

EDR HLRF Work Packages Draft Summary

GDE Meeting, Beijing, February 5 2007
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for
HLRF Collaboration

Work Package Goals

- Work packages to be defined for two phases:
 - *R&D for FY08-09 (plans ongoing)*
 - *Engineering packages for industrialization of prototypes, early production runs (by EDR FY09)*
- Following lists topics for work packages for HLRF BCD, ACD designs
 - *Modulators, Klystrons, HLRF*
- Example: Marx Modulator

BCD Modulator

- **BCD Modulator**
 1. *Modularization Redesign: Racks assemblies, main cap bank, switches, charger, bouncer cap bank & switches*
 2. *Procurement Package development with industry*
 3. *Bid packages for industry prototypes*
- **BCD Modulator Industrialization**
 1. *Factory & Test Modeling*
 2. *Factory Cost modeling*
 3. *Industrialization Plan, cost verification, ramp-up*
 4. *Maintenance Model, development of fixtures, personnel cost*

Marx Modulator

- **Marx Modulator Unit 1**
 1. *Complete Vernier, Charger & tests*
 2. *Pulse flattening alternatives, algorithms, testing*
 3. *Packaging, implementation in ESB*
- **Marx Modulator DFM**
 1. *Packaging redesign*
 2. *Board improvements*
 3. *Diagnostic controls redesign, implementation waveform sampling probes, testing*
 4. *Fabrication, test Unit 2*
 5. *Installation & testing Unit 2*
 6. *Fabrication, test Units 3-4*
 7. *Installation & testing Units 3-4*

Marx Modulator-2

- Marx Modulator Industrialization
 1. *Factory, cost models*
 2. *Factory work package development*
 3. *Factory fabrication Units 3-4*

Klystrons

- **BCD - MBK Klystron**
 1. *Commercial prototypes procurement, test plan*
 2. *Performance verification plans*
 3. *Cost analysis test systems*
 4. *Industry cost verification plans*
- **ACD - SBK Klystron**
 1. *Development plan, costs Unit 1*
 2. *Test plan, costs Unit 1*
 3. *DFM Unit 2 development, test plan, cost plan*
 4. *Factory Model, test, cost plan*
 5. *Maintenance model, cost analysis*
 6. *Industrialization plan, ramp-up, cost verification*

