WQB "Wide Aperture Quad" for Main Injector

27 May 2004
IB2 conference room
9:00 AM

Attendees: Leon Bartelson, Bruce Brown, John Carson, Weiren Chou, TJ Gardner, Hank Glass, Dave Harding, Dave Johnson, Vladimir Kashikhin, François Ostiguy, John Zweibohmer

The water cooling calculations have shown an unacceptable temperature rise using the 4Q120 conductor. No one present was confident he knew the available pressure drop in the tunnel, though the consensus was that it is probably 100 psi. There was similar uncertainty regarding the inlet water temperature, though it was thought to be about 95? F. Bruce will get accurate numbers from AD/MS. To preserve the current steel design, it is attractive to keep the same conductor outer dimensions and increase the water path diameter. An acceptable solution is available regardless of the precise numbers Bruce obtains. The conductor will need to be ordered in FY04 to be here at the end of the shutdown, implying that the money must obligated this year rather than deferring it until next year, as had been the plan when we thought that we could buy the conductor from Fermilab inventory. Weiren will follow up with AD management.

The lamination is pretty stable at this point. A witness notch will be added. The corners of the square could be left in place rather than cut off. There would be no savings in steel cost. There would be extra weight to carry around. Extra rigidity is not needed. Mounting feet might be easier or harder. John C. will check with Lucy to see whether she has a strong preference. The lamination is 34 cm (13.386") square. A tie bar extends another 0.95 cm (0.375") from the center. The whole magnet core is thus 70 cm (27.52”) square.

John C showed an overlay of various beam tubes on the pole tips: including the current beam tube, the 4Q120 beam tube, a square with rounded corners sitting skew, a pole-hugging tube with the circumference of a 6" round tube, and the ID of the 6" bellows. Everyone wanted to maximize the aperture with the pole-hugging tube. John will get that drawn up so procurement can begin. The vendor will be asked to make the transition to a round shape at the end.

John C and Vladimir have reach agreement on the chamfering of the end to provide relief for the coils.

Based on the calculated inductances, Leon thinks that a trim coil with 18 turns of 8 gauge square wire will be good. This allows running with the same supply that he had planned on. Using 6 gauge wire would be better, but that is squeezing the space available. Leon will e-mail a confirmation. Vladimir will confirm that the trim coil placement is acceptable magnetically.

Hank will look for the fixturing that supports one end of a Morgan coil in the middle of a Main Ring quad. We will then look at the body/end separation on the IQD that is due out of production in June. We may want to look at an IQB as well. This data may already exist; Hank will look. We may want to request end/body separation on the WQB. This would require a new fixture.

The steel requisition has all its signatures and is with the buyer. It should be on the street by the end of the week. The plan is to ask for a two-week response time. We are two weeks behind schedule here, but there is plenty of float.

The first article is currently scheduled for 1 April 2005 delivery. The timing of this relative to the ORBUMP is important to allow both to be done in a single shutdown next spring.

The BPM requirements should be examined. They will not be allowed to be the limiting aperture.

Next meeting in two weeks: Thursday, 10 June 2004. Same time, same place.