

PIP – BOOSTER LCW

Overview

Improvements

Labor and Schedule

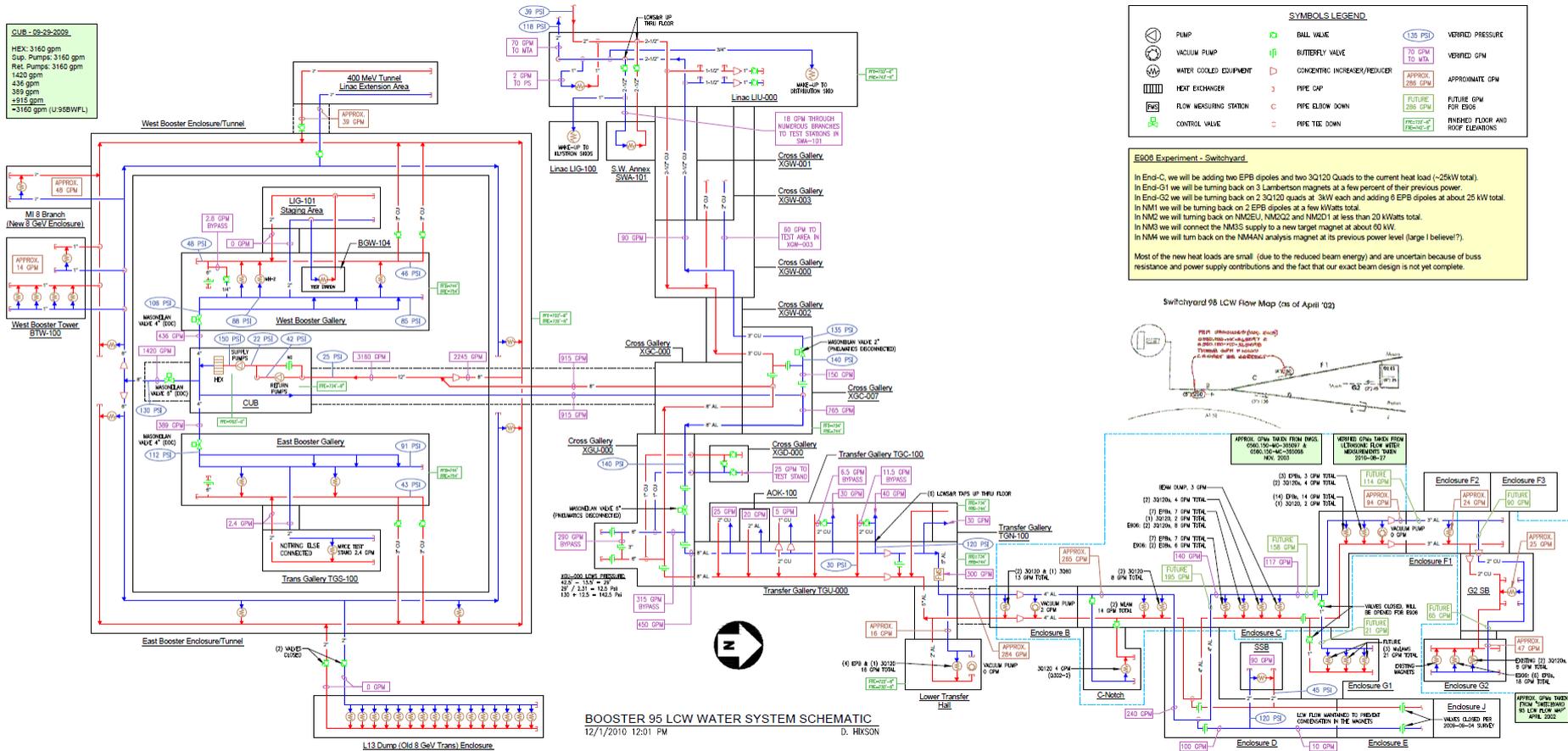
