A History of Leadership

In the past five decades, Canada has been well-positioned internationally in the field of advanced materials research—for the Canadian nuclear industry, for other industrial applications and for university research. This was, in a large part, due to the ingenuity and foresight of the nuclear research community and the Canadian government in designing and building the world-renowned NRX and NRU research reactors at AECL's laboratories at Chalk River.

However, the NRX research reactor is now permanently shut down and the NRU reactor—Canada's pre-eminent research reactor since 1957—will be shut down before the end of the year 2005. The closure of NRU will coincide with an increasing demand for knowledge of the structure and dynamics of materials. It will also coincide with a projected shortage of neutron beam sources worldwide.

"The Canadian neutron beam laboratory has provided Marubeni Canada Ltd. with access to a unique measurement probe, which has provided a basis for business with clients in Japanese heavy industries. The Canadian expertise in neutron beam research is world-class and should be retained by ensuring there is a neutron source into the twenty-first century."

Mr. Jun Fukuhara
President & CEO
Marubeni Canada Ltd.

"In today's high-tech economy, directed research and development lead to increased competitiveness. The collaboration between IVACO, McGill University and the NRC neutron laboratory illustrates how Canadian industries can benefit from the existence of a federally-supported infrastructure for science and technology."

Gordon Silverman
Vice President and General Manager
IVACO ROLLING MILLS

The Competitive Environment

All industrialized, and some newly-industrialized countries, have access to neutron beams from research reactors. However, because of the growing international awareness of the critical importance of neutrons for advanced materials development, the global demand is now exceeding supply.

Germany, Australia, Japan, Egypt, Holland, Thailand and China have identified the requirement for advanced materials research facilities in the twenty-first century and are already constructing, or planning to construct, new research reactors. In addition, all nuclear vendor countries have research reactors to support their commercial programs.

The recent OECD projections for neutron beam sources show that many existing research reactors around the world are reaching the end of their life. The survey predicts a serious reduction in research capacity, unless new sources are brought on line. This situation is particularly critical on the North American continent where beam time has been seriously oversubscribed for several years. The CNF will fill a critical gap in the North American infrastructure, both for advanced materials research and for the nuclear industry.

The CNF Reactor—World-class Canadian Technology

The source of neutrons for the CNF is a 40 MW pool-type reactor based on AECL's well-established MAPLE technology. MAPLE reactors are among the most advanced multipurpose research reactors available today.

The first demonstration of MAPLE technology is Korea's HANARO research reactor, which started up in 1995. Two MAPLE reactors, dedicated to the production of medical isotopes, are now under construction at AECL's Chalk River site, for MDS Nordion. This project on schedule and on budget.

As well, MAPLE research reactor technology is being offered in a proposal currently being developed for the Australian Nuclear Science and Technology Organization. The MAPLE reactors benefit from AECL's