



# ILC AD&I: Introduction and Overview

Project Management:

Nick Walker

Akira Yamamoto

Marc Ross



# The R&D Plan

- Stated TDP Goals:

- Updated ILC design

- Results of critical risk-mitigating R&D

- Updated VALUE estimate and schedule

- Project Implementation Plan



## ***ILC Research and Development Plan for the Technical Design Phase***

Release 3

February 2009

ILC Global Design Effort

Director: Barry Barish

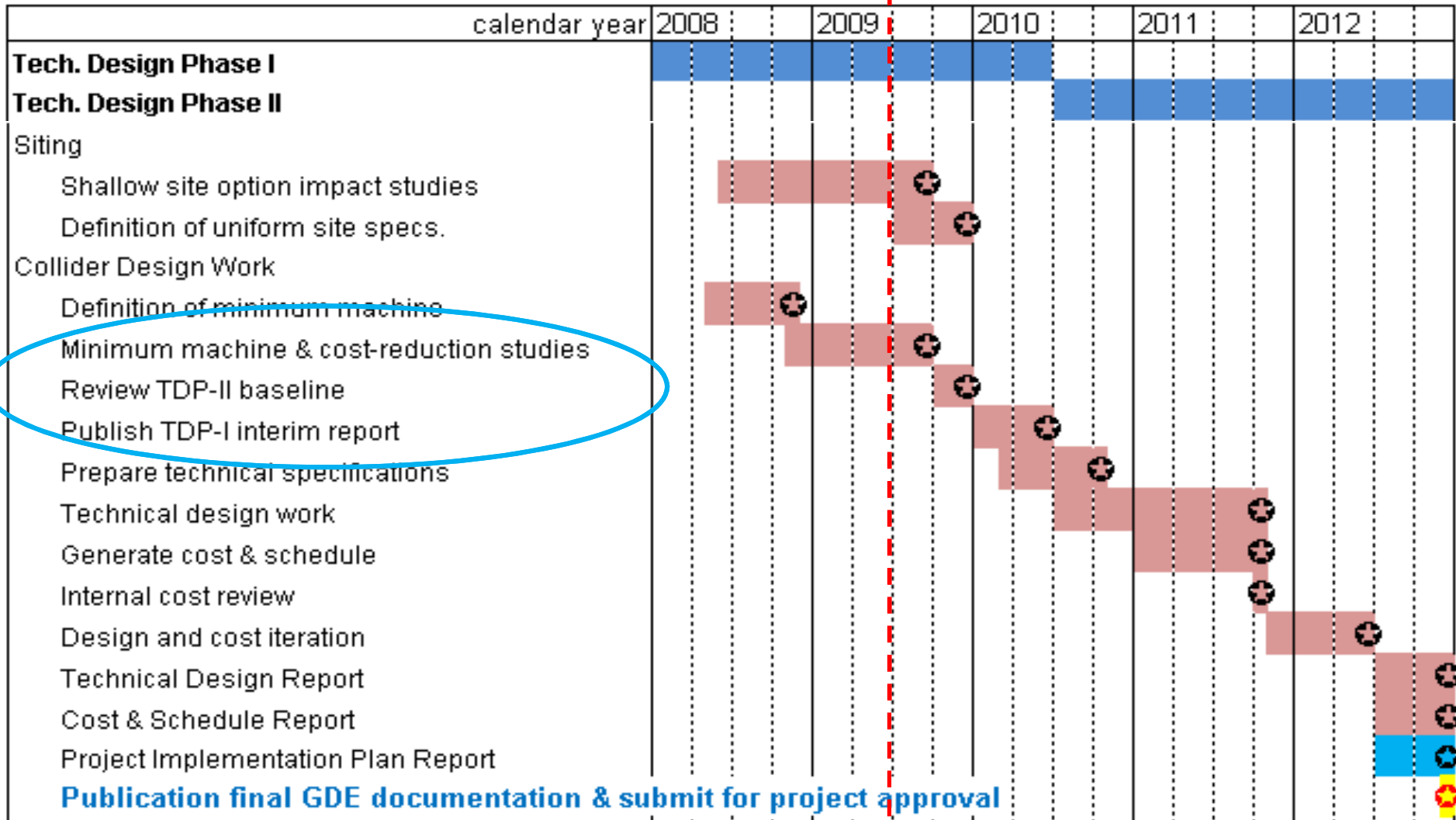
Prepared by the Technical Design Phase Project  
Management

Project Managers:

Marc Ross  
Nick Walker  
Akira Yamamoto



# TDP R&D Plan





# Updated Baseline Design

- Will reflect choice of new baseline at end of TDP1
  - Layout, integration, gradient etc.
  - Cost-driven
- Level of detail not expected to be beyond RDR
  - Unlikely to have “detailed engineering” resources available
- Better documentation (than for RDR)
  - Structured documents → traceability
  - Use of 3D CAD (“Visualisation”)
  - ILC-EDMS
  - Link to TRIAD and ICET (cost)
- More structured project management providing leadership
  - Of design decisions
  - Of cost estimates

More time than RDR  
(2 years)

Tools & methodology  
being developed now  
(TDP1)



