



Cost and Schedule

D. Sherese Humphrey PIP-II Beam Instrumentation Laser Wire Final Design Review May 2, 2024 A Partnership of: US/DOE India/DAE Italy/INFN UK/UKRI-STFC France/CEA, CNRS/IN2P3 Poland/WUST



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Summary Schedule

	T		Andread Manager Manager	
Activity Name	Free Float	Total Float	2021 2022 2023 2024 2025 Q1 Q2 Q3 Q4 Q1 Q2 Q3	2026 2027 2028 2029 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02
HO MS - Beam Instrumentation Ready for Beam Commissioning at PIP2IT	0	0		
HO MS - BI Laser System ready for Beam Testing	0	0		
HO MS - Transverse Emittance Monitor: Linac Software ready for Checkout	100	763		We have sufficient total float
HO MS - Cables inside of Racks ready for installation	100	445		we have sufficient total hoat
HO MS - Transverse Emittance Monitor: LEBT and MEBT DAQ and Controls ready for installation	100	385		to accomplish milestones
HO MS - Transverse Emittance Monitor: MEBT Pickup ready for installation	100	365		to accompnish milestories
HO MS - Transverse Profile Monitor: Wire Scanner Pickup ready for WFE Installation	100	297		associated with the laser
HO MS - BCM Pickup Ready for Installation into WFE	100	456		associated with the laser
HO MS - Transverse Emittance Monitor: LEBT Pickup ready for installation	100	295		wire scope
HO MS - Transverse Profile Monitor: Wire Scanner Electronics ready for WFE Installation	100	304		whe scope.
HO MS - Transverse Profile Monitor: Wire Scanner Electronics ready for BTL Installation	0	540		
HO MS - DCCT Pickup Ready for Installation into SCLinac	0	350		
HO MS - BPM Pickup Components ready for installation	100	326		
HO MS - Toroid Pickup Ready for Installation into SCLinac	100	509		
HO MS - WCM Pickup Ready for Installation into SCLinac	0	325		
HO MS - Scraper Electronics ready for WFE Accelerator Systems Installation	26	146		
HO MS - Transverse Profile Monitor: Laser Wire Electronics ready for HB650 Installation	100	468		
HO MS - Transverse Profile Monitor: Laser Wire Electronics ready for WFE Installation	100	625		
HO MS - Transverse Profile Monitor: Laser Wire Electroncs ready for SSR2 Installation	100	416		
HO MS - Transverse Profile Monitor: Laser Wire Electronics ready for LB650 Installation	100	479		
HO MS - Transverse Profile Monitor: Laser Wire Electronics ready for SSR1 Installation	100	320		
HO MS - BPM Chopper Electronics and Software ready for Installation	67	154		
HO MS - Transverse Profile Monitor: Wire Scanner Pickup ready for BTL Installation	100	575		
HO MS - Toroid Pickup Ready for Installation into BTL	100	709		
HO MS - BPM Electronics Ready for Installation	25	112		
HO MS - Neutron Detectors in Linac ready for installation	4	110		
HO MS - Longitudinal Profile Monitor System Ready for beam commissioning at PIP-II	100	434		
HO MS - BCM DAQ Electronics ready for Installation into WFE	0	87		
HO MS - Transverse Profile Monitor: Laser Wire Pickup ready for WFE Installation	33	139		
HO MS - Transverse Profile Monitor: Laser Wire Pickup ready for SSR2 Installation	0	185		
HO MS - Transverse Profile Monitor: Laser Wire Pickup ready for LB650 Installation	100	294		
HO MS - Transverse Profile Monitor: Laser Wire Pickup ready for HB650 Installation	100	294		
HO MS - Transverse Profile Monitor: Laser Wire Pickup ready for SSR1 Installation	0	185		
HO MS - Front-end Equipment in Transport Racks ready for installation	100	717		
HO MS - PMT Loss Monitors in Linac ready for installation	76	220		
HO MS - Ionization Loss Monitors in Transport Line ready for installation	100	717		
HO MS - Ionization Loss Monitors in Linac ready for installation	100	266		
HO MS - Front-end Equipment in Linac Racks ready for installation	100	140		
HO MS - BCM DAQ Software ready for Checkout of WFE	56	143		
HO MS - WCM Pickup Ready for Installation into BTL	40	398		
HO MS - BCM DAQ Hardware ready for BTL Installation	0	358		
HO MS - BCM DAQ Electronics ready for SCLinac Installation	100	208		
HO MS - BCM DAQ Electronics ready for BTL Checkout	100	587		
HO MS - BCM DAQ Software ready for SCLinac Checkout	100	224		
HO MS - Transverse Profile Monitor: Laser Wire System ready for Non-Beam Commissioning	100	414		
HO MS - BPM Software ready for Checkout	100	207		



Cost

Work Breakdown Structure	Estimate	Direct Hours	Direct M&S	Full Burden + Esc
121.03.09.03.03.01 AccS - BI - PIP-II - BProMS - Transverse Profile Monitor	01 Design	1,224	\$0	\$172,224
	02 Laser Wire FDR	661	\$0	\$92,129
	03 Laserwire Beamline Components	6,296	\$0	\$983,727
	04 Optical Transport Line	872	\$0	\$126,047
	06 DAQ and Controls Hardware	696	\$0	\$128,336
	Labor	9,749	\$0	\$1,502,463
	03 Laserwire Beamline Components	0	\$1,264,275	\$1,611,962
	04 Optical Transport Line	0	\$249,104	\$322,424
	05 Laser System	0	\$245,953	\$258,251
	06 DAQ and Controls Hardware	0	\$203,971	\$264,007
	Material	0	\$1,963,303	\$2,456,643
	Grand Total	9,749	\$1,963,303	\$3,959,106
	FTE	5.5		



PIP-II Laser Wire Final Design Review



Resources

- Laser Wire effort of order 5.5 FTE
- Technical demand rises to build production units
- Resource demand drop with handoff to installation and commissioning with beam
 - Still have BI personnel working under installation and commissioning
- Resources needs identified in P6
 - Actively recruiting new hires
 - Engineering physicist hired in 2023
 - Two electrical engineers hired in 2023
 - Two electrical engineers lost in the past year
 - Part-time technicians coming from College Of DuPage
 - DOE funding agreement
- Coordinating with directorate for additional personnel



Total PIP-II Beam Instrumentation Staffing Plan



Laser Wire Procurement Planning

- Laser Wire Beamline Hardware
 - 1st Units for Vacuum, Optical Components, and Stand
 - Remaining production ordering will occur post-first units assembly and evaluation
 - Orders from a single vendor exceeding \$250K will require Procurement Readiness Review (PRR)
- Bundled Procurements (primarily <\$250K)
 - Optical Transport Line
 - Laser System
 - DAQ and Controls Hardware
- Assembly and Testing will be performed in-house



Summary

- Overall scheme, scope of work is \$4M
- Labor and M&S budget identified, working against this plan
 - Labor estimates will be reassessed to ensure staffing plans remain adequate
- Bulk of cost is M&S
- Work expected to be completed well before needed

