PROGRESS IN THE SECTOR TEST

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There has been noteworthy progress in the Sector Test. The entire string has been cooled down and powered. Further, a 100 GeV/c proton beam has been injected and transported part of the way through the system.

The Sector Test is at present a string of 20 dipoles and 5 quadrupoles of the Tevatron installed in the Main-Ring tunnel from A-12 to A-17. The purpose of this test is to learn experimentally about the installation and operation of a superconducting magnet ring. One of the first goals of the Sector Test is to transport a beam of 100 GeV/c protons (injection energy into the Tevatron) through the system. The magnet string and the tests are to be extended through the complete A Sector.

Throughout the fall, there were considerable learning experiences in installation, particularly in checking out the vacuum system. It was not until well into December that the group could begin to cool the system down. Cooldown to superconducting temperature took a week, a good part of which was taken up by equipment breakdowns. The cooldown time could be shortened by boosting the satellite refrigerator with liquid helium from a dewar, which would require another transfer line.

A system to bring a fast-extracted proton beam from the Main Ring has also been built. Approximately 1.5×10^{10} protons of 100 GeV/c momentum were initially injected. Later in the tests, the intensity was reduced to 5×10^{9} protons.

The initial tests were beset by instrumentation difficulties. The current readout of the magnet power supply was inaccurate; it was not possible to use beam to tune up the system because beam could not be detected in the new position monitors, perhaps because of bunching problems. Beam was not detected at the end of the system at A-17.

It is known that beam was injected into the system because there were 5 beam-induced quenches in the first and second Tevatron dipoles. What was particularly encouraging was that recovery from these quenches was very rapid. A 30 - sec timing-out period is programmed into the system and the system was immediately superconducting at the end of this period in every case.

Not all the objectives of the Sector Test were met but it has now been shown that it is possible to meet them. The Sector Test group continues its work with optimism and vigor.

Rich Orr writing in the log book during the Sector Test work described on the preceding pages.

(Photograph by Fermilab Photo Unit)