

NPS Initial Installation

Feb, 3, 2023

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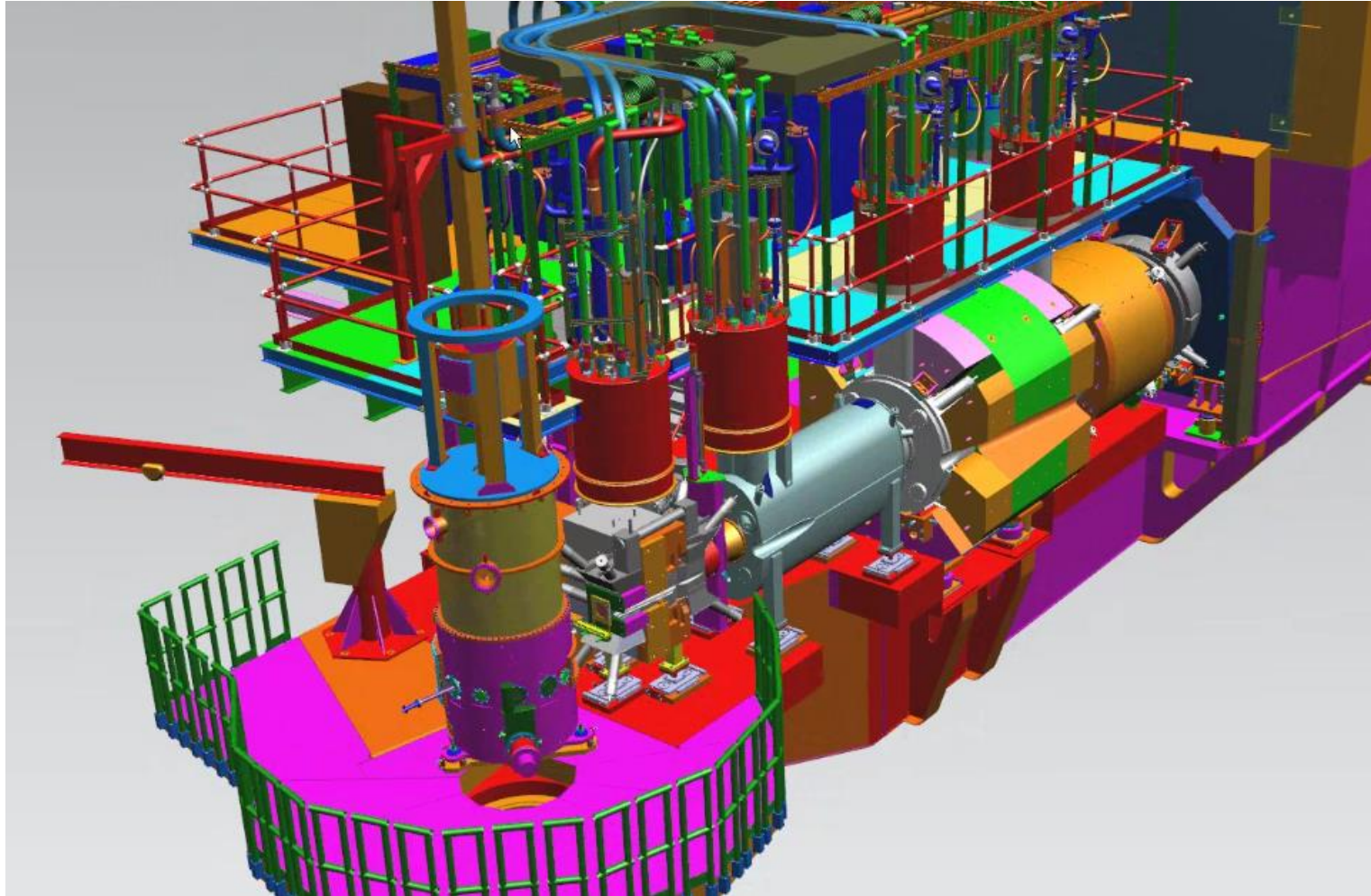
- Week One activities
- HB removal
- Target Work
- NPS Magnet installation
- Detector Installation
- Cables
- Beam Line
- NPS installation Schedule

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.

