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# **NOvA Near Detector Installation Coordination WBS 2.8.4**

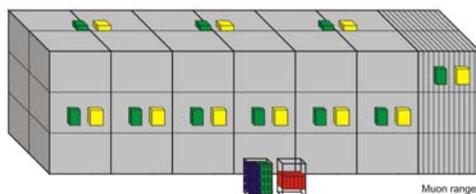
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K M Kephart



# WBS 2.8.4 –Near Detector Installation Coordination Overview

- Level four Elements of 2.8.4:
  - 2.8.4.1 – Review installation procedures
  - 2.8.4.2 – Assemble detector readout electronics & DAQ components
  - 2.8.4.3 – Scintillator module filling
    - 2.8.4.3.2 is installation of plumbing from the shaft to the detector location
  - 2.8.4.4 – APD, high voltage & readout electronics systems installation
    - 2.8.4.5.2 includes installation of cooling skids, plumbing & related hardware
  - 2.8.4.5 – DAQ system installation
  - 2.8.4.6 – Detector turn-on & commissioning





# WBS 2.8.4 –Near Detector Installation Coordination Overview

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- This WBS **does NOT include installation of the physical detector body** (see WBS 2.8.2), **or the related detector infrastructure** such as secondary containment (see WBS 2.8.1)
- Most of the elements of this WBS involve coordination of other L2 organizations, or of other L3s in 2.8. The main focus therefore of 2.8.4 is management of external resources and guaranteeing that procedures, NOvA data bases, ES&H documentation & Fermilab Operational Readiness Clearance documentation are available in a timely manner and enforced according to Fermilab and DOE regulations.
- **Early evaluation of installation procedures is vital** in order to guarantee proper sizing of the cavern for all components of the Near Detector
  - Detector blocks & Muon catcher
  - Electronics & related cooling
  - Utilities such as lighting, HVAC, fire suppression



# WBS 2.8.4.1 – Near Detector Procedures

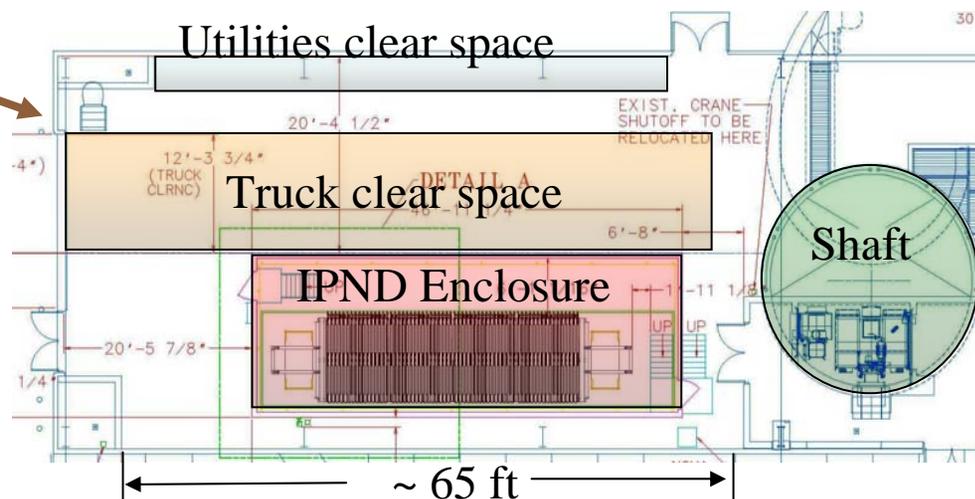
## Review

- Procedures from all groups supplying components to the Near Detector will be examined in concert
  - Must be physical room for all components
  - Must be room to safely install and work on all components
  - Must coordinate all tasks for safety and efficiency
- All components to be installed underground in the MINOS tunnel area must have several layers of basic review before work can begin
  - All components must be approved for use in the underground environment at Fermilab
  - All procedures must be documented using a Hazard Analysis process, even if in the final determination it is established that a written HA is not required
  - All personnel involved with the installation tasks assigned will receive proper training in the task as well as working in the underground environment before any work is begun
- Installation management must ensure that any required Fermilab ES&H reviews have been performed before any level 4 task begins operations in the experimental area
  - WBS 2.8.4.2 is not staged underground



## WBS 2.8.4.2 – Assembly of Electronics & DAQ Components

- Based on previous operational constraints in the MINOS underground area, it is expected that only one shift's worth of materials for assembly will be moved underground at a time
- All components will be staged under the direction of members of WBS 2.6 & 2.7 in the MINOS Service Building in a manner that will allow expeditious and safe transfer to the underground area
- Installation management will ensure that the required assembly and staging does not adversely affect other operations in the MSB or underground
  - Staging area is tight
- Installation management is responsible to see that all materials are appropriately tracked in the NOvA database system





