Fermilab | U.S. DEPARTMENT OF ENERGY | Office of Science

Technical Overview of Building Infrastructure Mechanical Systems

Maurice Ball/Jerzy (Yurick) Czajkowski

PIP-II LINAC Complex Mechanical Fluid Systems PDR

April 21, 2021

A Partnership of:

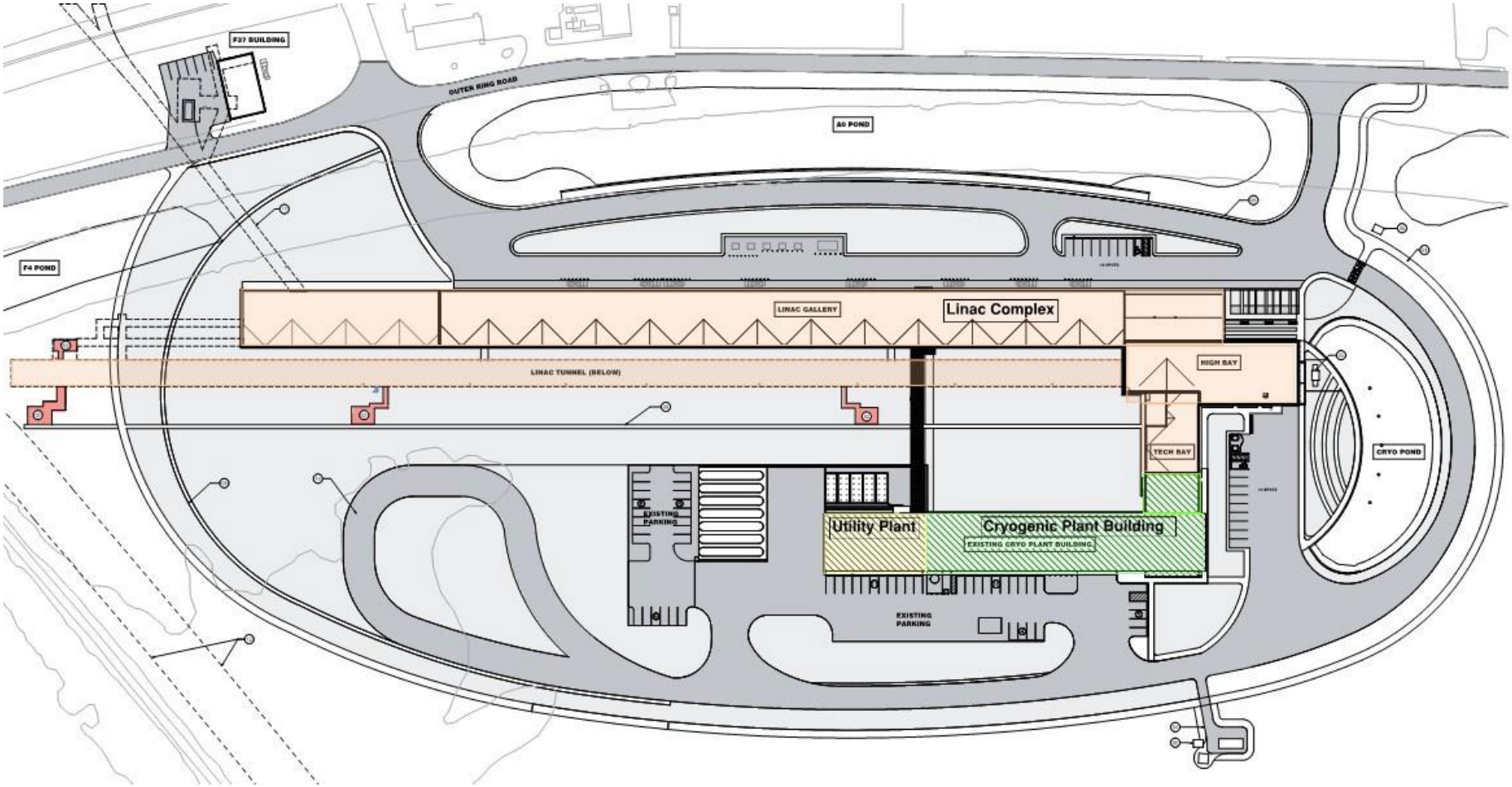
US/DOE
India/DAE
Italy/INFN
UK/UKRI-STFC
France/CEA, CNRS/IN2P3
Poland/WUST

