

Idaho State University Radiological Protection Education and Training for the Nuclear Renaissance

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Outline

- Introduction
- Background on Idaho State University (ISU)
- Health Physics and Nuclear Engineering programs
- Collaboration Plan
- Results



Introduction

- Human capital crisis in radiological science, nuclear science and engineering
- Loss of employees brings loss of historical and collective knowledge and lessons learned
- These problems will be exacerbated by the resurgence of nuclear power (both in the U.S. and worldwide)
- Health physics and radiological engineers are especially needed for these purposes.



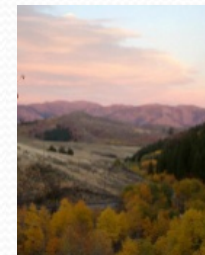
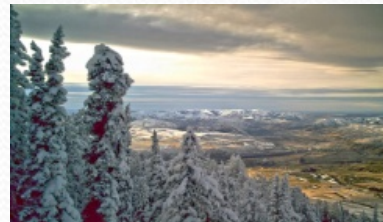
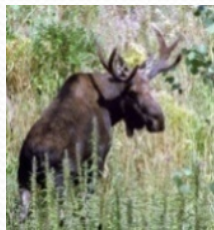
Background

- In 2003, the Idaho State Board of Education recognized the need to strengthen the nuclear science and technology infrastructure in Idaho
- Resulted in an assigned mission that guided ISU to include in its Strategic Plan a commitment to expand its programming and continue leadership in the area of nuclear science
- ISU has made exemplary progress
 - Specifically the HP and NE programs have embarked on a rigorous collaboration for strengthening its educational, research, and outreach programs



Background

- ISU, a Carnegie-classified doctoral research institution, was founded in 1901 educates, approximately 15,000 students in more than 280 programs
- Idaho's lead institution in health professions, medical, and nuclear science education
- Located in the heart of the Northern Rockies, the main campus is located in Pocatello in southeastern Idaho.
 - Within a few hours drive of Yellowstone National Park, the Tetons, Sun Valley, world-class skiing facilities in northern Utah and western Wyoming, and numerous fishing, rafting and mountain biking opportunities.



ISU Health Physics

- One of the largest and most respected HP programs in the nation.
- Only university in Idaho to provide baccalaureate and graduate degrees in HP as well as the only university in the country to offer all four degrees of the A.S., B.S., M.S., and Ph.D. in health physics.
- Only higher education institution in the U.S. to have both its B.S. and M.S. degree programs recognized by ABET in health physics under ABET's Applied Science Accreditation Commission (ASAC).

ISU health physics graduates can be found in nearly every employment sector around the world.



ISU Health Physics Stats

- Four full-time faculty (with several adjunct/affiliate faculty)
- Offer nearly 20 classes in HP
- Student enrollment – undergrads (~25), graduate (~40)
- Current research
 - Two environmental laboratories, the Environmental Monitoring Program (EMP) and the Environmental Assessment Laboratory (EAL).
 - Idaho Accelerator Center (IAC)
 - Research collaboration (internal dosimetry) with the United States Transuranium and Uranium Registries (USTUR)
 - Expanded research in medical physics, radiobiology, and homeland security
 - Research collaboration with the North American Technical Center (nuclear power occupational and public radiation exposure studies)



ISU Nuclear Engineering

- Formal nuclear engineering department established in 2007.
- Institute of Nuclear Science and Engineering (INSE) established in 2003.
- B.S. degree ABET accredited.
- Graduate opportunities offered in Pocatello and Idaho Falls
- Only university in Idaho to provide baccalaureate and graduate degrees in NE
- Nationally, only one of about 20 educational institutions with a viable nuclear engineering program



ISU Nuclear Engineering Stats

- Five full-time faculty (with several research and lecturer faculty)
- Offer nearly 15 classes in NE
- Student enrollment - undergrads (~100), junior/senior(~25), graduate (~25)
- Current research
 - Center for Advanced Energy Studies
 - Idaho Accelerator Center (IAC)
 - AGN-201 nuclear reactor
 - Expanded research in thermal hydraulics, modeling, radioactive waste studies, fast reactor development, advanced reactor systems, material science, and medical isotopes
 - Research collaborations with several national labs (INL, Argonne, LLNL, Oak Ridge, LANL)



