

E4R Test Facility program review, Thur 09/10/09 at FNAL WH1 East.

Present: H.Piekarz, S.Hays, J.Theilacker, Y.Huang, V.Shiltsev, D.Wolff, D.Harding, G.Velev, A.Zlobin, T.Peterson

Agenda and talks posted at: <http://indico.fnal.gov/conferenceDisplay.py?confId=2764>

Summary:

a) high level goal of the E4R test is direct comparison of AC losses in HTS superconducting magnet cables and in "conventional" LTS cables.

It is expected that HTS will have significantly lower losses that will make such a conductor advantageous for use in fast cycling (proton) accelerators (despite higher cost and technological challenges/reliability).

b) presentations of the E4R team (HP, SH, YH) showed great progress in setting up the facility and experimental program (slides will be available at the indico site First results of the "Phase I" program are expected in FY10 (HTS cable AC losses measurements).

c) help/assistance from AD and TD has been requested - that needs to be worked out in near future by HP and corresponding parties

Comments/suggestions/action items:

1. Jay T: a) the goals of testing must be detailed, a list of measurements, expected results and required instrumentation (accuracies) should be compiled; such a list will help to make a decision on cryogenic instrumentation; b) "...it will be a difficult measurement"

2. Dave H: a) it's an interesting test which will require a lot of care, so technical mini-review of the mechanical design by experts (eg by TD magnet experts) will be very helpful - to avoid surprises/flaws; b) particular concern/suggestion to carefully look at - electrical insulation design; c) did not hear much about budget (though HP assured that all they do is cheap - naturally limited by funds available from the APC)

3. Sasha Z: a) simultaneous experimental and theoretical analysis should be made - to have predictions for expected observations; b) cable design should be improved - EM analysis done (eg rectangular vs round cable shape), forces analyzed (large J in large B-fields), cable alignment issues considered, AC loss calc's; c) supports the request to generate a list of planned measurements with needed accuracies, etc (see 1a)

4. Tom P: (in addition to what others discussed) a) design of the plugs to be carefully reviewed; b) are there appropriate 7kA current leads available for free? (HP said the leads are lesser problem)

5. Dan W: a) it'd be nice to learn about availability of key players for the test (real concern); b) make sure that safety is done properly (HP and SH in charge)

6. Vladimir S: a) volunteered to compile magnet specs for fast cycling machines under considerations (B_{max} , cycle time, dB/dt , etc)