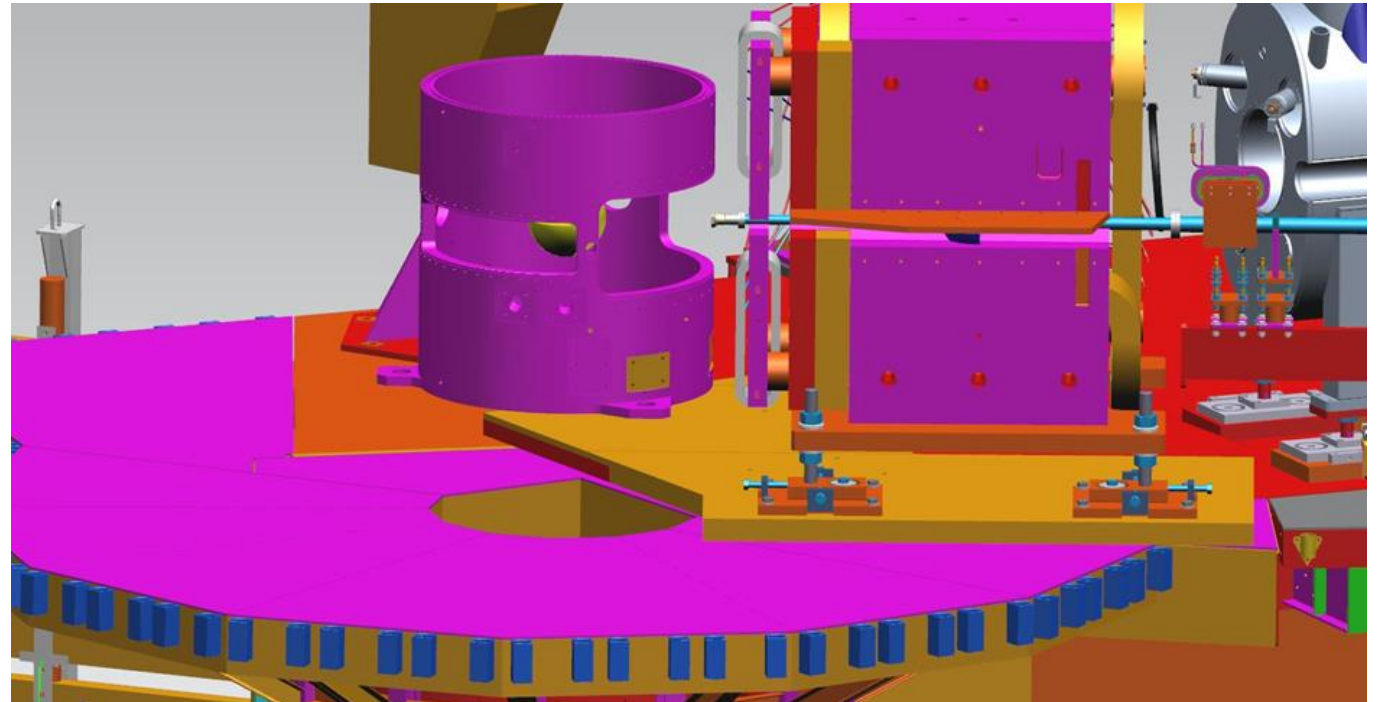
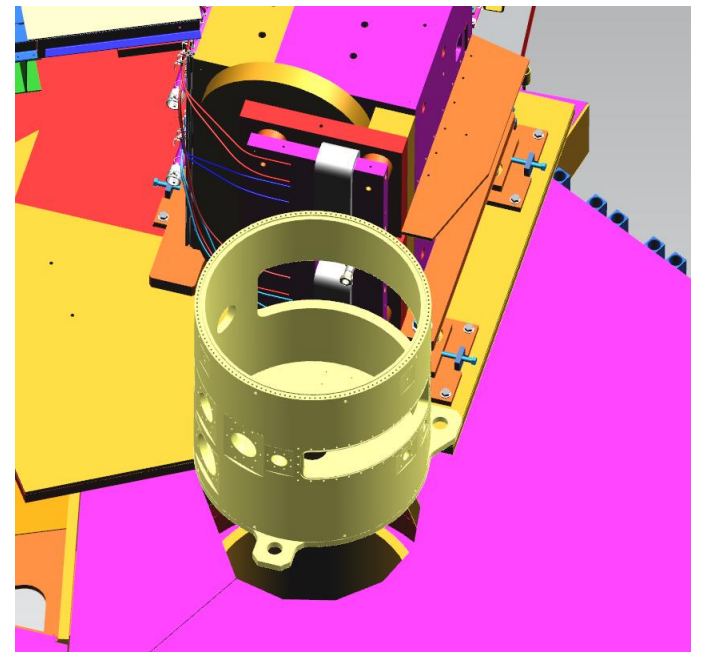


