NPS Initial Installation

Feb, 3, 2023 Steven Lassiter

Contents

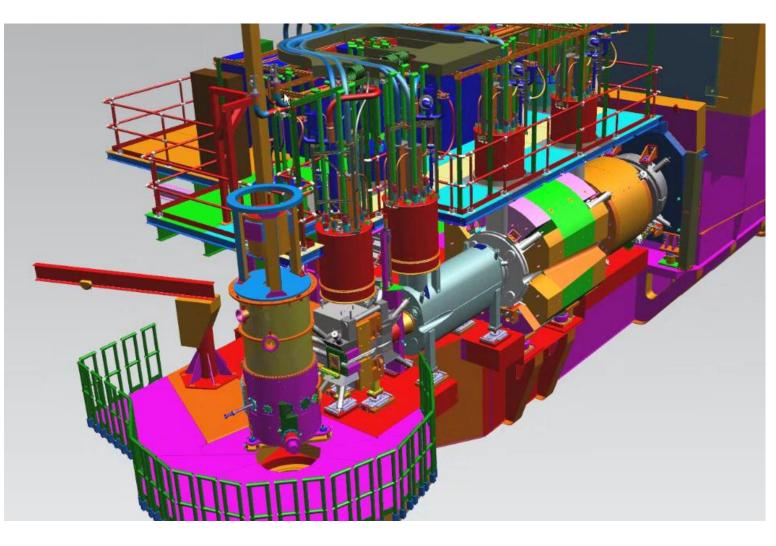
- Week One activities
- HB removal
- Target Work
- NPS Magnet installation
- Detector Installation
- Cables
- Beam Line
- NPS installation Schedule

Week One

- Day one: Beam Off Move SHMS to min angle (for roof block removal access) Turn off cryo to HB Let up SHMS Spectrometer Vacuum
- Radiation Cool off period 6 to 7 days
- Recovery of Ca-40 target by target group (Move SHMS as needed)
- Let up Downstream vacuum
- Remove downstream beamline (front section at least)

HB removal

- Turn off Cryo- warm up magnet 1 week to 10 days
- Remove shielding, collimators, PSU DC bus cables.
- Un-sting U-tubes
- Remove cabling, relief trees, install protection devices, remove support structures.
- Rig lifting ring to crane and maneuver off SHMS.
- If target has to taken off pivot, add 5 days prep work before lifting HB off and 14 days after to re-install target. Cryo group will be greatly impacted by the target removal. Schedules will effected.