Estimates - M&S

Summary

August 31, 2011

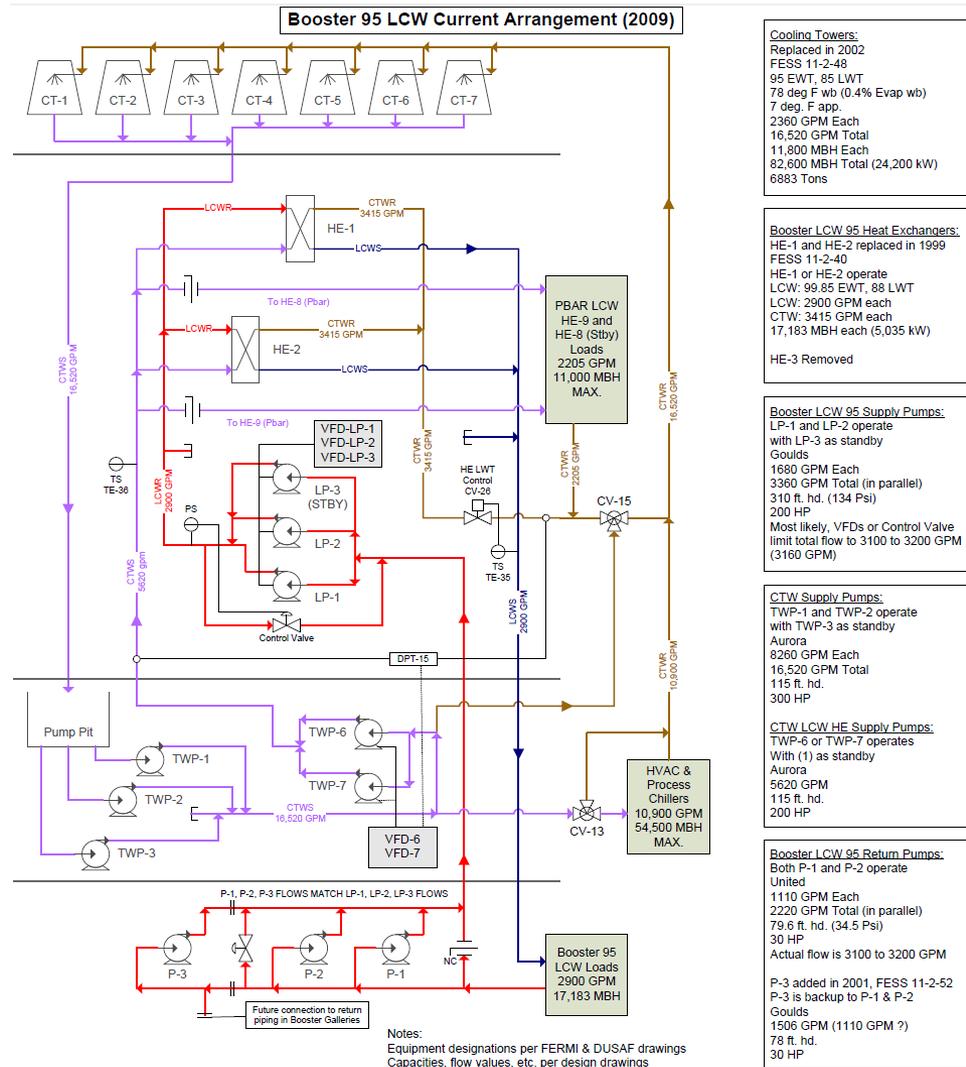
D. Hixson

Booster LCW System - Overall



