FINAL TECHNICAL & MANAGEMENT REPORT

Project Title: Nuclear Engineering Recruitment Effort

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Background: Since the 1960's, U.S. universities had been world leaders in nuclear engineering technology. Yet, in the past ten years there has been some slippage in that leadership role. The number of nuclear engineering students and trained personnel has decreased since the mid-1980's.

On the other hand, the need for trained nuclear personnel has again increased in the areas of national security, biotechnology, new generation reactors, and other technical fields. DOE has committed funding to help universities and colleges increase the number of nuclear engineers and reactor physicist graduates. ANS was selected to conduct a program to help build interest in nuclear engineering among high school and college students. ANS has coordinated and sponsored through its network of members an ongoing outreach program to inform and educate students and teachers about nuclear science and technology. ANS also will coordinate the pilot project and nuclear educational programs web site.

Project Objective: The purpose of this program was to support the costs of developing a nuclear engineering awareness program, an instruction program for teachers to integrate lessons on nuclear science and technology into their existing curricula, hands-on science centers and web sites for the exchange of nuclear engineering career information and classroom materials.

There were six objectives in the program. The analysis and conclusions follow:

OBJECTIVE 1: INCREASE AWARENESS AND INTEREST OF NUCLEAR ENGINEERING

Heighten the interest of college freshmen and high school students through the development of a college freshmen awareness program that will be initiated and continued at universities/colleges where professors of nuclear engineering and/or ANS student sections are established. The first objective was an awareness initiative to inform and encourage students to pursue nuclear engineering studies. The target group was students preparing to enter college or college freshmen in science, math, and engineering-related courses.

OBJECTIVE 2: INSTRUCT TEACHERS ON NUCLEAR TOPICS Instruct teachers at the middle and high school levels to teach nuclear-related topics. The second objective was pursued through workshops and sessions that provided teachers with current classroom-usable information and tools to improve overall scientific understanding concerning nuclear science and technology. Hands-on science centers were offered the loan of Geiger counters to use in hands-on exhibits. Teachers were provided with instruments and nuclear-related materials for use with students.

Summary of Action - Objectives 1 and 2

ANS utilized an extensive network of more than 10,500 members and cooperative relationships with many non-members to accomplish these two objectives of the program. ANS engaged the volunteer efforts of members at Local Sections, Student Sections, and Plant Branches, Organizational Members, and university faculty and the volunteer efforts of non-members who shared an enthusiasm for our project, to plan and carry out the large number of activities and events. By leveraging these relationships, ANS was able to provide career information to students (college and high school) and teachers and carried technical information about nuclear science and technology to teachers through workshops and sessions.

Work on this program began with events that took place while awaiting finalization of the grant date.

During the project, with assistance from the DOE/ONEST funding, ANS planned and organized or supported a total of 400 events – 116 in 2004, 120 in 2005, 125 in 2006, and 39 in the first quarter of 2007. The number of events in each category is summarized in the table below. For a detailed listing of events, see [Exhibit #1](#).

**Events Completed
January 1, 2004 - April 2, 2007**

	Events	Attendees
Workshops/Sessions	94	2312
NSTA Exhibit w/workshop	9	249
Career Day Activities	38	3780
Career Fair	42	60773
Classroom Visits	88	10738
Exhibits	27	24952
Science Fairs	26	18979
Boy Scout/Girl Scout Events	29	24425
Other Events	47	49704
Total	400	195,912

Project planning and on-site responsibility for successful completion of events was spread among several groups: ANS Headquarters staff, 42; individual ANS members, 38; ANS plant branches, 2; ANS organizational members, 23; ANS Local Sections, 143; ANS Student Sections, 125; Other interested individuals or groups, 27.

More than 1,885 volunteers participated in the outreach activities to teachers and students. These volunteers organized and planned activities, or they were present to assure successful completion of each event. Some individuals provided support for more than one event.

During the project, events were held in 32 states and the District of Columbia. An effort was made assure support to events reaching educators from states where we had no evidence of a large number of nuclear related learning opportunities for educators (Connecticut, Kansas, Maine, Minnesota, Nebraska, North Dakota, New Jersey, Washington).

Analysis and Findings

University and Student Section involvement in the project was strong and helped assure an impact among university students and prospective university students. Of the 400 events, Student Sections were responsible for 125. Student Sections conducted teacher workshops, engineering open house events on the university campus, career day activities for visiting high school students, classroom visits, summer camp activities for high school students, scout events, exhibits, and other activities. The events provided a mix of on-campus (college student) and off-campus (high school) outreach.