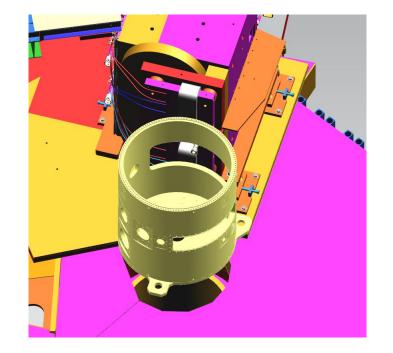
HB 1st lift onto SHMS

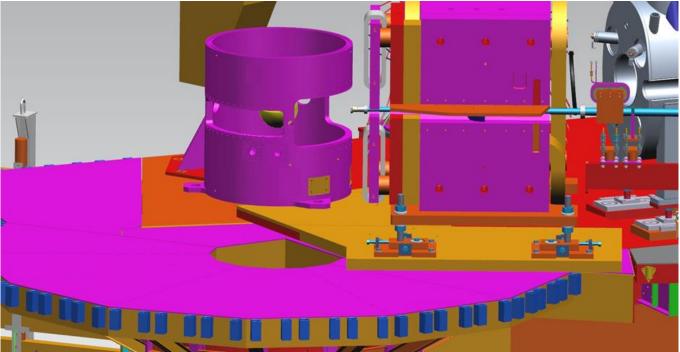




Target work

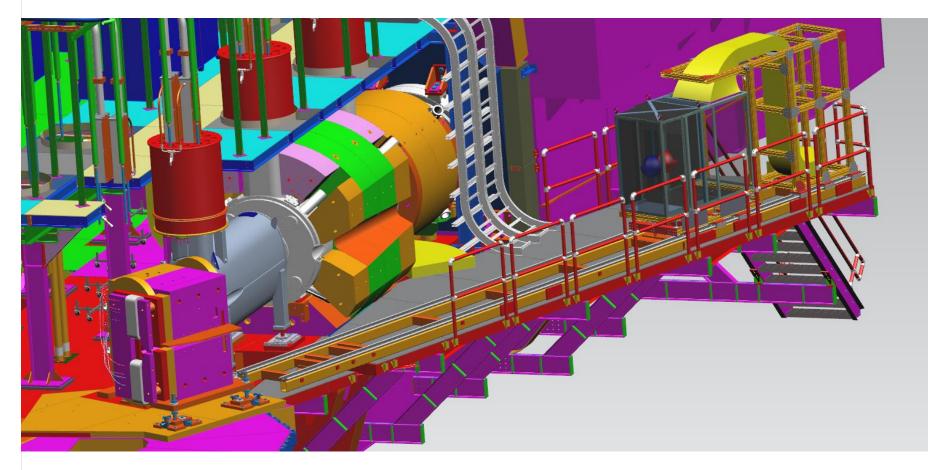
- Target work may need to be completed before NPS can be installed on the SHMS.
- NPS may prevent access to inside target chamber and block survey's ferro arm from doing alignment.
- 10 cm Target Cell length is only option for this time frame.
- SHMS can be rotated to larger angles and this may give clearance.





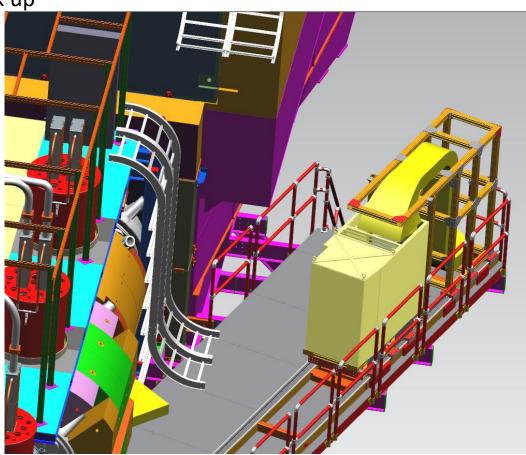
NPS Magnet Installation

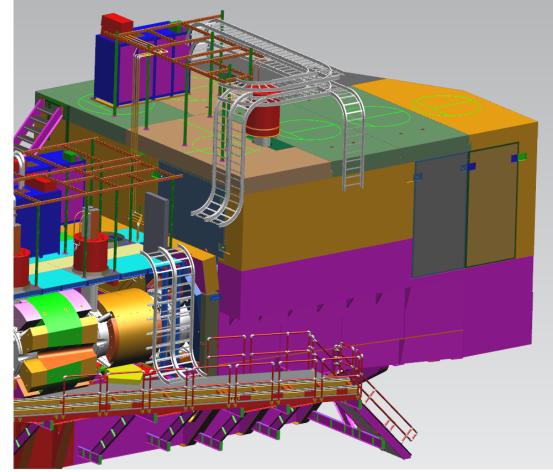
- NPS Platform installation
- Pivot platform reenforcement
- NPS magnet base installed
- Detector rails installed
- Magnet installed after target work is completed.
- Power supplies and infrastructure installed
- Some work can occur concurrently



Detector and Cables

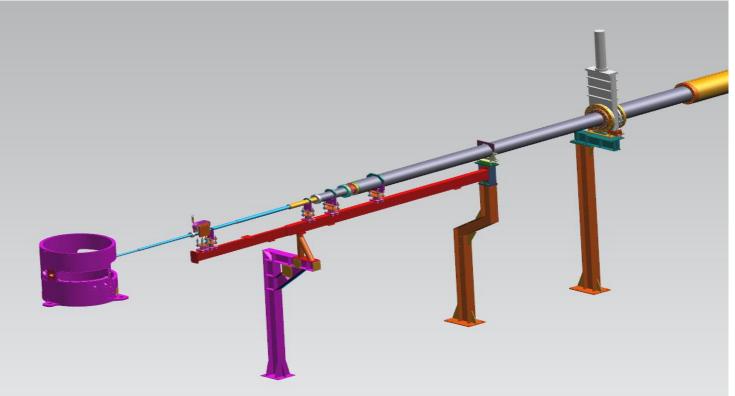
- Prep work for moving detector, cables and associated components.
- Cable tray and patch panel installation.
- Transport detector to Hall floor, then install on rails.
- Install Cable carrier
- Un-Spool cables.
- Cable hook up