RF Distribution

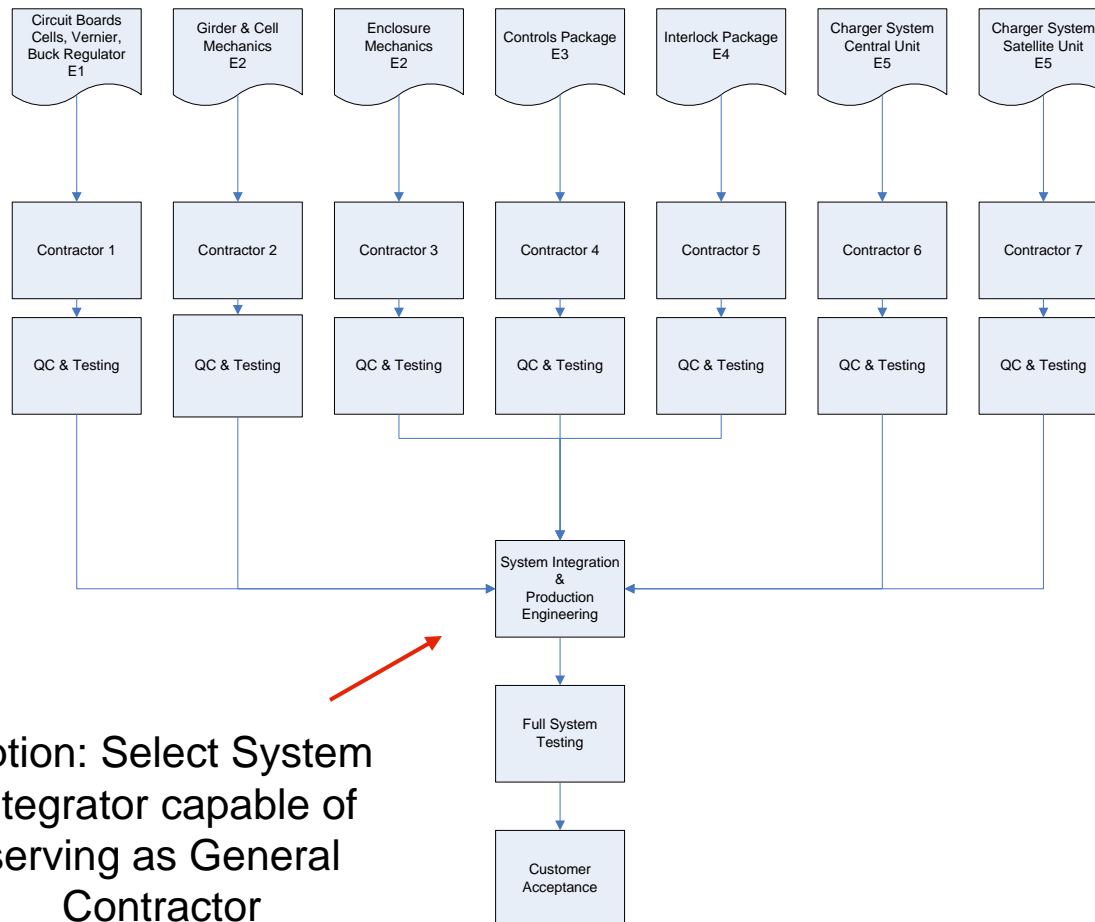
- **BCD - RF Distribution**
 1. *Track TTF, XFEL developments, industrialization, technical results*
- **ACD - RF Distribution**
 1. *Development plan, costs Prototype 1*
 2. *Prove at basic level with 1-2 hybrids & cavity couplers w/ loads*
 3. *Develop plan, costs for integrated structure*
 4. *Develop factory model, test plan with industry*
 5. *Develop staging and installation preparation model, costs*

Task Table

SYSTEM	R&D WP	EDR WP
•BCD Modulator R&D	7	
•BCD Modulator Industrialization		4
•Marx Modulator Unit 1	3	
•Marx Modulator DFM	5	
•Marx Modulator Industrialization		4
•BCD - MBK Klystron		4
•ACD - SBK Klystron	2	5
•BCD - RF Distribution	1	
•ACD - RF Distribution	3	3
<i>Total</i>	21	20

Work Package Flow

Example: Marx Modulator



- ← •Engineers Generate Bid Packages
- ← •Vendor Production
- ← •Vendor-Based QC & Testing
- ← Vendor System Integration & Production Engrg.
- ← •Vendor Based Full System Test
- ← •Customer Acceptance

