"The HFIR was brought back on line in April 1990."

management, DOE's Oak Ridge Operations manager, Joe La Grone, recommended reactivating the reactor in late 1988. And, in March 1989, Admiral Watkins surprised a Senate committee by announcing that HFIR operations would resume at Oak Ridge.

The long process of restarting the reactor was managed by Robert Montross, Jack Richard, Pete Lotts, and Hal Glovier. As a result, the HFIR was brought back on line in April 1990 at 85% of its original power. The Laboratory also restarted its Tower Shielding Facility reactor in December 1989, allowing shielding studies for breeder reactors funded by DOE and Japan to proceed. This reactor had been used for many years for shielding experiments developed, designed, and analyzed by Dan Ingersoll and others. The Laboratory mothballed its Bulk Shielding Reactor, Health Physics Research Reactor, and Oak Ridge Research Reactor, however, and initiated steps to decommission them, although Jack Richard and the Laboratory believed the Health Physics Research Reactor deserved retention as a national asset.

Age of Materials

In 1989, the National Research Council published a comprehensive study titled *Materials Science and Engineering: The Age of Materials*. It provided a detailed assessment of the critical roles materials science and engineering would play in the future economic competitiveness and prosperity of the United States. ORNL staff played a major role in this study, and the systematic development of multidisciplinary materials science programs at ORNL served as a case study of why materials were technologically and economically important, and why the 1990s seemed destined to become the "age of materials."

Materials science, which had begun in earnest during the Laboratory's nuclear airplane project in the 1950s, had slowly evolved from a program defined by disparate agendas into a cohesive and comprehensive research initiative. The Solid State Division, launched in 1950 under Douglas Billington, initially examined radiation effects on materials, but expanded over the decades to explore the physical properties of many types of materials needed for new technologies. This work was directed by Mike Wilkinson, Bill Appleton, Fred Young, and Jim Roberto. The Metals and Ceramics Division, begun in 1948, steadily moved into broad research and development efforts that included advanced alloys and ceramics, under the leadership of John Frye, Jim Weir, Jim Stiegler, and Doug Craig.

The interaction of these two divisions, together with support from the Chemistry, Chemical Technology, and Analytical Chemistry divisions, provided a broad multidisciplinary research organization with unparalleled capabilities for characterizing and analyzing materials. Alloys developed to withstand severe radiation damage in reactors were found to have valuable commercial applications. Ion beam facilities built to simulate radiation damage to materials were found useful for the fabrication of solar cells and semi-conductors. Furthermore, the fundamental understanding of

Mike Wilkinson, a pioneer in neutron scattering investigations, directed solid-state physics research at the Laboratory during the 1970s and 1980s.