

I&I Overview

Fabrice Matchard

Near Site Integration Workshop

16 March 2021



U.S. DEPARTMENT OF
ENERGY

Office of
Science

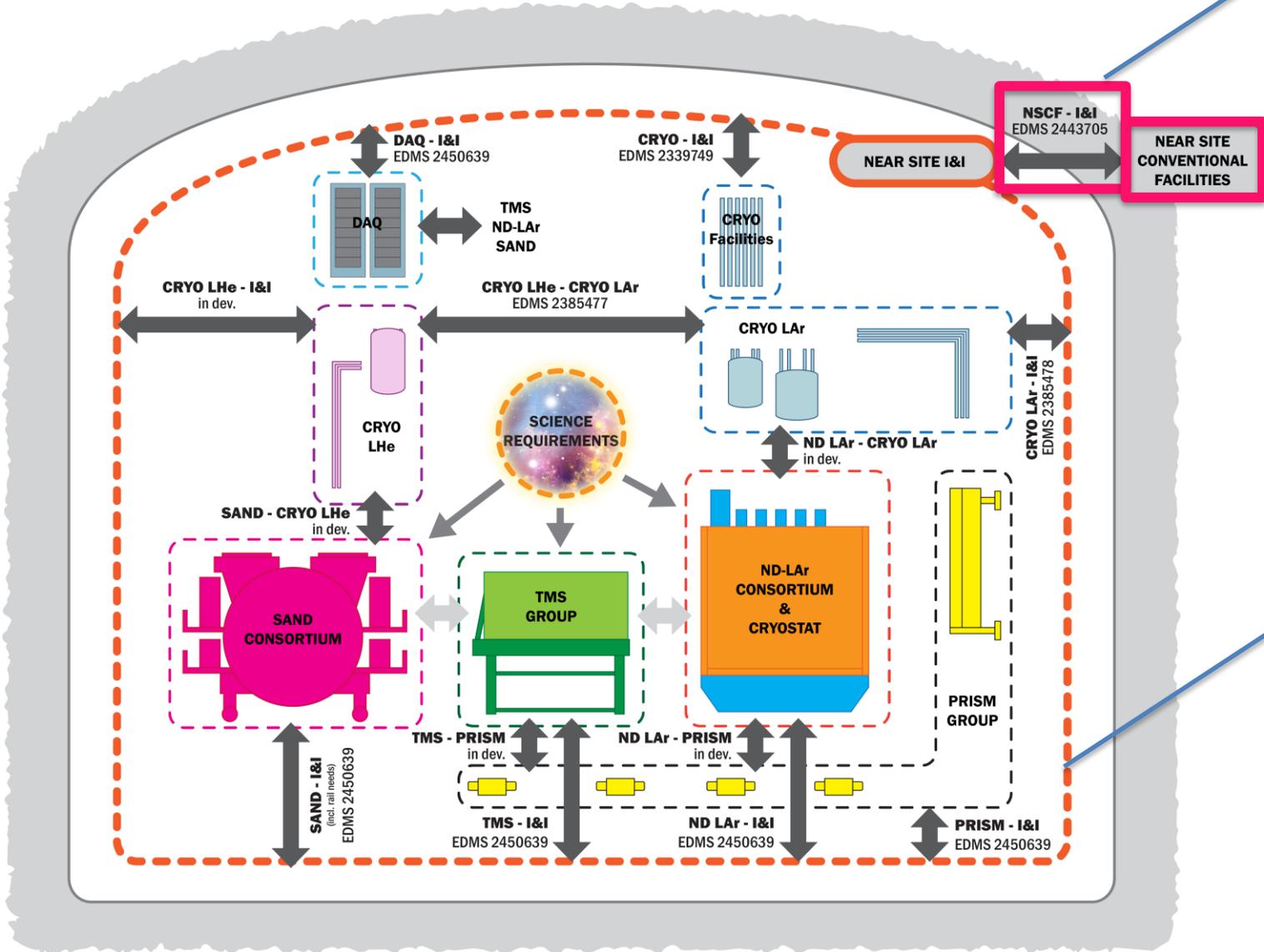
Workshop goals from I&I talks:

- Roadmap to BOE update and PDR (this talk)
 - Validate I&I-NSCF Interface requirements (2nd talk by Gordon)
 - Overview of the Installation sequence (3rd talk by Fabrice/Gordon)

