OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Distributed Energy and Electricity Reliability

High-Temperature Superconductivity:

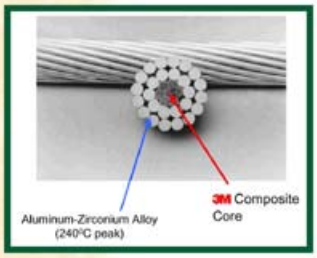
— Creating a More Efficient More Powerful Electrical Grid —

HTS wires are made using semiconductor or film industry technologies

HTS cable powers 20-MW manufacturing plant in Carrollton, Georgia

– Next-Generation High-Temperature Superconducting Wires

- High performance (>1MA/cm^2) with low cost potential
- Under development by four U.S. companies in the race to commercialization



Transmission Technology Research Program

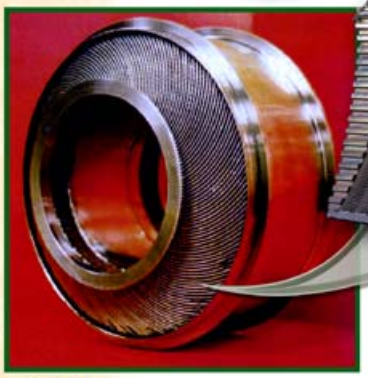
- ORNL is establishing a new facility to conduct accelerated life-cycle testing of high capacity advanced conductors for electricity transmission

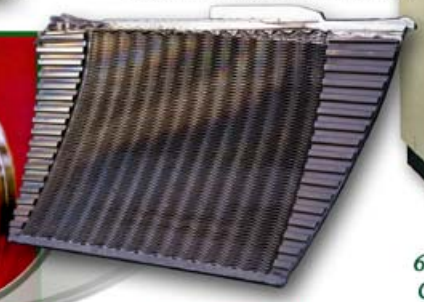
Evaluation of Materials for Advanced Microturbine Recuperators

Modified fuel-injection ports for exposure of test specimens

Recuperator materials will be evaluated after test campaigns to:

- Characterize the microstructure of the base alloy and corrosion products
- Determine the evolution of their physical and mechanical properties





Recuperator cells fabricated with candidate alloys

60kW natural gas-fired Capstone microturbine modified to operate at higher turbine rotor inlet temperatures

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