

Overview of SUNRISE and SCUREF

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**Southeastern Universities Nuclear Reactors Institute for
Science and Education (SUNRISE, LLC) and the South
Carolina Universities Research and Education Foundation
(SCUREF)**

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Oak Ridge National Laboratory, Nuclear Science and Technology Division

Student Summer Seminar

- What is SUNRISE?
 - History
 - Membership
- Enrollment Trend and University Research Reactors
- The Situation with Nuclear Science and Engineering (NSE) Education
- Status of Research Reactors in the US
- State of SUNRISE
- SCUREF/SUNRISE Memorandum of Understanding
- Type of Programs Managed by SCUREF/SUNRISE
- SUNRISE Future and Promise

What is SUNRISE History

- A NSE universities generally located in the Southeast incorporated as a not-for profit organization in December 2006
- Vision: “to enhance the quality of nuclear science and engineering education and research and other services in the Southeast and nationally for the purpose of supporting the development of the next-generation nuclear workforce, nuclear technology, and research”
- SUNRISE is to complement and supplement, and not duplicate or compete with capabilities existing at member universities.
- Private sector and government facilities were encouraged to join SUNRISE. ORNL has an MOU with SUNRISE, one is expected from SRNL.
- Currently, its membership includes 11 universities and 5 companies in the nuclear industry and two national laboratories
- One of its major goals is to create a center of excellence for advanced reactor technology, education, research and training. This center is based on the need to have a new research and a new training reactor.

SUNRISE Membership

University Members

Clemson University
Georgia Institute of Technology
Mississippi State University
North Carolina State University
South Carolina State University
University of Florida
University of South Carolina
University of South Carolina,
Aiken
University of Tennessee
Virginia Polytechnic Institute and
State University
Missouri University for Science
and Technology

MOU

Oak Ridge National Laboratory
Savannah River National Laboratory
(pending)