NSCF, Interface and Planning

Details in Gordon's Talk on Interface

Details in Kennedy's Talk on CF



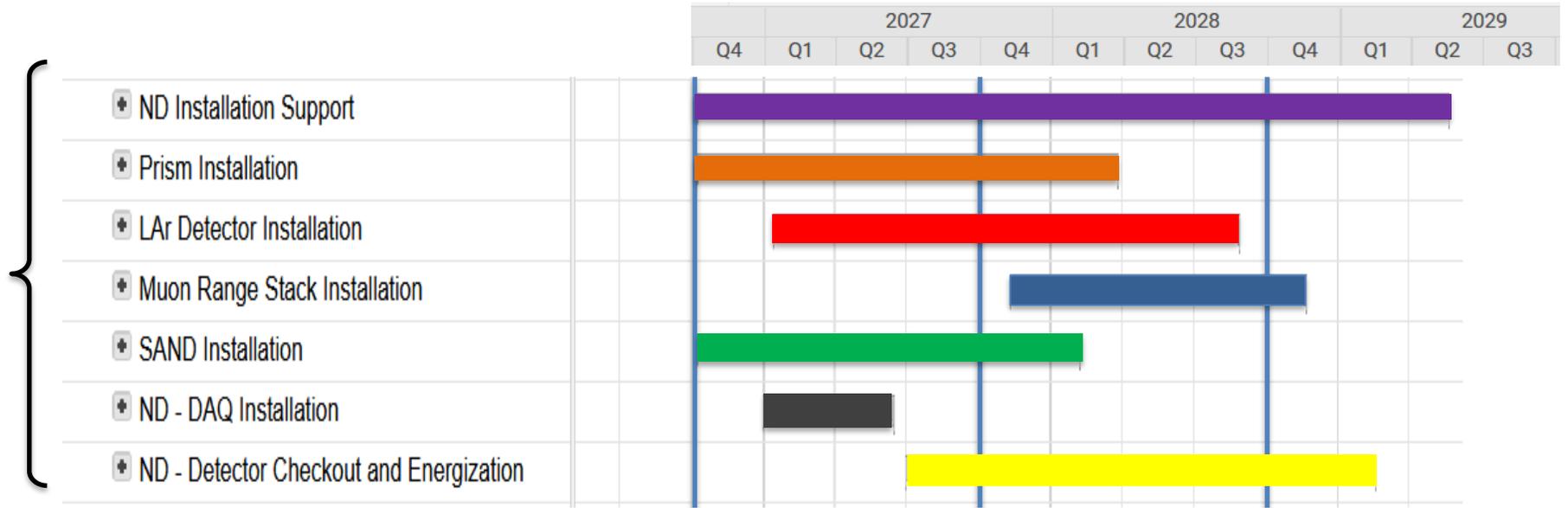
Fabrice's Talk on Installation

Roadmap to PDR:

- 1) Review and consolidate interface & requirements (by Friday March 19th)
Needed for NSCF 60%
- 2) Upload draft schedule (by Friday April 2nd)
Needed to prepare BOE update
- 3) Review Install Sequence and resources (on April 16th)
Needed to complete BOE update due on April 30th
- 4) Kickoff meeting for PDR Prep ~ May 8th
- 5) Second I&I workshop in June

