focused activity in the TIC:
Report by Silvia to follow

AC Report in last General Meeting:
https://indico.bnl.gov/event/21562/



ePIC TDR engagement — More about the preparatory work

CHAPTER 2

ePIC responsibility

Joint responsibility

Project responsibility

2 Physics Goals and Requirements

ePIC TDR engagement — More about the preparatory work

CHAPTER 8

8 Experimental Systems

- 8.1 Experimental Equipment Requirements Summary
- 8.2 General Detector Considerations and Operations Challenges
  - 8.2.1 General Design Considerations
  - 8.2.2 Backgrounds and Rates
  - 8.2.3 Radiation Level
- 8.3 The ePIC Detector
  - 8.3.1 Introduction
  - 8.3.2 Magnet
  - 8.3.3 Tracking
  - 8.3.4 Particle Identification
  - 8.3.5 Electromagnetic Calorimetry
  - 8.3.6 Hadron Calorimetry
  - 8.3.7 Particle Identification
  - 8.3.8 Far-Forward Detectors
  - 8.3.9 Far-Backwards Detectors
  - 8.3.10 Polarimetry
  - 8.3.11 Readout Electronics and Data Acquisition
  - 8.3.12 Software and Computing
- 8.4 Detector Integration
  - 8.4.1 Installation and Maintenance
- 8.5 Detector Commissioning and Pre-Operations

ePIC responsibility

Joint responsibility

Project responsibility

ePIC TDR engagement — a coming preparatory step

About chapter 8, subsystem texts

- Texts are expected to be **complete and full contained**: the reader can find there everything about a subsystem
- Texts should follow **a common scheme** to facilitate readers
  - When an item is not needed for a given subsystem, it can be skipped
- **TODAY we are discussing this scheme**

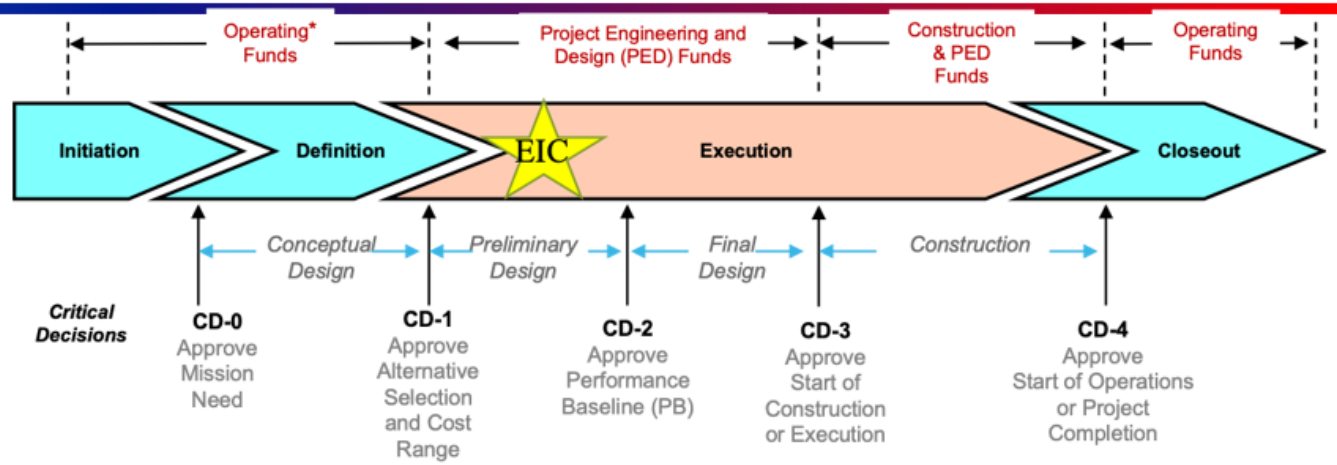
ePIC TDR engagement — a preparatory step

FOR EACH SUBSYSTEM

- Device **concept and justification** for the technological choice
- **Description**
  - General device description
  - Sensors
  - FEE
  - Other components (f.i.: radiators in calorimetry and in Cherenkov devices, …)
- **Performance** from available input (lab studies, test beam, prototyping, simulation studies)
- Expected **data rates** from FEE
- **Radiation hardness** of components
- **Services** (cooling, gas system, sensor power supply, FEE power supply, …)
- Subdetector **mechanics and integration**
- **Calibration, alignment and monitoring** strategy and tools
- **Status and remaining design effort**
  - R&D up to here (and missing, if any); E&D status and outlook
  - Other work needed for design completion
  - Status of maturity (with reference to next slide)
- **ES&H** (Environmental, Safety & Health) aspects and **QA** (Quality Assessment) planning
- **Construction planning**
- **Collaborators** (=Institutions) and their role, resources and workforce
- ***Risks and mitigation strategy***

Design Maturity

From PM report on 2/22 General meeting



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.