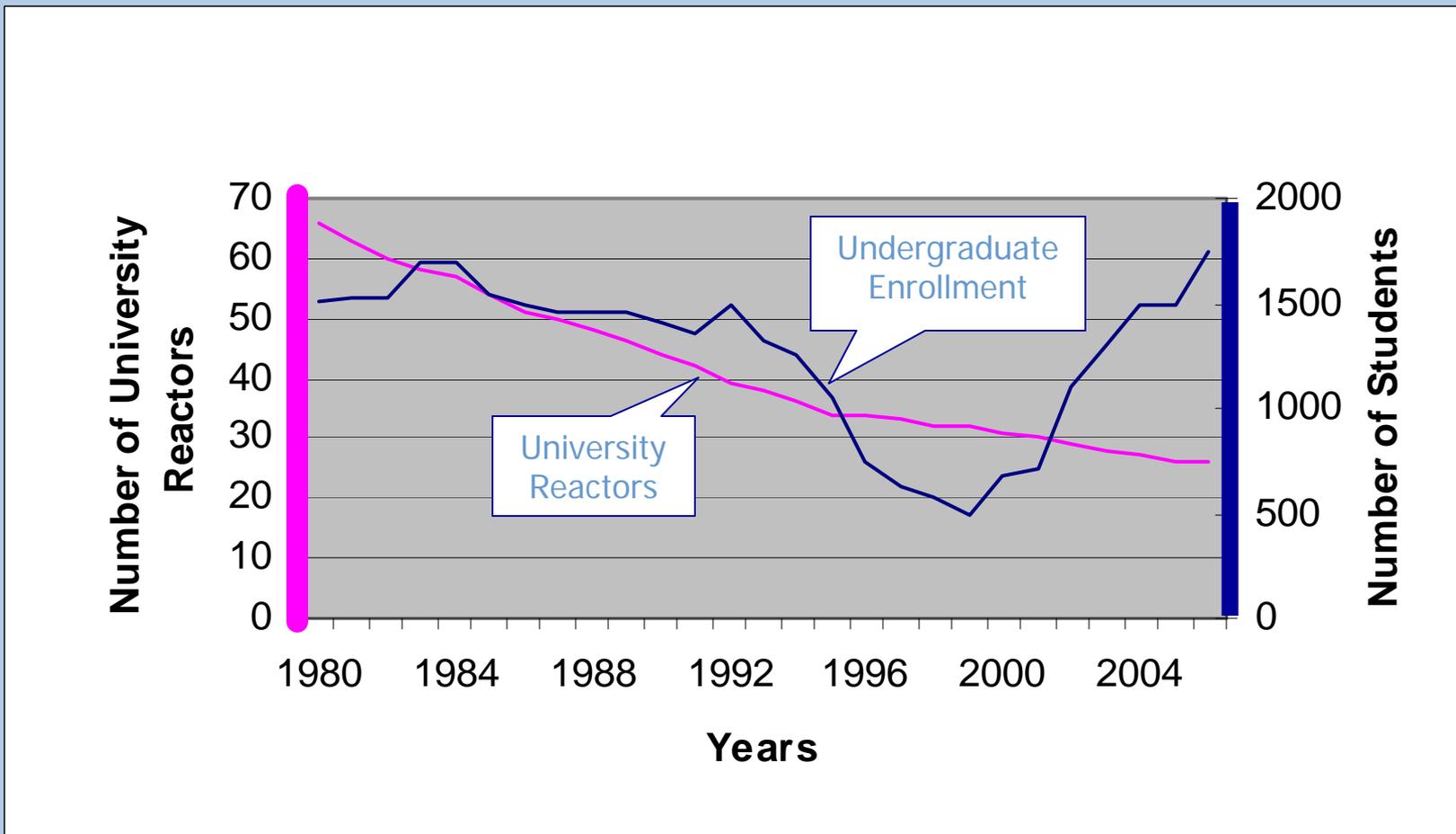
Industry Members

AREVA
Economic Development Partnership of Aiken and
Edgefield Counties
Fluor-Daniels
General Atomics
Westinghouse Electric Corporation
GE Hitachi Nuclear Energy (pending)

Board of Directors Officers

Farzad Rahnema - GT (Chair and Executive
Director)
Paul Turinsky - NCSU (Vice-Chair)
Travis W. Knight-USC (Secretary)
Craig Williamson (Director)