HB 1st lift onto SHMS



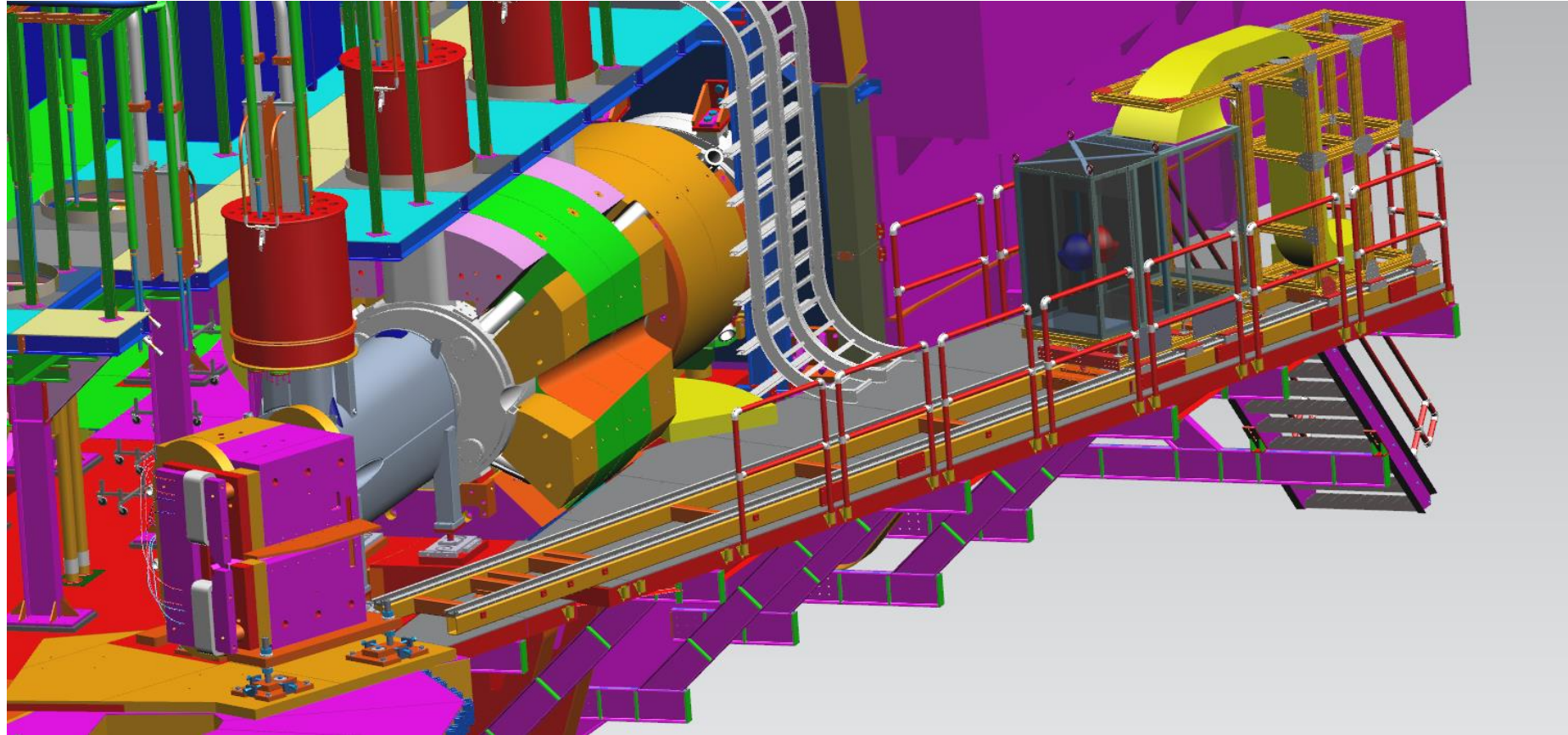
Target work

- 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.