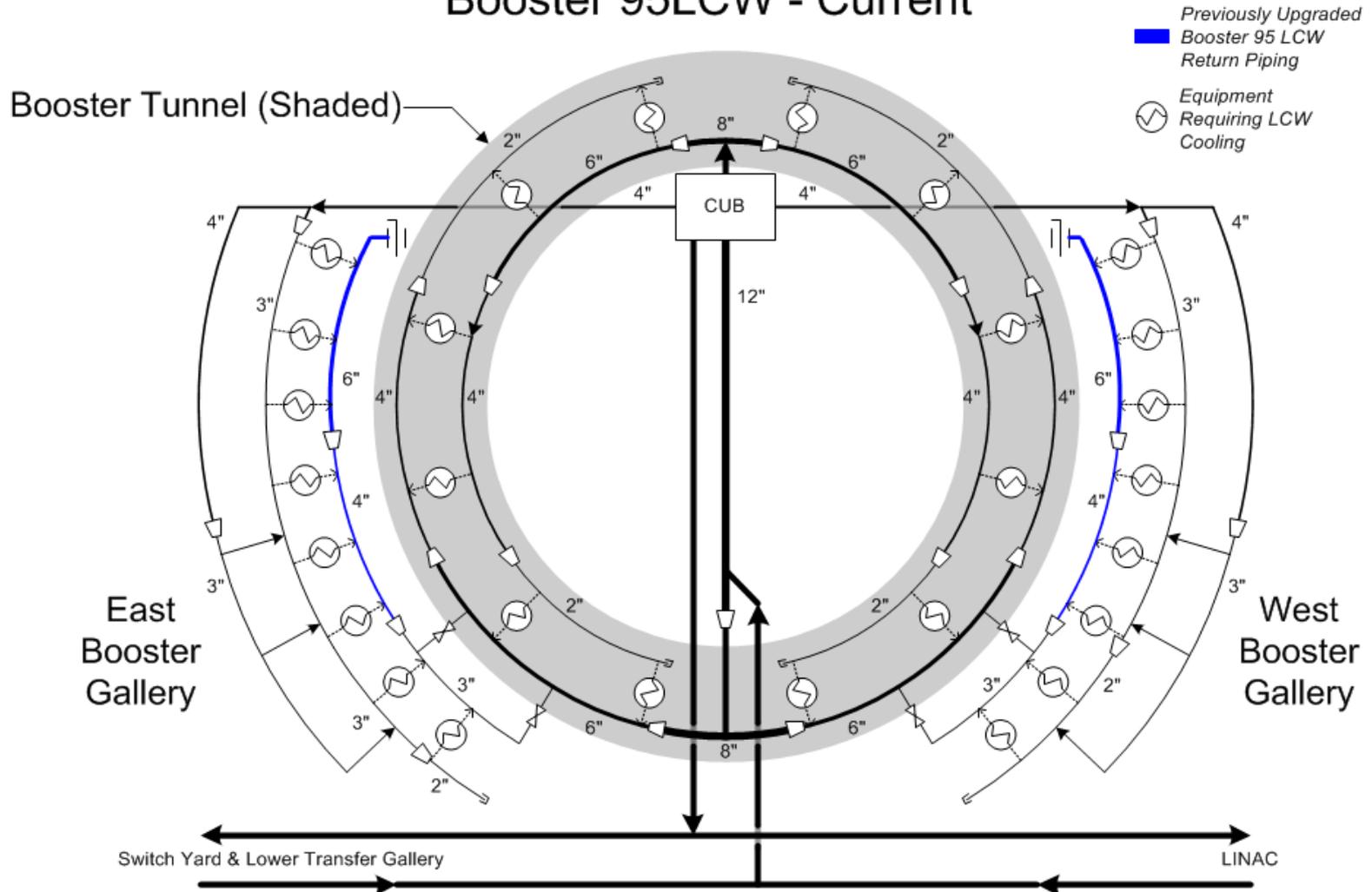
BOOSTER 95 LCW WATER SYSTEM SCHEMATIC
12/1/2010 12:01 PM D. HIXSON

