Preparing Schedules for the ILC PIP & TDR

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Fermilab

CFS at IWLC2010

CICG - Geneve – October 20, 2010

short & sweet summary

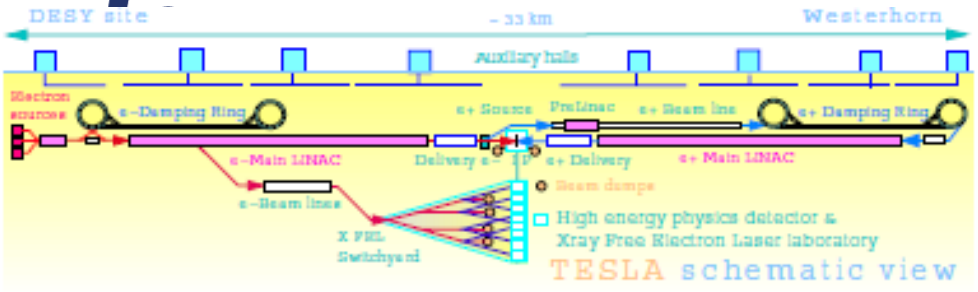
more in back-up slides

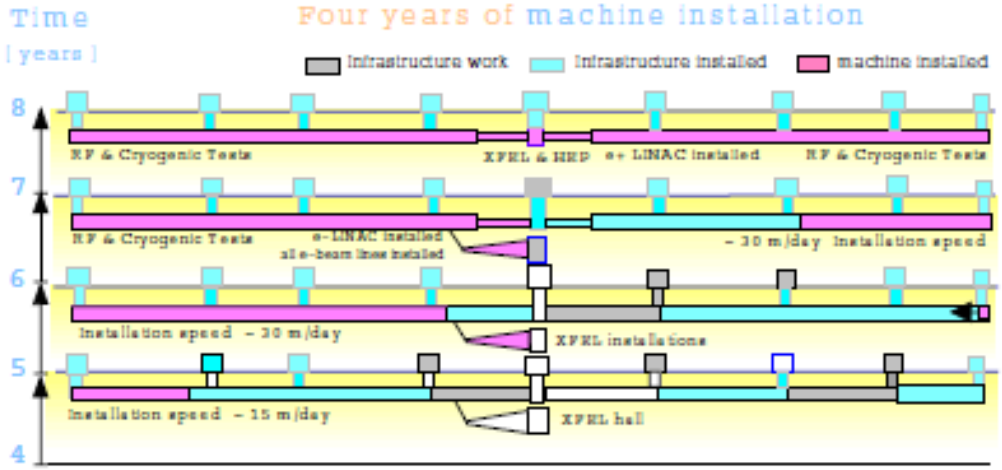
filename: PIP-Schedule-PHG-20oct2010-CFS.ppt

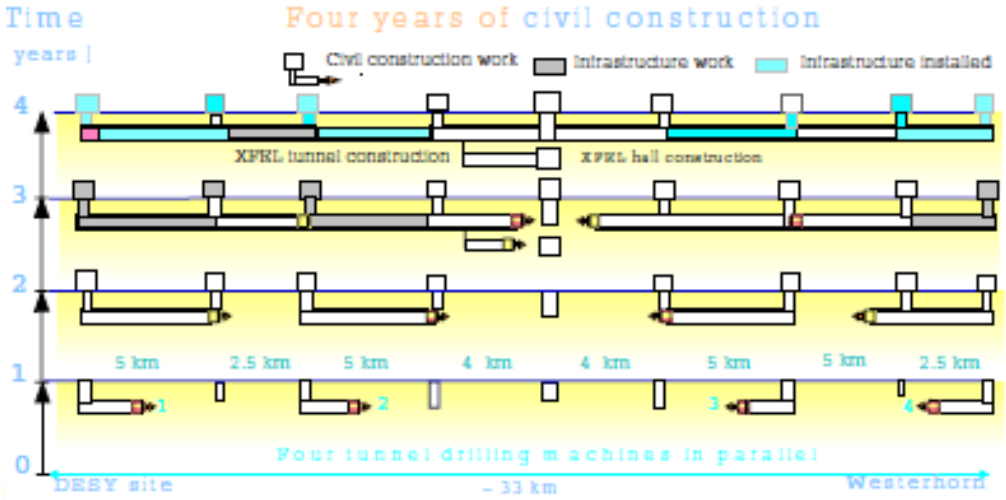
short summary

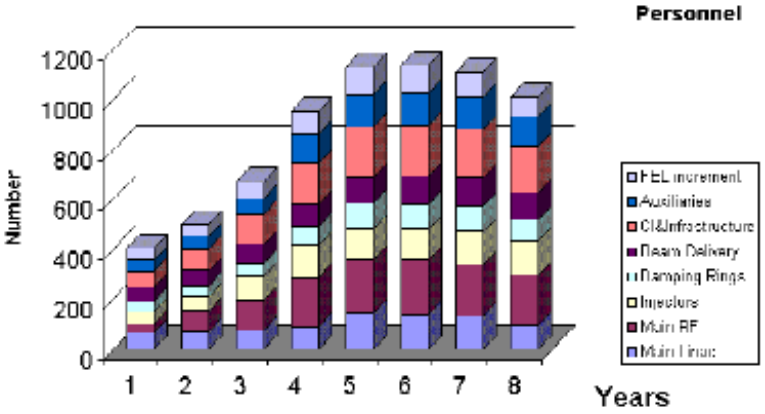
- Schedule for PIP is an executive summary
  (~ 1 page?) for governments and the public
- ***not*** the integrated & linked construction schedule
- yet it is expected to provide a realistic
  (defendable) timescale and resource profile
- How can we consistently prepare PIP-summary
  without producing the full schedule?
- Examples of PIP-level summary schedule:
  TESLA & XFEL TDRs, cold-USLCTOS,
  ILC RDR and its predecessors and children,
  AAA (Japan) civil schedule for Main Linac

TESLA TDR


DESY site
~ 33 km
Westerhorn
Auxiliary halls
Electron sources
e- Damping Ring
e+ Source
PreLinac
e+ Beam line
e+ Damping Ring
e- Main LINAC
Delivery e-
e+ Delivery
e+ Main LINAC
Beam dumps
e- Beam lines
X FEL Switchyard
High energy physics detector &
Xray Free Electron Laser laboratory
TESLA schematic view