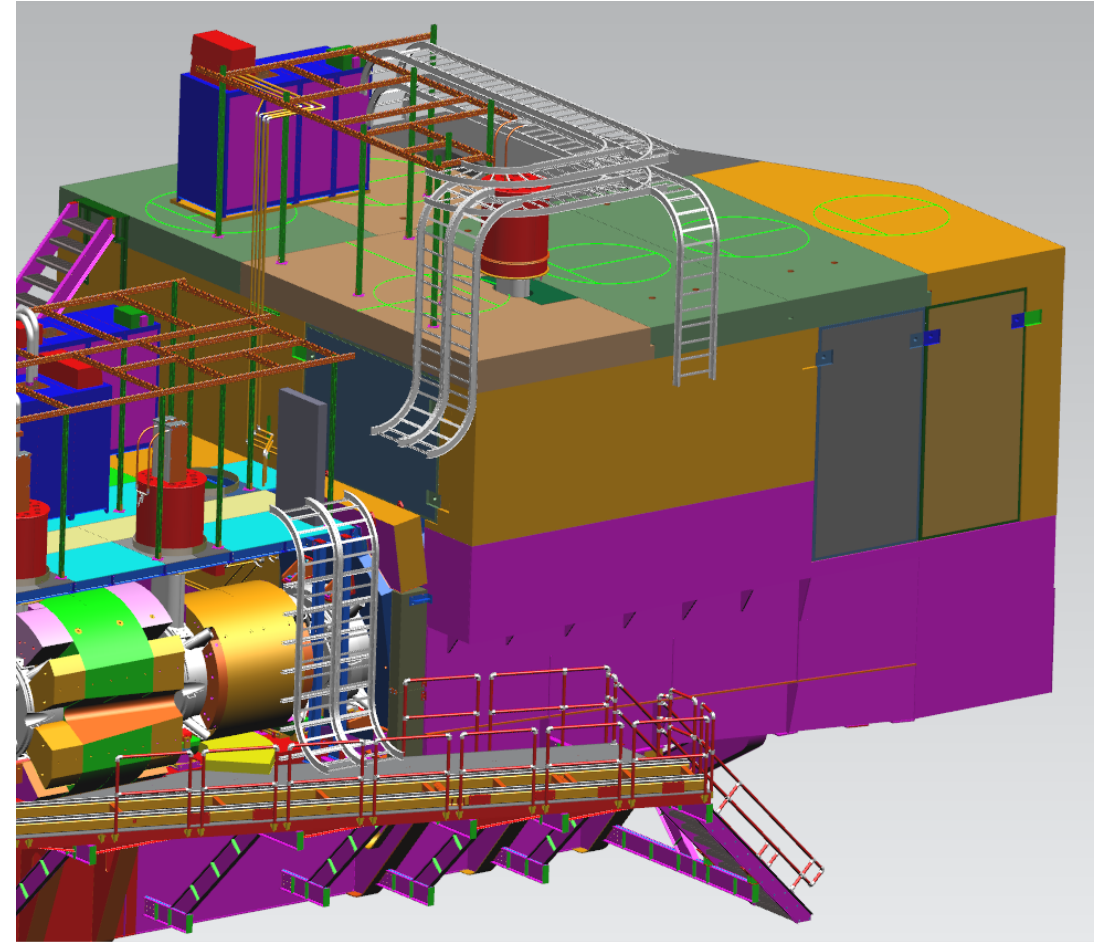