Table of Contents

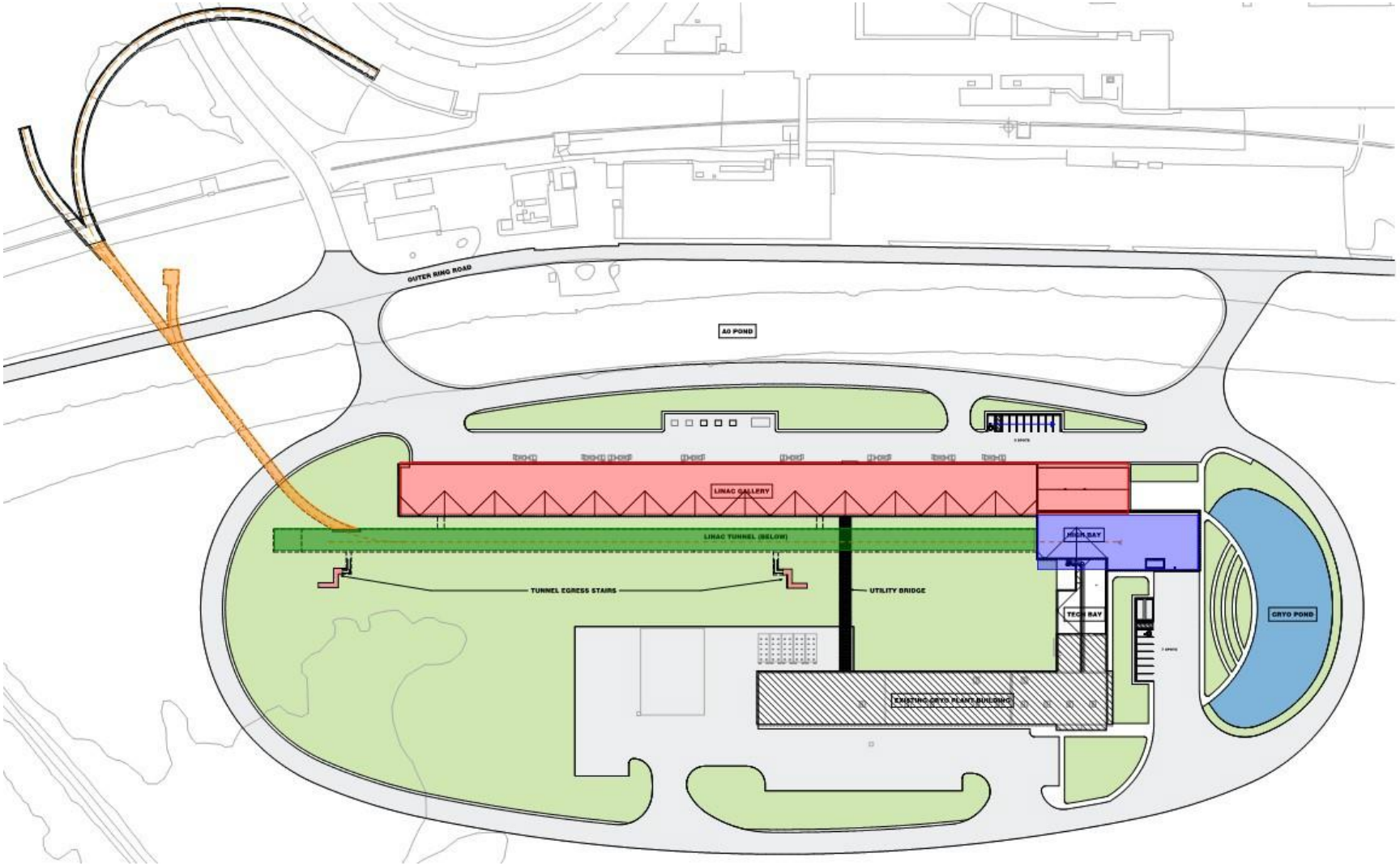
PIP-II Project Site

Aerial view of PIP-II Project location, looking south.

PIP-II Project site plan I



PIP-II Project site plan II



PIP-II Project Management and Level 2 Systems/Managers

ADVISORY COMMITTEES

PIP-II Machine Advisory Committee	**H. Weise**
PIP-II Project Management Group	**D. Glenzinski**
PIP-II Strategic Project Advisory Committee	**J. Yeck**

FNAL SUPPORT

ACCELERATOR DIV	**M. Lindgren**
APS-TD	**A. Romanenko**
CFO OFFICE	**V. Peoples**
WDRS	**T. Turner (acting)**
CSO OFFICE	**A. Kenney**
COO OFFICE	**K. Gregory**
CPO OFFICE	**D. Glenzinski**

TECHNICAL INTEGRATION

Technical Director - A. Klebaner

PROJECT ENGINEER	**L. Kokoska**
IN-KIND TECHNICAL INTEGRATION	**A. Rowe**
INTEGRATION COORDINATOR	**A. Martinez**
ELECTRICAL SYSTEMS COORD	**R. Crawford**
SRF COORDINATOR	**J. Holzbauer**
QUALITY ASSURANCE MGR	**J. Adetunji**
Quality Engineer	**T. DiGrazia**
Quality Engineer (SRF/CRYO)	**M. Luedke**

PIP-II Project

L. Merminga
PROJECT DIRECTOR
US TECHNICAL COORDINATOR

PROJECT MANAGER	**M. Kaducak**
TECHNICAL DIRECTOR	**A. Klebaner**
PROJECT SCIENTIST	**E. Pozdeyev**
IN-KIND CONTRIBUTIONS MANAGER	**L. Lari**
ENVIRONMENTAL, SAFETY & HEALTH	**J. Anderson Jr.**
SPECIAL ADVISOR	**S. Holmes**

INTERNATIONAL COORDINATION

Technical Coordinators

DAE-BARC	**S. Krishnagopal**
DAE-RRCAT	**P. Shrivastava**
UK-UKRI	**P. McIntosh**
ITALY-INFN	**C. Pagani**
FRANCE-CEA	**O. Napoly**
FRANCE-CNRS/IN2P3	**D. Longuevergne**
POLAND-WUST	**M. Chorowski**

PROJECT OFFICE

Project Manager - M. Kaducak

PROJECT CONTROLS MANAGER	**D. Leeb**
Project Controls Specialists	**M. Bossert**
	C. Jackson
	J. Randall
	A. Tomori
	L. Wolfe
OPSS CONSULTANT	**D. Hoffer**
FINANCIAL MANAGER	**T. Casillas**
PROCUREMENT MANAGER	**S. Gaugel**
Procurement Administrators	**C. Blanchard**
	S. Cozzens
	J. Eddy
RISK MANAGER	**L. Taylor**
LOGISTICS MANAGER	**TBD**
DOCUMENT SYSTEM MANAGER	**T. Langford**
EXECUTIVE ADMINISTRATION	**T. Langford**
Administrative Support	**K. Hannapel**