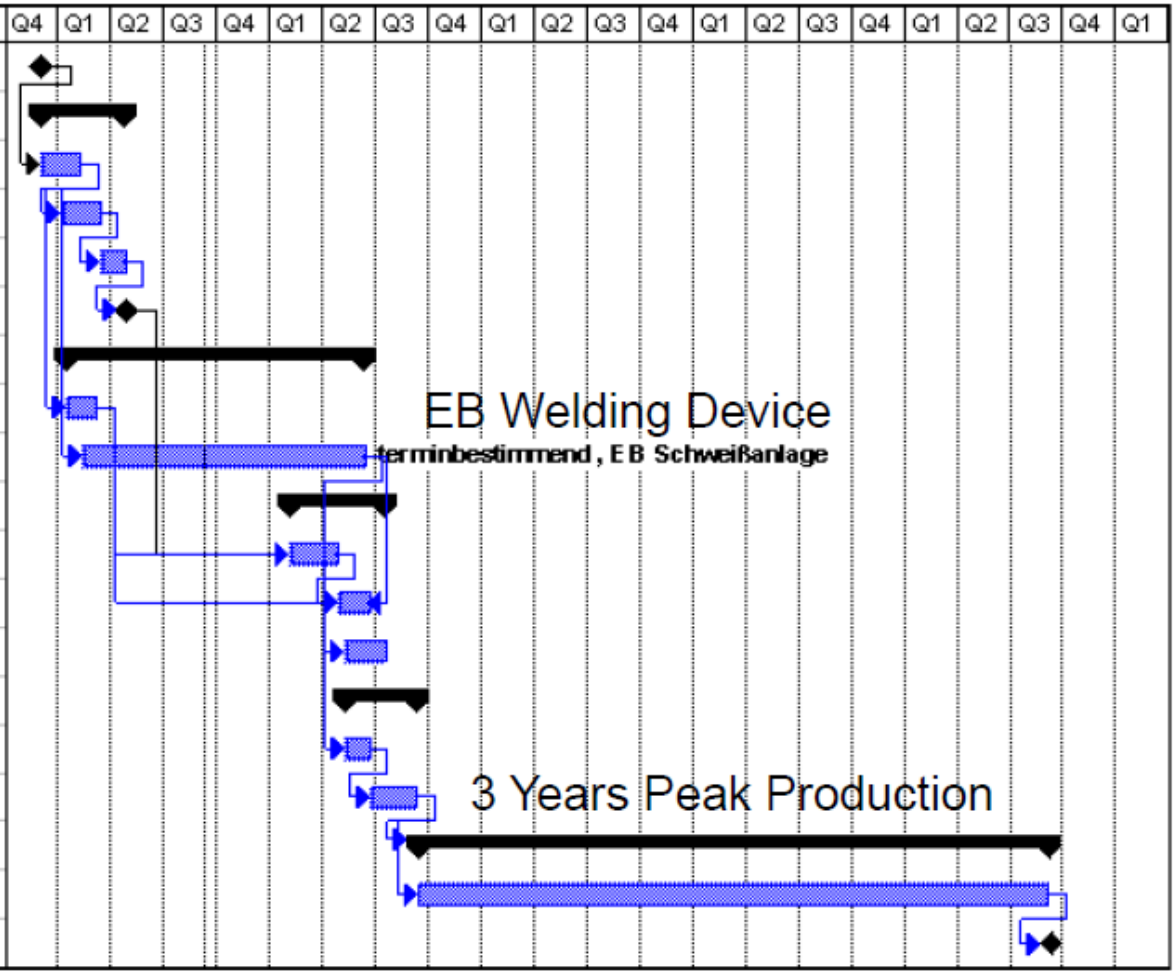

Time
[years]
Four years of machine installation
Infrastructure work
Infrastructure installed
machine installed
8
7
6
5
4
RF & Cryogenic Tests
XFEL & HEP
e+ LINAC installed
RF & Cryogenic Tests
RF & Cryogenic Tests
e- LINAC installed
all e- beam lines installed
~ 30 m/day Installation speed
Installation speed ~ 30 m/day
XFEL installations
Installation speed ~ 15 m/day
XFEL hall


Time
years]
Four years of civil construction
Civil construction work
Infrastructure work
Infrastructure installed
4
3
2
1
0
XFEL tunnel construction
XFEL hall construction
5 km
2.5 km
5 km
4 km
4 km
5 km
5 km
2.5 km
1
2
3
4
Four tunnel drilling machines in parallel
DESY site
~ 33 km
Westerhorn

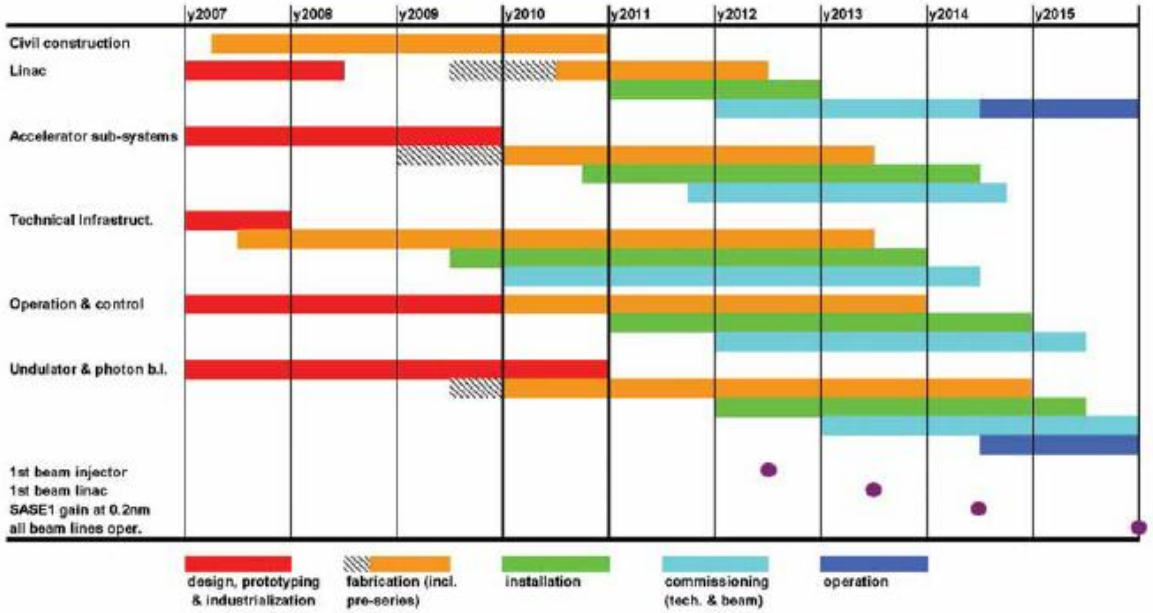

Personnel
Number
1200
1000
800
600
400
200
0
1
2
3
4
5
6
7
8
Years
FEL increment
Auxiliaries
CI&Infrastructure
Beam Delivery
Damping Rings
Injectors
Main RF
Main Linac