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# Preparing a Proposal 1/2

- Started with MM document (cost reduction)
  - Basically a result of discussions at Dubna June 08
- Formal preparation begins here at this meeting
  - This meeting is fundamentally a scope and planning meeting
- Concluding discussions for proposal: ALCPG (Sept/Oct 09)
  - Conclusion of process begun at this meeting
  - Final consensus (of this group) on scope and structure of Proposal Document



# Preparing a Proposal 2/2

- Formal document end 2009 (Draft)
  - October-December for writing
- Review and acceptance process
  - Initial review by AAP January
  - Release to broader community
  - Feedback / Discussion
  - Final “Acceptance Process” TBD
- This group is responsible to support PMs to propose the new ILC design
  - Ownership during TDP-2



# Goal of this meeting:

- Freeze the technical contents of the Proposal.
  - This is our most important action.
  - Discuss each of the roughly twenty subsections in turn, summarize each one, and resolve remaining issues to the greatest extent practical.
- (also begin preparation for the AAP review)





# Structure of the meeting

- Address the questions and comments listed in the 'Status of the SB2009 Proposal Document' (<http://ilc.kek.jp/SB2009/>).
- Summarize updates made to your section, including graphics.
- Additional comments and questions from Advisory Committees/Panels.
  - Crudely paraphrased or posted in the Indico meeting page.
- Please provide a proposed outline of your AAP presentation.
  - Invitation mailed Nov 13



# New Baseline Proposal Document: 'Status 1201A'

- **Sections Recovering From Crisis (Still needs intense care)**
  - Intro / Overview
  - SRF Gradient
- **Sections in Crisis**
  - Risk analysis
  - Availability



# To Do at DESY Face-to-Face: 'Status 1201A'

- Triage process
  - Critical open issues →
    - Group-wide or semi-group wide discussion and surgery on the spot.
    - With some follow-up work on subsequent days.
  - Semi-trivial touch-ups →
    - Identify issues on the spot. Fixes be applied by the primary authors on the fly.
    - With some follow-up work on subsequent days if needed.
  - ~17 subsections x 30 min = 9 hrs .eqv. 1 Full Day + reserve
  - Time is limited: We need to-the-point and concise-efficient discussion and response. No digressing speech, no tangential commentary, no unproductive ranting, please.
- Prep and org for AAP
  - One quarter day



# 'Triage process' goal

- This is a 'baseline proposal document'
  - Not our RD Plan
    - RD Plan major update mid-2010
  - Not a design document
    - End of TDP2
  - (section 1)
- Intended audience:
  - Project Director (primary)
  - Director's Review Panel (s)
  - Oversight Committees
  - Community at large



# Summary Statements need Confirmation:

From Section 1 – extracted and ‘bullet/ppt-ized’:

- “primary goal to constrain the VALUE estimate...”
- “top-level design elements ... have a large cost leverage”
- “RDR design is:
  - overly conservative,
  - immature from a detailed engineering standpoint,
  - performance driven...”
- “simplification ... and possible cost reduction up to 1 BILCU ... technical risk consistent with RDR...”
- “address in a more realistic way...potential site constraints...”



“a better, more cost optimized design...”

- “which in many respects is more complete and mature than RDR”



# Overview: (Section 2) (1)

- Single tunnel:
  - Simpler underground construction
  - Valid egress strategies
  - New HLRF concepts
  - Achievable availability
  - “support options for specific sites”
    - going beyond the “generic site” approach
- Reduced beam-power parameters
  - Largest anticipated cost saving
  - More demanding beam-beam
  - Design power specification for complex, high radiation component left unchanged

# *SB2009 has more crowded tunnels than RDR which will have an affect on installation and maintenance (1)*

**Linac** for Kly Clus>small effect with PS's and Instrumentation  
for a DSRF> true and needs study

Impact on installation is difficult to determine at this time for all areas because we have not developed a real model for either RDR or SB2009. Needs to be done in TDP2

Impact on maintenance was part of the availability study and impact is small

**DR's** The present DR designs have greatly improved tunnel layouts (independent of circumference) as this was one of the design criteria.  
2009 better than RDR



*SB2009 has more crowded tunnels than RDR which will have an affect on installation and maintenance (2)*

- **CENTRAL REGION** First impression is of a huge change on this question but it is much less than you think! **The support tunnel still exists and Availsym shows little change from the RDR to the SB2009 performance.**
- The E+ system from before the undulator to the 400 MeV point is the same whether you take the present more developed design and put it at 150 GeV or the end of the Linac. **The only difference is that one of three beams is called Linac or BDS.**
- The 5 GeV booster linacs for both e+ and e- are now in tunnels with two rather than one additional line but with the full support tunnel, this is not unreasonable.
- **The most difficult section continues to be the last 300m of each BDS because of the beam dump line and dump.**



# Overview: (2)

- **Choice of accelerating gradient**
  - Main Linac length consistent with an optimal choice of average accelerating gradient
  - –RDR: 31.5 MV/m, to be re-evaluated
  - Unchanged at this time
- **Changes to e+ source**
  - MPS is combined with BDS
  - Low-E e+ substantially shortened
  - Complex system moved to central location
  - Beamlines simplified – chicane is replaced by a simpler ‘dog-leg’



# Thanks to DESY

- For hosting both 2009 AD & I meetings:
  - 28-29.05.09 and 2-3.12.09
- Thanks to Frank and Nick!