

**Review of NuMI Integrated Installation Plan
March 20-21, 2002**

**Responses by Bruce Baller
May 7, 2004**

1. (Reviewer: R. Brooker) Outfitting of the pre-target region includes all electrical premise wiring, lighting, and trays, also extending Main Injector LCW piping through the stub and into the extension tunnel. The contractual work and is expected to take 13 months to complete, with beneficial occupancy expected June of 2003. Following beneficial occupancy, an estimated 23-weeks of shutdown would be required for installation of beam line components within the stub itself. Would this be several shutdowns or will the accelerator down the entire 23 weeks?

The work will be accomplished during scheduled and un-scheduled shutdowns.

2. (Reviewer: D. Ayres) Understand whether it is necessary and practical to hire outside contract surveyors to supplement and/or replace the Fermilab surveyors when they are unavailable during accelerator shutdown periods. The cost of hiring outside surveyors needs to be included in the cost estimate.

No outside contract surveyors were required.

3. (Reviewer: D. Ayres) Draw up a detailed installation schedule that includes all tasks that may compete with target hall use of the shaft and also shows planned accelerator shutdowns (recognizing that the latter are not well known this far in advance).

Done

4. (Reviewer: D. Ayres) Consider the use of electric rather than diesel lift trucks. These will need to have charging stations, which might be included in the SB&O contract.

Done

5. (Reviewer: D. Ayres) Handling and installation of the aluminum sheet material that seals the air flow channels between the target chase walls and the shield blocks is potentially quite dangerous, due to sharp edges and the need to work from ladders at some height above the floor. This process needs to be planned out carefully in advance, including a detailed JHA and provision of effective protective equipment.

Done

6. (Reviewer: D. Ayres) As suggested by one of the reviewers, the serial nature of much of this work makes it important to have spares of critical equipment, or at least a plan for experts to be on call to make repairs rapidly, so that equipment failures do not create a serious standing army problem.

OK

7. (Reviewer: H. Lee) The most important issue for installation the Target Hall is the manpower resources. Task Managers, Technicians and the Contracts personnel have not been identified. How many techs/crew and how many crews ?

Done

8. (Reviewer: H. Lee) Aluminum Air Block Sheet: The aluminum sheet is not easy to rivet together for airtight. How can we make a 90 degree angle bend?

The air block sheet metal is welded

9. (Reviewer: H. Lee) Work Cell: The remote handling issue has only just begun. Moving the hot modules/horn to and from the work cell will be difficult if we still do not have some wireless/wired camera. Can the lift tables move clockwise or counter clockwise? The work cell is build for changing the horn. Can we use it to do some minor repair?

We plan to use cameras.