Booster LCW System – at CUB



Booster LCW System – Booster

Booster 95LCW - Current

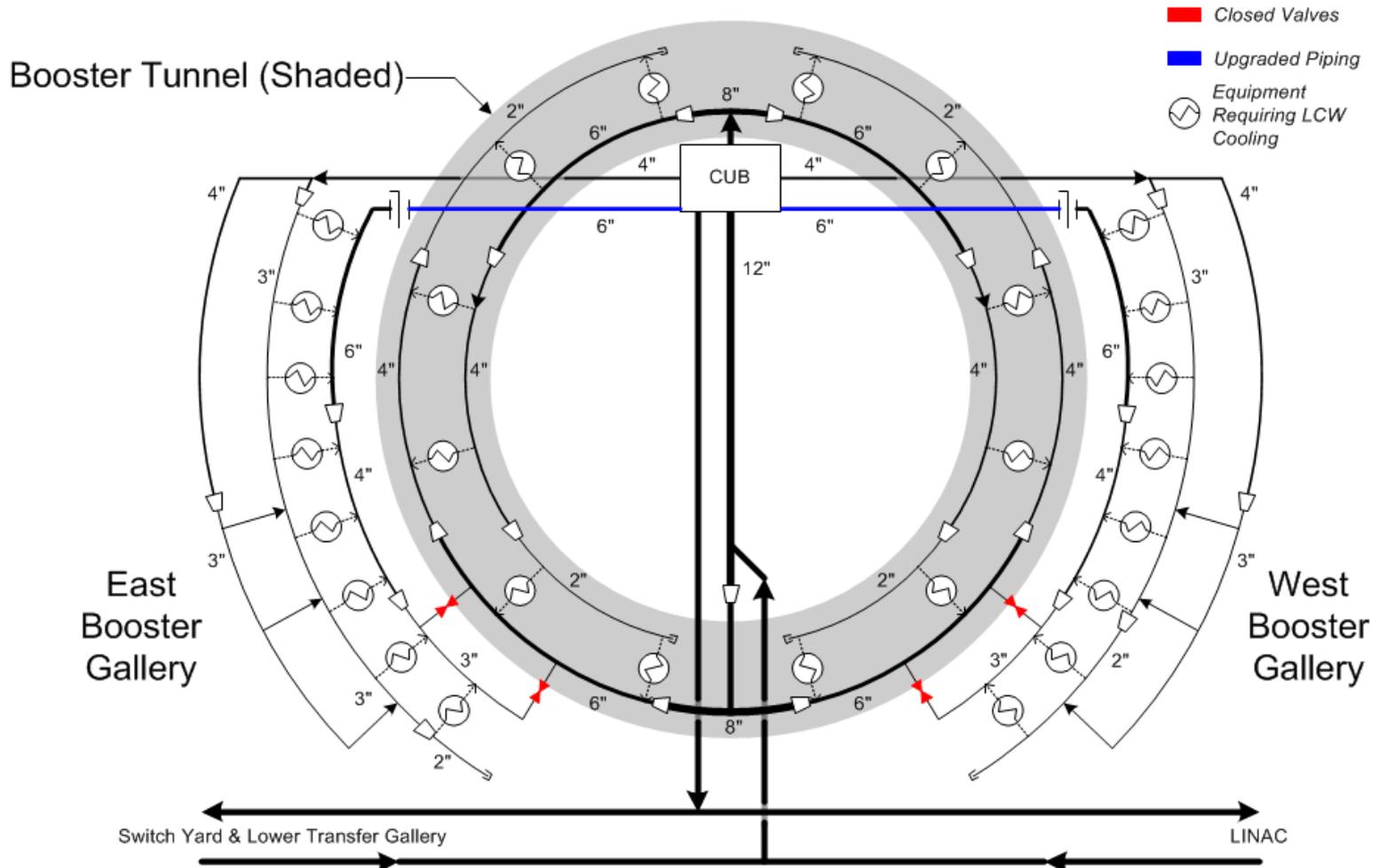


Booster LCW System – Improvements

- **Booster Gallery LCW Return Piping to CUB**
 - Designed to improve LCW return flow by minimizing pressure drop
 - Status:
 - FESS is waiting for funding/Task Number
 - Pipe routing determined, FESS drawings at 95%
 - FESS plans fixed priced contract, out to bid Jan. 2012

Booster LCW System – Improvements

Booster 95LCW – After 2012 Shutdown



Booster LCW System – Improvements

- New LCW Return Pumps with VFDs at CUB
 - Install new return pumps to match GPM of existing supply pumps
 - (2) of the (3) return pumps are very old (circa early 70s), all (3) have inadequate flow
 - Supply pumps: Design (2) at 1,680 GPM each, 3,360 GPM total
 - Supply pumps actually operating at 3,160 GPM total
 - Return Pumps: Design (2) at 1,100 GPM each, 2,200 GPM total
 - Return Pumps actually operating at 3,160 GPM total, far to the right on the pump curve
 - Status:
 - FESS – AD/MSD is waiting for funding/Task Number
 - FESS to purchase/install pumps as part of LCW return piping work
 - AD/MSD to provide pump procurement and installation guidance