Detectors and Consortia Schedules in P6

131.04.02
Near Site Integration



131.04.02 Near Site Integration

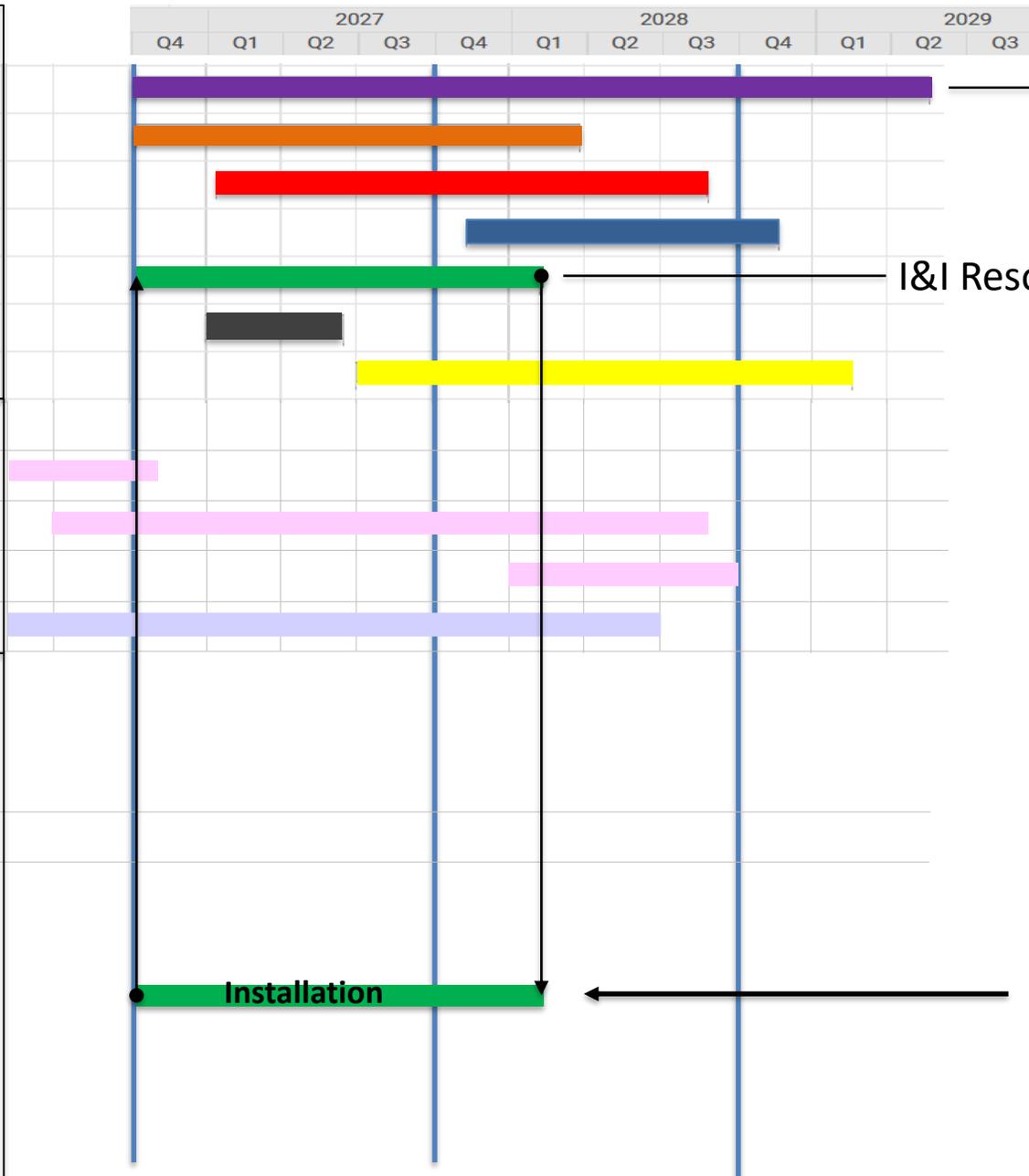
- ✦ ND Installation Support
- ✦ Prism Installation
- ✦ LAr Detector Installation
- ✦ Muon Range Stack Installation
- ✦ SAND Installation
- ✦ ND - DAQ Installation
- ✦ ND - Detector Checkout and Energization

131.01.03.04 Cryo Install

- 131.01.03.04.02.04.01 LAr Cryogenics System Installation - External Equipment
- 131.01.03.04.02.04.02 LAr Cryogenics System Installation - Shaft Equipment
- 131.01.03.04.02.04.03 LAr Cryogenics System Installation - LAr Moving Platform
- 131.01.03.04-571.04.04 LHe Cryogenics System Installation

131.02.03 Near Detector

- ✦ ND Milestones
- ✦ ND Management
- ✦ ND LArTPC
- ✦ ND LArTPC Cryostat
- ✦ ND Muon Spectrometer
- ✦ ND Beam Monitoring
- ✦ ND DAQ and Slow Controls
- ✦ ND PRISM Movement System
- ✦ ND Requirements Validation



I&I Level of effort



I&I Resources for SAND

Installation



I&I Support During the Installation Period

131.04.02.01 NS INTEGRATION PROJECT OFFICE

Detector Lead Engineer 1 FTE (Team/Engineering Coordination)

Detector Integration Engineer 1 FTE (Models Integration)

Detector Installation Engineer 1 FTE (Process Definition/Supervision)

Detector Installation Coordinator 1 FTE (Technicians Manager)

Electrical Installation Coordinator 1 FTE (EE Manager)

131.04.02.02 NEAR DETECTOR FACILITY SUPPORT AND SERVICES

Detector Material Planning 1.3 FTE (Components Coordinator)

Alignment Labor Initial 320 HRS (Develop Network)

Alignment Labor Final 720 HRS (Components Alignment)