Beam line

- Downstream corrector magnet installation
- 24" gate valve repairs
- Assembly beamline, connect to target chamber window, pump out, leak check and align.
- Re-install SHMS roof block and shielding



D	Task Name	Work Days	Start	Finish	Predecessors		Qtr 2, 2023					Qtr 3, 2023
						17 22 27	April 2023	16 21 2	May 2023	June 2023 26 31 5 10 15 20 2	July 20	123
1	NPS Mechanical Installation	80 days	Mon 3/20/23	Fri 7/7/23								1
2	Beam Off	1 day	Mon 3/20/23	Mon 3/20/23		Ч						
3	Radiation cool down period	6 days	Tue 3/21/23	Tue 3/28/23	2							
4	Target removal Ca-40 Bagged	1 day	Fri 3/31/23	Fri 3/31/23			5					
5	DS Beamline Removal & Pivot cleanup	2 days	Mon 4/3/23	Tue 4/4/23	4		1		_			
6	SHMS Shield Hut roof block removed for modifying	1 day	Mon 3/20/23	Mon 3/20/23		Ь						
7	SHMS Shield Hut roof block modifications-as tech pool is available	30 days	Tue 3/21/23	Mon 5/1/23	6	-						
8	HB Removal	18.05 days	Mon 3/20/23	Thu 4/13/23			1					
9	Target Chamber removal from Pivot (if needed)	5 days	Mon 4/3/23	Fri 4/7/23	4				_			
10	Target Platform Re-enforcement Install	7 days	Mon 4/10/23	Tue 4/18/23				h	_			
11	Sweeper Magnet Slider Plate Install	2 days	Wed 4/19/23	Thu 4/20/23	10			_	_			
12	Sweeper Magnet Slider Plate Alignment	2 days	Fri 4/21/23	Mon 4/24/23	11							
13	Transport Magnet to hall (May be done prior to SAD-23)	2 days	Mon 1/9/23	Tue 1/10/23					_			
14	Sweeper Magnet Support Installation to magnet	2 days	Tue 4/25/23	Wed 4/26/23	12				_			
15	Re-install Target chamber on pivot (if needed)	14 days	Wed 4/19/23	Mon 5/8/23	10							
16	Targets are installed and algined within chamber.	5 days	Mon 4/17/23	Fri 4/21/23				ь				
17	Crane Sweeper Magnet onto SHMS Platform	2 days	Mon 4/24/23	Tue 4/25/23	16							
18	Survey and align Sweeper magnet	3 days	Wed 4/26/23	Fri 4/28/23	17							
19	Install Cable tray inside SHMS Hut	14 days	Thu 4/13/23	Wed 5/3/23	8							
20	Detector Platform Install/stairs/handrails	4 days	Wed 4/19/23	Mon 4/24/23	10							
21	Detector Rail main sections install	3 days	Tue 4/25/23	Thu 4/27/23	20							
22	Detector Rail main sections Survey / Alignment	3 days	Fri 4/28/23	Tue 5/2/23	21							
23	Move Detector into Hall	2 days	Wed 5/3/23	Thu 5/4/23	22				-			
24	Detector Installation onto platform (no cable hook up)	2 days 2 days	Fri 5/5/23	Mon 5/8/23	23							
25	Move Detector towards pivot and secure in place for cable	1 day	Tue 5/9/23	Tue 5/9/23	23							
	hookup	1 day	100 5/ 5/ 25	142 5/5/25	24							
26	Mount and align rails section used in transporting detector	2 days	Wed 5/10/23	Thu 5/11/23	25				- -			
27	Mount Cable Carrying Cart to rails	2 days	Fri 5/12/23	Mon 5/15/23	26							
28	Cabling Tray and Support Installation	4 days	Wed 5/10/23	Mon 5/15/23	25							
29	Cable layout in trays and on deck	5 days	Tue 5/16/23	Mon 5/22/23	28							
30	Cooling lines and cooler installed	4 days	Tue 5/16/23	Fri 5/19/23	28				· · · · · · · · · · · · · · · · · · ·			
31	Cable connections Calorimeter/Patch Panels/Shield Hut	10 days	Tue 5/16/23	Mon 5/29/23	28					<u> </u>		
32	Detector cooling connections made up	2 days	Tue 5/30/23	Wed 5/31/23	31					-		