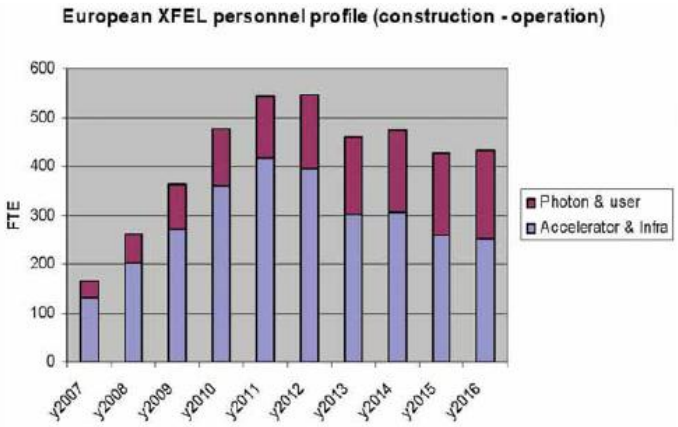
Cavity Production Schedule

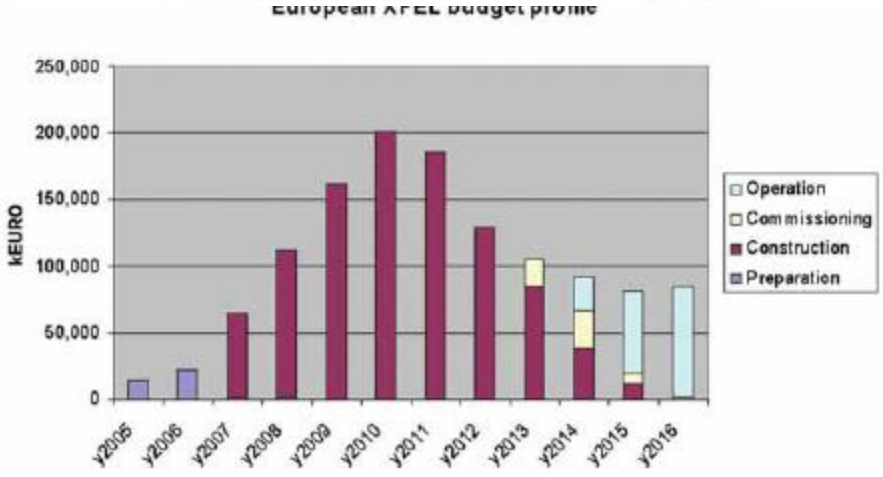
Nr.	Vorgangsname
1	1 Projektstart
2	**2 Planung**
3	2.1 Anlagenauslegung u. Planung
4	2.2 Gebäude u. Energieversogungsplanung
5	2.3 Baugenehmigungen
6	2.4 Freigabe zur Errichtung
7	**3 Beschaffung** Procurement
8	3.1 Betriebsgelände Auswahl
9	3.2 Maschinentechnik
10	**4 Errichtung** Construction
11	4.1 Gebäudetechnik
12	4.2 Infrastruktur
13	4.3 Maschinentechnik
14	**5 Inbetriebnahme** Preproduction
15	5.1 Kalte Inbetriebnahme
16	5.2 Warme Inbetriebnahme
17	**6 Produktion**
18	6.1 Vollastbetrieb
19	6.2 Produktionsende

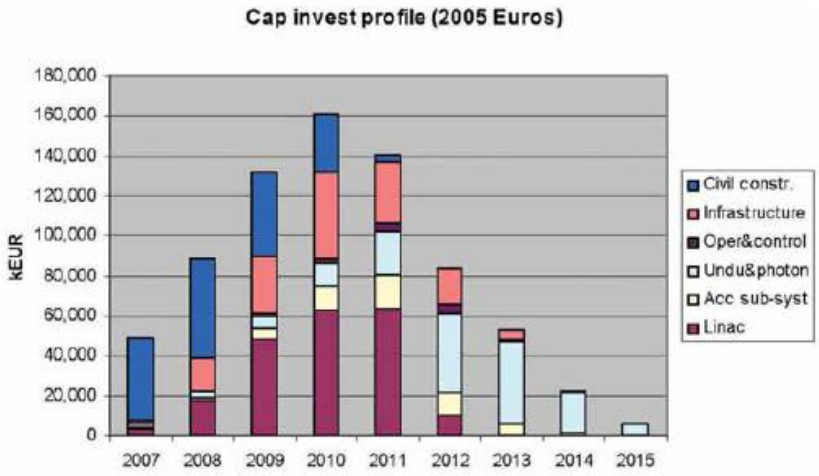


XFEL TDR

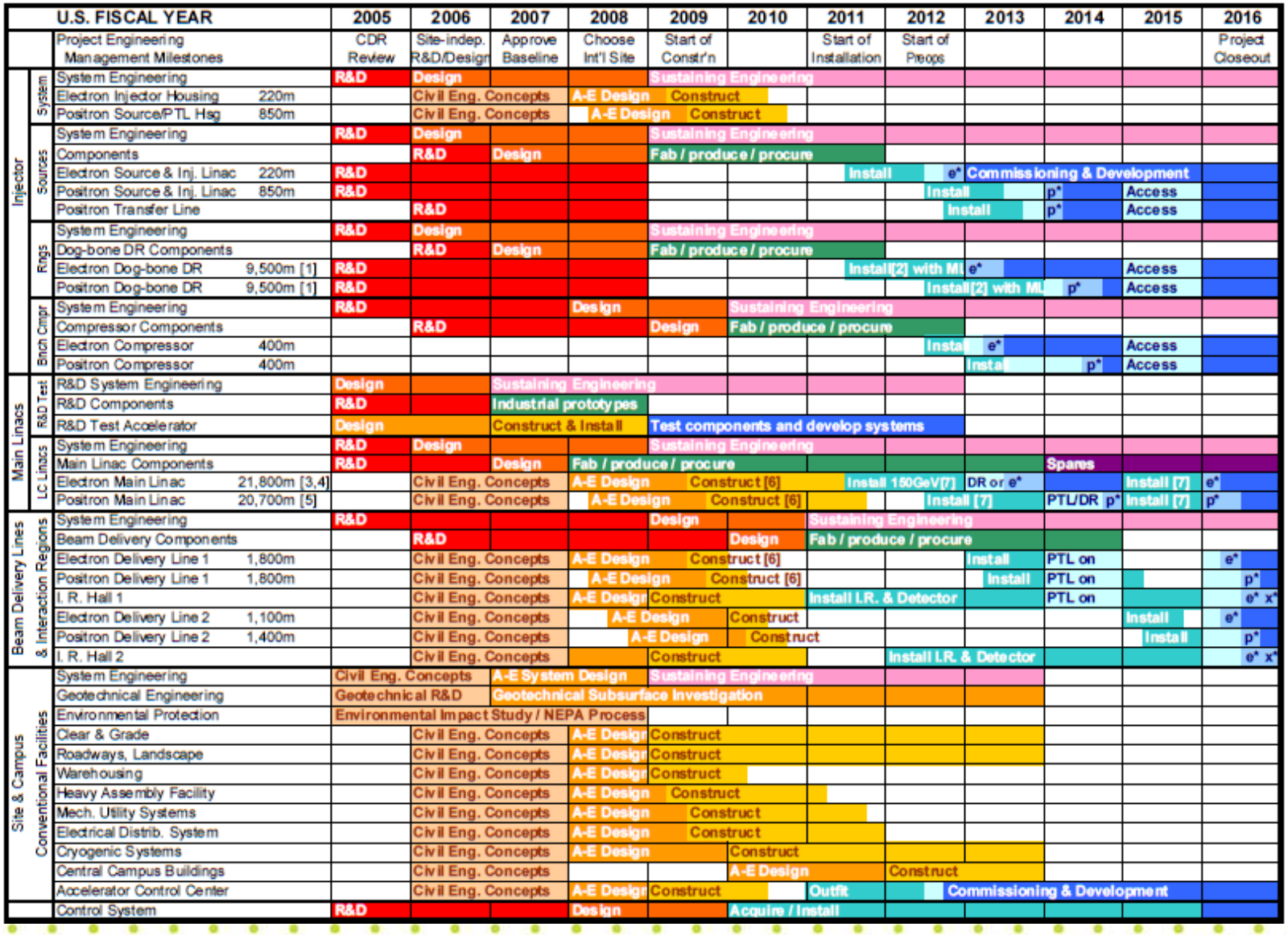

y2007
y2008
y2009
y2010
y2011
y2012
y2013
y2014
y2015
Civil construction
Linac
Accelerator sub-systems
Technical infrastruct.
Operation & control
Undulator & photon b.l.
1st beam injector
1st beam linac
SASE1 gain at 0.2nm
all beam lines oper.
design, prototyping & industrialization
fabrication (incl. pre-series)
installation
commissioning (tech. & beam)
operation