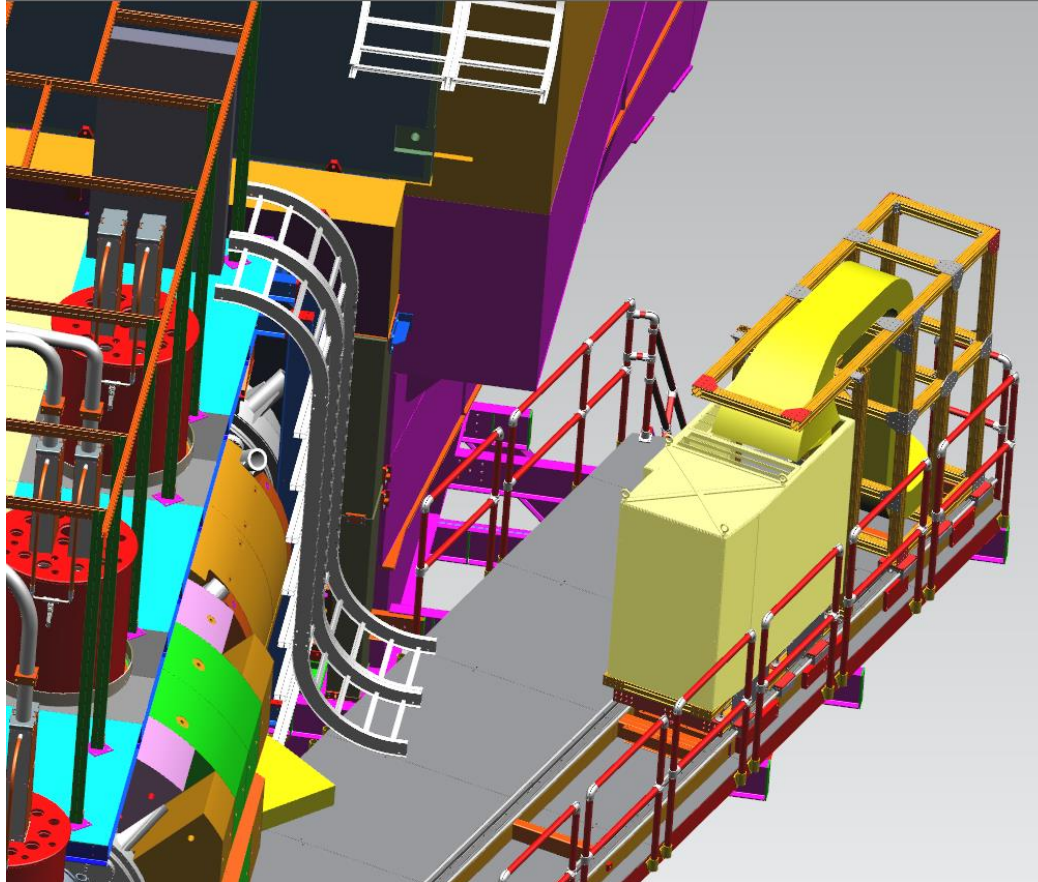
NPS Magnet Installation