## WBS 2.8.4.3 - Scintillator Module Filling

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- Installation management will oversee the installation of scintillator fill piping as well as vent return lines from the relaxation tank at the bottom of the shaft to the location of the detector, as specified by WBS 2.8.3 management
- Installation management will coordinate scintillator delivery
  - Trucks scheduled for maximum efficiency
  - Schedules must coordinate with other tasks in the MSB & underground since no other work can involve use of the shaft during filling
- Installation management will, in conjunction with management of WBS 2.8.3 oversee the filling of all modules in the Near Detector
  - Operational Readiness Clearance for filling must be in place
    - 100% Secondary Containment
    - Fire suppression and warning systems
    - Hazmat spill training of those responsible for filling
- Installation management will ensure all scintillator is catalogued in the NOvA database system



# WBS 2.8.4.4 & 2.8.4.5 - APD & Readout and DAQ Installation

- In conjunction with WBS 2.6 & 2.7 personnel, WBS 2.8.4 management is responsible for moving the APDs & readout electronics and DAQ underground, and for the installation of all components onto the detector
- WBS 2.8.4.4.2 includes the management & labor to install APD cooling and ventilation systems
  - Cooling skid installation
  - Plumbing for cooling
  - Heat Transfer system
  - Transfer of all system maintenance information to appropriate Fermilab organizations
- Installation management will ensure all APD and DAQ system components are logged into the NOvA database

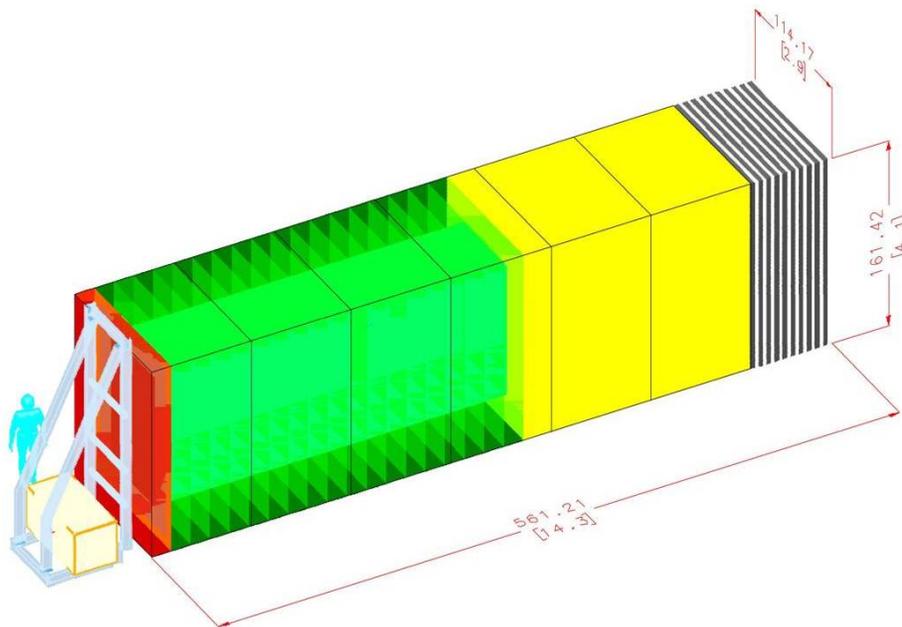


Bottom of the MINOS shaft



# WBS 2.8.4.6 – Near Detector Turn-on & Commissioning

- Operational Readiness Clearance
  - Required before turning on the detector
  - Will require a formal review
- Turn –on and commissioning of all electronics and DAQ components occurs under the direction of WBS 2.6 & 2.7 management
- Near Detector completed and ready to commission





# WBS 2.8.4 – Near Detector Installation Schedule

- Internal scheduling of many tasks will be based on experience from the IPND choreography
  - Tight installation spaces unlike the Far Detector
  - Some tasks turned over to Fermilab technical staff
    - Cooling skids & related plumbing & hardware
    - Plumbing for liquid scintillator delivery
  - Electronics & DAQ check-out provided by personnel from WBS 2.6 & 2.7
- External schedule triggers
  - Tied to Fermilab 2010 Accelerator shutdown schedule
  - ~ 2/3 of the scintillator, electronics and DAQ will already be at Fermilab and ready to be staged as soon as the IPND has completed its run in the MSB