European XFEL personnel profile (construction - operation)
FTE
600
500
400
300
200
100
0
y2007
y2008
y2009
y2010
y2011
y2012
y2013
y2014
y2015
y2016
Photon & user
Accelerator & Infra

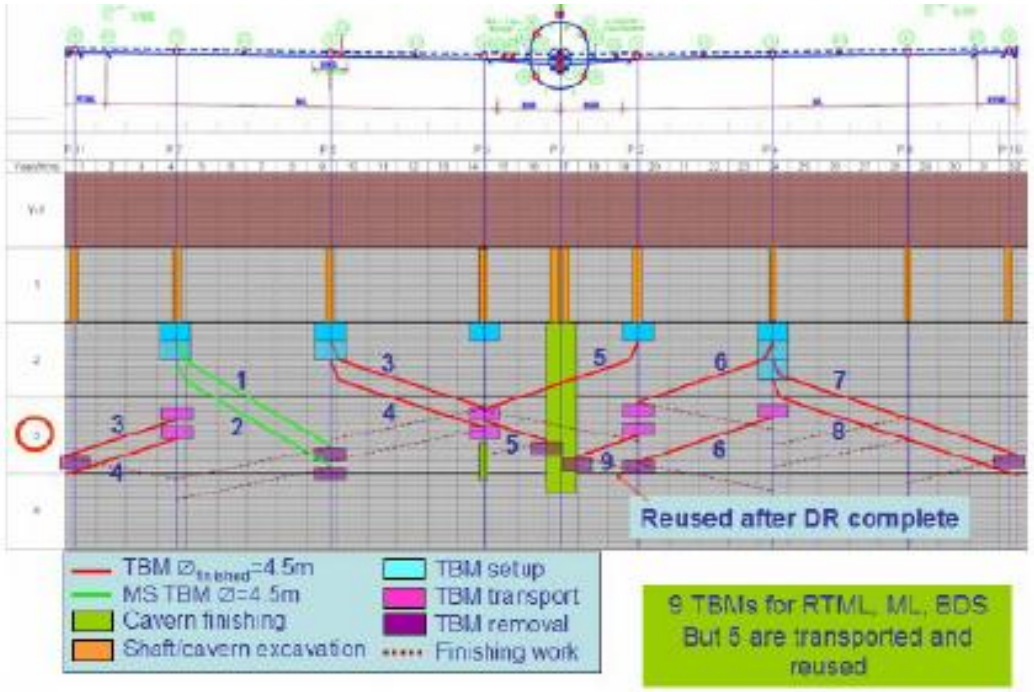

kEURO
250,000
200,000
150,000
100,000
50,000
0
y2005
y2006
y2007
y2008
y2009
y2010
y2011
y2012
y2013
y2014
y2015
y2016
Operation
Commissioning
Construction
Preparation


Cap invest profile (2005 Euros)
kEUR
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
Civil constr.
Infrastructure
Oper&control
Undu&photon
Acc sub-syst
Linac

