



# NuMI Director's Review Feb. 12, 2004

## NuMI Civil Construction



Front of MI-65 (Target) Service Building

Back of MI-65 with Sub-Station

Beneficial Occupancy of the MI-65 Service Building and the  
Underground Target Area occurred October 20, 2003

# Target Area Beneficial Occupancy on October 20, 2003



Upper Left:  
Target Hall



Upper Right:  
Underground  
RAW Room



Lower Left:  
Pre-Target



Lower Right:  
MI-65 Power  
Supply Room

Target Area at Beneficial Occupancy October 20, 2003

# Since Beneficial Occupancy NuMI Staff have been busy Filling up the Target Area



Upper Right:  
Target Pile  
Downstream  
Air Plenum



Left:  
Target Pile  
Looking  
Upstream

Lower Right:  
All Proton  
Beamline  
Magnets in  
Pre-Target





# The MINOS Service Building and Underground Area almost complete; Beneficial Occupancy March 4<sup>th</sup>

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Upper Left:  
MINOS  
Service  
Building



Lower Left:  
Spiral Pond



Right:  
MINOS  
Hall



# Utilities Installation is the most significant work remaining at the MINOS Area



Left:  
Wire pulling up  
the MINOS  
Shaft from junction  
box at shaft bottom.

Upper Right:  
Wire pulling  
Up the shaft and  
into electrical  
panels.



Lower right:  
Installation of a  
desiccant unit  
for the MINOS  
Area.



# Utilities Installation is the most significant work remaining at the MINOS Area (2)



Left: Conduits running up the MINOS shaft from junction boxes at shaft bottom.

Upper Right: Trimming Wires pulled up the shaft and into electrical panels.



Lower right: Installation of cable connections from Fermilab to the MINOS Area.





# Construction Status: A Summary of the Remaining Work

The Ragnar Benson has continued to make good progress on the Service Buildings and Outfitting Contract. At the end of January, the work was more than 97% complete as measured by the dollar value of work elements performed compared to the contract total value as modified. Approximately \$650K (of a modified total of \$20.5M) work remained to do as of January 31. The work is on schedule for beneficial occupancy March 4, 2004. Ragnar Benson and their work force did not achieve the third of four possible joint “safety/performance” awards for the period ending in mid-November. Four injuries in this period led to a re-emphasis on safety and a mutual commitment to try to achieve the incentive for the fourth and final period. The recordable incidents in the third period included a cut finger, a shoulder strain, a toe contusion, and a pedestrian hit by a backing vehicle. More than 130,000 hours have been worked and there have been five recordable incidents. We hope to be able to make the fourth award at the end of the work; there have been over 90 days with no incident. RBI’s commitment to the safety program remains very strong, and the Hazard Assessment program and daily start of shift meetings continue to work well.



# Construction Status: A Summary of the Remaining Work (2)

The remaining work as of January 31, 2004 is summarized by trade; expected progress to the date of the review is summarized on next slide.

- 1) Electrical work: Wire Pulling in Shaft, Service Building, Tunnels and Halls.
- 2) Electrical work: Trimming at panels and Equipment.
- 3) Electrical work: Ring out and energizing; Service Building, Downstairs.
- 4) Piping: Weld and pressure testing throughout.
- 5) Piping: Sump pump installation; testing.
- 6) Piping: Removal of mine pumps; blank off mine discharge pipes.
- 7) Fire Detection: Wire pulling throughout.
- 8) Fire Detection: Trimming, termination, checkout.
- 9) Fire Sprinklers: Final installation, checkout.
- 10) HVAC Controls: Wire pulling throughout, interface to Fermilab.
- 11) HVAC Controls: Trimming, checkout, equipment startup/balance.
- 12) Painting: Some first coats; trim and touchup.
- 13) Landscape: Complete 2<sup>nd</sup> hardstand, final grade repairs, and seed.
- 14) All systems; integrated testing, demonstration, owner instructions.
- 15) Punch List: Define and clear items.



