

Results form review of KEK development program

Lucio Rossi

@ CERN-KEK committee

12 December 2008

***Review on 'Research and Development of Advanced Superconducting Magnet
for the LHC upgrade'***

***12 December 2008
Bldg. 30/6.017***

Agenda

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|--|--|-------------------|
| 9:30 | Opening Remark | Lucio Rossi |
| 9:40 | Report from KEK
Introduction: General plan and management | Akira Yamamoto |
| 10:00 | Technical progress and Further Plan | Tatsushi Nakamoto |
| <i>11:00-11:20 Coffee break</i> | | |
| 11:20 | Comments (CERN's R&D plan and comments) | Gijs de Rijk |
| 11:35 | Q&A and Discussions | |
| 12:20 | Recommendations and Closing Remark | Lucio Rossi |

Participants:

KEK: Akira Yamamoto, Tatsushi Nakamoto, Katsunobu Oide, , Taka Kondo
CERN: L. Bottura, Th. Boutboul, L. Oberli, G. de Rijk, L. Rossi, E. Todesco, T. Taylor
US-DOE: Bruce Strauss

Comments - 1

- The program proved to be tougher than expected
 - Previous results were obtained for different applications (Fusion, VHF solenoids) that do not require such a high quality as accelerators.
 - Most results obtained in “uncertain” conditions (reproducibility).
 - Overall has constitute a progress in HF conductor R&D and is a solid basis for continuing the collaboration.
 - The reviewers appreciate a lot that such a progress have been done in a very busy period for KEK 9end of LHC and J-Parc construction and commissioning)

Comments - 2

- Overall the proposed continuation of the program is **very appreciated** and should have the scope to finally validate the use of Nb₃Al for accelerator magnets. *It is time to do a breakthrough and assess the possibility for LHc-upgrades.*
 - Define conductor targets in a more detailed way (today only J_c has been really quoted)
 - Define magnet targets
 - Define priorities in the lab equipments

Comments - final

- Conductor is the heart of the program
 - Magnet as conductor test in real environment
 - Necessity to study a good instrumentation for the magnet
- Set an analysis team (in collaboration) re-examining all tests done in the past (also 1.9 K).
- Define a protocol of measurements to qualify materials (including 1.9 K test)
- Strong support to the basic physics study
- **To review the program formally somehow in 2010** to advise the CERN-KEK committee about the use of remaining money and eventual addition of resources for the very long cable test.

KEK-CERN HFM collaboration

Possibilities for KEK-CERN collaboration (from de Rijk):

- Further cable tests to be done in Fresca (up to 10 T)
- Small scale model Coil tests at CERN
- Cabling: CERN has a (40 strands) cabling machine which offers possibilities for the Nb₃Al program
- Metallurgical study of the strands: CERN support possible
- Possibilities for KEK to participate to EuCARD !
 - associate from KEK at CERN, paid by the collaboration ?
 - Thermal studies
- Radiation resistance of epoxy (cyanite esters)

- First coil (later) : test single quadrupole cos Θ coil in FNAL/CERN mirror

- Global EU-JP-USA collaboration: so far through labs, ... extension may be envisageable but ...