131.04.02.03 NEAR DETECTOR INSTALLATION

Technician Crew Lead 1 FTE

Technician Crew Lead 1 FTE

Technician 1 1 FTE

Technician 2 1 FTE

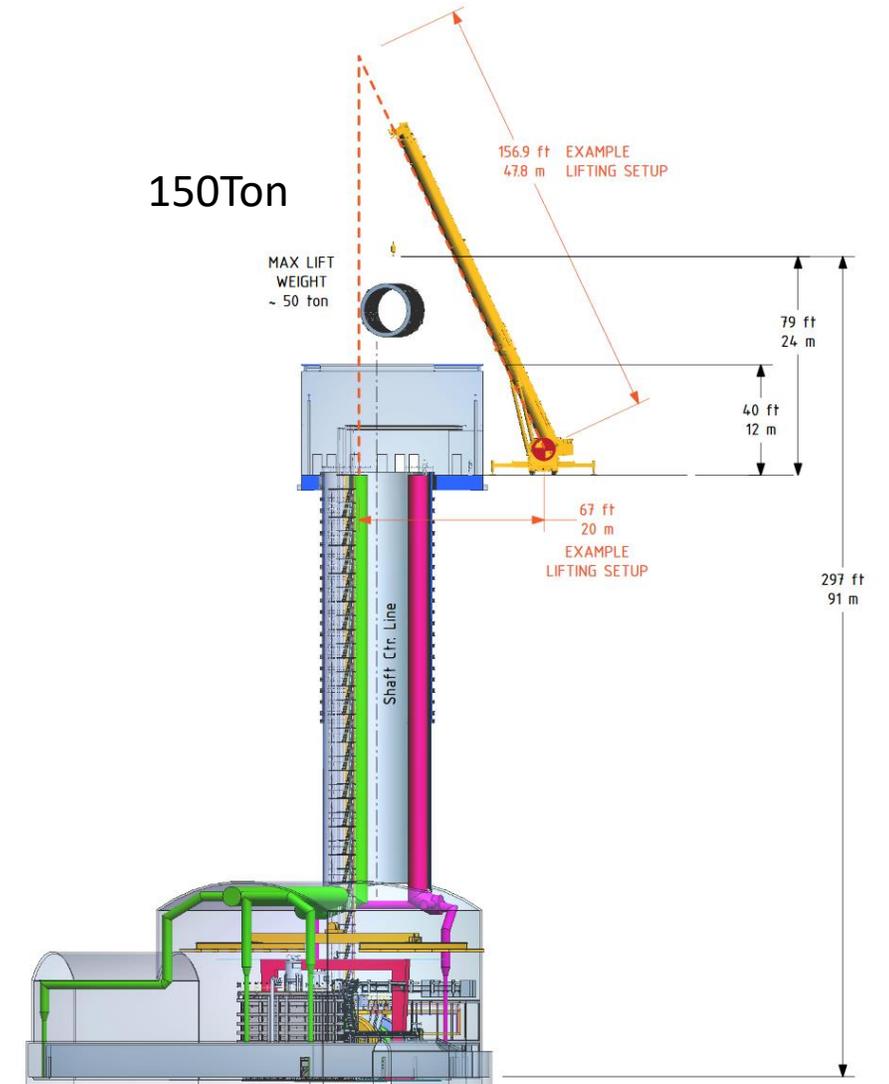
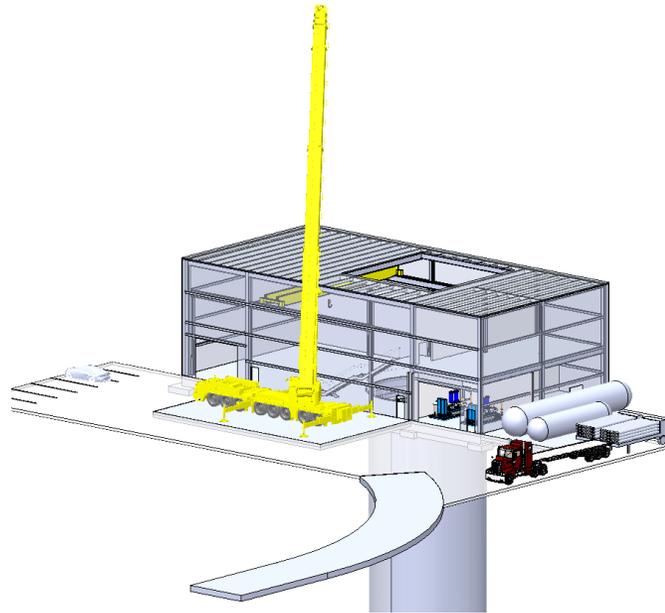
Technician 3 1 FTE

