



ILC AD&I MEETING

CONVENTIONAL FACILITIES AND SITING GROUP UPDATE

V. Kuchler



Overview

- *General Planning for the ALCPG 09 Meeting*
- *Status of CFS Area System Design Development*
- *Status of CFS Response to SB 2009 Working Assumptions*
- *Status of CFS Milestones Listed in the ILC R&D Plan*



CFS Planning for ALCPG 09

- ***A Full 2D Beamline and Enclosure Layout will be Developed Prior to the Albuquerque Meeting***
- ***Some Work on a 3D Layout will also be Completed by ALCPG 09***
- ***The Effects of Area System Redesign and SB 2009 Working Assumptions will be Incorporated into the CFS Machine Layout***
- ***CFS Progress on the ILC R&D Milestones will also be Reported at ALCG 09***



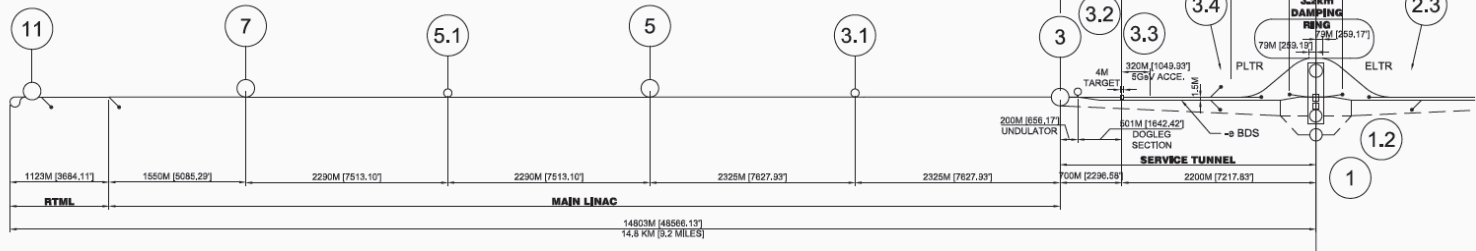
CFS Area System Design Development

- *e- and e+ Sources have New Position, Configurations and Lengths Established, However Details for Injection and Extraction to the Damping Rings Still Need to be Finalized*
- *Most Information for the Damping Ring has been Defined*
- *RTML Length has been Reduced and Overall Layout has been Defined*
- *Most Information for the Main Linac has been Defined with the Exception Some Revised Definition for Shaft Spacing with Respect to Cryogenic Requirements*
- *Beam Delivery System Information is Established, but Work is Needed to Develop Enclosure Configurations When Area Systems Share a Common Tunnel*



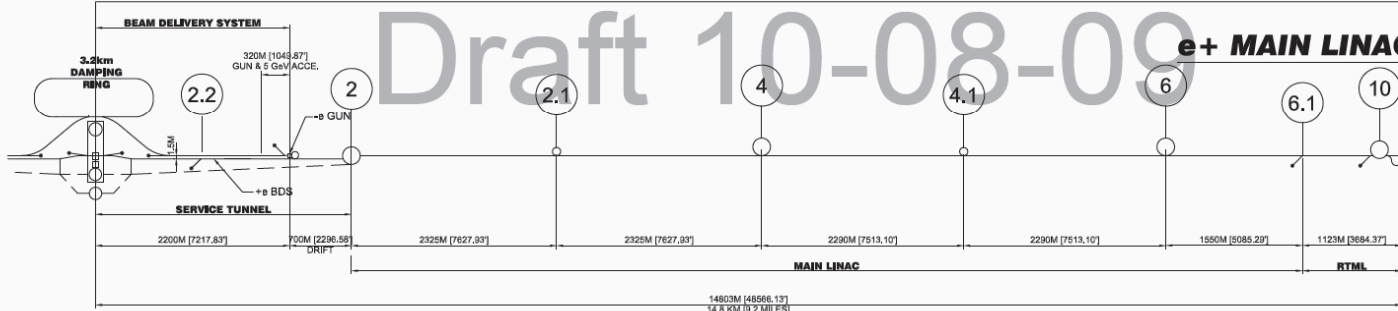
Schematic Machine Layout

e- MAIN LINAC



Draft 10-08-09

e+ MAIN LINAC



SITE / TUNNEL LENGTHS (M)

e- SIDE ML + RTML	e+ SIDE ML + RTML	B. D. S. + SOURCES + SERVICE	DAMPING RING	TOTAL
13233	13233	5800 + 5800 + 1800	3238	43104