WBS 121.01 PROJECT MANAGEMENT

M. Kaducak
System Manager

WBS 121.02 SRF & CRYO SYSTEMS

C. Boffo
System Manager
G. Wu, SRF Science

WBS 121.03 ACCELERATOR SYSTEMS

E. Harms
System Manager

WBS 121.04 LINAC INSTALLATION & COMMISSIONING

J. Leibfritz
System Manager
A. Soha, Deputy Mgr.

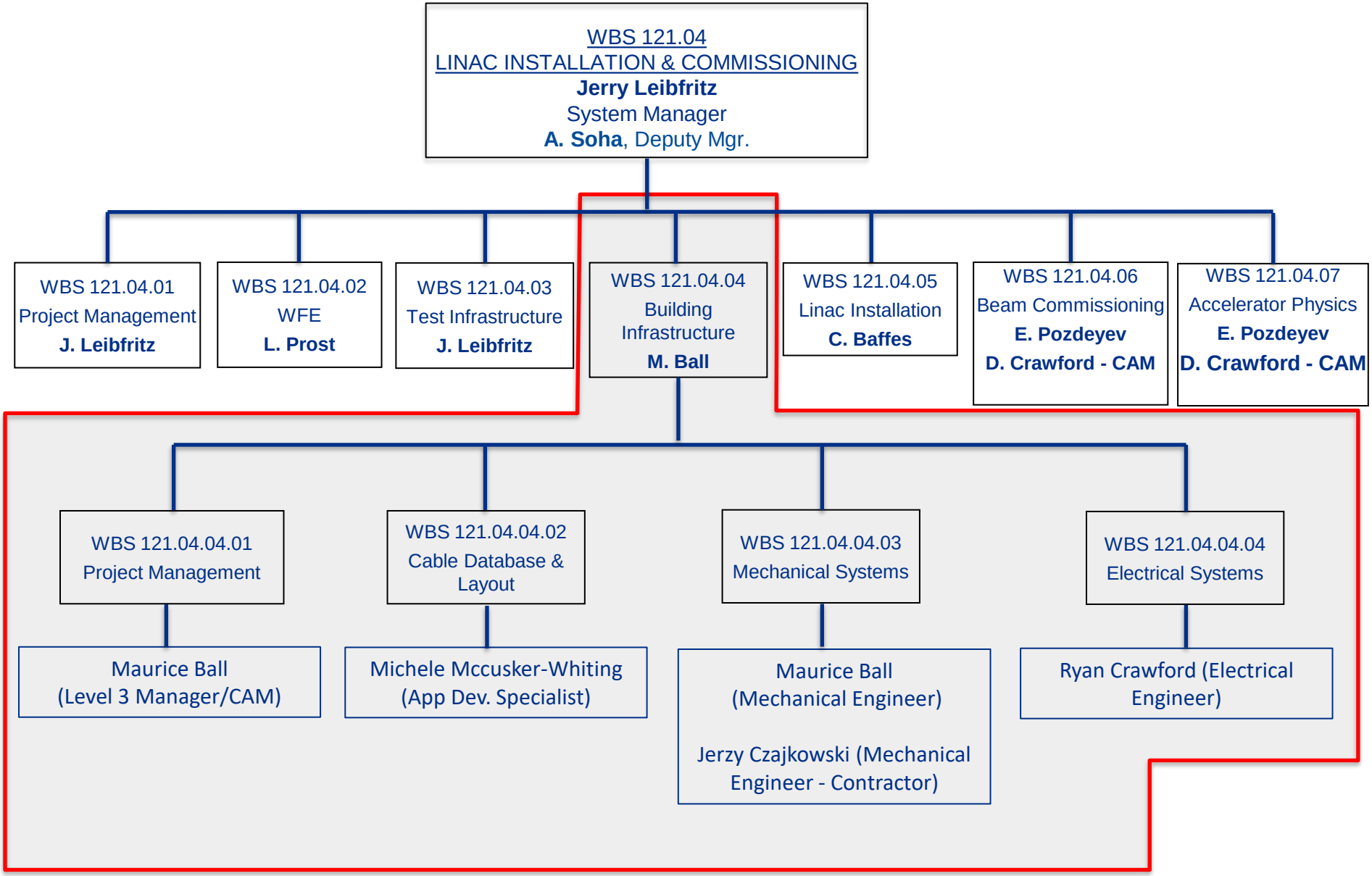
WBS 121.05 ACCELERATOR COMPLEX UPGRADES

I. Kourbanis
System Manager

WBS 121.06 CONVENTIONAL FACILITIES

S. Dixon
System Manager

Organization/Team



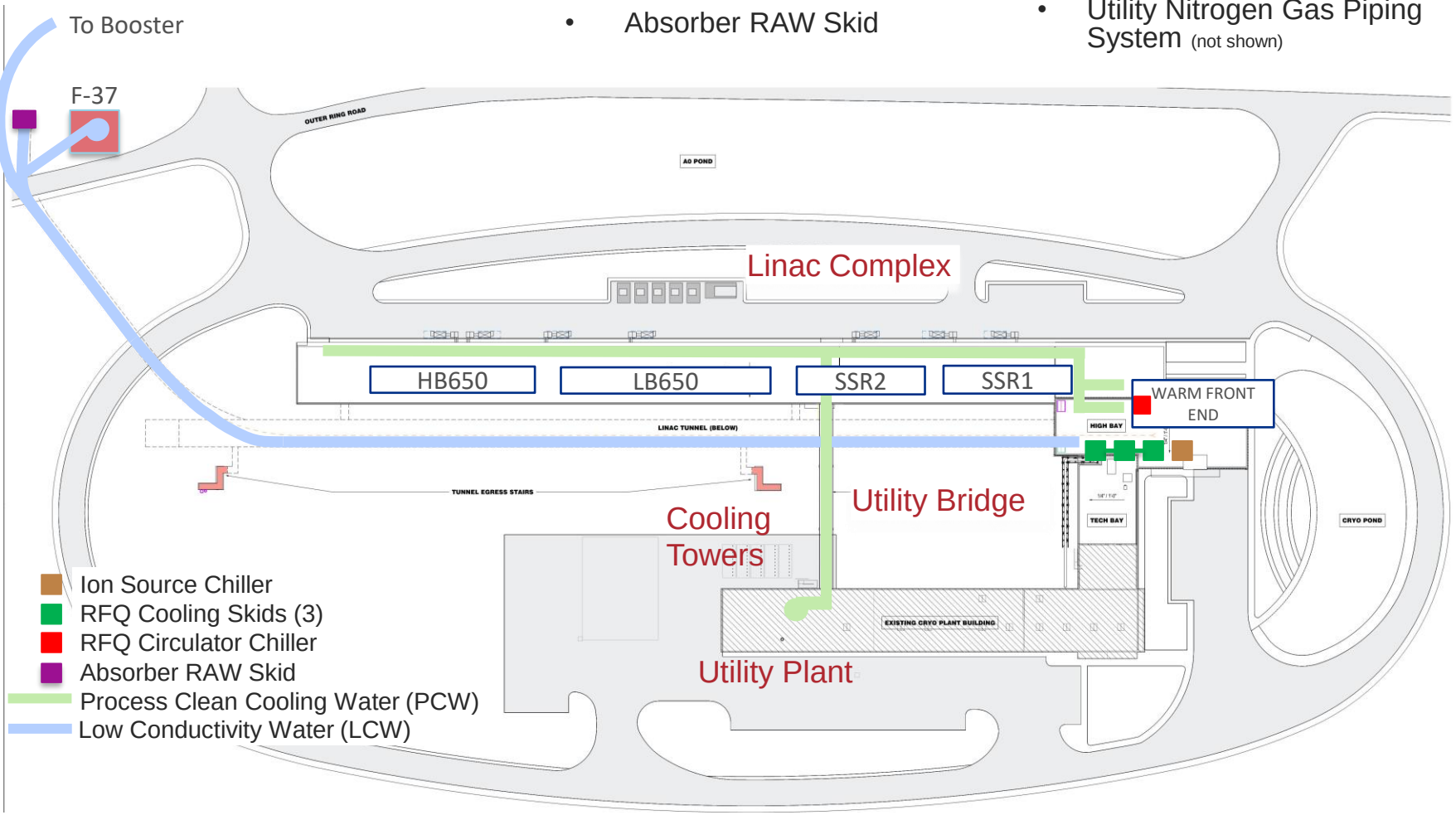
Technical Scope/Deliverables

Designs of the following systems are for the entire PIP-II Complex (High Bay Building, Linac Gallery, Linac Tunnel, and Beam Transfer Line)