Electrical Technician 1 FTE

External Crane

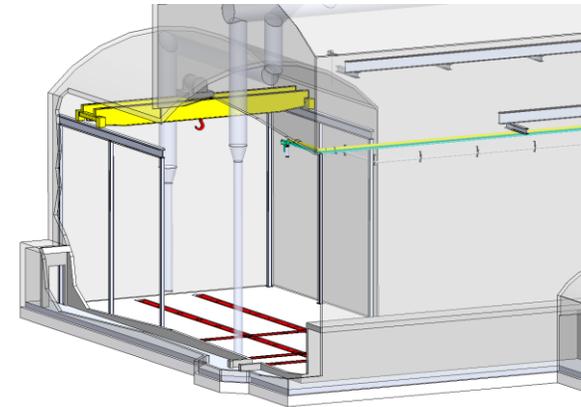
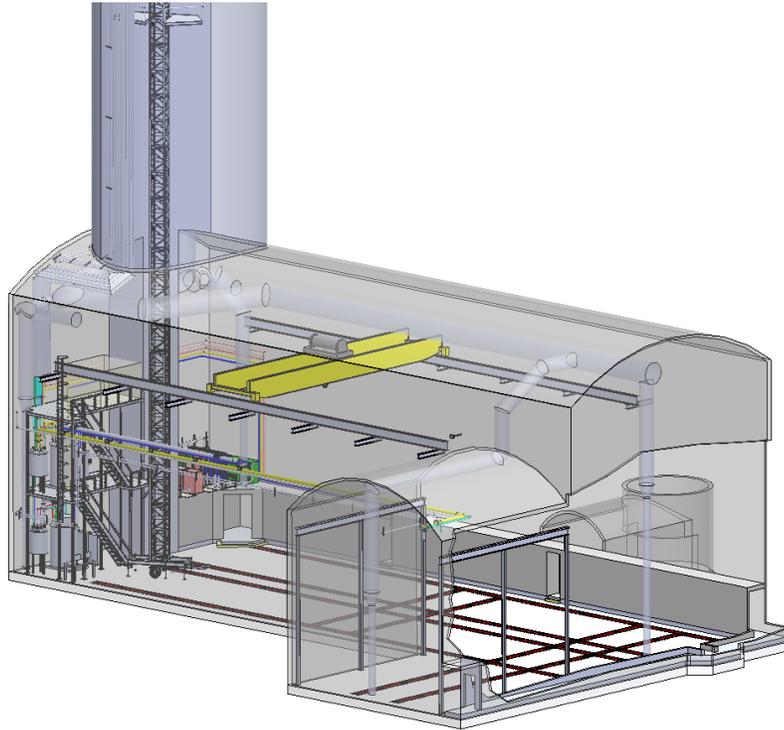
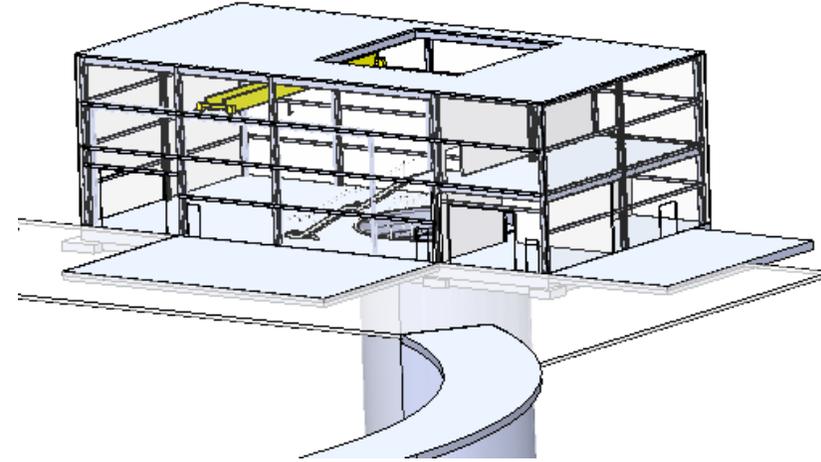
External crane required capacity ~150T

Installation of LAr and GHe storage tanks, lowering of heavy detector components and equipment to cavern