# Construction Status: A Summary of the Remaining Work (3)

The expected progress to the date of the review (Feb 12<sup>th</sup>) is summarized on this slide.

- 1) Electrical work: Wire Pulling in Shaft and Service Building complete.
- 2) Electrical work: Trimming in Service Building complete.
- 3) Electrical work: Ring out and energize the Service Building complete.
- 4) Piping: Weld and pressure testing throughout complete.
- 5) Piping: Prepare for Sump pump installation 3<sup>rd</sup> week of February.
- 6) Fire Detection: Wire pulling throughout almost complete.
- 7) Fire Detection: Trimming, termination, checkout underway.
- 8) Fire Sprinklers: Final installation, checkout underway.
- 9) HVAC Controls: Wire pulling throughout, interface to Fermilab complete.
- 10) HVAC Controls: Checkout, equipment startup/balance start Feb. 16th.
- 11) Painting: Trim and touchup remain.
- 12) Landscape: Completed 2<sup>nd</sup> hardstand. Final grade repairs, and seed subject to weather conditions.
- 13) All systems; integrated testing, demonstration, owner instructions underway in Service Building.



# Construction Status: Evaluation of the Ragnar Benson Project Schedule

There are 340 work elements in the “Original” Ragnar Benson schedule, and work has started on 332 of the work elements, with 311 of those completed as of 2/2/04. Completion for beneficial occupancy is scheduled for March 4, 2004. The schedule shows a negative float of 10 days. Ragnar Benson has previously demonstrated the ability to “push” to complete work as milestones become due, and the present contractual date of March 4, 2004 is certain to be met. We track the negative schedule variance weekly, and at the moment it is \$250K, with a total of \$650K work remaining, including the work contributing to the negative schedule variance. It should be noted that \$1.3M work was accomplished during the month of January, so the \$650K work remaining is half that accomplished in January. The negative schedule variance has been reduced by \$564K since the end of October. We recently negotiated the schedule impact of the latest supplemental work additions, resulting in the extension of the beneficial occupancy from January 31<sup>st</sup> to March 4th. The contractor has been working two shifts since mid-November, and worked three shifts for most of January.



# Construction Status: Progress Since Upstream Beneficial Occupancy

## Major Accomplishments Since October 20, 2003:

- 1) Target Service Building (MI-65) beneficial occupancy.
- 2) Target area underground (outfitting) beneficial occupancy.
- 3) The fifth crane for the MINOS Hall is mounted, powered, not tested.
- 4) The south half of the MINOS site was cleared, graded and seeded, and the MINOS access roadway was paved.
- 5) The MINOS site utilities are essentially complete; some final work at the sanitary sewer connection is underway.
- 6) The MINOS Service building is weather tight and heated by a portable furnace.
- 7) Natural gas fired MINOS emergency generator is functional.  
Permanent power feeding the MINOS site. Building power on.
- 8) Work has continued on piping, electrical, HVAC, and fire detection installation in the MINOS and absorber Halls, muon alcoves, and accessways. MINOS Shaft utility installation complete.
- 9) Fermilab pumped the MINOS sump discharge water into the laboratory ICW system on a temporary basis; the final connection will be made in February.



# SB&O

# Construction Schedule

## ASSESSMENT OF MILESTONE COMPLETION

Milestone	Definition	Detailed Definition NuMI Project Plan 10/01	Corresponding Ragnar Benson Work Elements (Draft Schedule 11/18/02)	Early Comp.	Late Comp.	DOE Date (Con- tract) Plan)
L-2- L-2-11	<b>Beneficial Occupancy Of Service Buildings At Fermilab</b>	Beneficial Occupancy of both Fermilab service buildings (Target and MINOS) is obtained.	1620	11/25	<b>3/4/04</b> (revised date has been accepted.)	5/31/04