Enrollment Trend and University Research Reactors



The Situation with Nuclear Science and Engineering (NSE) Education

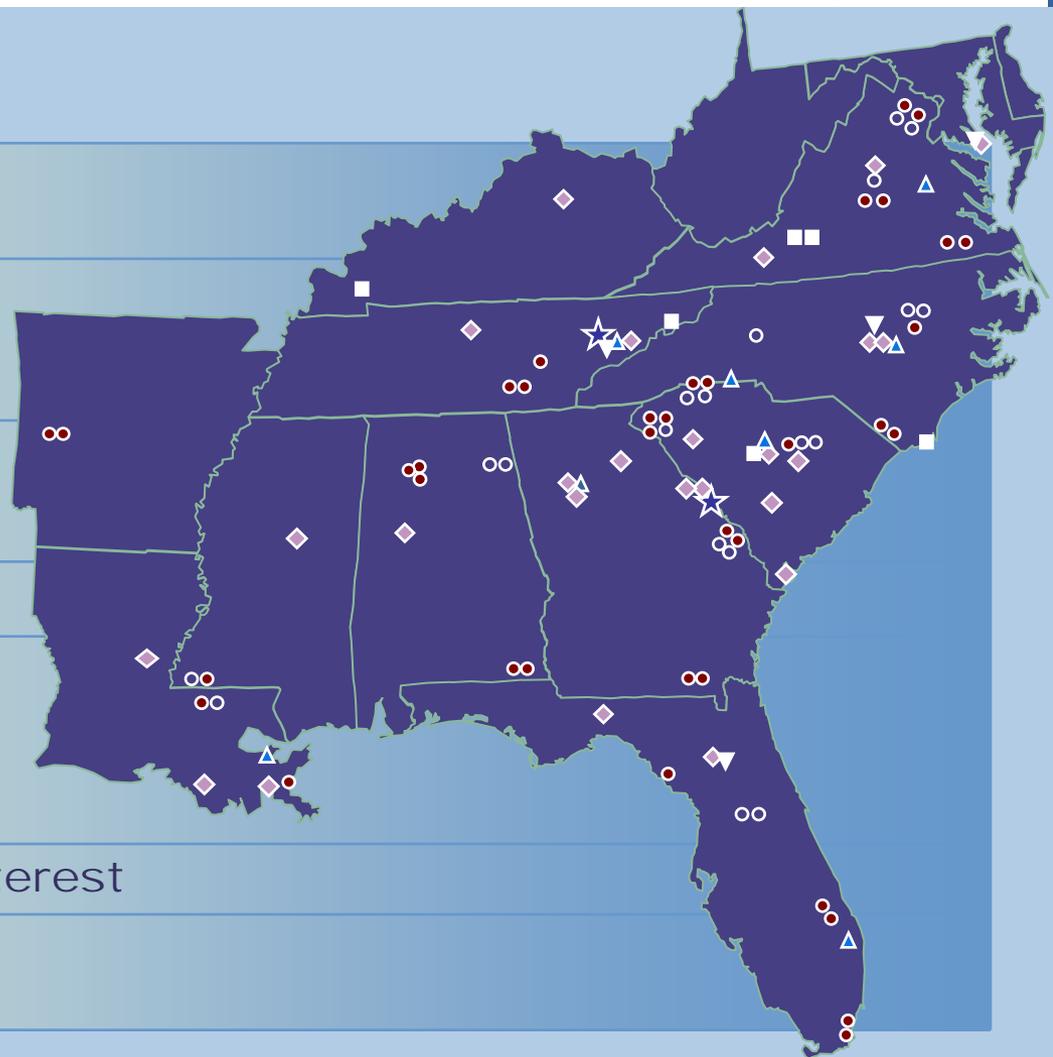
- Rapidly rising undergraduate enrollment requires improved infrastructure, however one needs to be cautious in reviewing this data because a number of schools have included their Medical Physics enrollments, which have also increased rapidly over the last 5 years.
- Number of graduate students has only increased slightly.
- Number of URRs continue to decline ... from 60+ down to 26
- Universities have been forced to de-emphasize reactor-related course work
 - students receive degrees without hands-on reactor experience
- Evaporating pool of nuclear workers
 - Engineers, radiochemists, health physicists, and radiation protection techs...
- Questionable ability for universities to field a growing workforce to support nuclear renaissance initiatives
- Demand has also increased in national security areas in particular nuclear forensics, security and safeguards, and non-proliferation.

Status of Research Reactors in the US

- More than half have been shut down since 1980
- More than 80% are over 30 years old
- Most designed for neutron applications
- Most not capable of performing R&D or training for next generation reactors
- Only one has been built in the last 20 years
- Number of URRs are likely to continue to decline
- URRs lack the capabilities to advance nuclear power plant technology including real life training

The Southeast is Strategically Positioned To Support Nuclear Education and Workforce Development

- ★ 2 national laboratories
 - Oak Ridge and Savannah River
- △ 8 nuclear generators
 - TVA, Entergy, Southern, Duke, Progress Energy, FP&L, Dominion, SCANA
- 40 of 104 operating NPPs (**>40% of US nuclear capacity**)
- 17 of 30+ proposed new NPPs
- 6 nuclear suppliers
 - NFS, BWXT, GE, Westinghouse, AREVA, USEC + numerous nuclear contractors
- ◇ >20 universities with nuclear interest
- ▼ 4 research reactors
 - HFIR, NCSU, UF, UMD



