Moving the Interlocked Gate Near Downstream End of Main Ring F-sector Upstream

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There is an interlocked gate located near the downstream end of Main Ring F-sector which separates all but a very small downstream portion of F-sector from Transfer Hall. At present, to access most of F-sector, the Main Injector and the Recycler beams must be off. A radiation safety study was done to see whether an interlocked gate could be moved further upstream to allow access into most of F-sector without the need to turn the beam off in the Main Injector and the Recycler. If such a relocation was possible, it would allow for greater access of F-sector for inspection, repairs, or other work without disruption of the beam in the Main Injector tunnel to NuMI. The radiation study showed that even under accident conditions, it would be safe to move the gate by approximately a kilometer to near the upstream end of F-sector. Unfortunately, 2 issues were found that made such relocation not practical at this time. The main problem had to do with what has been referred to both as “Feeder 89” and “MOS89” switch problem. Feeder 89 supplies power from the substation to F0, F1, F2, F3, F4, MI-8 and MI-52 and includes the Main Injector sextapoles and the upstream components of the NuMI primary beam line. Using the existing access procedure, turning off Feeder 89 required to make access possible to F-sector, a familiar and simple 10 minute procedure can be used. An alternative to using the Feeder 89 switch does exist to turn off power to the F-sector but Steve Hayes informs me it is more complicated, more time consuming (perhaps 30 minutes or longer at 2 places), presently less safe, and for Operations it would be a new procedure. The other possible problem is the planned construction of the PIP-II tunnel in the next few years which would intersect the Main Ring tunnel between F3 and F4. The present interlocked gate is downstream of the location of this PIP-II intersection with the Main Ring. If the present gate is moved but with PIP-II in mind and no changes to using Feeder 89, the section of the tunnel that will be accessible may be significantly restricted and not cost effective.

My understanding from Steve Hayes is that the alternative to using Feeder 89 is to open the circuits further downstream that would turn off the two circuits, Feeders 94 & 95, that supply power to F0 and to F1, F2, F3 and F4 respectively. To do it the inexpensive way, Steve described the process as the following: "To leave MI operational during access into F sector the first choice would be to create a LOTO procedure that would leave MI feeders (96 & 97) ON while locking out 94 & 95. What this would mean is that instead of turning OFF MOS 89 ops would use the control panel to turn OFF breaker 94 and 95. Then the HV electrician would rack out these breakers to the safe point (built in to the cell) and lock the breaker, then ops would over lock the breaker. The only problem would be that normally the keys are in one lock box in the MC so if they lock these keys in the normal box then when people accessing F sector would over lock then if and access in MI would be necessary then people would need to come out to allow the MI keys in the box. A new lock box for F sector would be needed $0.1k."

To create a new lock system that is similar to the system now in used to access F-Sector that turns off the two circuits would require something in the order of $500K according to Steve Hays. This would be for civil construction to house new gear as there is no space available at KRS to house the new lock system.

Given these findings, both the “$0.1K” and the “$500K” options were deemed unsuitable changes to the facilities at this time. The interlocked gate separating most of Main Ring Tunnel F-Sector from Transfer Hall will remain in its present location.