

U.S. Department of Energy • Superconductivity Program for Electric Power

2005 WIRE DEVELOPMENT WORKSHOP

January 19-20, 2005 • St. Petersburg Bayfront Hilton • St. Petersburg, Florida

Introduction:

The 2005 Wire Development Workshop is being sponsored by the Office of Electric Transmission and Distribution (OETD), U.S. Department of Energy's Superconductivity Program for Electric Power Systems and will focus on critical issues associated with second generation YBCO-coated conductors. Leading U.S. scientists and engineers from national laboratories, universities, and industries will discuss the current status of the second-generation wires, electric power prototype demonstrations and will also address the possible second generation conductor design and engineering and related AC losses in YBCO. The workshop will be held at the St. Petersburg Bayfront Hilton, St. Petersburg, Florida, January 19-20, 2005. Dress for the workshop is "Business Casual."

Specific Workshop Objectives:

- Assess the performance goals for the various components of the final conductor, i.e., the metallic substrate/buffer templates, YBCO coating, and any additional stabilizers needed for stable conductor operation.
- Discuss the second generation conductor design and engineering to reduce the *ac* losses and improve the performance of the conductors.
- Report the progress toward HTS prototype demonstrations.
- Cover issues such as the SPI project readiness reviews, review and comment on the program's (2005-2010) milestones for HTS electric power prototypes.
- An updated coated conductor development plan, a "roadmap update".

Purpose and Description:

YBCO-coated conductor research continues to expand our capability to process long-length conductors. Recently, the Applied Superconductivity Conference, ASC/04, Jacksonville (October 3-8, 2004), the International Workshop on Coated Conductors for Applications (CCA 2004), Kanagawa, Japan (November 19-20, 2004), and 17th International Symposium on Superconductors, ISS 2004, Niigata, Japan (November 23-25, 2004) explored critical issues related to second-generation YBCO-coated conductors. Summaries of the CCA 2004 and ISS 2004 will be provided to all attendees of the DOE Workshop.

Eight sessions will be held to focus on various aspects of second-generation coated conductor development. In each session, 4-5 speakers will address a number of issues formulated by the session chairs and organizers. At the end of each session, a panel discussion will be held. The first day of the Workshop will be composed of five sessions. The presentations in Session I will consist of the status of the coated conductor research in Japan, Europe, Korea, China and at several U.S. companies. Session II will focus on the status of the Superconductivity Partnership with Industry (SPI) projects. Session III will focus on the flux pinning and thick YBCO film growth. A comparison will be made among several potential processing techniques, which include pulsed laser deposition, Ex-situ BaF₂/TFA process, and MOCVD. Session IV will focus on the issues related to *ac* losses and 2G conductor design and engineering. Issues like various conductor designs to reduce the *ac* losses, optimal wire width and I_c will be discussed in this session. Session V, our late evening "Rump Session," will be dedicated to the

late breaking news/results/new directions/packaging/ environmental stability/ac losses/joining of lengths/slitting/stability & quench protection/cryogenic issues/ mechanical properties, etc. The second day of the Workshop will be devoted to sessions VI, VII, and VIII. This includes the status of the 2G-Templates (substrates/buffers) fabrication, advanced characterization of coated conductors (in-situ diagnostic tools, spectroscopic characterizations, reel-to-reel critical current, roughness measurements, etc.) and the concurrent session on SPI, commercial readiness reviews, etc. At the end of the workshop, session chairs will contribute to the workshop summary. In addition, the steering committee will help Energetics to update the roadmap.

Workshop Organizing Committee:

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