Assessment as of 02/02/04: The RBI milestones now project to complete 3/4/04, but the remaining DOE Milestone is not threatened. For the remaining milestones, there is not too much scheduling difference between the two schedules. **An agreement to again modify the MINOS area occupancy date to 3/04/04 was reached in early January;** the work had projected to about 34 workdays late using the previously revised occupancy date of 1/31/04. RBI and NuMI Project Management continue to discuss the work necessary to complete the contract. The MINOS schedule variance has been recalculated to include the impact of the extension of Milestone 9 to 3/4/04 as mutually agreed to for occupancy at MINOS. The recalculation was done on January 12, 2004.

10/6/03	Negative schedule variance at MINOS area (old schedule)	\$ 1602.8K
10/6/03	Negative schedule variance at MINOS area (add 43 days)	\$ 550.8K (Removed \$1052K)
10/13/03	Negative schedule variance at MINOS area	\$ 645.2K (Lost additional \$94.4K)
10/20/03	Negative schedule variance at MINOS area	\$ 631.8K (Improved by \$13.4K)
10/27/03	Negative schedule variance at MINOS area	\$ 813.5K (Lost additional \$181.7K)
11/03/03	Negative schedule variance at MINOS area	(No update generated)
11/10/03	Negative schedule variance at MINOS area	\$ 717.1K (Improved by \$96.4K)
11/17/03	Negative schedule variance at MINOS area	\$ 689.3K (Improved by \$27.8K)
11/24/03	Negative schedule variance at MINOS area	\$ 769.9K (Lost additional \$80.6K)
12/1/03	Negative schedule variance at MINOS area	\$ 682.1K (Improved by \$87.8K)
12/8/03	Negative schedule variance at MINOS area	\$ 675.2K (Improved by \$6.9K)
12/15/03	Negative schedule variance at MINOS area	\$ 629.2K (Improved by \$46.0K)
12/22/03	Negative schedule variance at MINOS area	\$ 574.2K (Improved by \$55.0K)
12/29/03	Negative schedule variance at MINOS area	\$ 485.3K (Improved by \$88.9K)
1/5/04	Negative schedule variance at MINOS area	(No update generated)
1/12/04	Negative schedule variance at MINOS area (add 34 days)	\$ 348.5K (Removed 136.8K)
1/19/04	Negative schedule variance at MINOS area	\$ 318.4K (Improved by \$30.1K)
1/26/04	Negative schedule variance at MINOS area	\$ 290.7K (Improved by \$27.7K)
2/2/04	Negative schedule variance at MINOS area	\$ 249.6K (Improved by \$41.1K)

RBI has agreed to provide the necessary effort to recover the remaining negative schedule variance. RBI worked three shifts at MINOS for the installation of the shaft utilities. RBI is now working two shifts, and also two shifts on Saturdays, to recover from the existing negative schedule variance. Any necessary multiple shift operation (including a resumption of the third shift if necessary) will continue to the end of the project. NuMI Project Management now believes that completion on 3/4/04 is a solid projection at this time. This projection is based on a continuation of the improvement seen for the last two months.



# February '04 Construction Status Service Buildings & Outfitting

Extraction Room, Carrier Tunnel; Fermilab  
Beneficial Occupancy taken in June

Target Service Building (MI-65): Beneficial Occupancy taken October 20, 2003

Absorber Hall & Access Tunnel, Muon Alcoves: Electrical and piping installation complete. Ventilation installation underway. March 4<sup>th</sup> beneficial occupancy on schedule.

MINOS Service Building: is weather tight. Utilities testing underway Modified contract completion date for all MINOS work March 4<sup>th</sup>.

MINOS Shaft, MINOS Hall and Access: Electrical, piping, and HVAC installation continuing. March 4<sup>th</sup> beneficial occupancy on schedule.

Target Hall, Pre-Target, Support Rooms. Beneficial Occupancy taken October 20, 2003

