Report from the Project Management

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JINR Dubna GDE Workshop

4.06.08

6 Months after Black December

- Re-emphasis of TD Phase Plan now complete
  - **Org. chart remains unchanged**
  - **R&D Plan re-structured and consolidated**
    - Release 2 – see later
- Focus remains unchanged
  - **Risk mitigating R&D**
    - SCRF (→ presentation from Akira Yamamoto)
    - Beam test facilities (Electron cloud at CesrTA, ATF-2,…)
  - **Cost reduction (via CFS)**
    - Accelerator layout
    - MDI
    - Shallow site options → “uniform” site

  } Focus of this workshop
- New element
  - **Project Implementation Plan**

Progress This Year (Highlights)

- Cavity optical inspection system (Kyoto, KEK)
  - **Major breakthrough in S0 program**
- Progress on cryomodule plug compatibility specifications
- Securing S1-global commitment
  - **31.5 MV/m cryomodule**
  - **Collaboration DESY, FNAL, KEK**
- RF distribution system tests
  - **determining the power overhead**
- 9mA tests at TTF2/FLASH (DESY)
  - **Planning & preparatory work for full beam-loading experiments**
- CesrTA initial phase installation work
  - **First beam July**
- Positron source undulator tests at RAL, UK (STFC)
- ATF-2 installation – towards first beam end 2008

R&D Plan History

- Rel. 1 DRAFT completed November 2007
  - **Then EDR R&D Plan**
  - **Submitted to ILCSC, FALC for feedback and endorsement**
  - **Limited circulation to TAG leaders**

- Black December strikes
  - **Back to the drawing board**
  - **Initial impact on scope (response plan) circulated end of January 08**

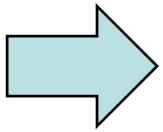
- Updated (now TD Phase) R&D Plan for FALC in May
  - **Followed by major restructuring of document**
  - **Consolidation of four-year plan**

- Will be released this Friday 6.06.08 (designated Rel. 2)

Restructuring

- Purpose of document
- Introduction
- General R&D Goals
- R&D Coordination
- Primary TD Phase goals
  - **SCRF**
  - **CFS & Global**
  - **Accelerator Systems**
- Resource tables
- Work Package Participation

- **Appendices**:
- Appendix 1 S0 Program
- Appendix 2 CFS activities
- Appendix 3 BTF
- Appendix 4 Work Packages
- Appendix 5 Synergy Projects
- Appendix 6 Participating institutes



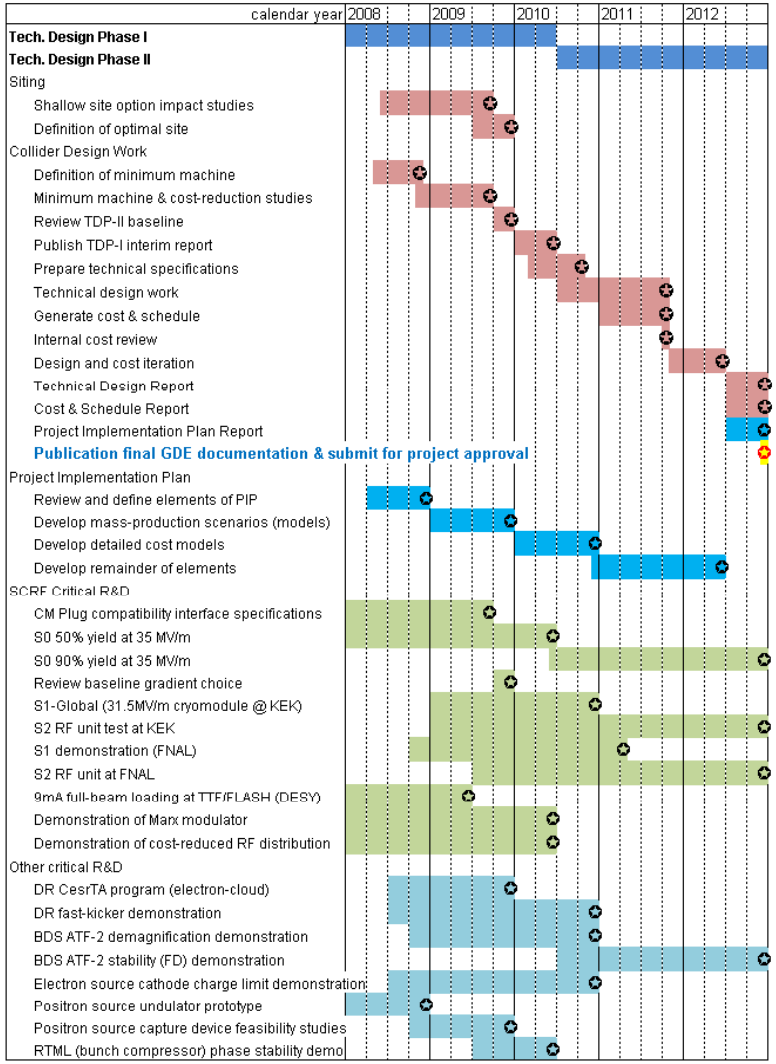
- Purpose of document
- Overview of TD Phase (**new**)
- Critical R&D
  - **SCRF**
  - **Test Facilities**
  - **Other (mostly AS)**
- Machine Design, Cost Reduction Activities
  - **CFS & Global**
  - **Accelerator Systems**
- Cost, Schedule and the PIP (**new**)
- Global Coordination

- **Appendices**:
- A: Resources and WP participation
- B: Work Packages Descriptions
- C: Synergy Projects
- D: Institutes

Future R&D Plan Releases

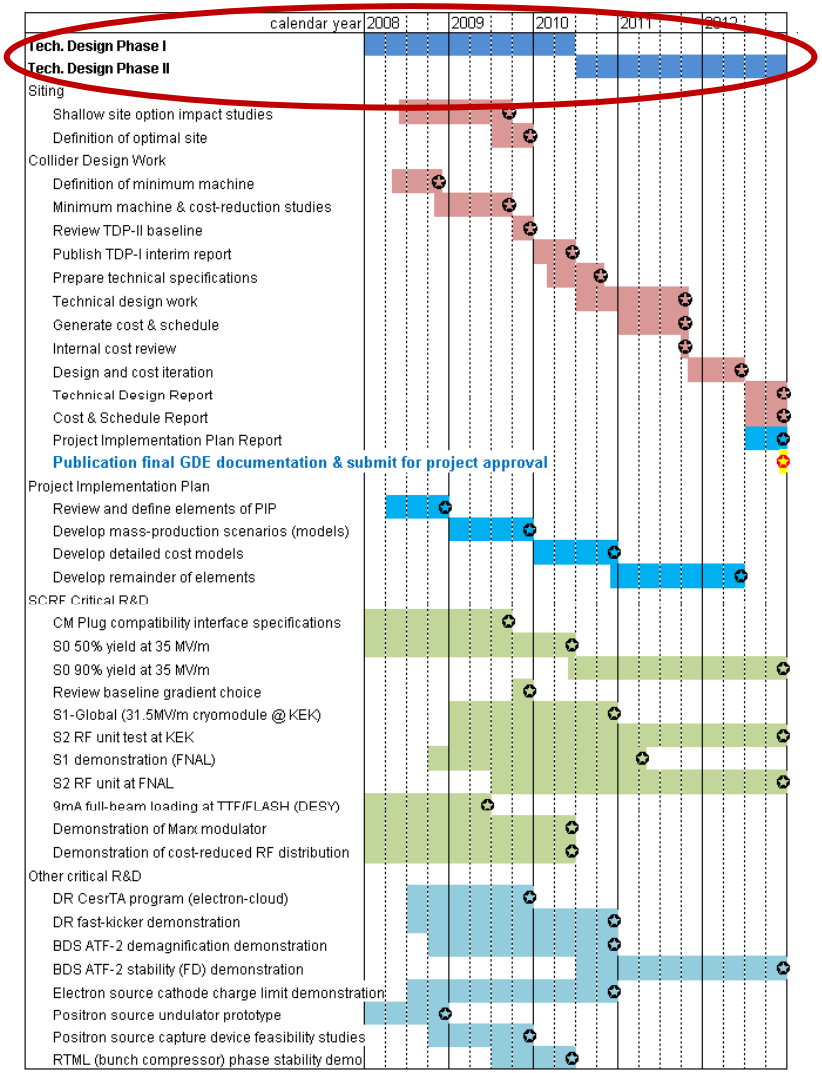
- Reviewed and re-release every six months
  - **Next update December**
- TAG leaders will be given ownership of Appendix B material
  - **Work Package descriptions etc.**
  - **Formally signed-off by responsible PM.**
- Some work to structure document to ease future updates still required
  - **ILC-EDMS**
  - **Linked Excel table etc.**