- Low Conductivity Water (LCW) System
- Process Clean Water (PCW) System
- Compressed Air Distribution System
- Utility Nitrogen Distribution System
- RFQ Intermediate Cooling Skid
- RFQ Vane Cooling Skid
- RFQ Wall Cooling Skid
- Absorber RAW Skid
- RFQ Circulator Chiller
- Ion Source Chiller

Technical Scope/Deliverables

- Process Clean Water (PCW) System
- Low Conductivity Water (LCW) System
- RFQ Intermediate Cooling Skid
- RFQ Vane Cooling Skid
- RFQ Wall Cooling Skid
- Absorber RAW Skid
- RFQ Circulator Chiller
- Ion Source Chiller
- Compressed Air System (not shown)
- Utility Nitrogen Gas Piping System (not shown)



Technical Requirements - PCW

- Building Infrastructure shall design the PCW system according to the following specifications:
- Discharge Pressure = 105 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 86ºF +/- 1ºF
- Delta T (ΔT) = 7.2 Fº
- Total Heat Load = 8,146 KW
- Total Flow Required = 7723 GPM
- Side stream Particulate filtration at 5 micron
- Oxygen removal levels = >20 PPB
- Cooling water flow requirement summary for individual components can be found in the Building Infrastructure Water Usage Document – Teamcenter Document #ED0012655

Technical Requirements - LCW

- Building Infrastructure shall design the LCW System according to the following specifications:
- Discharge Pressure = 105PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 95°F+/- 1ºF
- Delta T (ΔT) = 17° F
- Total Heat Load @Δ17 Fº = 200 KW
- Total Flow Required = 315 GPM
- Oxygen removal levels >20 PPB
- Resistivity = 4 MOhm*cm
- Side stream Particulate filtration at 5 micron
- Cooling water flow requirement summary for individual components can be found in the Building Infrastructure Water Usage Document – Teamcenter Document #ED0012655

Technical Requirements – RFQ Intermediate Skid

- Building Infrastructure shall provide the RFQ Intermediate cooling water skid according to the following specifications:
- Discharge Pressure = 100 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 70°F +/- 1.0ºF
- Delta T (ΔT) = 21.0 Fº
- Total Heat Load = 71 KW
- Nominal Flow Required = 49 GPM
- Resistivity = 2 MOhm-CM
- Full flow Particulate filtration at 1 micron

Technical Requirements – RFQ Wall Skid

- Building Infrastructure shall provide the RFQ Intermediate cooling water skid according to the following specifications:
- Discharge Pressure = 100 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 86°F +/- 0.5ºF
- Delta T (ΔT) = 5.0 Fº
- Total Heat Load = 50 KW
- Nominal Flow Required = 136 GPM
- Resistivity = 2 MOhm-CM
- Full flow Particulate filtration at 1 micron

Technical Requirements – RFQ Van Skid

- Building Infrastructure shall provide the RFQ Intermediate cooling water skid according to the following specifications:
- Discharge Pressure = 100 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 86°F +/- 0.5ºF
- Delta T (ΔT) = 5.0 Fº
- Total Heat Load = 29 KW
- Nominal Flow Required = 65 GPM
- Resistivity = 2 MOhm-CM
- Full flow Particulate filtration at 1 micron

Technical Requirements – RFQ Circulator Chiller

- Building Infrastructure shall provide the cooling water system, including supply and return piping, valves, and instrumentation, for the RFQ circulator and loads according to the following specifications:
- Discharge Pressure = 100 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 83°F +/- 1.0 ºF
- Delta T (ΔT) = 10 Fº
- Total Heat Load = 29 KW
- Total Flow Required = 20 GPM
- Resistivity = n/a

Technical Requirements – Absorber RAW Skid

- Building Infrastructure shall design the Absorber RAW cooling system, including supply and return piping, valves, and instrumentation for the Absorber according to the following specifications:
- Discharge Pressure = 100 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 100°F +/- 1 ºF
- Delta T (ΔT) = 23.5 Fº
- Total Heat Load = 25 KW
- Total Flow Required = 20 GPM
- Resistivity = n/a
- Full flow particulate filtration at 5 micron

Technical Requirements – Compressed Air System

- Building Infrastructure shall design the compressed air system infrastructure according to the following specifications:
- Discharge Pressure = 100 PSIG
- Total Discharge Flow = 1060 SCFM (903.8 SCFM required)
- Dewpoint = - 40°C/F
- Particulate Filtration = .1 micron
- Instrument air flow requirement summary for individual components can be found in the Instrument Air Usage Document – Teamcenter Document #ED0012529

Technical Requirements – Nitrogen Gas System

- Building Infrastructure shall design piping infrastructure for utility nitrogen gas according to the following specifications:
- Discharge Pressure = 100 PSIG
- Total Discharge Flow = 35.5 SCFM (20 g/s)
- Nitrogen gas flow requirement summary for individual components can be found in the Nitrogen Usage Document – Teamcenter Document #ED0012529

Technical Requirements – Ion Source Chiller

- Building Infrastructure shall provide the Ion Source LCW System according to the following specifications:
- Discharge Pressure ≥ 70 PSIG
- Suction Pressure = 15 PSIG
- Supply Temperature = 70ºF +/- 1.0ºF
- Delta T (ΔT) = 7.2 Fº
- Total Heat Load = 12 KW
- Total Flow Required = 14 GPM
- Resistivity = 4 MOhm-CM
- Built-in particulate filtration at 5 micron