COLD-USLCTOS – *no personnel or spending profiles*

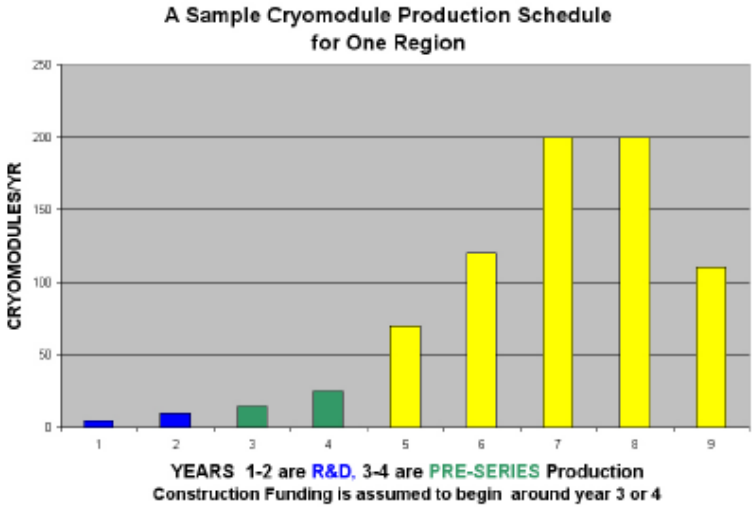


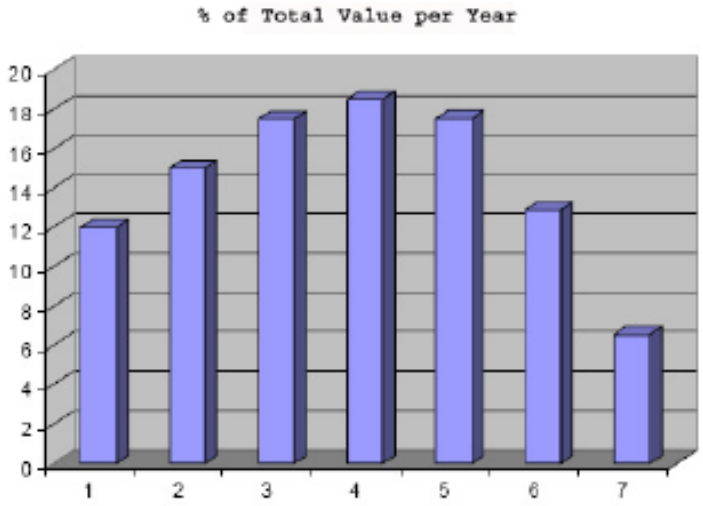
ILC RDR



9 TBMs for RTML, ML, BDS
But 5 are transported and reused

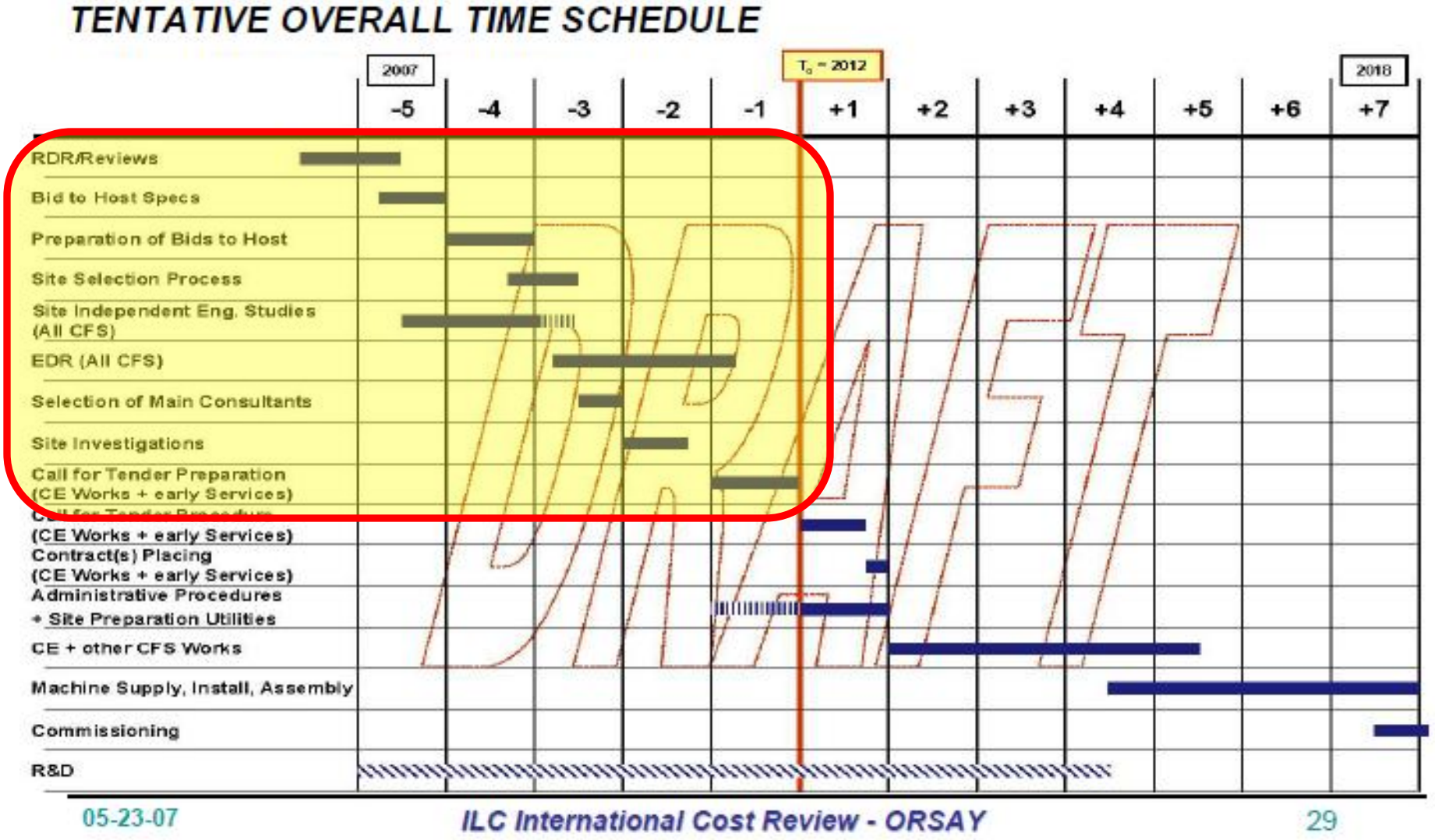
↑
Martin Gastal





did not include
installation schedule
nor personnel profile

Jean-Luc Baldy - CF&S oriented includes pre-construction activities



Mike Harrison – P5 – February 1, 2008

construction "value-%" only from RDR

POSSIBLE SEVEN YEAR CONSTRUCTION SCHEDULE AND COST PROFILE

SYSTEM/YEAR	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT	% of TOTAL
CF&S	11	11	9	4	1	1	0		37% of total
CRYOMODULES	1	3	4	5	5	3	2		23% of total
RF SYSTEMS		0	1	3	4	2	1		11% of total
CRYO SYSTEMS		1	2	2	2	1	0		8% of total
MAGNETS & PS's			1.5	2	2	2	0.5		8% of total
CONTROLS				1	1	1	1		4% of total
INSTALLATION				1	1.5	1.5	1		5% of total
VACUUM				0.5	0.5	0.5	0.5		2% of total
INSTRUMENTATION					0.25	0.5	0.25		1% of total
DUMPS					0.3	0.4	0.3		1% of total
OVERALL COMMISSIONING					OPS FUNDING	OPS Funding	OPS Funding	FULL OPS FUNDING	
Total	12	15	17.5	18.5	17.55	12.9	6.55		100

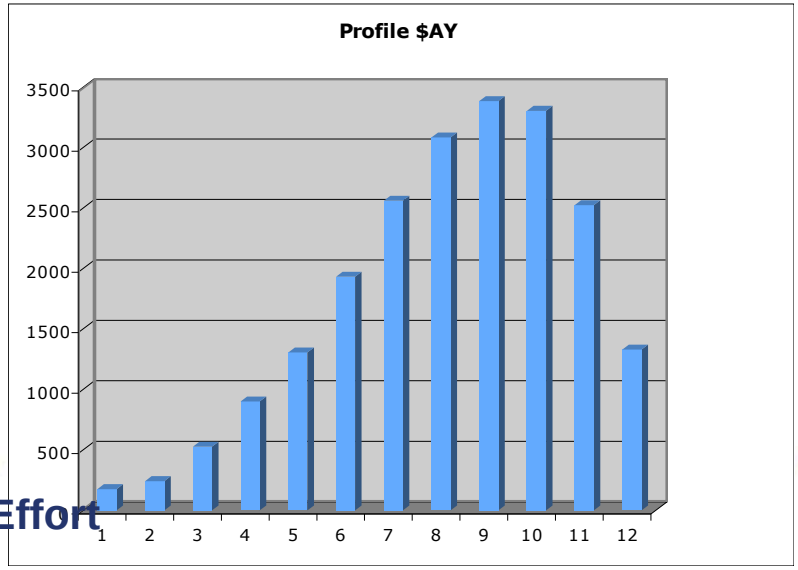
Mike Harrison – P5 – February 1, 2010

(all-inclusive DOE-like) ILC Construction costs (TEC)

Year	Funding Type	CD's	Funding $FY07	Funding at year	Inflator	Host 50%	non-Host 20%
FY11	Program	CD0	150	172	1.148	86	34
FY12	Program		250	297	1.188	148	59
FY13	PED	CD1	420	516	1.229	258	103
FY14	PED	CD2	795	1011	1.272	506	202
FY15	PED		1074	1414	1.317	707	283
FY16	Project	CD3	1492	2033	1.363	1017	407
FY17	Project		1900	2680	1.411	1340	536
FY18	Project		2174	3174	1.460	1587	635
FY19	Project		2300	3475	1.511	1738	695
FY20	Project		2200	3441	1.564	1720	688
FY21	Project		1700	2752	1.619	1376	550
FY22	Project		845	1416	1.675	708	283
FY23	Ops			0	1.734	0	0
	Totals ($M)		14900	21913		10957	4383
				Inflation	3.5%		