PM TD Phase 1 & 2 Schedule



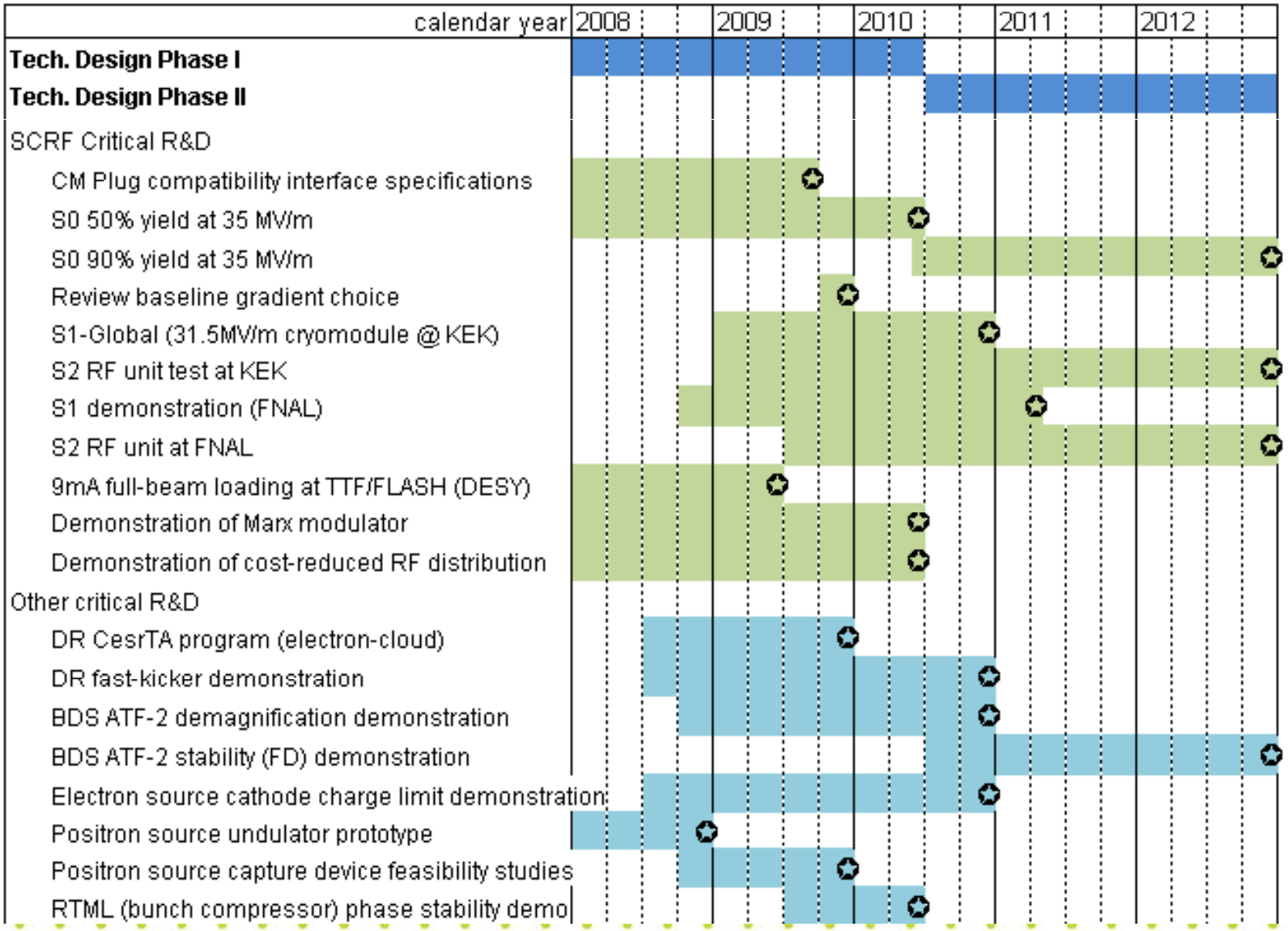
- A tentative top-level management plan for TD Phase 1 & 2 now exists
  - **Published in R&D Plan**
  - **More detailed schedule being updated**
    - MS Project
- Part of release 2
- Encapsulates the PMs strategy and vision for the next four years
  - **Critical R&D**
  - **Cost reduction / machine design**
  - **Project Implementation Plan**

