

**Hazardous Materials Management: PCBs in Insulated  
Electrical Cable, Lessons Learned from Electrical Upgrades at the Holifield  
Radioactive Ion Beam Facility at the Oak Ridge National Laboratory**

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**ABSTRACT**

The Holifield Radioactive Ion Beam Facility at the Oak Ridge National Laboratory (ORNL) serves as a national research facility by providing accelerator beam time to visiting scientists from all over the world. The Holifield Facility was originally built in the early 1960's and has undergone several major renovations over the years. Since 1994, an effort has been underway to systematically replace all 1960/1970 era high voltage power supplies with newer models. This activity has generated various wastes including: capacitors, circuit boards, scrap metal, and a large volume of insulated electrical cable.

In 1994, about the same time that electricians began removing bulk quantities of cable from the Holifield Facility in Oak Ridge, a lessons learned bulletin was issued from the Paducah Gaseous Diffusion Plant, highlighting the potential for polychlorinated biphenyls (PCBs) in cable insulation. At Paducah, various types of cable insulation were analyzed and many samples tested had positive results ranging from 41 parts per million (ppm) to 3446 ppm PCBs. Then in 1996, PCBs were found in electrical cable from an old test reactor at the Savannah River site. At Savannah River, the PCBs may be linked to facilities with specifications for fire protection, heat or thermal cycling, water proofing, and/or chemical resistance. This is consistent with findings of the U.S. Navy, where many vessels utilize transformers, wiring, and other components that contain PCBs.

Since the Holifield Facility utilizes electrical cable for a number of high-voltage, high-current and/or high-temperature applications, our cable was recognized to be PCB-suspect and a decision was made to analyze waste cable for PCBs. Both PCB-contaminated (>500 ppm) and PCB-detectable (<50 ppm) cable have been identified at the Holifield Facility. This paper summarizes results of our findings related to PCBs in insulated electrical cable. Specific information on the types of cable analyzed for PCBs will be provided; including brand names, cable markings, rated voltage, etc.

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\*Oak Ridge National Laboratory, managed by Lockheed Martin Energy Research Corp. for the U.S. Department of Energy under contract number DE-AC05-96OR22464.

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