Interface Specification

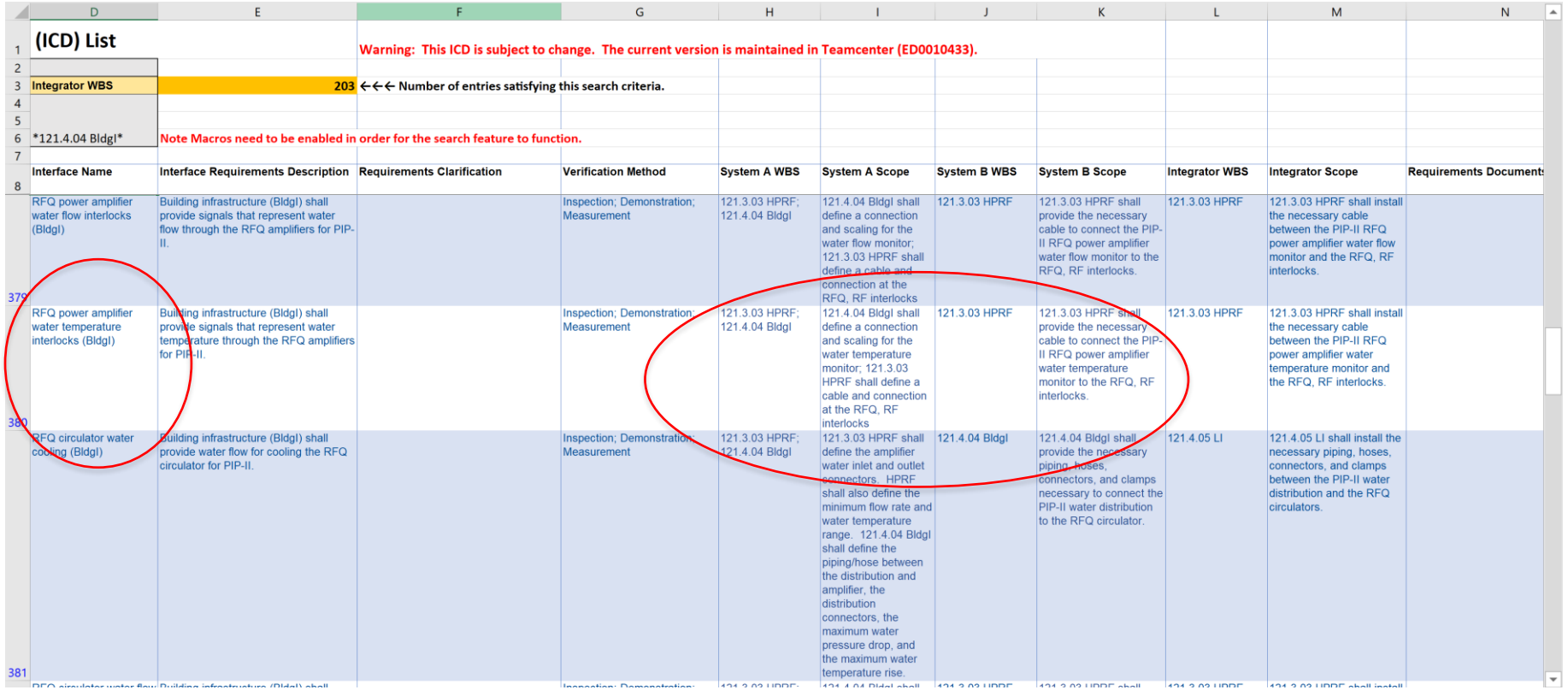
- Interfaces - a point where two systems meet and interact
- The PIP-II Project has set up guidance for the creation of Interface specification and documentation
- Interface documentation is critical; help ensure that all related parties understand how they interface with each other.
- Master Interface Control Document (Master ICD) – high level listing of all PIP-II interfaces between systems.
- Interface Specification Document (ISD) - More detail description of the interfaces between our systems and others.

Interface Specification (continued)

- Critical Interfaces:
  - PCW requirements (PCW system distributed over a large area of the LINAC Complex)
  - Supply Temperature between CTW and PCW
  - Heat exchanger/heat transfer between Absorber and RAW cooling skid
- Interface Control Document
  - ED0010433 Master Interface Control Document
  - Interface Specification Document (ISD) – just underway

Master Interface Control Document (ICD) - Screenshot

- Screenshot example
- RFQ Power Amplifier water temperature interlocks
- Interface between HPRF and BLDGI



(ICD) List

Warning: This ICD is subject to change. The current version is maintained in Teamcenter (ED0010433).

Integrator WBS | 203 ←←← Number of entries satisfying this search criteria.

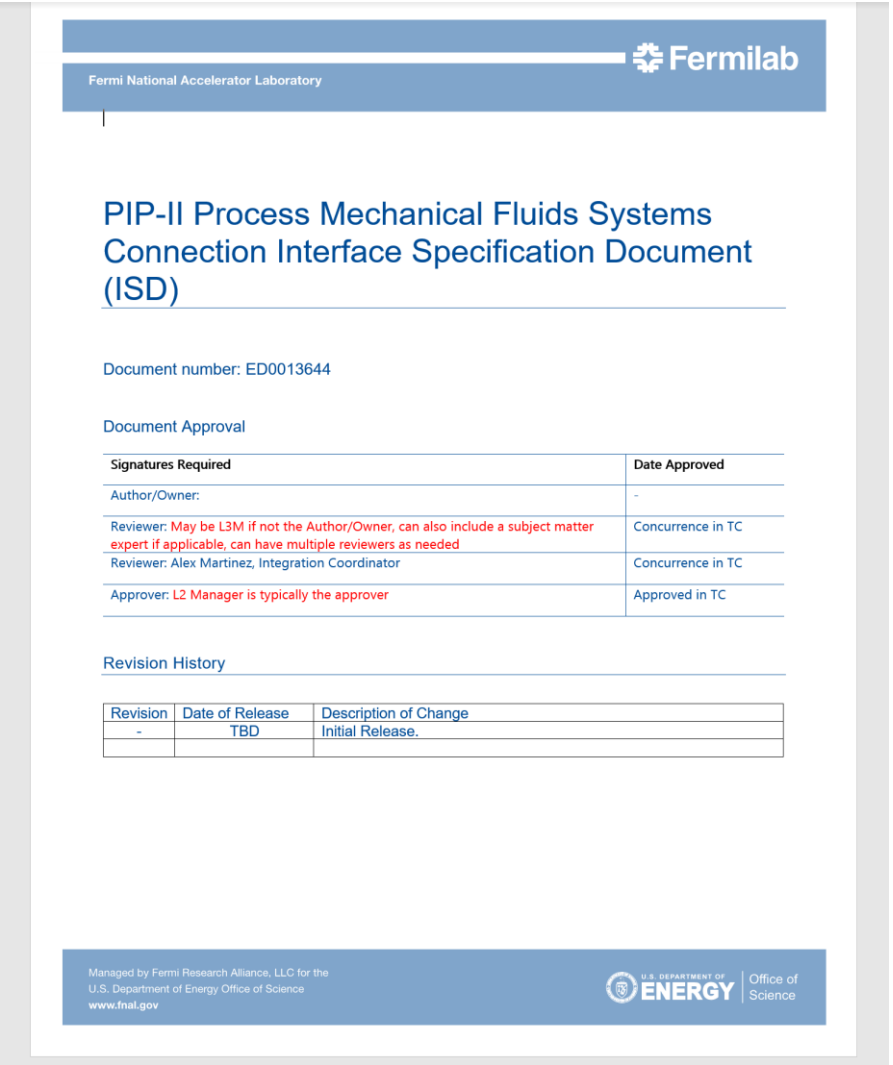
121.4.04 Bldgl

Note Macros need to be enabled in order for the search feature to function.