Schedule: Basic Premise

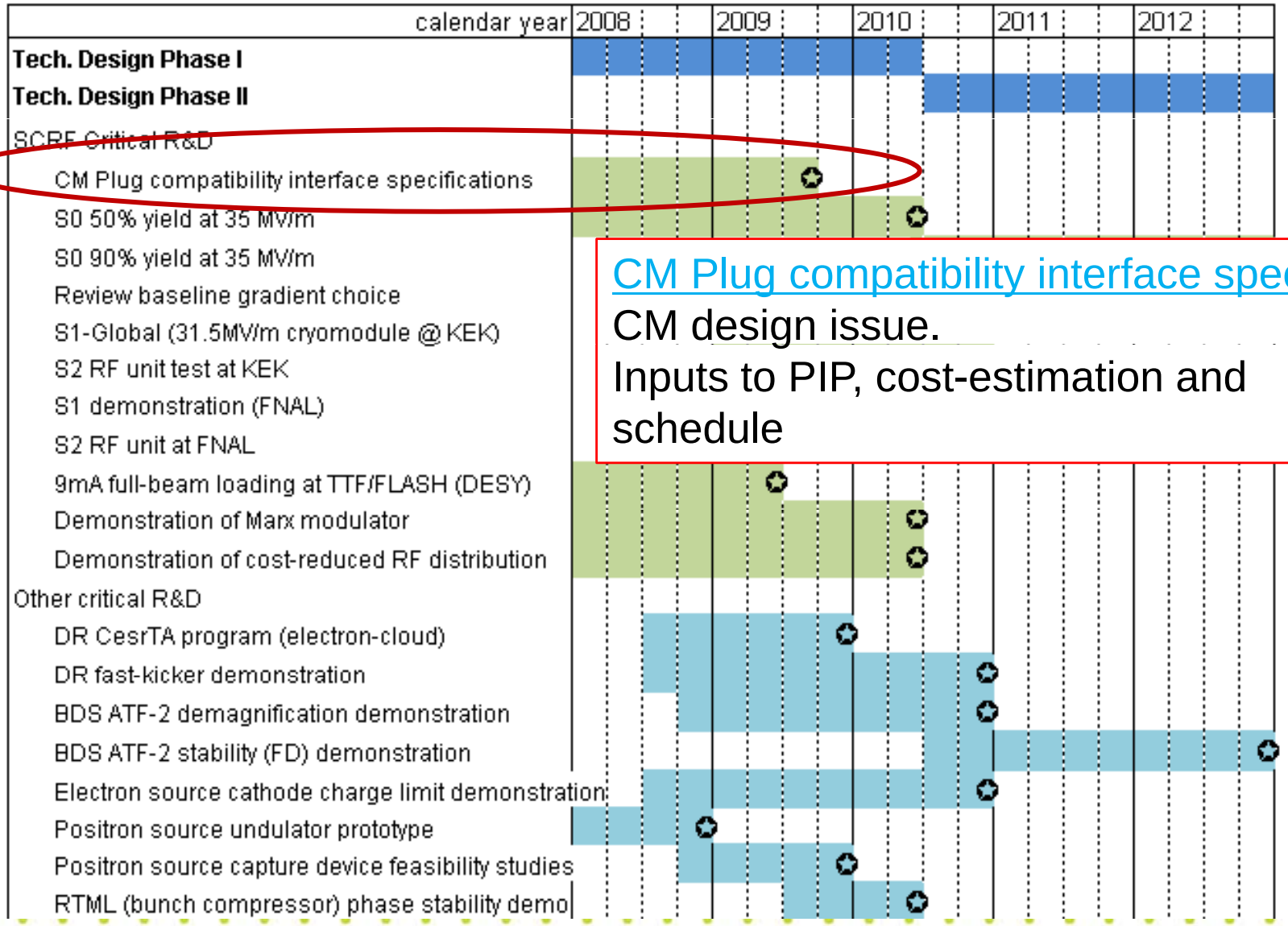


- Basic time-scale
  - **Phase 1: July 2010**
    - Paris meeting already scheduled
  - **Phase 2: end of CY 2012**
    - Not previously well-defined
    - Fits with current SCRF planning (S2 for example)

Critical R&D


calendar year
2008
2009
2010
2011
2012
Tech. Design Phase I
Tech. Design Phase II
SCRF Critical R&D
CM Plug compatibility interface specifications
S0 50% yield at 35 MV/m
S0 90% yield at 35 MV/m
Review baseline gradient choice
S1-Global (31.5MV/m cryomodule @ KEK)
S2 RF unit test at KEK
S1 demonstration (FNAL)
S2 RF unit at FNAL
9mA full-beam loading at TTF/FLASH (DESY)
Demonstration of Marx modulator
Demonstration of cost-reduced RF distribution
Other critical R&D
DR CesrTA program (electron-cloud)
DR fast-kicker demonstration
BDS ATF-2 demagnification demonstration
BDS ATF-2 stability (FD) demonstration
Electron source cathode charge limit demonstration
Positron source undulator prototype
Positron source capture device feasibility studies
RTML (bunch compressor) phase stability demo

Critical R&D

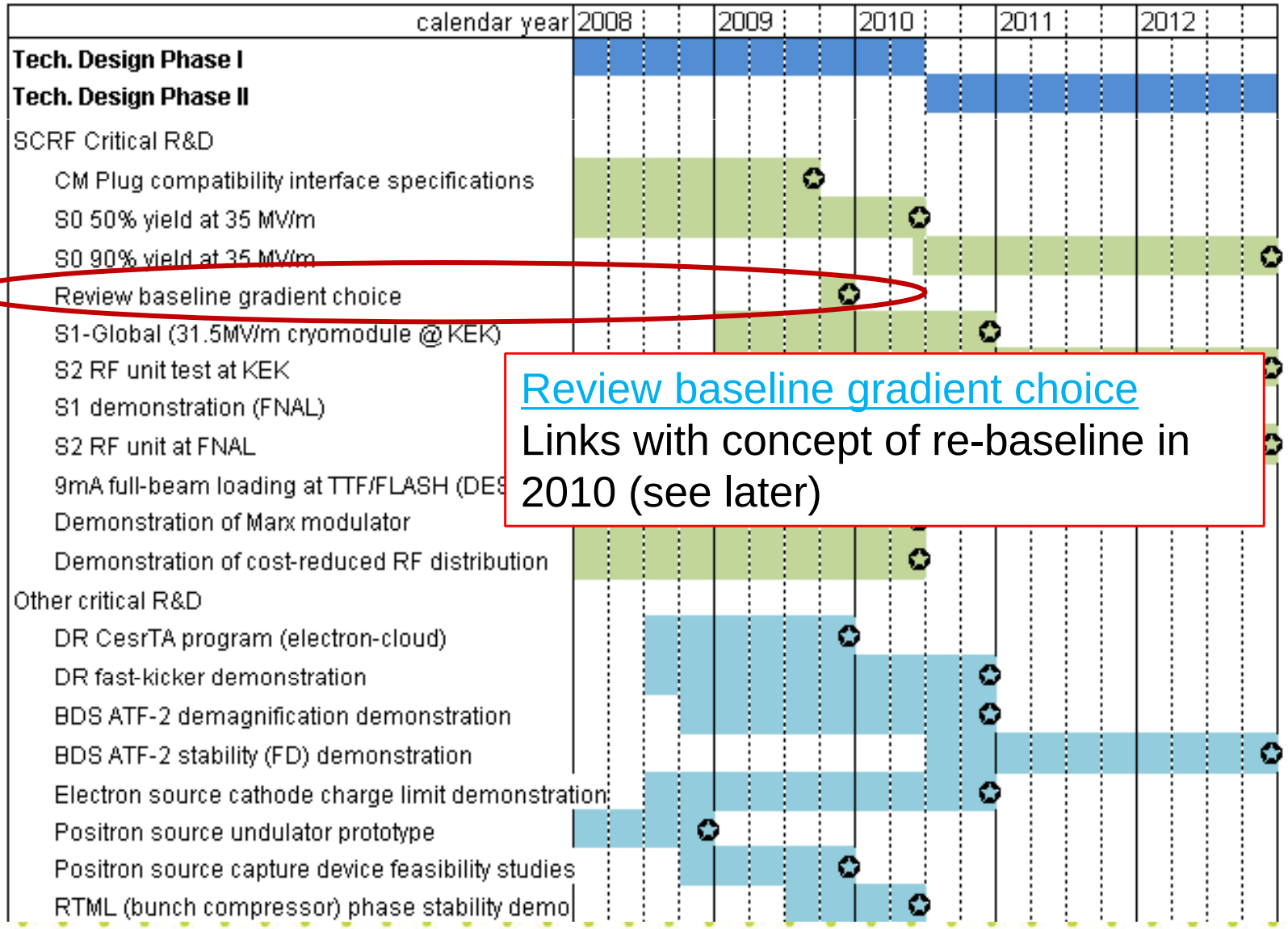


CM Plug compatibility interface specs.

CM design issue.