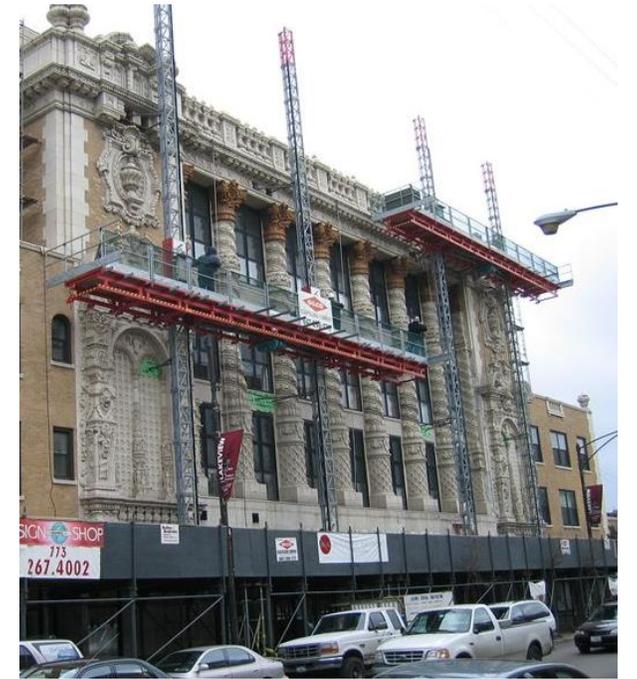
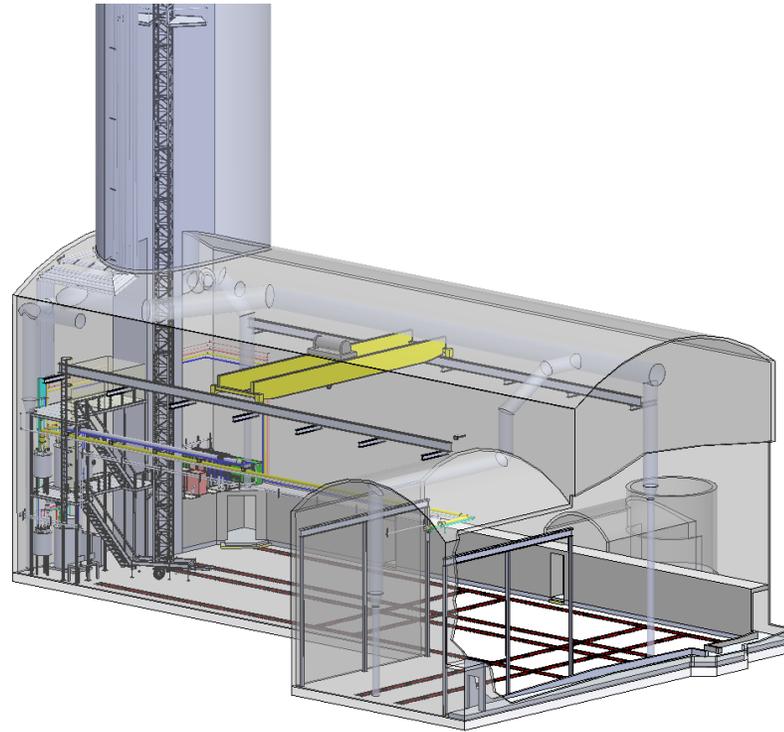
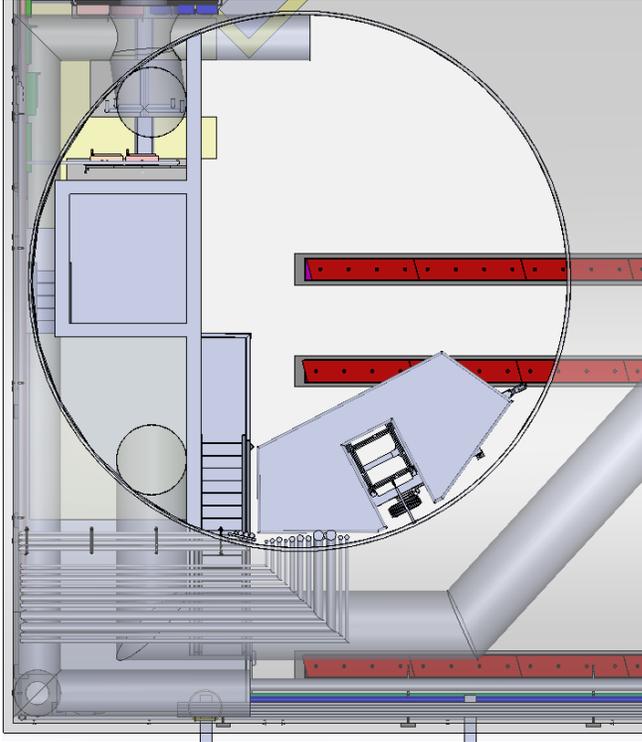