	Interface Name	Interface Requirements Description	Requirements Clarification	Verification Method	System A WBS	System A Scope	System B WBS	System B Scope	Integrator WBS	Integrator Scope	Requirements Documents
379	RFQ power amplifier water flow interlocks (Bldgl)	Building infrastructure (Bldgl) shall provide signals that represent water flow through the RFQ amplifiers for PIP-II.		Inspection; Demonstration; Measurement	121.3.03 HPRF; 121.4.04 Bldgl	121.4.04 Bldgl shall define a connection and scaling for the water flow monitor; 121.3.03 HPRF shall define a cable and connection at the RFQ, RF interlocks	121.3.03 HPRF	121.3.03 HPRF shall provide the necessary cable to connect the PIP-II RFQ power amplifier water flow monitor to the RFQ, RF interlocks.	121.3.03 HPRF	121.3.03 HPRF shall install the necessary cable between the PIP-II RFQ power amplifier water flow monitor and the RFQ, RF interlocks.	
380	RFQ power amplifier water temperature interlocks (Bldgl)	Building infrastructure (Bldgl) shall provide signals that represent water temperature through the RFQ amplifiers for PIP-II.		Inspection; Demonstration; Measurement	121.3.03 HPRF; 121.4.04 Bldgl	121.4.04 Bldgl shall define a connection and scaling for the water temperature monitor; 121.3.03 HPRF shall define a cable and connection at the RFQ, RF interlocks	121.3.03 HPRF	121.3.03 HPRF shall provide the necessary cable to connect the PIP-II RFQ power amplifier water temperature monitor to the RFQ, RF interlocks.	121.3.03 HPRF	121.3.03 HPRF shall install the necessary cable between the PIP-II RFQ power amplifier water temperature monitor and the RFQ, RF interlocks.	
381	RFQ circulator water cooling (Bldgl)	Building infrastructure (Bldgl) shall provide water flow for cooling the RFQ circulator for PIP-II.		Inspection; Demonstration; Measurement	121.3.03 HPRF; 121.4.04 Bldgl	121.3.03 HPRF shall define the amplifier water inlet and outlet connectors. HPRF shall also define the minimum flow rate and water temperature range. 121.4.04 Bldgl shall define the piping/hose between the distribution and amplifier, the distribution connectors, the maximum water pressure drop, and the maximum water temperature rise.	121.4.04 Bldgl	121.4.04 Bldgl shall provide the necessary piping, hoses, connectors, and clamps necessary to connect the PIP-II water distribution to the RFQ circulator.	121.4.05 LI	121.4.05 LI shall install the necessary piping, hoses, connectors, and clamps between the PIP-II water distribution and the RFQ circulators.	

Interface Specification Document (ICD) - Screenshot

- Defining and listing of interfaces is well developed and continuing
- Over 200 specific interfaces listed so far.
- ISD - Detailing interfaces is underway



Fermi National Accelerator Laboratory

Fermilab

PIP-II Process Mechanical Fluids Systems Connection Interface Specification Document (ISD)

Document number: ED0013644

Document Approval

Signatures Required	Date Approved
Author/Owner:	-
Reviewer: May be L3M if not the Author/Owner, can also include a subject matter expert if applicable, can have multiple reviewers as needed	Concurrence in TC
Reviewer: Alex Martinez, Integration Coordinator	Concurrence in TC
Approver: L2 Manager is typically the approver	Approved in TC

Revision History

Revision	Date of Release	Description of Change
-	TBD	Initial Release.

Managed by Fermi Research Alliance, LLC for the U.S. Department of Energy Office of Science
www.fnal.gov

U.S. DEPARTMENT OF ENERGY | Office of Science

Schedule

PIP-II - BCR511 Baseline 20210331 | **PIP-II Project Schedule** | 11-Apr-21 14:01