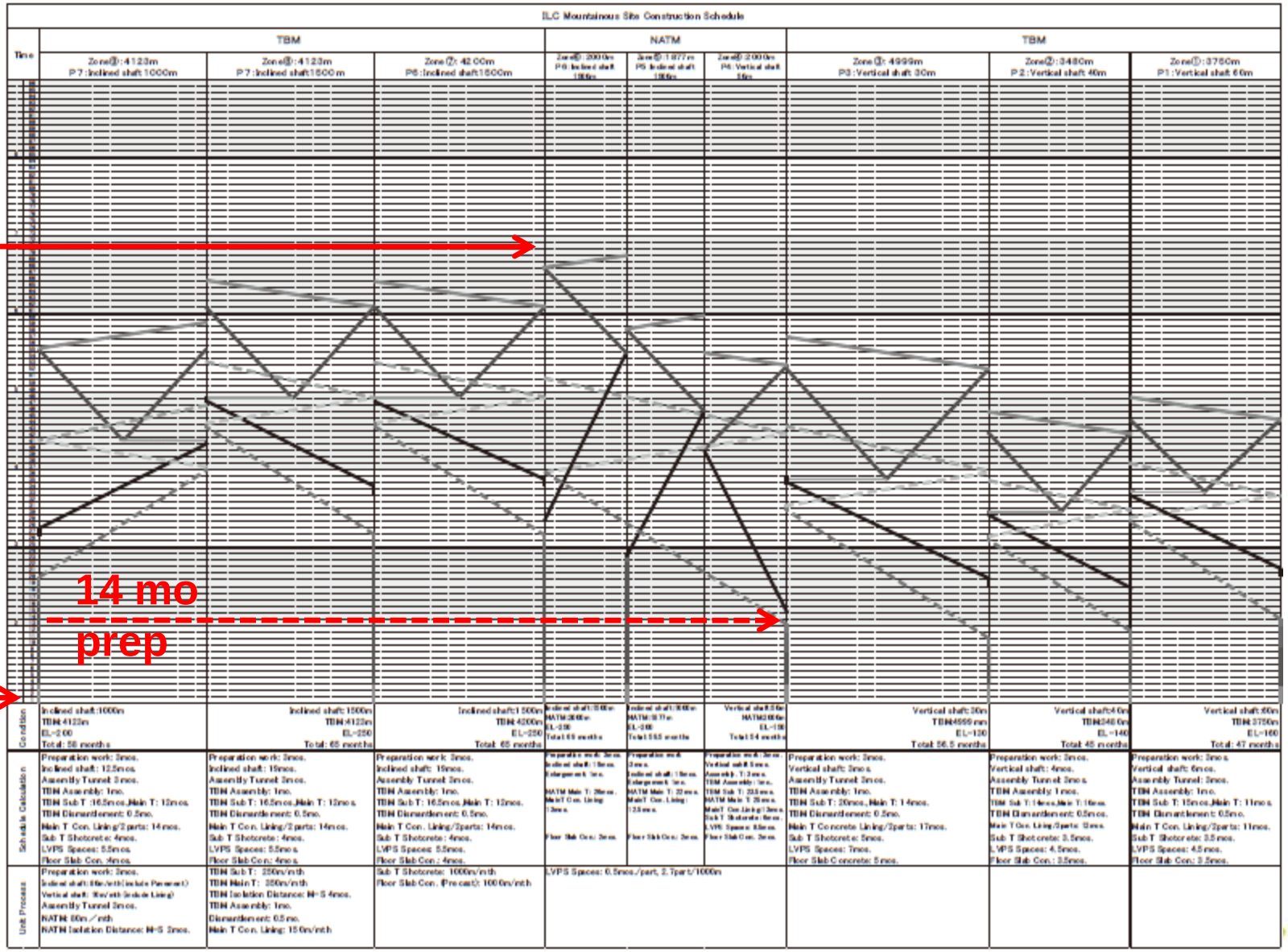
With the long lever arm we are sensitive to assumptions on inflation. A change of 0.5% = $1.2B AY

Totals do not include programmatic funding



AAA-Japan – for Main Linac

http://ilcagenda.linearcollider.org/getFile.py/access?contribId=10&resId=0&materialId=paper&confId=4613



what do we need when?

by end of TD Phase: a block format, top-down summary, showing vital linkages, cost phasing, and constraints. Can this project be realistically completed in a finite time? EXCEL or MS Project Is this consistent with what PMs are considering?

by time to go to governments for project approval: Primavera: integrated resource-loaded, linked to cost estimates & basis of estimates with most details

by beginning of construction project: Primavera integrated with ILC accounting system via COBRA for Earned Value Management System

PIP-schedule(s) should:

- Accommodate multiple governance models
- Accommodate multiple sites (flat vs. mountainous)
- Include pre-construction activities
- Civil Engineering must include ML caverns, tunnel widenings, and Damping Rings
- Illustrate, if not solve, interferences & bottle-necks
- Accommodate early commissioning of e- Source, auxiliary e+ Source, & DRs during construction of ML, RTML & installation of BDS
- Accommodate commissioning of BDS while installing Experiments

What does CPDG RFC have to say?

20100209C

Request for Comment: White Paper on the Comprehensive Project Design Guidance (CPDG) for the International Linear Collier

GD-4, 5, 6: Accelerator Construction Process – Technical. Assignment: GDE. This WP deals with a group of timeline analyses for the construction steps to follow for the ILC accelerator and related facilities. The proposed contents of the studies include the following:

GD4: Design preparation stage – Finalization of the accelerator design, and advanced manufacturing studies.
GD5: Construction stage – Steps to follow in component fabrication, component installation and commissioning.
GD6: Schedule for conventional facilities – Steps to follow in tunnel excavation and construction of surface facilities.

- Sounds like ILCSC wants GDE to provide …by end of TDR. Sounds like schedule needs to be much more well developed than top-down PIP schedule outline.

Questions to Answer:

- Should R&D be included? US DOE would say so…
- When are resources (funding & personnel) required?
- What cryomodule rate is needed for installation?
  JIT delivery = no "outdoor" warehousing
- How is shorter ***schedule*** optimized ***vs.*** higher ***cost***?
- Who provides the PIP-schedule? ***do-it-ourselves!***
  top-down from senior management, not engineered!
  Small team: Cost Eng(s), CFS, scheduling (Katy?), leaders of long lead time items (cavities, CM, etc), with guidance from Project Managers
- Needed scope & maturity of schedule for GD-4,5,6?
- ***Discussion…***

discussion notes:

backup slides and examples

the more complete story

outline

- Path toward two schedules – PIP and TDR
- Examples of PIP & TDR-level schedules
- What do we need when? A schedule for schedules!
- Multiple Sites? => Final Site - Governance Models
- Commissioning Constraints (or desires)
- Schedule (along with scope & cost) as project driver
- Schedule for pre-construction and commissioning
- Shortcomings of Conventional Construction Scheds
- Who's going to participate in forming schedules?
- What does CPDG say about any of this?

