The Charge to the Subcommittee

NSAC is asked to do an assessment of how the present NSF and DOE educational investments relevant to nuclear science are being made and to identify key strategies for preparing future generations of nuclear physicists and chemists.

or, in other words,

Develop a “Strategic Plan for Education in Nuclear Science.”

The Charge continued
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- Education at all levels – undergraduate, graduate student, postdoctoral – is important to NSF/DOE. Are the current investments in education optimal?

- What are the present and probable future skills and roles of nuclear scientists in the public and private sectors?

- What does the demographic picture for the future of nuclear science look like? What can we say about improving work force diversity?

The Charge continued
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Your report should document the status and effectiveness of the present educational activities, articulate the projected need for trained nuclear scientists, identify strategies for meeting these needs, and recommend possible improvements or changes in NSF and DOE practices. Your report should also identify ways in which the nuclear science community can leverage its capabilities to address areas of national need regarding K-12 education and public outreach.

Subcommittee Members

Cornelius Beausang	Yale University
Joseph Cerny	UC Berkeley/LBNL
Jolie A. Cizewski	Rutgers University
Timothy J. Hallman	Brookhaven National Laboratory
Calvin R. Howell	Duke University
Andrea Palounek	Los Alamos National Laboratory
Warren Rogers	Westmont College
Brad Sherrill	Michigan State University
Robert E. Welsh	William and Mary College
Sherry Yennello	Texas A&M University

Web-based Surveys

A. Ph.D.s in Nuclear Science: 5-10 years later. (Survey format final.)
B. Current postdoctoral appointees. (In development.)
C. Current graduate students. (In development.)
D. Current undergraduates. Survey in progress for those in REU(s). (Research Experiences for Undergraduates). Discussion at Tucson meeting with CEU(s). (Conference Experience for Undergraduates). Additional survey at selected universities being considered.

Ph.D.s in Nuclear Science: 5-10 Years Later

A. The overall career path including postdocs from receipt of the Ph.D. until the present, and his/her demographic background.
B. The search for the first non-postdoc job after receiving the Ph.D.
C. The retrospective evaluation of his/her doctoral education and experience.
D. His/her assessment of the usefulness of the Ph.D.
E. The intersection of family and career.
F. Recommendations and opinions (open ended questions.)

Other "Quantitative" Tasks

- Make further use of the Survey of Earned Doctorates data, e.g., compare Ph.D. production, percent of Ph.D.s going to temporary visa holders, time to Ph.D., and work force diversity over time in nuclear science to other physics subfields, to materials science, etc.
- Determine the number of current postdocs and the percentage of those who got their Ph.D. abroad. Try for trend data.
- Evaluate the balance among undergraduate, graduate student and postdoctoral support from DOE and NSF. Is this balance optimal?
- Develop the current demographic picture of nuclear science. What retirements are to be expected in the next decade? What is the anticipated hiring by universities, national laboratories and selected industry? What skills are needed?

Examples of "Qualitative" Tasks

- Develop "experts" among the Subcommittee members on postdoctoral, graduate student, undergraduate, K-12 and public education.
- Develop "experts" among the Subcommittee on work force diversity issues.
- What fields can we emulate which are doing a better job than nuclear science in these educational areas?
- Hold a workshop to learn from outside experts in these areas, e.g., in doctoral education
    - Carnegie Initiative on the Doctorate
      George Walker
      (chemistry, mathematics)
    - Re-envisioning the Ph.D.
      (University of Washington.)

Some of the Other Questions to Answer

- From the surveys, how effective is the current education in nuclear science? What steps need to be taken by DOE/NSF to address critical issues that have been raised?
- What new academic (and financial?) approaches are needed in our doctoral and postdoctoral education? Are there serious educational issues that need to be addressed?
- What new steps need to be taken at the undergraduate level to encourage interest in nuclear science? Review the results of the summer programs and schools. Are the large university and national laboratory programs “active enough,” and are they effective?

Some of the Other Questions to Answer --Continued--

- What new steps need to be taken to bring more women and under-represented minorities into nuclear science? Look at related programs and data. Ask the Associate Deans of some key Graduate Schools for new, effective techniques.
- How can nuclear scientists best interact with K-12 and public education? Talk to the leadership of some science museums and relevant K-12 leaders. Learn about successful programs sponsored by NSF, DOE, APS, ACS, etc.
- Should DOE nuclear science have a merit review criterion like NSF's criterion 2: "What are the broader impacts of the proposed activity"?
- Are the agencies spending their education dollars effectively? Is the nuclear science community adequately leveraging its capabilities into K-12 and public outreach?

How NSAC Can Help Its Subcommittee

- We would be pleased to learn your thoughts and advice on any aspect of fulfilling the charge.
- Let us know what disciplines you think are doing a better job than is nuclear science in these many areas and, if possible, how.
  - Particularly in workforce diversity
  - And in K-12 and public education.
- Let us know of any innovations in improving the science pipeline that are particularly successful and could be imported into nuclear science.

Please send these to: jcerny@uclink4.berkeley.edu

Thank you.