Activity ID	Activity Name	Duration	Start	Finish	Total Float	Labor Units	Material Cost
PIP-II - BCR511 Baseline 20210331		1355	15-Dec-20	11-May-26	583	4476	3,724,044
LINAC INSTALLATION and COMMISSIONING (Inst)		1355	15-Dec-20	11-May-26	583	4476	3,724,044
Inst - Building Infrastructure (Bldgl)		1355	15-Dec-20	11-May-26	583	4476	3,724,044
Inst - Bldgl - Mechanical Systems for PIP-II (Mech)		1355	15-Dec-20	11-May-26	583	4476	3,724,044
Inst - Bldgl - Mech - Design		435	15-Dec-20	08-Sep-22	253	3509	288,209
Components: GenMechSys Mechanical System - General		425	04-Jan-21	08-Sep-22	253	0	97,851
BLDGI-23962	Accept Services for Linac Complex Mechanical Fluid systems - Preliminary Design (M&S)	61	04-Jan-21	30-Mar-21	253	0	28,000
BLDGI-30352	Accept Services for Linac Complex Mechanical Fluid systems - Respond to recommendations from PDR (M&S)	40	31-Mar-21	25-May-21	253	0	5,854
BLDGI-30362	Accept Services for Linac Complex Mechanical Fluid systems - Develop final design (M&S)	99	26-May-21	14-Oct-21	253	0	30,000
BLDGI-30372	Accept Services for Linac Complex Mechanical Fluid systems - Respond to recommendations from FDR (M&S)	30	15-Oct-21	29-Nov-21	253	0	10,000
BLDGI-30382	Accept Services for Linac Complex Mechanical Fluid systems - Prepare for PRR (M&S)	135	30-Nov-21	14-Jun-22	253	0	8,927
BLDGI-30392	Accept Services for Linac Complex Mechanical Fluid systems - Respond to recommendations from PRR (M&S)	60	15-Jun-22	08-Sep-22	253	0	15,070
Components: LCmplxLCW Linac Complex LCW System		425	04-Jan-21	08-Sep-22	253	860	0
BLDGI-28402	Incorporate CF Design changes in advance of Linac Complex LCW System PDR (L)	19	04-Jan-21	29-Jan-21	295	26	0
BLDGI-28122	Develop Preliminary Design for Linac Complex Mechanical Fluid systems (L)	61	04-Jan-21	30-Mar-21	253	185	0
BLDGI-28132	T6 MS - Start Preliminary Design Review for Linac Complex Mechanical Fluid systems (PDR)	0		30-Mar-21	253	0	0
BLDGI-28142	Respond to recommendations from Linac Complex Mechanical Fluid systems Design PDR (L)	40	31-Mar-21	25-May-21	253	89	0
BLDGI-28222	T6 MS - Close Preliminary Design Review for Linac Complex Mechanical Fluid systems (PDR)	0		25-May-21	253	0	0
BLDGI-28152	Develop Final Design for Linac Complex Mechanical Fluid systems (L)	99	26-May-21	14-Oct-21	253	345	0
BLDGI-28162	T6 MS - Start Final Design Review for Linac Complex Mechanical Fluid systems (FDR)	0		14-Oct-21	253	0	0
BLDGI-28172	Respond to Recommendations from Linac Complex Mechanical Fluid systems Design FDR (L)	30	15-Oct-21	29-Nov-21	253	140	0
BLDGI-28232	T6 MS - Close Final Design Review for Linac Complex Mechanical Fluid systems (FDR)	0		29-Nov-21	253	0	0
BLDGI-28182	Prepare for PRR for Linac Complex Mechanical Fluid systems Design (L)	135	30-Nov-21	14-Jun-22	253	50	0
BLDGI-28192	T6 MS - Start PRR for Linac Complex Mechanical Fluid systems Design	0		14-Jun-22	253	0	0
BLDGI-28202	Respond to Recommendations from Linac Complex Mechanical Fluid systems Design PRR (L)	60	15-Jun-22	08-Sep-22	253	25	0
BLDGI-28212	T6 MS - Close Linac Complex Mechanical Fluid systems Design PRR	0		08-Sep-22	253	0	0
No Components		10	15-Dec-20	30-Dec-20	0	2649	190,358
121.RL.11.01	Pre-CD2 121.RL.11.01 LCW Systems ACWP	10	15-Dec-20	30-Dec-20	0	1118	17,961
121.0285PD	121.04.04.03 Linac Installation and Commissioning - Building Infrastructure Mechanical Design - Labor ACWP	10	15-Dec-20	30-Dec-20	0	1334	123,439
121.0226OP	121.04.04 Linac Installation and Commissioning - Building Infrastructure Mechanical Design - Labor ACWP	10	15-Dec-20	30-Dec-20	0	198	48,958
Inst - Bldgl - Mech - Procurements		770	31-Mar-22	24-Apr-25	670	332	2,608,651
Components: 01 01		141	01-Oct-24	24-Apr-25	670	258	405,730
BLDGI-30712	SVT Duration to Prepare First Bundled REQ for mechanical equipment for F37 building	10	01-Oct-24	14-Oct-24	681	0	0
BLDGI-30612	Prepare Bundled REQs for mechanical equipment for F37 building (L)	22	01-Oct-24	30-Oct-24	681	60	0
BLDGI-30722	SVT Duration to Complete Appoval Cycle of First Bundled REQ Processed for mechanical equipment for F37	10	15-Oct-24	28-Oct-24	681	0	0
BLDGI-30622	REQ Approval Cycle for mechanical equipment for F37 building	21	15-Oct-24	12-Nov-24	681	0	0
BLDGI-30732	SVT Duration from Processing First Bundled REQ to First PO Awarded for mechanical equipment for F37 buil	20	29-Oct-24	25-Nov-24	681	0	0
BLDGI-30642	Support Bundled Procurements for mechanical equipment for F37 building (L)	90	29-Oct-24	12-Mar-25	681	72	0
BLDGI-30632	T6 MS - Last Bundled REQ Approved for mechanical equipment for F37 building	0		12-Nov-24	780	0	0
BLDGI-31212	T6 MS - First Bundled PO Awarded for mechanical equipment for F37 building	0		25-Nov-24	681	0	0
BLDGI-30742	SVT Duration for First Bundled PO Delivery for mechanical equipment for F37 building	20	26-Nov-24	27-Dec-24	681	0	0
BLDGI-30662	SVT Vendors Supply and Deliver All Bundled Procurements for mechanical equipment for F37 building	80	26-Nov-24	26-Mar-25	681	0	0
BLDGI-30752	RCV-ACCEPT Deliveries of Bundled Procurements for mechanical equipment for F37 building (M&S)	61	30-Dec-24	27-Mar-25	681	0	405,730
BLDGI-30692	QC Inspect all Bundled Deliveries for mechanical equipment for F37 building (L)	70	30-Dec-24	09-Apr-25	681	14	0
BLDGI-31032	Prepare REQ for mechanical installation for F37 building (L)	22	02-Jan-25	03-Feb-25	670	60	0
BLDGI-31042	REQ Approval Cycle for mechanical installation for F37 building	15	04-Feb-25	24-Feb-25	670	0	0
BLDGI-31052	T6 MS - REQ Approved for mechanical installation for F37 building	0		24-Feb-25	670	0	0
BLDGI-31062	Support Procurement for mechanical installation for F37 building (L)	43	25-Feb-25	24-Apr-25	670	52	0
BLDGI-30652	T6 MS - Last Bundled PO Awarded for mechanical equipment for F37 building	0		12-Mar-25	701	0	0
BLDGI-30672	T6 MS - RECEIVED last Delivery of Bundled POs for mechanical equipment for F37 building	0		27-Mar-25	690	0	0
BLDGI-30702	T6 MS - QC Inspections Complete and Nonconformances Resolved for all Bundled Procurements for mech ec	0		09-Apr-25	681	0	0

Actual Work | Remaining Work | Critical Remaining Work | Milestone

Page 1 of 2

TASK filter: WBS = .