Collaboration Plan

- Nuclear energy research collaborations through the Center for Advanced Energy Studies (CAES)
 - Nuclear science, physics and health physics research collaborations through the Idaho Accelerator Center
 - New joint faculty positions with expertise in reactor design and/or health physics
 - Joint graduate fellowships
 - Integration of curricula and courses, including new courses required by students of both programs
 - Increased use of distance learning for recruiting of A.S.(radiological technicians), B.S., and M.S. degree seeking students
- Joint outreach efforts for student recruitment



Idaho Accelerator Center

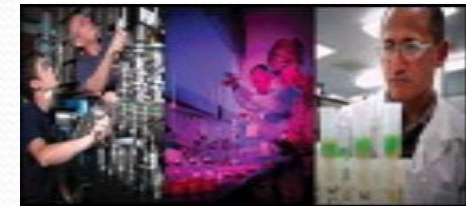


- Several HP and NE faculty and students participate in research at the Idaho Accelerator Center (IAC), which is one of the largest accelerator facilities in the world.
- The IAC has two 2-Mev Van de Graff accelerators, a 10-Mev Varitron electron accelerator, three 4-Mev electron linear accelerators (or LINACs), an 18-Mev LINAC, and a 30-Mev very fast pulse LINAC
- ~\$3 Million/year in research funding (staff of ~20, 3 facilities)
- Current research:
 - Pulsed power, novel beams and beam physics
 - Non-destructive evaluation, assay, and materials analysis
 - Basic nuclear measurements and applications
 - Nuclear physics research
 - Homeland security and nuclear non-proliferation/safeguards



Center for Advanced Energy Studies

- A public/private partnership
 - Universities, private industry, national labs
- Integrate resources, capabilities and expertise
 - Establish a network of networks
 - Improve access to research facilities & equipment
 - Expand researcher-to-researcher collaborations
 - Enhance student educational opportunities
- Deliver innovative, cost-effective, credible research
 - Nuclear energy and Fossil, Renewable, and Alternative Energy
 - Energy Policy Studies



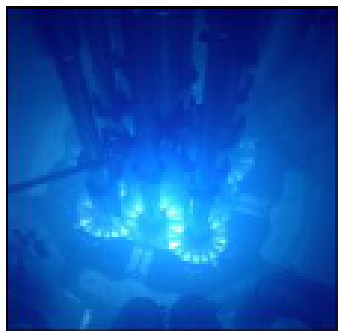
ETRAP 2009

A new multi-institution resource focused on energy education and secure sustainable energy solutions

CAES research initiatives and affiliated programs

Radiological/HP
Nuclear Power

**Nuclear Science
and Engineering**



ATR User Facility
Center Nuclear Space Research
Center Nuclear System Design/Analysis

Material Science



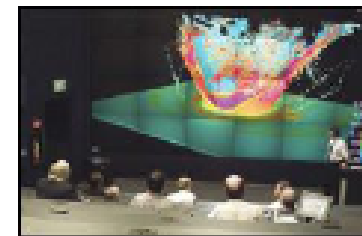
Materials Joining
Initiative

Public Policy and Law



Energy Policy
Institute

Modeling & Simulations



Control Room Simulator
Center for Advanced Modeling

Energy/Water



Carbon Management



Southwest & Big Sky CO₂

Bioenergy



Cellulosic Ethanol
Idaho Strategic Energy Alliance

Center for Advanced Energy Studies **CAES**



Results

- ISU In the short time that the ISU nuclear engineering and health physics programs have established a formal collaborative effort
- Funding has been secured for joint faculty positions (2), undergraduate scholarships and graduate fellowships (partially from U.S. NRC grants, ~\$1,000,000)
- Joint appointments between Physics and NE have been finalized (Harris and Imel)
- Substantial funding from DOE for research and infrastructure projects



Results

- DOE awarded scholarships and fellowships
- Increased recruitment efforts
- Technology improvements for televised classes and long-distance learning
- Joint course and degree offerings between Health Physics and Nuclear engineering
 - Also through ISU and University of Idaho
- ESTEC radiological protection technician program?



Thank You for your
attention!

Questions?