Fixed Cranes

- Bridge cranes required for surface building and cavern
 - 15T Surface building crane
 - 50T Cavern crane
 - 15T Alcove crane



Mast Climber



CAVERN LIFTING EQUIPMENT RENTALS

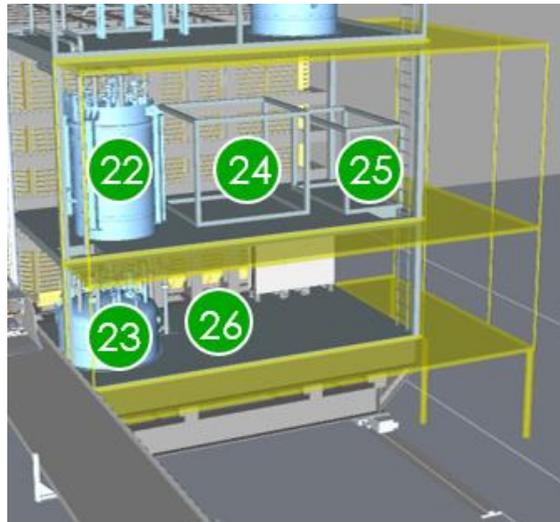
Scissor Lift

Telescopic Boom Lift

Carry Deck Crane

Fork Lift

Scaffolding



Resources and Predecessors

Locations

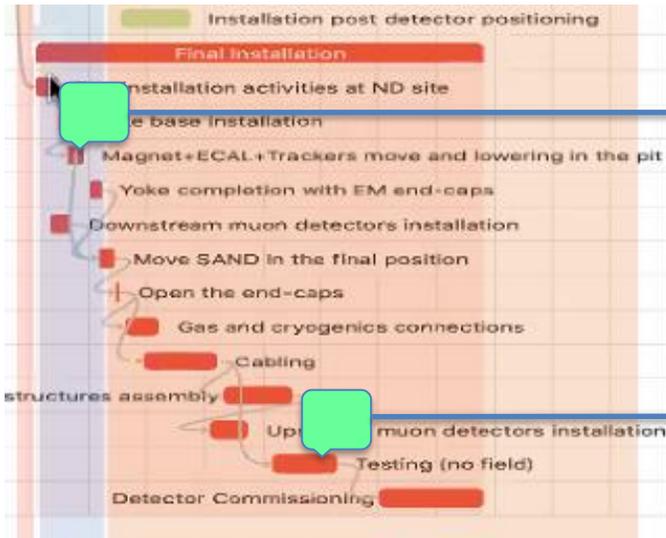
Surface
Shaft
Cavern
Alcove

Equipment

External crane 150T (E-Crane)
Surface crane 15T (S-Crane)
Cavern crane 50T (C-Crane)
Alcove Crane 15T (A-Crane)
Mobile Crane (M-Crane)
Mast Climber (M-Climb)
Monorail (M-rail)
Scaffolding (Scaf)