Schedule (Continued)

PIP-II - BCR511 Baseline 20210331 | **PIP-II Project Schedule** | 11-Apr-21 14:01

Activity ID	Activity Name	Duration	Start	Finish	Total Float	Labor Units	Material Cost
BLDGI-31072	T6 MS - PO Awarded for mechanical installation for F37 building	0		24-Apr-25	670	0	0
No Components		753	31-Mar-22	01-Apr-25	311	74	2,202,921
BLDGI-28602	T6 MS - Acquisition Plan Started for LCW System	0		31-Mar-22	301	0	0
BLDGI-28612	Prepare Acquisition Plan for LCW System	32	01-Apr-22	16-May-22	301	0	0
BLDGI-28622	Review and Approve Acquisition Plan by PIP-II Procurement Manager for LCW System	32	17-May-22	30-Jun-22	301	0	0
BLDGI-28632	T6 MS - Acquisition Plan Approved for LCW System	0		30-Jun-22	301	0	0
BLDGI-28452	Prepare REQ for LCW System (L)	35	03-Jan-23	21-Feb-23	177	8	0
BLDGI-28462	REQ Approval Cycle for LCW System	15	22-Feb-23	14-Mar-23	177	0	0
BLDGI-28472	T6 MS - REQ Approved for LCW System	0		14-Mar-23	177	0	0
BLDGI-28642	T6 MS - DOE Notified REQ is =>$1M for LCW System	0		14-Mar-23	177	0	0
BLDGI-28482	Support Procurement for LCW System (L)	128	15-Mar-23	13-Sep-23	177	16	0
BLDGI-28492	T6 MS - PO Awarded for LCW System	0		13-Sep-23	177	0	0
BLDGI-28502	SVT Vendor Supplies and Delivers LCW System - Batch 1 of 5 - Utility Plant LCW	20	14-Sep-23	11-Oct-23	177	0	0
BLDGI-28512	T6 MS - Delivery of LCW System - Batch 1 of 5 - Utility Plant LCW	0		11-Oct-23	479	0	0
BLDGI-28552	QC Inspect LCW System - Batch 1 of 5 - Utility Plant LCW (L)	23	12-Oct-23	13-Nov-23	479	8	0
BLDGI-28522	SVT Vendor Supplies and Delivers LCW System - Batch 2 of 5 - RFQ Skids	56	12-Oct-23	05-Jan-24	177	0	0
BLDGI-28562	ACCEPT Delivery of LCW System - Batch 1 of 5 - Utility Plant LCW (M&S)	1	14-Nov-23	14-Nov-23	479	0	1,182,563
BLDGI-28532	T6 MS - Delivery of LCW System - Batch 2 of 5 - RFQ Skids	0		05-Jan-24	415	0	0
BLDGI-28572	QC Inspect LCW System - Batch 2 of 5 - RFQ Skids (L)	20	08-Jan-24	05-Feb-24	415	12	0
BLDGI-29892	SVT Vendor Supplies and Delivers LCW System - Batch 3 of 5 - Linac Tunnel (hosings & cnxns & compresse	146	08-Jan-24	01-Aug-24	177	0	0
BLDGI-28582	ACCEPT Delivery of LCW System - Batch 2 of 5 - RFQ Skids (M&S)	1	06-Feb-24	06-Feb-24	415	0	142,249
BLDGI-29902	T6 MS - Delivery of LCW System - Batch 3 of 5 - Linac Tunnel (hosings & cnxns & compressed air & N2)	0		01-Aug-24	405	0	0
BLDGI-29912	QC Inspect LCW System - Batch 3 of 5 - Linac Tunnel LCW (L)	20	02-Aug-24	29-Aug-24	405	10	0
BLDGI-29932	SVT Vendor Supplies and Delivers LCW System - Batch 4 of 5 - Linac Gallery (hosings & connections)	124	02-Aug-24	03-Feb-25	177	0	0
BLDGI-29922	ACCEPT Delivery of LCW System - Batch 3 of 5 - Linac Tunnel (hosings & cnxns & compressed air & N2) (M&	1	30-Aug-24	30-Aug-24	405	0	268,451
BLDGI-29942	T6 MS - Delivery of LCW System - Batch 4 of 5 - Linac Gallery (hosings & connections)	0		03-Feb-25	177	0	0
BLDGI-29972	SVT Vendor Supplies and Delivers LCW System - Batch 5 of 5 - BTL (hosings & connections)	20	04-Feb-25	03-Mar-25	311	0	0
BLDGI-29952	QC Inspect LCW System - Batch 4 of 5 - Linac Gallery (hosings & connections) (L)	20	04-Feb-25	03-Mar-25	177	10	0
BLDGI-29982	T6 MS - Delivery of LCW System - Batch 5 of 5 - BTL (hosings & connections)	0		03-Mar-25	311	0	0
BLDGI-29962	ACCEPT Delivery of LCW System - Batch 4 of 5 - Linac Gallery (hosings & connections) (M&S)	1	04-Mar-25	04-Mar-25	177	0	544,458
BLDGI-29992	QC Inspect LCW System - Batch 5 of 5 - BTL (hosings & connections) (L)	20	04-Mar-25	31-Mar-25	311	10	0
BLDGI-30002	ACCEPT Delivery of LCW System - Batch 5 of 5 - BTL (hosings & connections) (M&S)	1	01-Apr-25	01-Apr-25	311	0	65,200
BLDGI-28592	T6 MS - Accept Final Delivery of LCW System	0		01-Apr-25	311	0	0
Inst - BldgI - Mech - Installation		485	05-Jun-24	11-May-26	583	635	827,184
Components: 01 01		175	28-Aug-25	11-May-26	583	0	185,000
BLDGI-30602	Accept miscellaneous materials for installation of mechanical equipment in F37 building (M&S)	175	28-Aug-25	11-May-26	583	0	10,000
BLDGI-31082	SVT Vendor Supplies and Delivers mechanical installation for F37 building	175	28-Aug-25	11-May-26	583	0	0
BLDGI-31122	ACCEPT Delivery of mechanical installation for F37 building (M&S)	175	28-Aug-25	11-May-26	583	0	175,000
BLDGI-31132	T6 MS - Accept Final Delivery of mechanical installation for F37 building	0		11-May-26	583	0	0
No Components		169	05-Jun-24	07-Feb-25	342	635	642,184
BLDGI-20292	Receive Services for Mechanical Installation in Utility Plant (LCW) (M&S)	116	05-Jun-24	15-Nov-24	395	0	627,184
BLDGI-27922	Receive Engineering Services for Mechanical Installation in Utility Plant (LCW) (M&S)	116	05-Jun-24	15-Nov-24	395	0	15,000
BLDGI-20332	Support to Mechanical Installation in Utility Plant (LCW) (L)	116	05-Jun-24	15-Nov-24	342	435	0
BLDGI-23672	Support to Mechanical Installation in Utility Building - Qtr4 FY23 (scope may be integrated with CF) (L)	53	18-Nov-24	07-Feb-25	342	200	0