Inputs to PIP, cost-estimation and schedule

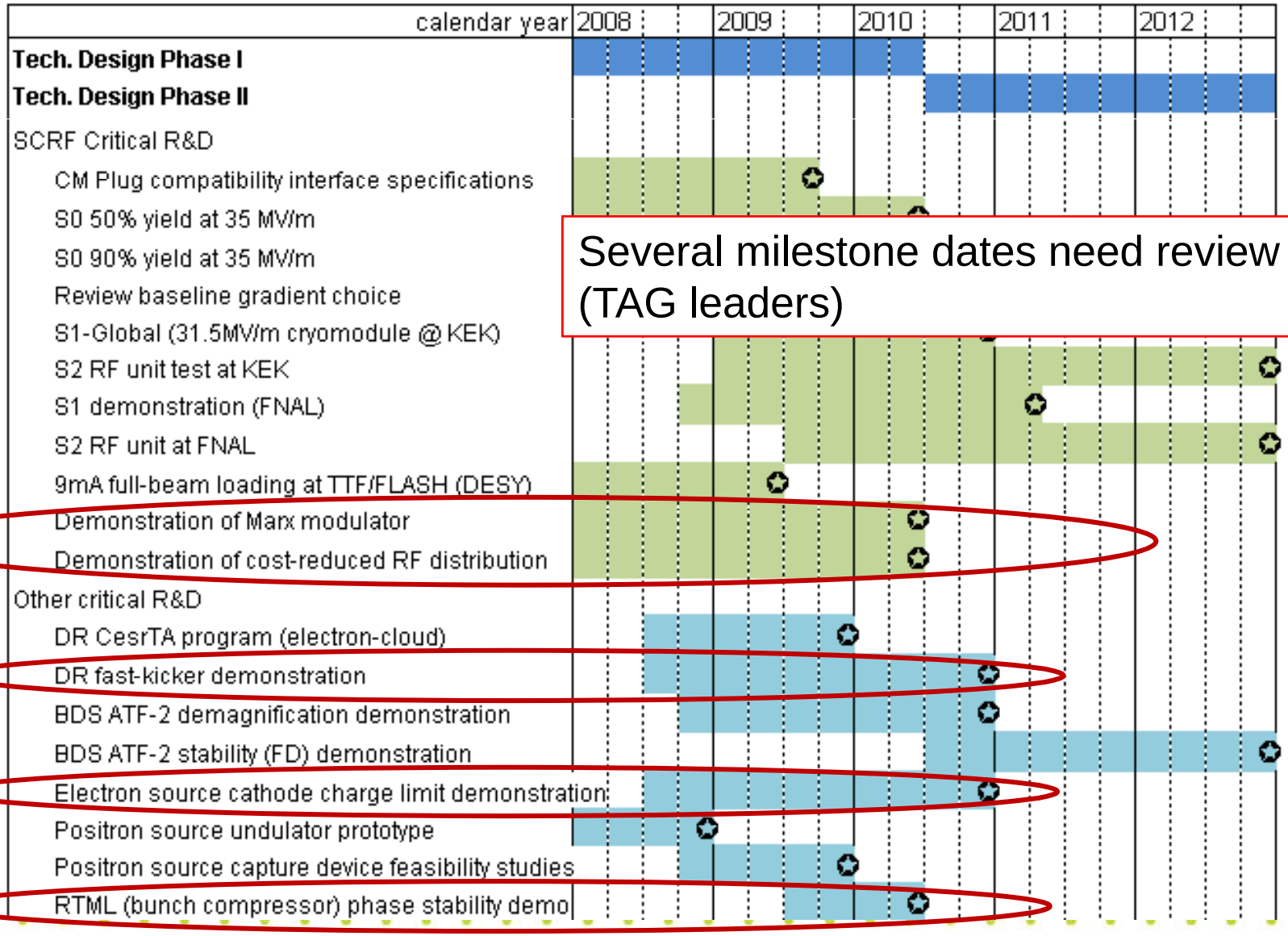
Critical R&D



Review baseline gradient choice

Links with concept of re-baseline in 2010 (see later)

Critical R&D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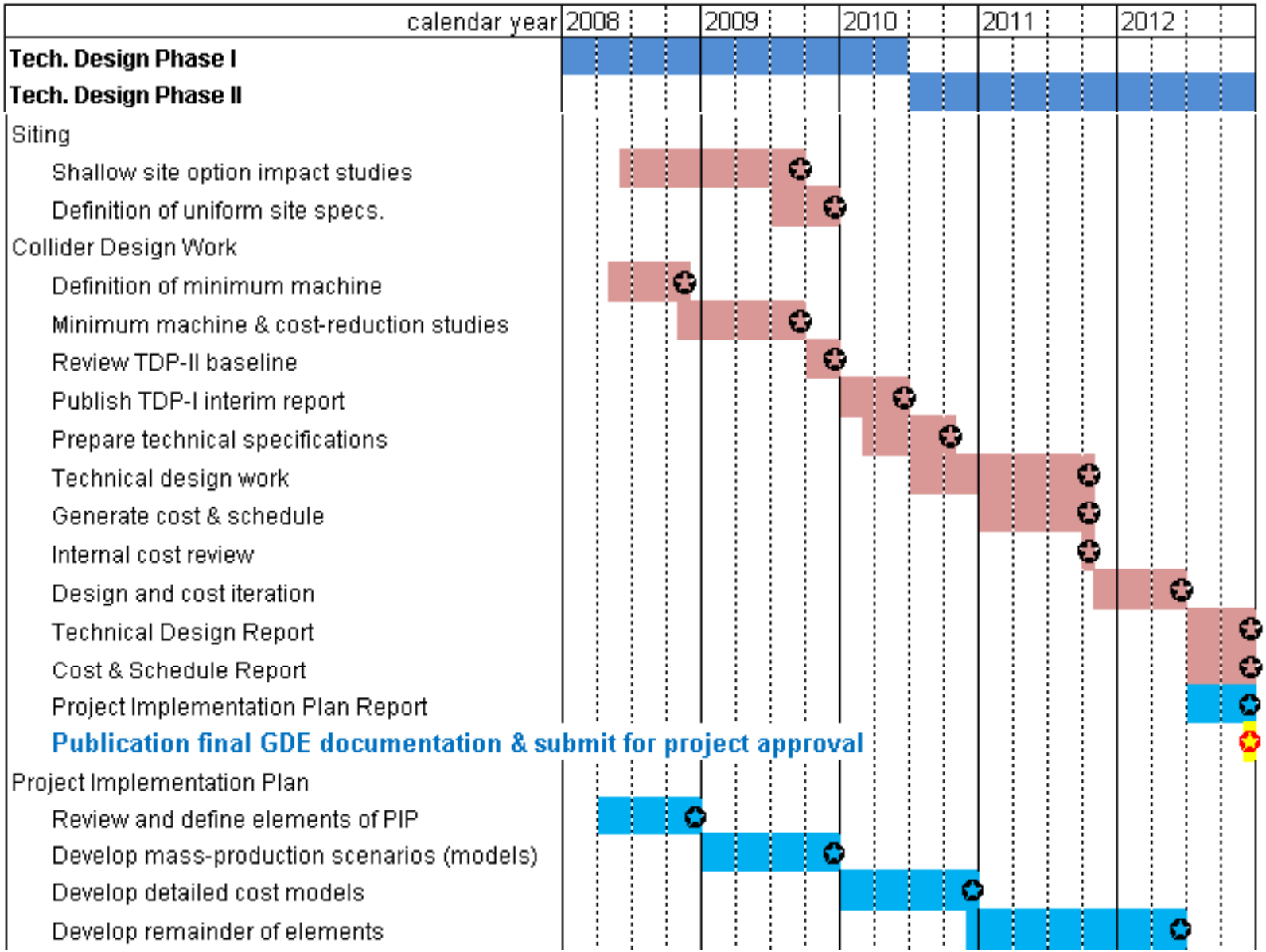
RTML (bunch compressor) phase stability demo
Several milestone dates need review (TAG leaders)