I&I Personnel

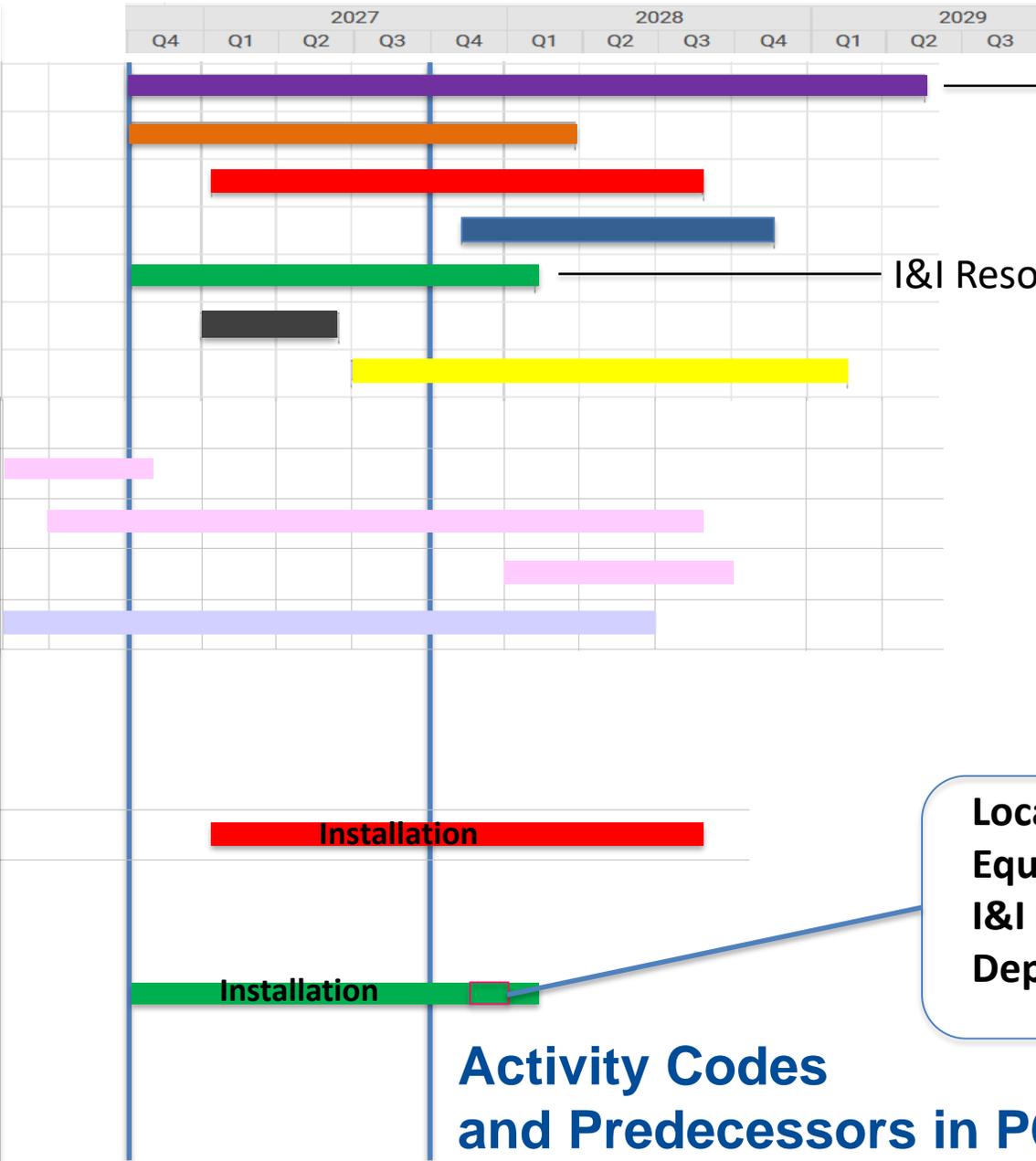
Technician Crew Lead (Lead)
General Technicians (Tech)
Electrical Technician (Elec)
Alignment Personnel (Align)



Location: Surf, Shaft and Cavern
Equipment: E-Crane, S-Crane, C-Crane
I&I Personnel: Lead, Tech (X2), Align
Predecessors: PRISM rail

Location: Alcove
Equipment: A-Crane
I&I Personnel: none
Predecessors: none

<h3>131.04.02 Near Site Integration</h3> <ul style="list-style-type: none"> ND Installation Support Prism Installation LAr Detector Installation Muon Range Stack Installation SAND Installation ND - DAQ Installation ND - Detector Checkout and Energization
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I&I Level of effort



I&I Resources for SAND

Location: Surf, Shaft and Cavern
Equipment: E-Crane, S-Crane, C-Crane
I&I Personnel: Lead, Tech (X2), Align
Dependencies: PRISM rail

Activity Codes and Predecessors in P6

Project Controls Support: Jonathan Coleman jcoleman@lbl.gov, Mohammed Elrafih <melrafih@fnal.gov>

	Point of contact for Interface and Requirement	L2 SignOffs	Point of Contact for Installation	Schedule
Role	Communicate Detector Interface Requirements to Gordon Cline	Signoff the Interface and Requirement Documents	Assemble the material for installation planning	Translate the workflow into a resource loaded schedule
ND-LAr	Andrew Lambert, Jonathan Asaadi	Dan Dwyer	Andrew Lambert, Jonathan Asaadi	Dan Dwyer and Andrew Lamberts, Jonathan Coleman (P6)
Cryo	Joaquim Prats and Li Wang	David Montanari	Joaquim Prat and David	Team effort: David, Joaquim (Ar), Li (He), Ian (PC) - Mohammed Elrafih
SAND	Claudio Montanari	Claudio Montanari	Claudio Montanari and Luca Stanco	Claudio Montanari
TMS	Vic Guarino	Tom Lecompte	Howard Budd	Howard (Install), Tom LeCompte(Overall)
Cryostat	Peter Tennessen	Fabrice Matichard	Peter Tennessen	Fabrice Matichard (CAM), Jonathan Coleman (P6)
PRISM	Robert Flight, Mike Wilking, and Nadine Kurita	Mike Wilking	Mike Wilking	Nadine Kurita