Booster LCW System – Improvements

- Isolation Valves and Strainers - Booster Enclosure
 - Replace isolation valves on LCW Mains, on LCW bus piping, and on RF Cavity LCW branch piping. Replace Y-strainers with basket strainers
 - Work was in Proton Source Improvement Plan Task Force
 - Status:
 - AD/MSD waiting for funding
- LCW Manifolds - Solid State Upgrades
 - Upgrades to manifolds and strainer to handle increased flow
 - Envisioned back in 2007, may no longer be necessary, not in Proton Source Improvement Plan Task Force
 - Status:
 - Design is complete – 1-1/2” LCW connections are already in place, remainder of manifold could easily be upgraded in the future
 - AD/MSD waiting for funding
 - PIP management to determine whether to proceed

Booster LCW System – Labor and Schedule

- Booster Gallery LCW Return Piping to CUB
 - Most of the design work is done
 - FESS will need funding/Task Number to generate drawings and finish design work – start Oct. 2011, FY 2012
 - Installation will take place during the FY 2012 shutdown and will be supervised by FESS
 - AD/MSD will need to provide some oversight
 - Coordination of limited AD/MSD manpower with other shutdown activities (i.e. ANU/NOvA, Tevatron/Pbar Decommissioning, etc) is absolutely essential
 - Will need to assign AD/MSD Engineer, Techs, and Controls person to help commission and balance the LCW system, and to connect controls to ACNET

Booster LCW System – Labor and Schedule

- New LCW Return Pumps with VFDs at CUB
 - Most preliminary design work is done
 - FESS will need funding/Task Number to generate drawings and finish design work – start Oct. 2011, FY 2012
 - Need to assign AD/MSD Engineer to finish pump selection – coordinate labor with labor needed by ANU/NOvA
 - Installation will take place during the FY 2012 shutdown and will be supervised by FESS
 - Coordination of limited AD/MSD manpower with other shutdown activities (i.e. ANU/NOvA, Tevatron/Pbar Decommissioning, etc) is absolutely essential
 - Will need to assign AD/MSD Engineer, Techs, and Controls person to help commission and balance the LCW system, and to connect controls to ACNET

Booster LCW System – Labor and Schedule

- Isolation Valves and Strainers - Booster Enclosure
 - Need funding decision – then purchase materials
 - Will need to assign Techs to install valves and strainers, and AD/MSD Engineer and Techs to help balance the LCW system.
 - Installation can take place over the FY 2012 shutdown
- LCW Manifolds - Solid State Upgrades
 - Need decision on whether to pursue this improvement – PIP Management
 - Most of the design work is done
 - Need funding decision – then obtain materials
 - Will need to assign Techs to install manifolds, and AD/MSD Engineer and Techs to help balance the LCW system.
 - Installation can take place piecemeal, as each station is upgraded, or could take place over the FY 2012 shutdown

Booster LCW System – Estimates

Task	Materials	Labor	Notes
LCW Returns to CUB	\$125,000	120 hrs ₁	By FESS, Materials include installation labor. Labor shown is for AD/MSD Engineering/Tech support only
LCW Return Pumps	\$70,000	160 hrs ₂	Materials include installation labor. Labor shown is for AD/MSD Engineering/Tech support only
Isolation Valves & Strainers (Booster Enclosure LCW Piping)	\$30,000	460 hrs	From Proton Source Task Force Estimate
LCW Manifolds (SSD Upgrades)	\$10,000	200 hrs	From M. Cooper: 'Booster LCW Upgrade Scope of Work', Mar. 5, 2007
Controls and Instrumentation	\$10,000 ₃	160 hrs ₃	From M. Cooper: 'LCW Upgrade Estimate Rev A', Mar. 7, 2007
Totals:	\$245,000	1,100 hrs	

Footnotes:

1. 40 hrs oversight, 80 hrs commissioning
2. 60 hrs pump requisition (selection, coordination, PR, etc.), 20 hrs oversight, 80 hrs commissioning
3. Includes ACNET items (Cabling, programming, etc.)

Booster LCW System – Summary

- Improvements to be made are well understood
 - Need funding commitment and funding timeline to move forward
 - Need to assign manpower
 - Most design work is complete, need some time to tie up some loose ends, coordinate with FESS, etc. – FY 2011 and 2012
 - LCW return pumps requisition will take some time to complete – FY 2012
- Most improvements would take place during the FY 2012 shutdown
 - Some could take place sooner – depends on funding
 - Coordination of limited AD/MSD manpower with other shutdown activities (i.e. ANU/NOvA, Tevatron/Pbar Decommissioning, etc) is absolutely essential