Task Name	Work Days	ssiter\Documents\NP Start	Finish					
	Work Days	Start	Finish	Dradacaccord				
Detector Survey / Alignment			Finish	Predecessors	Qtr 2, 2023		Qtr 3, 2023	
Detector Survey / Alignment					April 2023 17 22 27 1 6 11 16 21 2	May 2023 6 1 6 11 16 21 26	June 2023 31 5 10 15 20 25	30 5 10 15
Detector Survey / Augment	3 days	Tue 5/30/23	Thu 6/1/23	31			(
PS Magnet PSU Install	15 days	Wed 4/26/23	Tue 5/16/23	17	ř			
Measure for connections, LCW, AC and DC and order materials	2 days	Wed 4/26/23	Thu 4/27/23					
PSU put in place within Hall (may be done prior to SAD-23)	1 day	Wed 4/26/23	Wed 4/26/23					
LCW connections	6 days	Fri 4/28/23	Fri 5/5/23	35	ľ			
AC power connections	13 days	Fri 4/28/23	Tue 5/16/23	35	ľ			
DC Bus connections	13 days	Fri 4/28/23	Tue 5/16/23	35	ſ			
Instrumentation and controls connections	6 days	Fri 4/28/23	Fri 5/5/23	35	ľ			
Test of Magnet PSU connected to magnet	3 days	Tue 5/2/23	Thu 5/4/23	40,62				
PS Corrector Coil PSU Install	127 days	Tue 1/3/23	Wed 6/28/23					η
stall Shield wall on SHMS lower deck	5 days	Wed 5/17/23	Tue 5/23/23	34		The second se		
ownstream Corrector Magnet PSU Install	173 days	Thu 9/22/22	Mon 5/22/23			1		
stall Down Stream Beam line Configuration A	23 days	Tue 5/23/23	Thu 6/22/23					
HMS HMS Angle verification/check out	2 days	Fri 6/23/23	Mon 6/26/23	97				
stall doghouse on top of SHMS detecut hut roof to cover cable	3 days	Tue 6/27/23	Thu 6/29/23	98				
entration								
PS Mechanically Ready	1 day	Fri 6/30/23	Fri 6/30/23	99				
eld Map NPS magnet on SHMS (Stray Fields)	6 days	Thu 6/29/23	Thu 7/6/23	54				
able hook up and checkout ?????	28 days	Tue 5/30/23	Thu 7/6/23	31				
	Measure for connections, LCW, AC and DC and order materials PSU put in place within Hall (may be done prior to SAD-23) LCW connections AC power connections DC Bus connections Instrumentation and controls connections Test of Magnet PSU connected to magnet PS Corrector Coil PSU Install stall Shield wall on SHMS lower deck ownstream Corrector Magnet PSU Install stall Down Stream Beam line Configuration A HMS HMS Angle verification/check out stall doghouse on top of SHMS detecut hut roof to cover cable entration PS Mechanically Ready eld Map NPS magnet on SHMS (Stray Fields)	PS Magnet PSU Install15 daysMeasure for connections, LCW, AC and DC and order materials2 daysPSU put in place within Hall (may be done prior to SAD-23)1 dayLCW connections6 daysAC power connections13 daysDC Bus connections13 daysDC Bus connections6 daysInstrumentation and controls connections6 daysTest of Magnet PSU connected to magnet3 daysPS Corrector Coil PSU Install127 daysstall Shield wall on SHMS lower deck5 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Other factors

- New safety environment _ paper work, TOSPs, work procedures and more eyes on workers. Work pauses likely.
- Other Hall C SAD_23 jobs occurring in the hall:

HMS LN2 flex line replacement.

PSU LCW Flushing, filter cleaning and internal inspections.

SHMS Q1, HMS Dipole vacuum maintenance.

Cryo line insulating vacuum maintenance.

HMS Rotation panel box re-wired.

- Transporting the detector to the hall Details?
- Fall Protection for U-tube operations Tie off points needed?
- Crane reach for removing SHMS roof block SHMS at 5.5 deg needed?

