

Building an Integrated Nuclear Engineering and Nuclear Science Human Resources Pipeline at the Idaho National Engineering and Environmental Laboratory

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In 2002, the US Department of Energy (US DOE) transferred sponsorship of the INEEL and ANL-W to the DOE Office of Nuclear Energy, Science and Technology and designated the INEEL and ANL-W as the nation's lead laboratories for nuclear reactor and nuclear fuel cycle research and development. This transfer acknowledged the laboratories' history, infrastructure, expertise and commitment to collaborate broadly in order to fulfill its assigned role as the nation's center for nuclear energy research and development.

Key to this role is the availability of well-educated and trained nuclear engineers, professionals from other disciplines of engineering, nuclear scientists, and others with advanced degrees in supporting disciplines such as physics, chemistry, and math.

In 2005 the INEEL and ANL-W will be combined into the Idaho National Laboratory (INL). One of US DOE's objectives for the INL will be for it to take a strong role in the revitalization of nuclear engineering and nuclear science education in the US.

Responding to this objective for the INL and the national need to rejuvenate nuclear engineering and nuclear science research and education, ISU, University of Idaho (UI), Boise State University, the INEEL, and ANL-W are all supporting a new Institute of Nuclear Science and Engineering (INSE), initially proposed by and to be administered by ISU. The Institute will rely on the resources of both universities and the INL to create a US center for reactor and fuel cycle research to development and attract outstanding faculty and students to Idaho and to the INL.

The Institute and other university based education development efforts represent only one component of a viable Human Resources Pipeline from university to leading edge laboratory researcher. Another critical component is the successful integration of new graduates into the laboratory research environment, the transfer of knowledge from senior researchers, and the development of these individuals into world-class engineers and scientists.

The INEEL Education Initiatives Department, housed in the Human Resources (HR) Directorate believes a highly integrated systematic approach from university to laboratory is necessary to the effectiveness of the pipeline. Currently, a refocusing of INEEL educational programs including scholarships, fellowships, internships, faculty exchange, and educational outreach programs is being conducted under the direction of the Education Director and a executive level Education Advisory Council. Additionally a

mentoring program is under development to facilitate the integration and transfer of knowledge from senior researchers to incoming graduates.

While internal alignment efforts are underway, external alignment efforts must now be planned and developed. Anxious to learn from the experiences of others, INEEL's HR Directorate, the INSE, ANL-W, UI, and ISU will conduct a review of national and international best practices and case studies found in academic and industry literature to identify programs and approaches that might be applied to the INL and the subsequent opportunities and issues that they might represent.

It is proposed that the results of this collaborative study be shared with the IAEA in paper and presentation format at the International Conference on Nuclear Knowledge Management: Strategies, Information Management and Human Resource Development. A brief outline of the proposed paper and presentation follows:

- I. Introduction
 - a. Brief discussion of the historical role of the US DOE and national laboratory role in nuclear energy research and education.
 - b. Brief discussion of the current state of US nuclear energy education.
 - c. Explanation of the expected role of the INL in revitalizing nuclear engineering and nuclear science education in the US.
- II. Current collaborative efforts to build components of an HR pipeline from education through full integration into the research environment and transfer on knowledge from senior researchers.
 - a. Institute of Nuclear Science and Engineering and other university/laboratory education collaborations.
 - b. Laboratory based educational and mentoring programs refocus and alignment activities.
 - c. Laboratory mentoring program as a knowledge transfer mechanism.
- III. Identification of practices, programs, and strategies found in a review of national and international best practices and case studies found in academic and industry literature that may assist the INL with the revitalization of nuclear engineering and nuclear science education in the US.
- IV. Discussion of the opportunities and challenges these practices will represent from both the laboratory and university perspectives.
- V. Presentation of recommended strategies and practices that could guide the INL as it seeks to integrate and facilities its partnerships with the INSEA and other universities.

The work upon which this proposed paper is based will be completed by early July 2004. The paper will be prepared and ready to present by the September IAEA conference, should it be accepted.