and now for a real project schedule: NOvA = $ 278 M => ANU page 1 of 33

Nova Project
WBS 2.0 - ANU Construction
Gantt Chart

Director's CD-2/3a Review
April 17, 2008

WBS	Activity Desc.	Duration	Start	Finish	Predecessors	Resource Assignments (Labor %, M&S FY07$)	BOE DOCDB No.	MSP Unique ID
2	Construction Project	1887d	01Dec06	29Oct14			0	0
2.0	ANU Construction	1828d	01Dec06	13Mar14			0	2247
2.0.1	Recycler Upgrades	1081d	28Dec07	17Apr12			0	2248
2.0.1.1	Recycler Ring Modifications	801d	02Feb09	06Apr12			0	2249
2.0.1.1.1	Beam Lines (Transfer, Abort & RR 30 Straight)	801d	02Feb09	06Apr12			0	2250
2.0.1.1.1.1	Common Tooling for Permanent Magnet Assembly	70d	06Mar09	11Jun09			0	3133
2.0.1.1.1.1.1	Prep Req & Award PO for Tooling Parts	40d	06Mar09	29Apr09	2.10.8.6[FS]; 1.0.1.1.2.2.6.3[FS]		1809	3069
2.0.1.1.1.1.2	Receive & Inspect Tooling Parts	10d	30Apr09	13May09	2.0.1.1.1.1[FS]	M,FNAL,AD,MAND$,$18000;L,FNAL,TD,TECH,MT_W,20%	1809	3070
2.0.1.1.1.1.3	Assemble Tooling	20d	14May09	11Jun09	2.0.1.1.1.2[FS]	L,FNAL,TD,TECH,MT_W,40%;L,FNAL,TD,ENG,ME,10%	1809	3071
2.0.1.1.1.2	RR Magnet & Instrumentation Stands	341d	02Feb09	08Jun10			0	2261
2.0.1.1.1.2.1	Final Design IL Magnet Stands	40d	18Oct09	14Dec09	1.0.1.1.2.1.2.1[FS]	L,FNAL,AD,ENG,ME,60%;L,FNAL,AD,ENG,DRFT,76%	1725	3226
2.0.1.1.1.2.2	Final Design EL Magnet Stands	40d	03Sep09	29Oct09	1.0.1.1.2.1.2.2[FS]	L,FNAL,AD,ENG,ME,60%;L,FNAL,AD,ENG,DRFT,76%	1725	3227
2.0.1.1.1.2.3	Final Design RR-30 SS Magnet Stands	25d	23Jul09	28Aug09	2.10.8.7[FS]; 2.0.1.1.1.14.13[SS+10d]	L,FNAL,AD,ENG,DES,76%;L,FNAL,AD,ENG,ME_SR,8%;L,FNAL,AD,ENG,ME,64%	1725	1678
2.0.1.1.1.2.4	Final Design BA Kicker Stands	19d	02Feb09	26Feb09	2.10.8.7[FS]	L,FNAL,AD,ENG,DES,76%;L,FNAL,AD,ENG,ME_SR,8%;L,FNAL,AD,ENG,ME,64%	1725	1701
2.0.1.1.1.2.5	Final Design Instrumentation Stands	25d	23Jul09	26Aug09	2.10.8.7[FS]; 2.0.1.1.1.14.2[SS+10d]; 2.0.1.1.1.14.7[SS+10d]; 2.0.1.1.1.14.13[SS+10d]	L,FNAL,AD,ENG,DES,76%;L,FNAL,AD,ENG,ME_SR,8%;L,FNAL,AD,ENG,ME,64%	1725	3083
2.0.1.1.1.2.6	Prep Req & Award PO for IL Magnet Stands	40d	16Dec09	16Feb10	2.0.1.1.1.2.1[FS]; 2.10.8.6[FS]	L,FNAL,AD,ENG,ME,6%	1788	2253
2.0.1.1.1.2.7	Vendor Fab & Receive IL Magnet Stands	80d	16Feb10	08Jun10	2.0.1.1.1.2.6[FS]	L,FNAL,AD,ENG,ME,1%;L,FNAL,AD,TECH,MT_W,2%;M,FNAL,AD,MAND$,$50000	1788	2905
2.0.1.1.1.2.8	Prep Req & Award PO for EL Magnet Stands	40d	30Oct09	30Dec09	2.0.1.1.1.2.2[FS]; 2.10.8.6[FS]	L,FNAL,AD,ENG,ME,6%	1788	2254
2.0.1.1.1.2.9	Vendor Fab & Receive EL Magnet Stands	80d	04Jan10	26Apr10	2.0.1.1.1.2.8[FS]	L,FNAL,AD,TECH,MT_W,2%;M,FNAL,AD,MAND$,$43000;L,FNAL,AD,ENG,ME,1%	1788	2906
2.0.1.1.1.2.10	Prep Req & Award PO for RR-30 SS Magnet Stands	40d	27Aug09	22Oct09	2.0.1.1.1.2.3[FS]; 2.10.8.6[FS]	L,FNAL,AD,ENG,ME,6%	1788	2255
2.0.1.1.1.2.11	Vendor Fab & Receive RR-30 Magnet Stands	70d	23Oct09	08Feb10	2.0.1.1.1.2.10[FS]	L,FNAL,AD,TECH,MT_W,2%;L,FNAL,AD,ENG,ME,1%;M,FNAL,AD,MAND$,$30000	1788	2907
2.0.1.1.1.2.12	Prep Req & Award PO for BA Kicker Stands	40d	27Feb09	23Apr09	2.0.1.1.1.2.4[FS]; 2.10.8.6[FS]	L,FNAL,AD,ENG,ME,6%	1788	2252
2.0.1.1.1.2.13	Vendor Fab & Receive BA Kicker Magnet Stands	60d	24Apr09	20Jul09	2.0.1.1.1.2.12[FS]	M,FNAL,AD,MAND$,$1000;L,FNAL,AD,ENG,ME,1%;L,FNAL,AD,TECH,MT_W,2%	1788	2908
2.0.1.1.1.2.14	Prep Req & Award PO for RR Instrumentation Stands	40d	27Aug09	22Oct09	2.0.1.1.1.2.6[FS]; 2.10.8.6[FS]	L,FNAL,AD,ENG,ME,6%	1528	3088

FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14

01Jan08

Project: NOVA_PROJECT
View: NOVA_BARVW_Simple_99
Filter: Nova_ANU_Construction
Sort:
Date: 15Apr08 01:47PM

