

## NuMI Kicker Piping and Tubing Installation

After consultation with Jack Furlong of FESS Engineering it was decided that the best way to bring chilled water to the south utility room in MI-60 would be to tee into the existing 2 ½" lines that feed John Reid's skid outside the test cave in the drop hatch area of the building. From there it is about 180' to the proposed location of the Kicker Cooling skid. Bob Slazyk's expertise was employed in routing and estimating the cost of installation. Taking advantage of existing piping, we have laid out a route that would work well, providing we gain approval from FESS. The labor for this run is estimated to be 1 week for a 2-man pipefitting crew (foreman & journeyman). Current rates are \$67.40 and \$64.90 per hour respectively. 40 hours for each comes to \$5292.

The tubing installation is more involved and will take a greater effort to accomplish. The penetration will require 7 - 10' sections of 1" tubing to be welded together because of clearance limitations in the south utility room. Leak checking must be performed after every weld. The lab possesses an automatic tubing welder (Technical Division) but it is not certain if it could be loaned to the T&M pipefitters. Once in the Main Injector the routing is straightforward except for in a couple of areas. The labor for this installation is estimated to be 2 weeks for a 2-man crew to weld 2 runs 220' long of 1" 316L tubing. This cost would be \$10584.

Total for the two jobs is:  $5292 + 10584 = \$15,876$