Design / Cost Reduction / PIP



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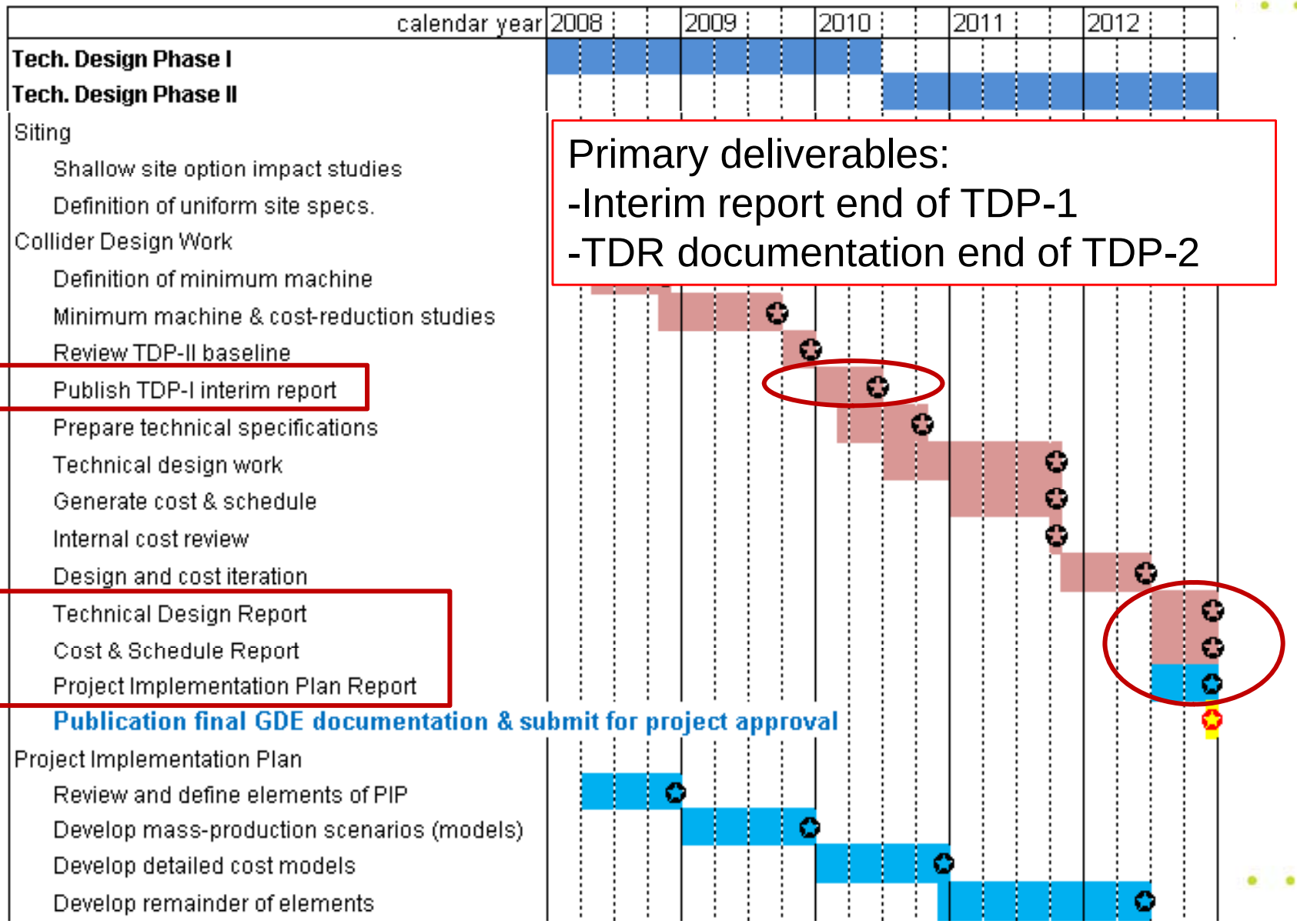

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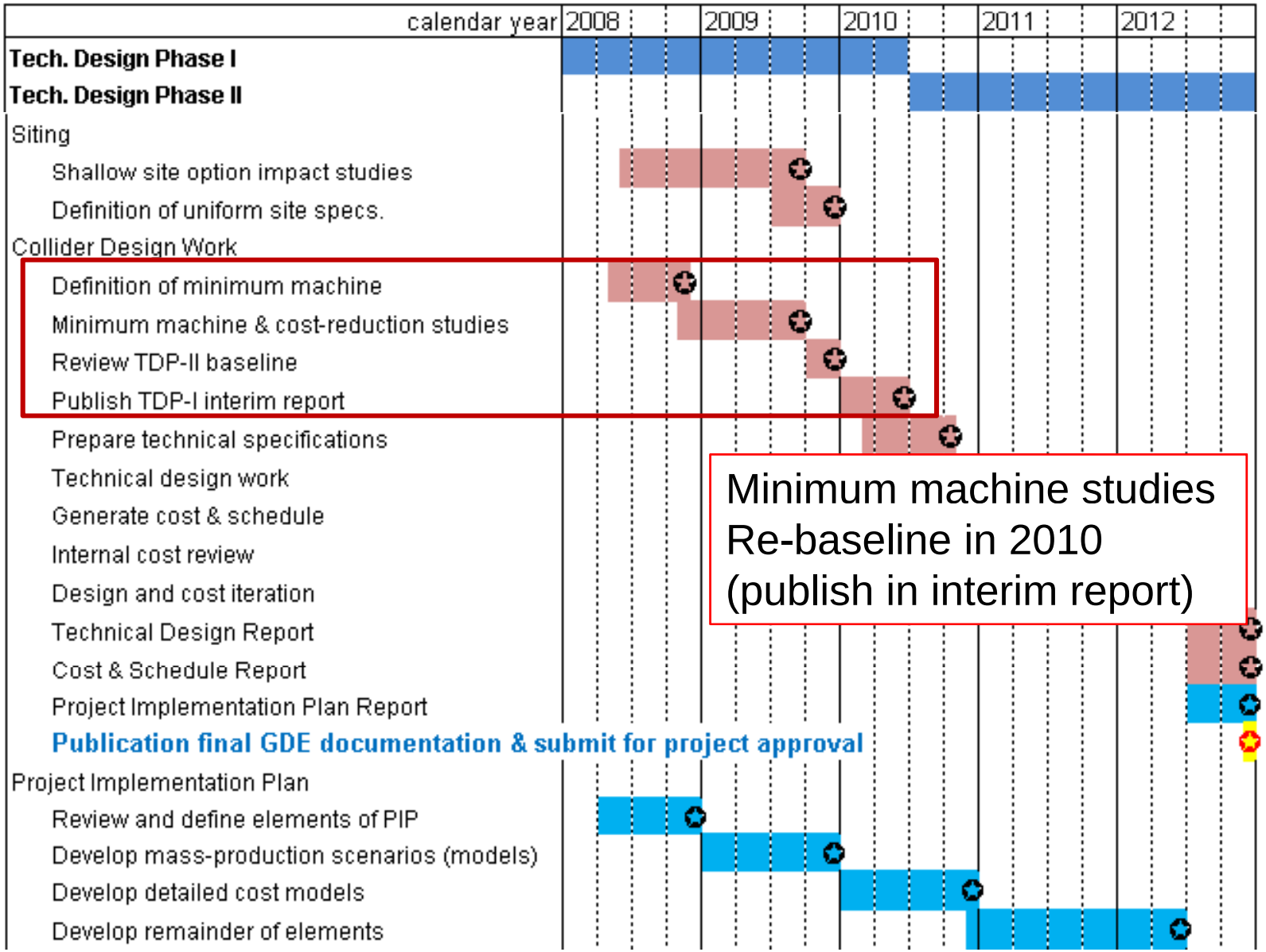