TUNNELS

AREA	e- INJECT., KAS BEAM	D.R.	R.T.M.L. BEAM	MAIN LINAC BEAM	B. D. S. BEAM + SERVICE	B. D. S. SURVEY
Ø M	5.2	5.2	5.2	5.2	5.2 + 5.2	1.5 + 2.2

SHAFTS

POINT	1.0	1.1	1.2	2	3	3.3	5.2	4	5	6	7	10	11	12/C	13/A
Ø M	9	16	16	14	14	4	4	14	14	9	9	14	14	9	9

BORINGS

POINT	2.1, 3.1, 4.1, 5.1	2.2, 3.2	1.3, 1.4, 2.4, 3.5
Øm	3	1.50	

SHAFT BASE CAVERNS

POINT	2, 3, 4, 5, 6, 7, 10, 11
(L x W x H) m	49 x 16 x 18 + 3 STORIES

SOURCES CAVERNS

POINT	UNDULATOR	KAS, 3.3	e- INJECTION	2.2, 3.2
(L x W x H) m	21161 m³	6574 m³	110 x 15 x 10 27.5 x 22 x 15	7 x 15 x 7.5

DAMPING RING

POINT	B, D, E, F	12/C, 13/A
(L x W x H) m	16 x 8 x 8	75 x 10 x 10 + 1 STORY

DETECTORS HALL

POINT	1.1, 1.2	1.0
(L x W x H) m	120 x 25 x 39	40 x 15 x 15

MAIN BEAMLINE DUMPS (BDS)

POINT	1.3, 1.4, 2.4, 3.5
(L x W x H) m	30 x 20 x 10



Typical Area System Criteria Spreadsheet

CFS SB 2009 Area System Criteria				
Damping Ring				
CFS Lead	CFS Support	Area/Technical System Point (s) of Contact		
J. Osborne	T. Lackowski	S. Giuducci, N. Collomb		
	General Description	Specific Criteria	Source of Information	Date of Information
What is status of Current Design	Current design is fairly well understood.		Collomb and Ewan Paterson in the CFS AD&I meeting @ SLAC	July 20-21, 2009
How does the Current Design differ from the RDR Layout	Current ring is 3.2 km and racetrack in shape. Location is offset from line of Main Linacs (50-60 m). Damping ring is in the same plane as the BDS.		Collomb and Ewan Paterson in the CFS AD&I meeting @ SLAC	July 20-21, 2009
Is there a working lattice file	A working lattice file is in place		Email from Susanna Giuducci	July 27, 2009
What is the new position of the system with respect to adjacent systems	See above		Collomb and Ewan Paterson in the CFS AD&I meeting @ SLAC	July 20-21, 2009
What are the constraints for the beamline connections to the adjacent area systems	Damping ring should clear the IR hall by a minimum of 10 m		Collomb and Ewan Paterson in the CFS AD&I meeting @ SLAC	July 20-21, 2009
What are differences/similarities to the RDR heat loads and/or cooling requirements	Magnet power losses are 70% of RDR. RF power and radiation power is half, but wiggler radiation is 88% of the total radiation power. RF power requirements would be half for the smaller ring.		Email exchange between maro Ross and Susanna Giuducci	July 15, 2009
What are differences/similarities to the RDR electrical requirements	Electrical requirements are reduced and scale with the heat loads.		Collomb and Ewan Paterson in the CFS AD&I meeting @ SLAC	July 20-21, 2009
What are support requirements i.e. control racks, power supplies, additional service tunnel or	as in the RDR. One alcove will remain in each curved section. Each injection and extraction line contains 12 kicker magnets.		Collomb and Ewan Paterson in the CFS AD&I meeting @ SLAC	July 20-21, 2009
Milestone Description	Status	Expected Completion Date		
Preliminary Working Criteria Established	Most Criteria has been established. Specific Linac length is still needed. Geometry for injection and extraction into Damping Ring is known.	August 11, 2009		August 4, 2009
Preliminary Working Layout Established	2D Drawings are begun and expected completion date established	August 11, 2009		August 4, 2009
Working Layout Incorporated into Overview Machine Layout (2D)	Not yet started	August 11, 2009		August 4, 2009
Internal CFS Review of Layout	Electronic review of layout within the CFS Group	August 18, 2009		August 4, 2009
Review with Area System Points of Contact	Will include direct or webex meetings with the Area System points of contact for the complete review and approval of preliminary layout.	August 25, 2009		August 4, 2009
3D Drawing Developed				
3D Civil Information Forwarded to DESY				
3D CFS Services Information				
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Typical Area System Milestones