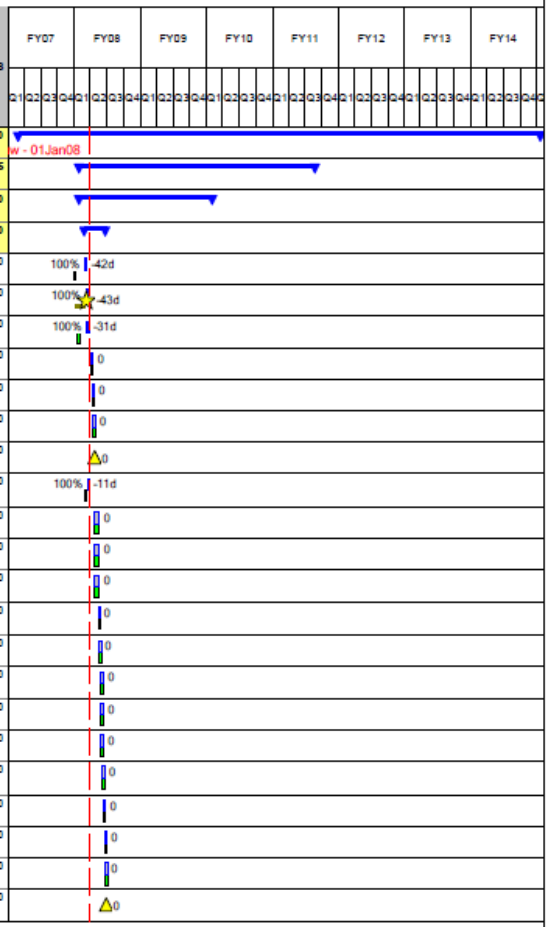
Baseline: Nova_PMB
Page 1 of 33

NOvA Detector – page 1 of 133
OpenPlan – resource loaded, linked to COBRA

Nova Project
WBS 2.1 - 2.10 Detector Construction
Gantt Chart

Director's CD-2/3a Review
April 17, 2008

WBS	Activity Desc.	Duration	Start	Finish	Predecessors	Resource Assignments (Labor hrs, M&S FY07$)	BOE DOCDB No.
2	Construction Project	1887d	01Dec06	29Oct14			0
2.1	Site and Building	886d	01Nov07	28May11			2106
2.1.1	Site Preparation Package	608d	01Nov07	06Nov09			0
2.1.1.1	Title 2 (Design) Phase	78d	01Dec07	27Mar08			0
2.1.1.1	Prepare request for proposal for A/E	5d	01Dec07	04Dec07	1.9.6.10[FS]		0
2.1.1.2	Issue RFP to A/E for Title 2 for Site Prep Package	0	05Dec07	05Dec07	2.1.1.1[FS]; 1.9.6.16[FS]		0
2.1.1.3	Review received proposal	10d	10Dec07	17Dec07	2.1.1.2[FS+10d]		0
2.1.1.4	Prepare requisition	5d	02Jan08	08Jan08	2.1.1.3[FS]		0
2.1.1.5	Circulate for signature	5d	09Jan08	15Jan08	2.1.1.4[FS]		0
2.1.1.6	Prepare purchase order	5d	16Jan08	23Jan08	2.1.1.5[FS]		0
2.1.1.7	PO Released for Title 2 for Site Prep Package	0	24Jan08	24Jan08	2.1.1.6[FS]		0
2.1.1.8	Hold kickoff meeting	1d	18Dec07	18Dec07	1.1.4.6.9[FS]; 1.1.4.3.8[FS]; 2.1.1.7[FS+6d]	M.UMNTC.PD.MANDSXMPT,11884.00,	0
2.1.1.9	Prepare drawings	15d	24Jan08	13Feb08	2.1.1.8[FS]	M.UMNTC.PD.MANDSXMPT,47937.00,	0
2.1.1.10	Prepare specifications	15d	24Jan08	13Feb08	2.1.1.8[FS]	M.UMNTC.PD.MANDSXMPT,6892.00,	0
2.1.1.11	Prepare cost estimate/schedule	15d	24Jan08	13Feb08	2.1.1.8[FS]	M.UMNTC.PD.MANDSXMPT,6892.00,	0
2.1.1.12	Assemble, print, and distribute documents	2d	14Feb08	16Feb08	2.1.1.11[FS]; 2.1.1.1.10[FS]; 2.1.1.9[FS]	M.UMNTC.PD.MANDSXMPT,1188.00,	0
2.1.1.13	Comment and compliance review	5d	18Feb08	22Feb08	2.1.1.12[FS]		0
2.1.1.14	Revise drawings	10d	26Feb08	07Mar08	2.1.1.13[FS]	M.UMNTC.PD.MANDSXMPT,29961.00,	0
2.1.1.15	Revise specifications	10d	26Feb08	07Mar08	2.1.1.13[FS]	M.UMNTC.PD.MANDSXMPT,6892.00,	0
2.1.1.16	Revise cost estimate/schedule	10d	26Feb08	07Mar08	2.1.1.13[FS]	M.UMNTC.PD.MANDSXMPT,6892.00,	0
2.1.1.17	Assemble, print, and distribute documents	2d	10Mar08	11Mar08	2.1.1.16[FS]; 2.1.1.1.14[FS]; 2.1.1.16[FS]	M.UMNTC.PD.MANDSXMPT,1188.00,	0
2.1.1.18	Perform quality assurance review	5d	12Mar08	18Mar08	2.1.1.17[FS]		0
2.1.1.19	Finalize documents	5d	19Mar08	26Mar08	2.1.1.18[FS]	M.UMNTC.PD.MANDSXMPT,16680.00,	0
2.1.1.20	Assemble, print, and distribute documents	2d	26Mar08	27Mar08	2.1.1.19[FS]	M.UMNTC.PD.MANDSXMPT,1188.00,	0
2.1.1.21	Site Prep Package Title 2 completed	0	27Mar08	27Mar08	2.1.1.20[FS]		0



Project: NOVA_PROJECT
View: NOVA_BARVW_Simple_2
Filter: NOVA_DETECTOR_CONSTRUCTION
Sort:
Date: 15Apr08 12:59PM

Baseline: Nova_PMB
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Path toward two schedules

- **Schedule for Project Implementation Plan (PIP)**
  - my understanding of what Mike Harrison desires:
  - handy summary for governments & public
  - top down by management & scientists
  - just sketches, guesses… not engineered
  - EXCEL-level, not even MS Project – see examples
  - but he wants (firm) timescale and funding profile
- **Schedule for Technical Design Report (TDR)**
  - engineered, professionally scheduled, linked
  - fully integrated & resource loaded => funding profile
  - at least MS Project, if not Primavera, -based
- **Same preparation timescales? Consistency?**

Just for reference: DUSEL for NSF

- Spencer Curtis dropped by on Tuesday, Oct 12 and said TRIAD was producing a Primavera-based, resource-loaded schedule of about 4,000 elements for Kem Robinson (LBNL) in preparation for their Preliminary Design Report and Review. This PDR will set the baseline for the DUSEL project in South Dakota.

what do we need when?

by end of TD Phase: a block format, top-down summary, showing vital linkages, cost phasing, and constraints. Can this project be realistically completed in a finite time? EXCEL or MS Project Is this consistent with what PMs are considering?

by time to go to governments for project approval: Primavera: integrated resource-loaded, linked to cost estimates & basis of estimates with most details

by beginning of construction project: Primavera integrated with ILC accounting system via COBRA for Earned Value Management System

schedule must accommodate multiple governance models

- CERN-like: pooled funding & central management
- In-kind: still need time links and interfaces, central team still must manage & optimize
- any degree of hybrid between these two extremes

must accommodate multiple sites

- At PIP level through end of Tech Design Phase
- With regard to Conventional Facilities part, maybe a single schedule could accommodate both “flat-land” sites, but I would expect schedule for mountainous sites to be different.
- Once ILC site is selected, the CFS design, estimate, and schedule and interfaces with everything else, will have to be done for that particular site.

shortcomings of CFS schedules

- Both CERN and AAA schedules concentrate on Main Linac, BDS, and Experimental Hall, not including Damping Rings (Drill&Blast/NATM) or tunnel widenings, caverns, etc, only TBMs
- AAA (and Tracey Lundin) warn that interface betw ML & Exp. Hall will need much coordination e.g. (no) ML rock removal through Exp. Hall?
- Are there enuf shafts for optimized construction?
- We will want to start beam commissioning the e- Source, auxiliary e+ Source, & DR as soon as possible, even while simultaneously constructing ML, RTML, and installing BDS.

schedule vs. cost

- Which is more important? How to optimize?
- Investing in more production lines for faster production of cavities will increase the average cost per cavity.
- How many TBM operations could operate simultaneously without interference?
- What is the cost effectiveness optimization?

schedule should include pre-construction & commissioning

- Do as much as possible ***before*** start of project: steps leading up to project approval & funding, off-project design, industrialization, vendor qualification, pre-series, site selection, selection of Architectural Engineering - Construction Management (AE/CM) firm, customizing design for specific site, remaining on-project design (problematic for ITER!!!), call for tenders, etc.
- Commissioning of early stages e-, e+, & DR while continuing construction of RTML & ML and installing BDS & Experiments.

What about R&D?

- Should R&D be included in these schedules?
  DOE considers R&D part of construction project

what do we need to know?
what can PIP schedule tell us?

- When are resources (funding & personnel) required?
- How fast/early will cryomodules be needed to match conventional construction & installation?
  Only ***51*** CMs needed for e- and aux. e+ Sources
  Gee, that's ~ ½ of XFEL for 2 x 5 GeV
  Can these be provided through pre-series?
- JIT (just-in-time) delivery - no outdoor warehousing!

do we need professional help?

- Vic Kuchler says understanding “constructability” and optimization of underground construction will require professional assistance from experts
- GDE resources may be available for such help with both preliminary design and scheduling
- Mike Harrison doesn’t think this effort is needed for the PIP schedule, but may be for the TDR schedule
- That leaves us to ***do-it-ourselves*** => forming an integrated schedule will require attention and contributions from all area and technical groups

CPDG RFC seems to indicate that

such a detailed schedule would be beyond TDP
and be developed by the ***pre-ILC*** organization

discussion

- Your comments and suggestions, especially about scope, timescales, and personnel, are very welcomed!