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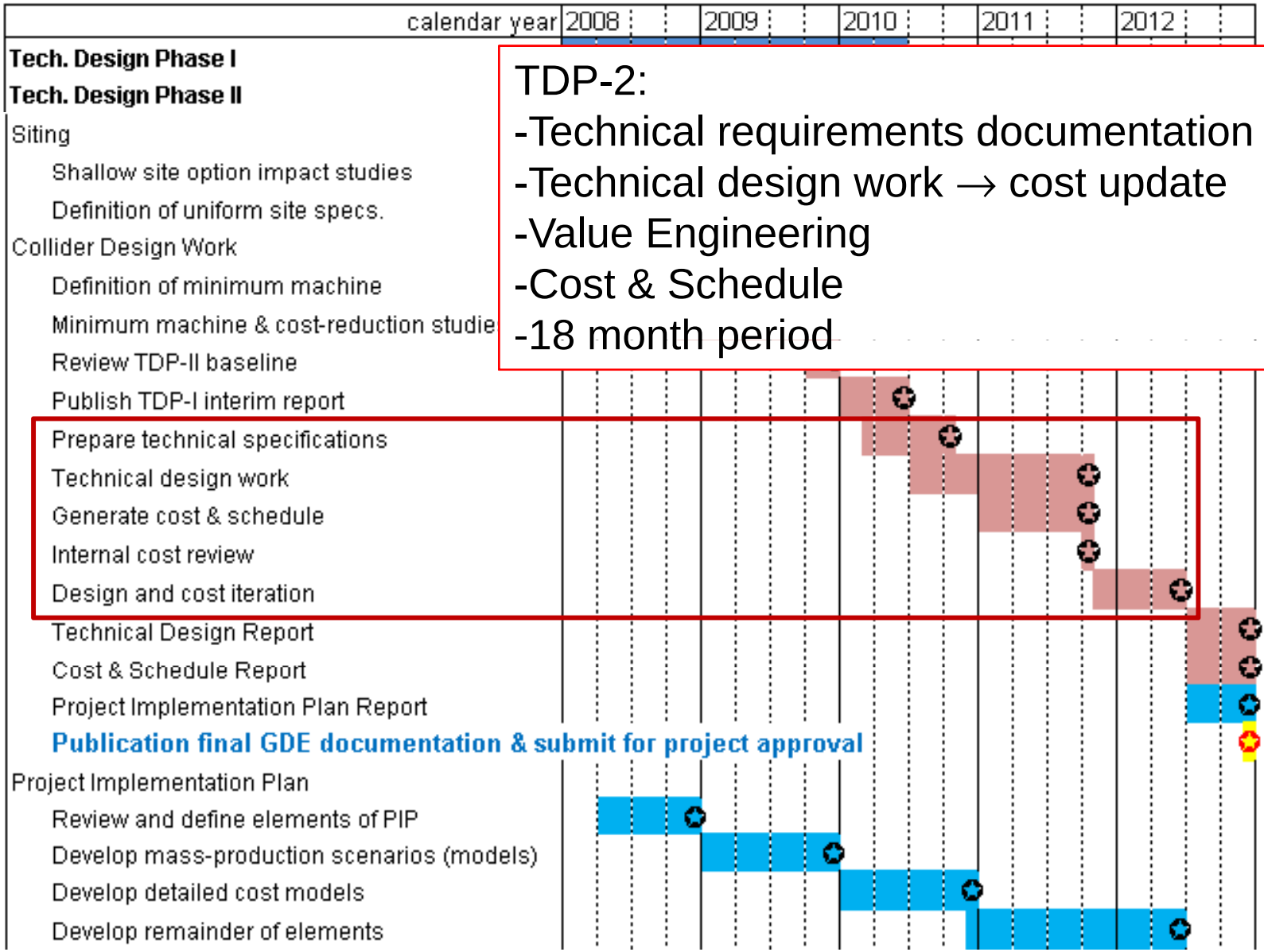


TDP-2:

-Technical requirements documentation

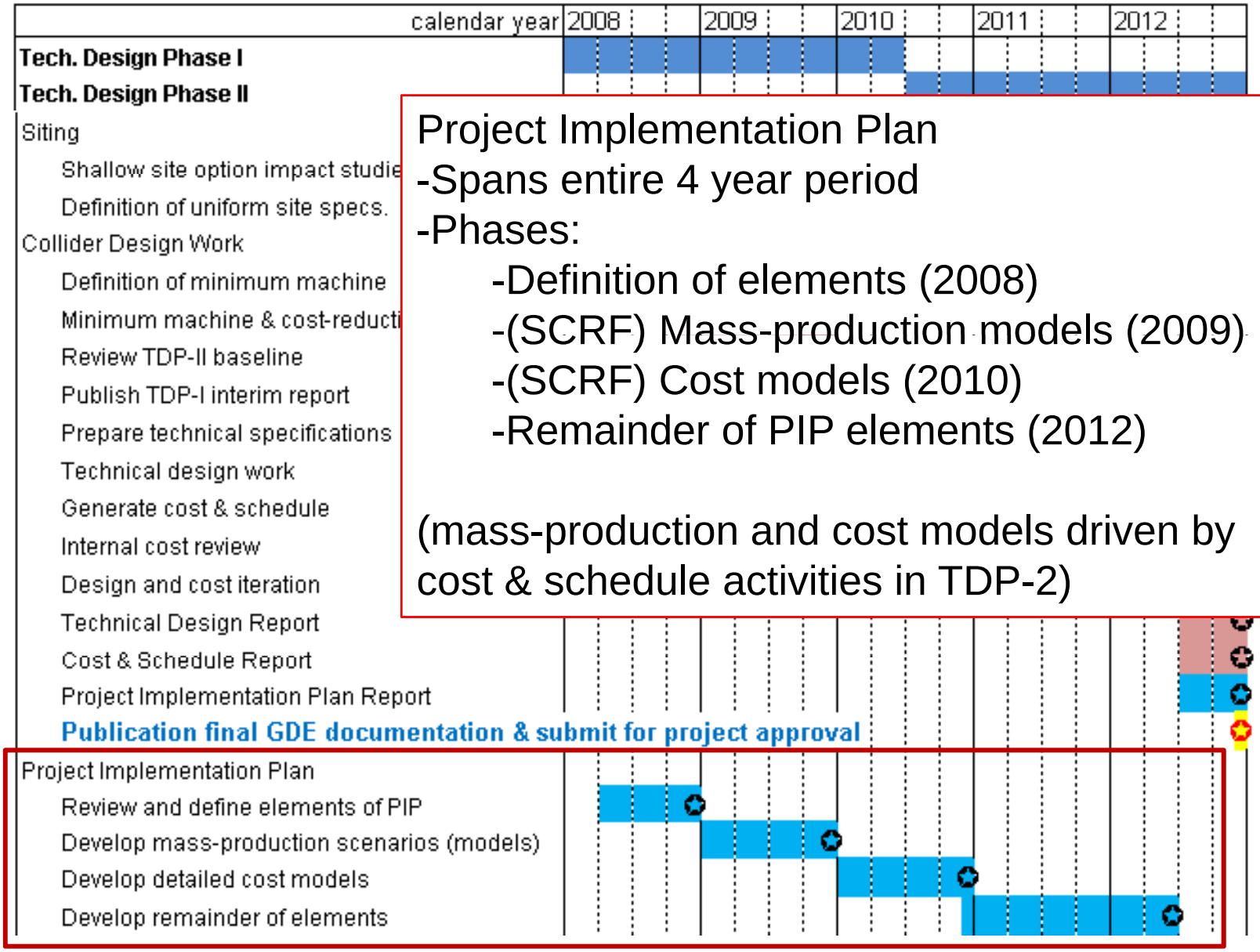
-Technical design work → cost update

-Value Engineering

-Cost & Schedule

-18 month period

Design / Cost Reduction / PIP



Project Implementation Plan

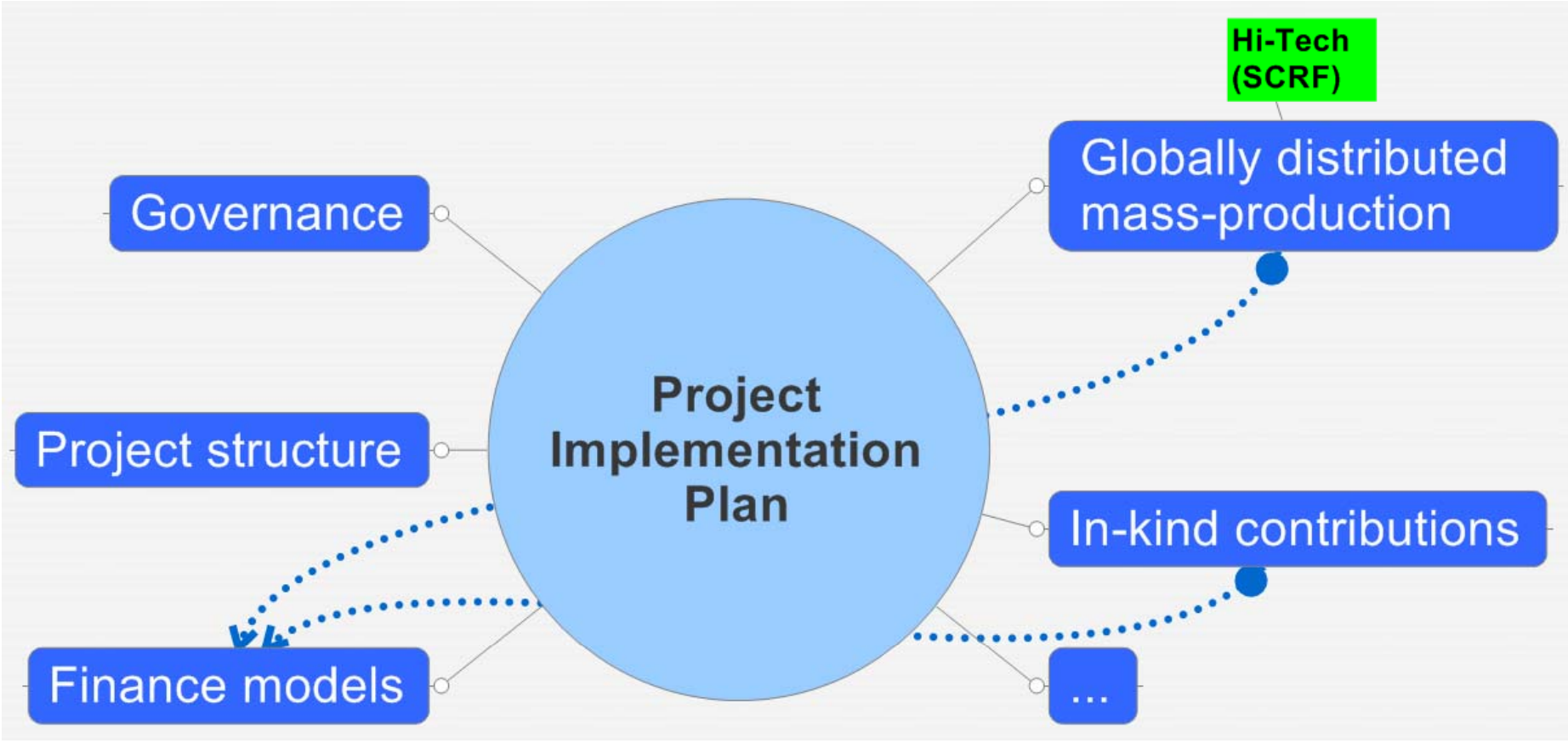
-Spans entire 4 year period

-Phases:

- -Definition of elements (2008)
- -(SCRF) Mass-production models (2009)
- -(SCRF) Cost models (2010)
- -Remainder of PIP elements (2012)

(mass-production and cost models driven by cost & schedule activities in TDP-2)

Project Implementation Plan



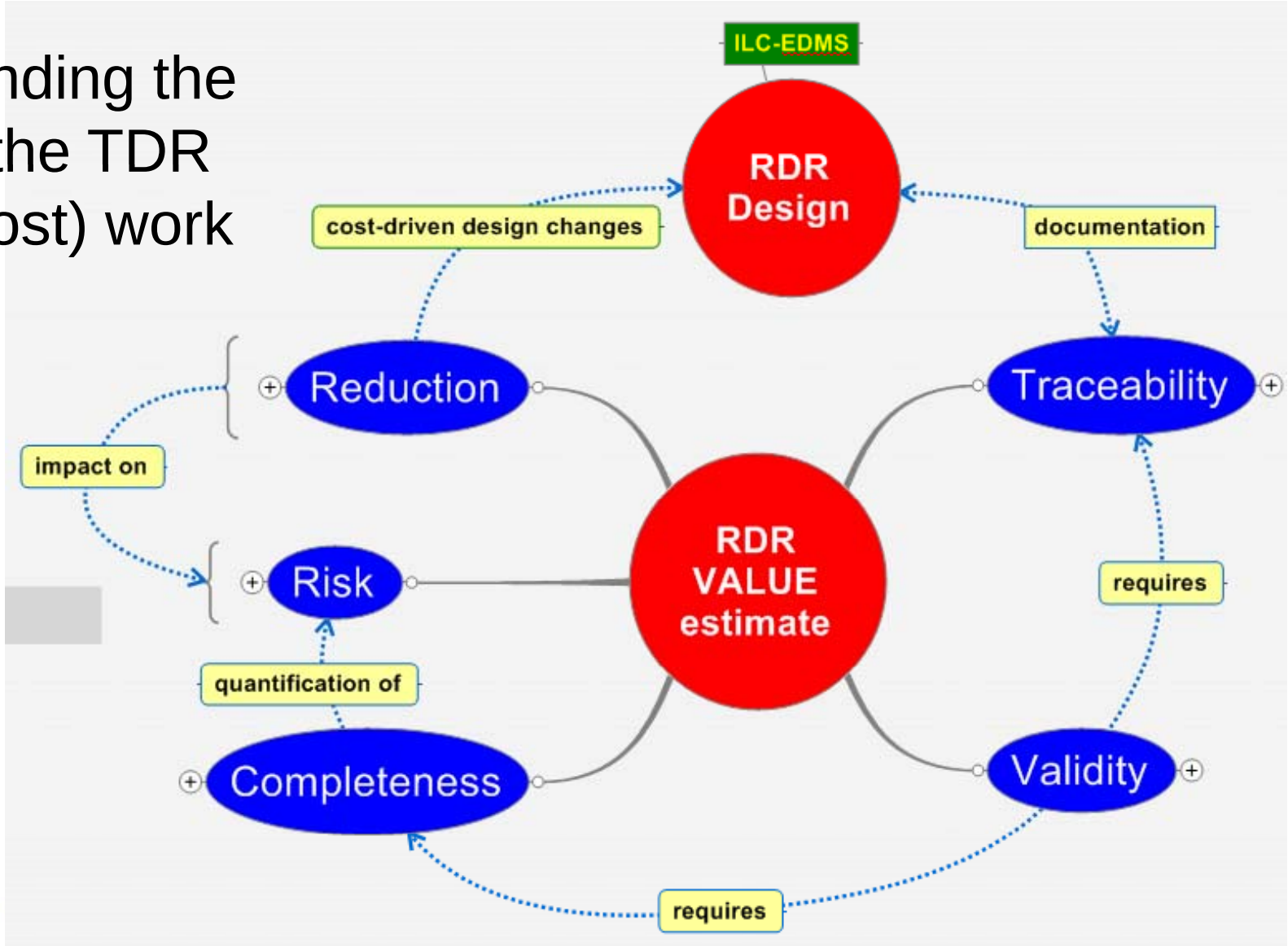
Cost Management Group

- Top-level group to support PM activities in:
  - **Consolidation of RDR material (incl. costs)**
  - **Organising cost & schedule methodology and tools for TD phase**
  - **Top-level ownership of costs**
  - **Analysis of cost-drivers and possible cost-driven design studies**
    - Minimum machine concept (*see later*)
    - Parametric studies
    - …
- Membership:
  - **Ross, Walker, Yamamoto, Bialowons, Garbincius, Shidara, Paterson, Carwardine, Elsen, Himel, Lehner (sec)**
- 3.5 day meeting at DESY in May

