

# Superconducting Partnership with Industry Readiness Review Update

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DOE 2003 Superconductivity Peer Review

# SPI Readiness Reviews

- A DOE program initiative to ensure SPI projects go as planned.
  - Focus is on collaboration with the SPI team to identify potential failure modes: issues involving cryogenic temperatures and high voltage are a major concern.
  - DOE will provide expertise as needed from national laboratories, universities, consultants.
  - Pre-operation planning and testing will be reviewed and discussed.
  - Reporting will be for DOE and team use only.

# Anticipate 3 reviews over an SPI time cycle

- **Phase 1:**

- Shortly after the SPI is awarded, hold initial meeting to review the technical proposal and identify those system aspects potentially likely to repeat past problems or lead to new ones.
- Identify resources and activities needed to address any potential problems.
- Estimate meeting length  $\frac{1}{2}$  -1 day.

# Anticipate 3 reviews over an SPI time cycle

- **Phase 2:**

- Prior to hardware procurement/fabrication, review those critical areas where redundancy or back-up systems may be needed or where team prior experience may be limited.
- Potential problem areas are vacuum system integrity, high voltage details, heat loads, transient mechanical loads, unanticipated heating sources, partial discharge, thermal stresses, etc.
- Would require 1-2 days on-site with discussion of plans to prevent potential problems and of component/subsystem testing to qualify system prior to assembly.
- Non-disclosure agreements will be signed by reviewers if business-sensitive information is involved.

# Anticipate 3 reviews over an SPI time cycle

- **Phase 3:**

- Before system operation (for example, tie-in to the grid) do a final review to confirm that the phase-2 review concerns have been resolved and inspect the as-built hardware. At this stage safety systems (to protect personnel and hardware) could be reviewed in some detail.
- Look over project test plans to ensure completeness (for example, generation of data for technical standards for new technology).



# Peer Review Interface

- At the annual peer review:
  - Each SPI team present “readiness” preparation activities in accordance with the revised evaluation criteria.
  - Only non-proprietary information will be presented.
  - Peer reviewers provide feedback on readiness review program implementation.

# Revised 2003 evaluation criteria

- **FY 2003 Performance/ FY 2004 Plans:** (SPI Panel: Included in this area for SPI projects is how the team is identifying, managing, and mitigating risks to a successful demonstration over the 2-year evaluation window.)

**FY 2003 Results:** The presenter should identify major risks to a successful outcome, how they are mitigated (via a focused R&D program and/or redundancy, for example) and progress made during the last year on risk mitigation. (SPI Panel: Included in this area are results and recommendations from the phased SPI readiness reviews by the independent review team chartered by DOE.)

**Research Integration:** Private sector presenters will describe how collaborations have accelerated their ability to overcome problems and mitigate risks in progressing towards commercial products and applications.

- **Bottom line:** How is the team addressing technical risk mitigation?

# SPI Readiness Review Status

Project	Lead Company	Status (Jul 2003)	Reviews Done	Review Plans
HTS transformer 5/10 MVA	WES/ SuperPower	30 K initial test complete; warm-up in progress	Test program 6/3-4/2003	None; project will be complete by late 2003
HTS motor 5000 HP	Rockwell	R&D		FY 2004
Ultra long length HTS cable at AEP	Ultera (Southwire)	Design/ R&D		FDR: January 2004
Reciprocating magnetic separator	DuPont	Fabrication	HTS solenoid CDR: 3/10/03	FDR
Superconducting flywheel	Boeing	Testing @ 100 kW (Phase 2)		Test program review Sept 2003
HTS 100 MVA generator rotor	GE	Design/R&D		CDR July 2003
Open MRI	Oxford Inst.	About 1 yr delay; Conductor dev.		Fall/winter 2003
Matrix fault current limiter	SuperPower	Design/R&D	CDR:6/10-12/03	FDR:Oct 2003
Long length HTS cable at LIPA	AMSC/ Nexans	Design/R&D		CDR Oct 2003
HTS cable at Albany (NYSERDA)	SuperPower/ SEI	Design/R&D		CDR Nov 2003
Follow-on transformer R&D	WES	Under discussion		CY 2004

# Cryogenics Initiative Status

- Two companies selected for development of cryocoolers, work starts this month:
  - Praxair, Inc.
    - HTS-3, pulse-tube, 60-80 K, 300 watt, 25-30 %  $\eta$
    - HTS-4, pulse-tube, 65-80 K, 1500 watt, 25-30 %  $\eta$
  - Cryomech, Inc.
    - HTS-1, GM, 25-40 K, 200 watt @ 40 K, >20 %  $\eta$ , >18,000 hr MTBM
    - HTS-3, pulse-tube, 60-80 K, 300 watt, 25-30 %  $\eta$
- No bids on statement of work for cryostat development; this is a concern.