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



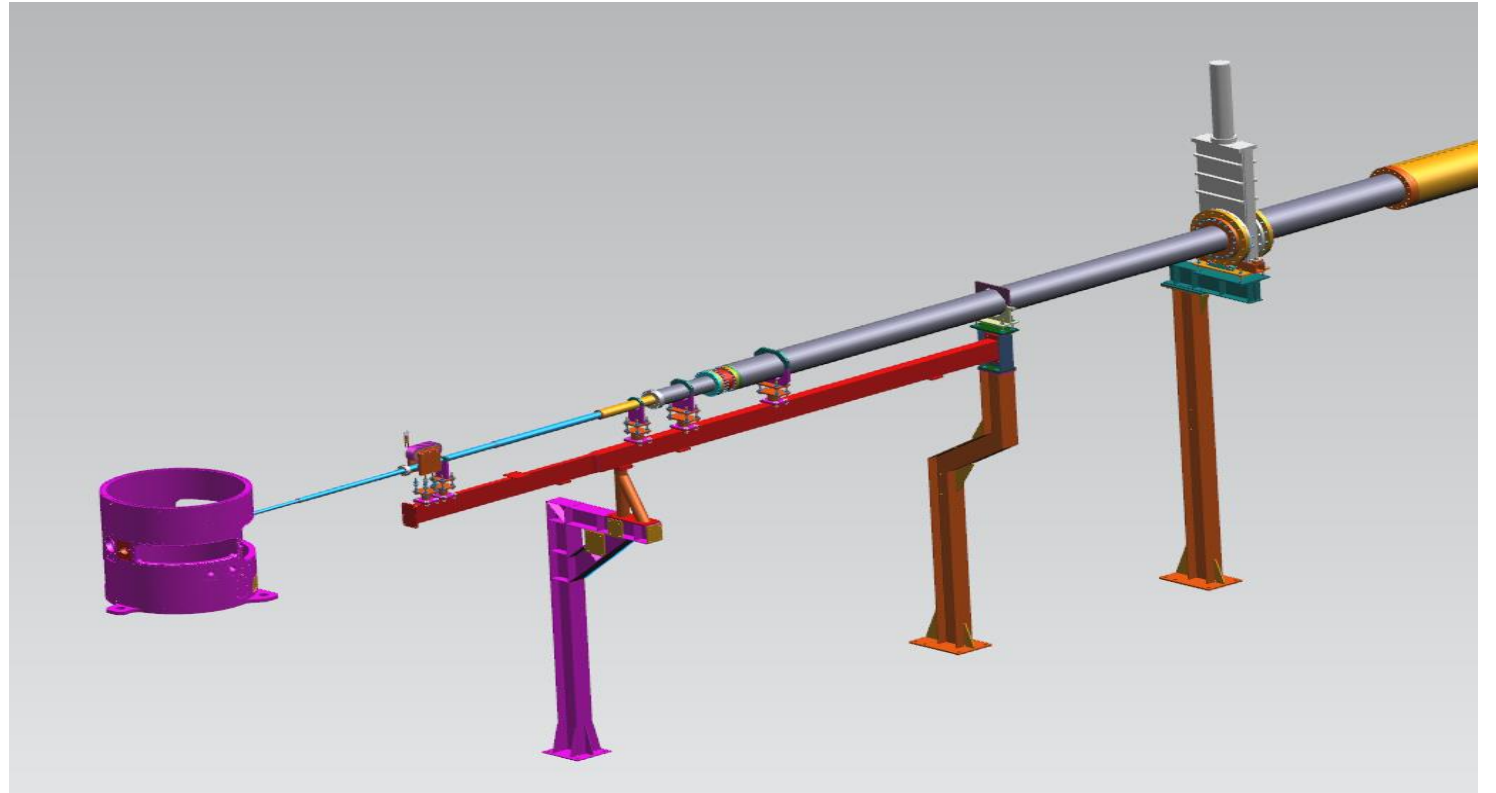
Detector and Cables

- 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



ID	Task Name	Work Days	Start	Finish	Predecessors	Qtr 2, 2023																												Qtr 3, 2023						
						April 2023							May 2023							June 2023							July 2023													
						17	22	27	1	6	11	16	21	26	1	6	11	16	21	26	31	5	10	15	20	25	30	5	10	15										
1	NPS Mechanical Installation	80 days	Mon 3/20/23	Fri 7/7/23																																				
2	Beam Off	1 day	Mon 3/20/23	Mon 3/20/23																																				
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	DS Beamline Removal & Pivot cleanup	2 days	Mon 4/3/23	Tue 4/4/23	4																																			
6	SHMS Shield Hut roof block removed for modifying	1 day	Mon 3/20/23	Mon 3/20/23																																				
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																																				
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																																				
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 aligned within chamber.	5 days	Mon 4/17/23	Fri 4/21/23																																				
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	Fri 5/5/23	Mon 5/8/23	23																																			
25	Move Detector towards pivot and secure in place for cable hookup	1 day	Tue 5/9/23	Tue 5/9/23	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																																			
32	Detector cooling connections made up	2 days	Tue 5/30/23	Wed 5/31/23	31																																			

[illegible]

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?