→ begin planning for critical cost review

RDR Costs: critical points

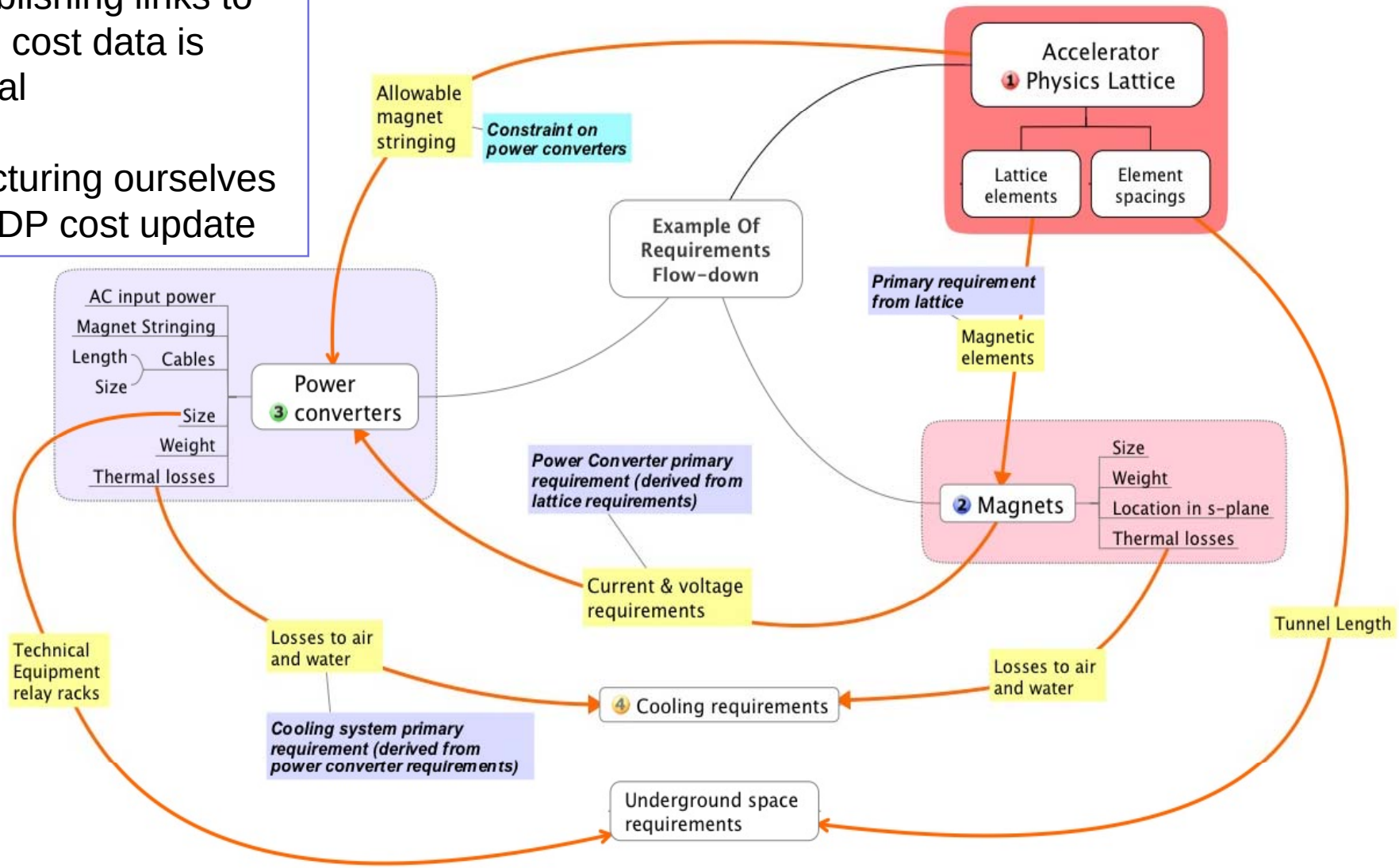
Understanding the scope of the TDR (design/cost) work



RDR Costs: critical points

Establishing links to RDR cost data is critical

Structuring ourselves for TDP cost update



The Dubna meeting: PM plan

- The RDR represents a consensus design, which reconciled inputs from our constituent accelerator designers / engineers
  - **CFS just one aspect**
- We believe a more cost-effective design, based on the RDR, is possible and mandated by a need to ‘optimize’ the ILC design
  - **(some *sacrifices* may be necessary)**
  - **This is to be started at this workshop**

PM Assumptions:

- There exists a ‘minimal design’ that satisfies all scope requirements and facilitates cost comparisons for ‘optional’ features
  - **Not a trivial concept due to design optimization and consolidation already in RDR**
- The shallow machine is more cost-effective
  - **Effective reliability strategy for single tunnel layout NOT done for RDR – due to time / resource limitations**
- The process can be done within the ‘consensus – building’ context established for RDR
  - **Our community must buy-in and participate**

Minimum Machine Concept (1)

- Physics scope (WWS document)
  - **200-500 GeV centre-of-mass energy range**
  - **$2x10^{34}$ $cm^{-2}s^{-1}$**
  - **polarised electrons**

- Identify cost-driving requirements and criteria
  - **Push back on them to acceptable minimum**
  - **(May increase risk to performance, which must be quantified)**
  - **CFS will be primary target**
    - Underground volume
    - Process cooling water
    - …

Minimum Machine Concept (2)

- Reduced margin, overhead, (conservatism)
- Other important areas
  - **Beam dynamic requirements (vibration, temperature stability etc.)**
  - **Magnet families and power-supply distributions**
  - **…**
- Needs work to make initial definition
  - **Iteration with TAG groups**

This Workshop

- Working Groups
  - **A. Shallow solutions: Explore features and develop reduced-cost, shallow tunnel solutions. Both CLIC and ILC. Includes single tunnel.**
  - **B. Infrastructure: Review infrastructure requirements and develop cost-effective solutions for accelerator infrastructure – power, water, air etc. Both CLIC and ILC.**
  - **C. Siting: Examine possible sites and evaluate possible design differences that accommodate features. Includes staging, design modifications and upgrade issues.**
  - **D. Accelerator Systems: particular focus on the central injection complex, BDS and RTML.**
- Strong emphasis on cost-reduction
  - **Covers many of the concepts/issues previously presented**

CLIC – ILC Collaboration

- Purpose: bring the two collider development communities together
  - **held plenary meetings – Feb and May 2008**
- establish 5 working groups and conveners:
  - **CFS, BDS, Detectors, Cost / Schedule, Beam Dynamics**
  - **mandates defined**
- Promote participation in each other's meetings etc.
  - **open internal meetings via telecon: 'webex'**
- plans to be developed this week (and next)
  - **review mid-August and at fall meetings**
  - **summarized at closing Friday.**

Calendar (six-months)

- June 4-6 GDE Meeting (JINR)
- July 7 Cornell SRF visit
- July 8-11 Damping Ring Workshop (Cornell)
  - ***Aug 25 26 XFEL Cold Linac (DESY)***
- Sept 5 -6 EC (KEK) (+ Sep 4 and Sep 7-9)
- Sept 11 Jlab SRF visit
  - ***Sept 15 16 XFEL Project review (DESY)***
  - ***Oct 14-17 CLIC Collaboration (CERN)***
- Oct 19-20 Project Advisory Committee (Paris)
  - ***Oct 20-23 TESLA Technology Collaboration (India)***
- Oct 24 ILC SRF (India)
- Oct 29-31 Positron source – (Daresbury)
- Nov16-20 LCWS / GDE Workshop (Chicago)
  - ***Dec 1-3 First XFEL Acc. Consortium (DESY)***

2009:

- early 2009
  - **AAP: interim-review (in planning)**

Reviews

- PAC
  - **Primary oversight committee (ILCSC/ICFA)**
  - **Includes detector groups**
  - **First review October 19-20 in Paris**

- AAP
  - **Internal GDE advisory panel (technical)**
  - **Also has review responsibilities**
  - **Members will be better integrated in day-to-day activities**
  - **Mid TDP-1 interim review early 2009**
    - Final review towards end of TDP-1 in 2010

Final Words

- Despite black December significant world-wide progress
- Release of R&D Plan imminent
  - **6 months late but**
  - **A better plan ☺**
- Importance of Project Implementation Plan
- Cost reduction strategy taking shape
  - **CMG activities**
  - **Minimum machine and uniform site concepts**
  - **Real work starts here at Dubna workshop**