



US LHC Accelerator Research Program
bnl - fnal - lbnl - slac

LHC Hardware Commissioning Session

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Goals for US Hardware Commissioning

- We want to make sure our US LHC hardware deliverables are installed and commissioned efficiently
- We want to turn on LHC physics as soon as possible
- We see this as part of a “buy in” to participate in the operation and future planning international accelerator projects
- We see this as an opportunity to gain experience to commission a very challenging machine; bring experience back to home institution



Hardware Commissioning History

- 2002 HC part of LARP baseline
 - HC = Installation Oversight and Commissioning of US Deliverables
- Summer 2003: HC part of approved LARP
 - Effort ~ 2 FTE/year
- November 2003: Discussion with CERN about Structure of US participation
 - Defining job types, length of stays, role in commission
- June 2004: Change of Scope of HC Commissioning
 - Include Global Commissioning?
- November 2004: CERN Document on Resource Requirements
- Present: Understand time scale and scope of participation in light of the emerging LHC HC time line.
- Present 2: Creation of CTF to look at overall commissioning issues



Hardware Installation/Commissioning Schedule

- Major schedule revision is in the works:
 - Features of Schedule:
 - Holding to Schedule for Beam in 2007
 - Start with installation and commissioning of LSS L8
 - Spotlight on US Deliverables.
 - More aggressive arc installation schedule in 2006
 - // Magnet transport& installation with QRL installation
- Sense of Urgency to HC Planning

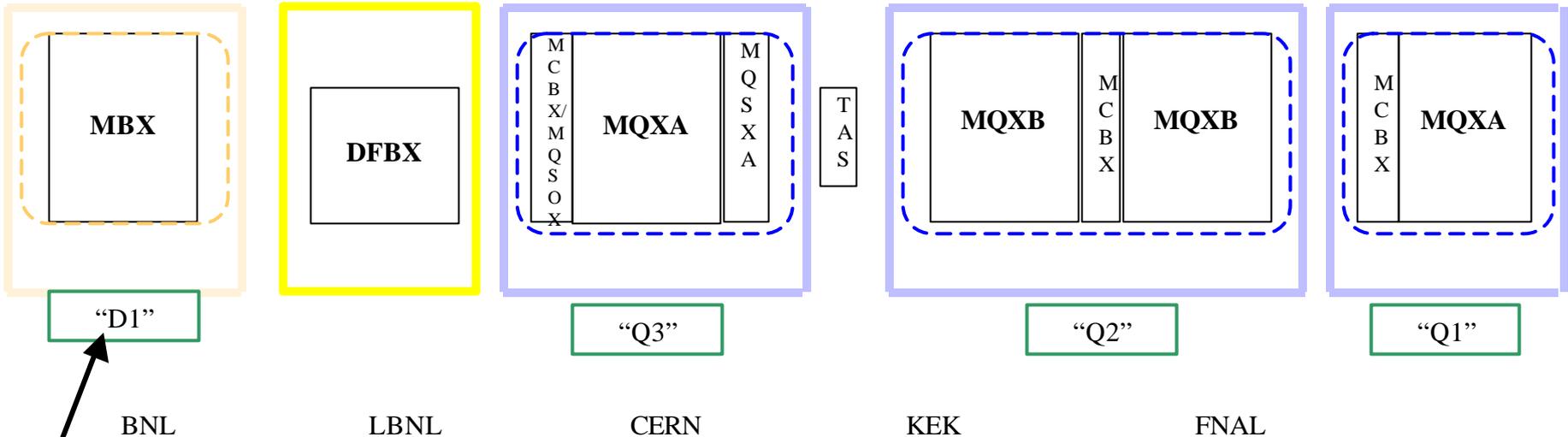


Components to be Commissioned in 5 IR's

In IR1,2,5, 8

Cryo, Powering, Vacuum etc. tied into the sector

To IP →



IR 2,8 only

Other important components
 Hadron and neutral absorber for IR1, 5(LBNL)
 Other separation dipoles in IR 1,2,4,5,8 (BNL)



Status of US Deliverables(1)

Separation dipoles, All have been built

D1 all shipped to CERN

D2 all but one shipped to CERN

D3 0 out of 3 shipped

D4 1 out of 3 shipped

DFBX (in construction)

2 delivered to CERN

2 ready for shipment

Tan/Tas Absorbers Delivered to CERN



Status of US Deliverables(2)

IR Quads Q1, Q2 Q3 (still in construction, delivery by end of CY 05)

Q1 and Q3

made of MQXA's + correctors

which are all built and delivered to US

4 Q1's shipped to CERN

1 Q3 shipped to CERN

Q2

made of MQXB's + correctors

MQXB still finishing last one, correctors at FNAL

1 MQXB needed, 4 Q2's shipped to CERN



Participation in Global Hardware Commissioning

- Desire by CERN for Participation from outside of CERN
Expressed in LHC-PM-MR-0002
“Resources for Hardware Commissioning”
and In Hardware Commissioning WG discussions
- Informal discussions between CERN and US.
- Commissioning Task Force formed
Propose organization to overall commissioning effort
- Sense of urgency to make decisions as start of HC is Fall 2005



The Hardware Commissioning Session Agenda

- Introduction (Lamm)
- CERN HC status and Resource needs (Saban)
- Status of Commissioning Efforts
(Rasson,Wanderer,Lamm,Harms)

- Round table discussion of HC issues