State of SUNRISE

- SUNRISE offers one stop service for technical services, research support, and workforce development
- SUNRISE represents the nuclear science and engineering programs in the Southeast with growing interests throughout the United States
- SUNRISE has enthusiastic support from industrial organizations and national laboratories
- SUNRISE will assist the new M&O at SRNL and SRS with university outreach
- Overall objective of a new reactor facility will continue to be emphasized.
- SUNRISE has a memorandum of understanding with SCUREF to share resources and develop education and research programs. (4 of 5 members of SCUREF are also members of SUNRISE)
- Current Initiatives: Nuclear Forensics, Nuclear Non-Proliferation, Stockpile Stewardship, GAR Training, International NSE Assistance, SUNRISE/Utility Scholarships, and DOE-SR Grant Program

SCUREF/SUNRISE Memorandum of Understanding

- The South Carolina Universities Research and Education Foundation (SCUREF) is a 501 c 3 not profit founded in 1989, with members including Clemson University, University of South Carolina, University of South Carolina, Aiken, South Carolina State University, and the Medical University of South Carolina
- SCUREF holds a Cooperative Agreement to Manage University Education and Research Programs. Those currently managed by SCUREF include:
 - Nuclear Engineering and Health Physics Fellowships and Scholarships
 - Rickover Fellowships in Nuclear Engineering
 - Nuclear Engineering University Partnership Programs
 - Radiochemistry Education Award Program
 - Junior Faculty Awards in Nuclear Engineering
 - Nuclear Forensics Graduate Fellowship Program
 - Research (Task Order) Support to SRS/SRNL
 - SRS/SRNL Internship Program
 - Nuclear Energy Advisory Committee
- The establishment of new Nuclear Engineering programs at USC and SCSU were in part due to SCUREF's initiatives

SCUREF/SUNRISE Memorandum of Understanding

- SCUREF also holds a subcontract agreement with WSRC to perform task order research. Currently there are 30 Task Orders in effect with a funded amount of about ~\$2.2M.
- The Board of Directors of SUNRISE and the Board of Trustees of SCUREF are in the process of reviewing an MOU which could lead to a merger.
- The Nuclear Forensics Graduate Fellowship Program was the first comprehensive continuing program managed by SUNRISE. Seven Fellowships were announced in April 2008. And it is expected that at least two of these Fellows will participate in an internship and dissertation work at SRNL.
- If SCUREF and SUNRISE combine their efforts they will become the single largest administrator of nuclear science and engineering education programs in the nation.

Type of Programs Managed by SUNRISE/SCUREF

Research-Radiochemistry

3 year awards used to support students, faculty and develop infrastructure, matching university funding, laboratory collaboration

Faculty Awards-Nuclear Engineering

3 year Junior Faculty Awards at qualified nuclear engineering programs, matching university funding, laboratory collaboration

Graduate Fellowships and Undergraduate Scholarships-Nuclear Engineering, Radiochemistry (Nuclear Forensics) and Health Physics

4 year nationally competitive awards, participating universities, required laboratory practicum, stipend, tuition and fees, travel expenses, supplemental funding (fellowships), one payment (scholarships)

Minority Serving Institutional Programs

5 year nationally competitive awards in NSE, supports collaboration with national laboratories and collaboration with existing NSE universities e.g. UW/SCSU, MU/PURR, UC/TU, GT/AU, MST/LU

SUNRISE Future and Promise

- Timing could not be better, Nuclear Renaissance
- One stop comprehensive source for NSE technical assistance, research support, collaboration, and workforce development
- Instead of dealing with individual universities customers can draw on multiple university/industry/laboratory with a single administration
- SUNRISE can be flexible by dealing with individual academic departments, faculty members, research staff etc.
- SUNRISE can provide a comprehensive approach in responding to RFPs. Allows for multiple application (individual university and/or SUNRISE collaboration)
- SUNRISE can offer opportunities for partnerships with industry and national laboratories when RFP is restricted to just universities, or when RFP is looking for consortia.