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SB 2009 Working Assumptions (WA)

The Project Management proposes the following top-level WA for SB2009 as a focus for the initial discussions (incremental to the RDR baseline):

1. A Main Linac length consistent with an optimal choice of average accelerating gradient (currently 31.5 MV/m, to be re-evaluated)
2. Single-tunnel solution for the Main Linacs and RTML, with two possible variants for the HLRF
 - a. Klystron cluster scheme
 - b. DRFS scheme
3. Undulator-based e⁺ source located at the end of the electron Main Linac (250 GeV)
4. Reduced parameter set (with respect to the RDR) with $n_b = 1312$ and a 2ms RF pulse.
5. ~3.2 km circumference damping rings at 5 GeV, 6 mm bunch length.
6. Single-stage bunch compressor with a compression factor of 20.
7. Integration of the e⁺ and e⁻ sources into a common “central region beam tunnel”, together with the BDS.



SB 2009 CFA WA Status

- ***WA 1 – Dependent on Technical Decision***
- ***WA 2a & 2b***
 - ***Americas Region - Klystron Cluster is Complete, DRFS Still to be Completed. Tunnel Diameter Still needs Optimization***
 - ***European Region - Both Schemes are Being Worked on by Amberg Consulting***
 - ***Asian Region - Both Schemes have been Investigated. Cost estimates Need to be Updated***
- ***WA 3 – Undulator-Based e+ Source has been Incorporated into the New CFS Machine Layout***
- ***WA 4 – Low Power Option is Reflected in the New Area System Criteria and CFS Machine Layout***
- ***WA 5 – 3.2 km Damping Ring has been Incorporated into the New CFS Machine Layout***
- ***WA 6 – Single Stage Bunch Compressor has been Incorporated into the RTML and New CFS Machine Layout***
- ***WA 7 – Coordination of the Central Region Beam Layouts are Being Developed and will be Incorporated into the New CFS Machine Layout. Specific Lattice Information is Still Needed***



CFS R&D Plan Milestone Status

- ***Process Water Value Engineering***
 - ***Completed***
- ***Alternative Tunnel Configuration***
 - ***Preliminary Work was Resumed by Hanson Engineering***
 - ***T. Lundin Attended the Workshop to Review the Dubna Geotechnical Report in June, 2009***
 - ***2-Day Workshop was Held at Fermilab on Aug 3-4, 2009 to Review Progress and Begin to Develop Cost Estimates***
 - ***A Second 2-Day Workshop is Planned to Internally Review the Final Configuration Analysis and Cost Estimates on August 24-25, 2009 at Fermilab***
 - ***Project Manager's Review will be Scheduled Prior to the ALCPG 09 Meeting in Albuquerque in September***
 - ***This Milestone will be Completed by ALCPG 09***



CFS R&D Plan Milestone Status

- **Life Safety and Egress Global Document**
 - *Hughes and Associates will now begin to Review the Alternative Tunnel Configurations to Develop Life Safety and Egress Plans for Each Alternative. The Initial Planning Meeting is Scheduled for Aug 12, 2009 at Fermilab.*
 - *CLIC Document Is Complete*
 - *XFEL Document has been Translated into English*
 - *LHC Document is being Developed*
 - *Asian Document has been Completed*
 - *All Individual Documents will be Compiled into a Single Comprehensive Document with an Executive Summary Which will Describe Commonalities and Distinctions in the Various Reports The Executive Summary will be Added to Complete the Document Prior to the AAP Review in January, 2010*
- **Surface Building Criteria Review**
 - *Not Scheduled for Completion Until July, 2010*