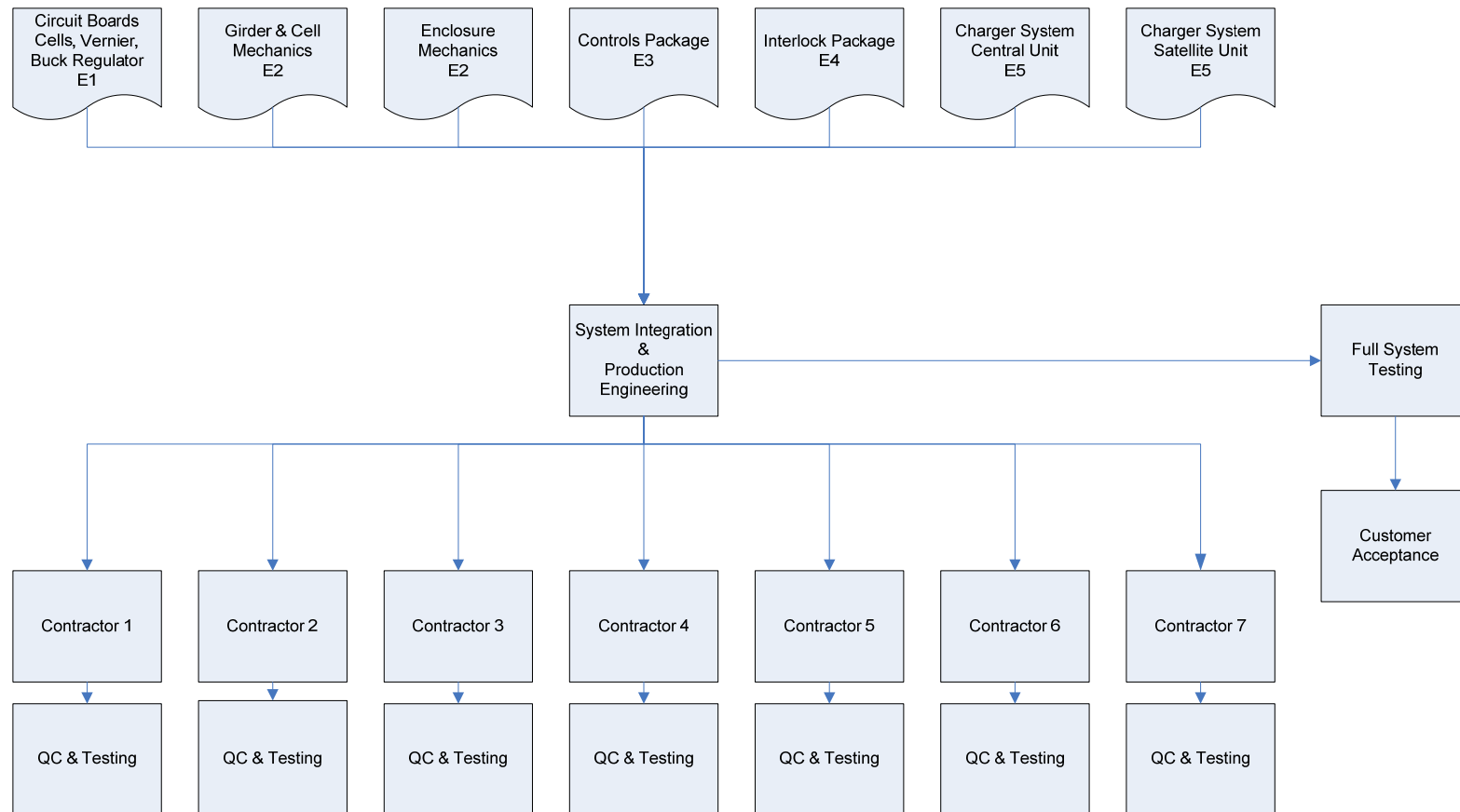
Option: Select System Integrator capable of serving as General Contractor

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ILC HA Electronics R&D
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Work Package Flow

Example 2: General Contractor



WP Example Discussion

- Basic decisions needed about how to structure work. Some options:
 - *Engineering development of WP can be done by one laboratory or inter-lab inter-regional collaboration (preferred)*
 - *Integrated WP's can be bid in part or in whole to vendors in 3 regions*
 - *Getting prototypes from 3 regions (e.g. klystrons) preferred*
 - *Management needs tight control over process*
 - *Management models need to be developed.*

WP Example Discussion 2

- Decision Options – Cont'd.
 - *Process development, resources needed for*
 - Overall WP and sub-tasks
 - Qualified engineering to develop WP's
 - Design engineering
 - QC and testing
 - System integrators
 - Contracts liaison
 - Etc.
- Models for each phase needed in order to analyze resources types, scheduling, resource loading for duration.

Summary

- WP stage will involve major expansion of engineering resources in ILC.
- Planned R&D for 08-09 currently does not contain WP resources necessary for EDR.
- EDR report writing resources need to be added to above.