The project had an impact on enrollments in nuclear engineering programs. Two specific examples illustrate the impact, Texas A&M and University of Missouri-Rolla. Texas A&M reported that as the project continued and they received materials to support their outreach to high school and university students, there was an increase in the percentage of their undergraduate enrollment admitted each year which could be identified as "previously impacted" through classroom visits, career day events, etc. (36.5% in 2004, 44.7% in 2005, 50% in 2006, and it is projected at 49.5% in 2007). University of Missouri-Rolla received materials for nuclear summer camps for high school junior and

seniors during the years 2004-2006. In that time, 157 students attended the camp and 22 of them (14%) have subsequently been accepted at the university with a stated preference for a major in Nuclear Engineering. In 2006, 16 were already enrolled and constituted 11% of the NE undergraduates at the University of Missouri-Rolla. In the fall of 2007, six (6) more students identified as "nuclear campers" will enter the Freshman Engineering Program with a stated preference for a major in NE.

The project expanded on the growth momentum for college enrollments in nuclear fields; that momentum began developing during a previous project (2001-2003) also funded by a grant from DOE. A study done during this project (Department of Energy – University Working Group Survey Results, May 24, 2006, by Christine Messer) showed that undergraduate enrollments grew during the period of both projects. In fact, NE enrollment levels in 2004-2005 were more than 2-1/4 times what they were in 2000-2001

Nuclear Sciences Undergraduate Enrollment

	NE	Combined Nuclear*
2000-2001	582	668
2001-2002	710	855
2002-2003	990	1113
2003-2004	1221	1365
2004-2005	1345	1520

Data from University Working Group Survey Results, compiled by Christine Messer, May 24, 2006

*Nuclear Engineering, Health Physics, Radiological, and Other.

Student membership in the American Nuclear Society increased during the grant period (2004-2006), as shown by the following counts (from the end of each calendar year). Student membership growth serves as a further indicator that the population of students who expect to work in the nuclear field has been growing.

ANS Student Membership

2001	741
2002	784
2003	1110
2004	1230
2005	1306
2006	1394

The educator workshop program provided 2,561 teachers with instruction on the basics of radiation, applications of nuclear science and technology, how to use Geiger Counters, and experiments and demonstrations that are ready for classroom use. Participants received a teacher handbook and experience with a Geiger Counter which they can use in the classroom. Teachers go away from these workshops with knowledge, materials, and equipment that enables them to conduct hands-on activities with their students. Teacher evaluations of workshops have consistently indicated that workshop training is meeting their needs and providing enthusiasm about including nuclear science and technology information in their classroom instruction.

Teachers attending workshops demonstrated interest and enthusiasm for teaching about nuclear topics, despite indications that they have limited time available for adding new curriculum content.

Teachers who participated in workshop sessions, of whatever length, consistently provided a high level of agreement with the statements “I will recommend this workshop to other educators” and “I will be able to utilize content from the workshop in my classroom.”

The potential for continuing impact on secondary students, as a result of the teacher workshops is extensive. On average, the teachers who attend have contact with 60-125 students each year. As a result, we estimate that the teachers who attended workshops during the grant period have the potential to reach approximately 153,000 to 320,000 students annually with information about nuclear science and technology and careers in the field.

Materials produced and distributed during the project will continue to serve teachers. Career posters, Career brochures, and quantities of mini-DVDs with career information produced during the project will continue to serve the needs of teachers as they inform students about career opportunities in nuclear science and technology.

The **ReActions** newsletter, funded during the project, provides periodic stimulation to workshop attendees and others on the mailing list (18,000+ and growing), with information about new applications of nuclear science and technology. The on-line **ReActions** archive provides a reference point for teachers who come to the web site seeking additional resources.

OBJECTIVE 3: NUCLEAR EDUCATION PROGRAMS WEB-SITE - Design, implement, and maintain a single website with appropriate links that would allow interested individuals and groups to find out about career, research, and educational opportunities in nuclear engineering and health physics. (This project also contained in Objective 4.)

Summary of Action

ANS provides the web space and server for the new Nuclear Education, Research and Careers web site. It is located at www.aboutnuclear.org. The site provides information for K-12 and college students about potential NS&T careers, education requirements, educational institutions, and scholarships/fellowships. The responsibilities of the site are shared with University/Lab Associates (see Objective 4). A considerable amount of career information was added to the web site, providing site visitors with additional resources.

It provides links to information about: nuclear engineering and health physics programs at universities, professional organizations, scholarship information, fellowship, and internships.

During the project, teachers and students were provided information about www.aboutnuclear.org in order to build awareness among the target audience and promote its use.

Analysis and Findings

Usage of the site has grown steadily as shown in the following table.

Visits to www.aboutnuclear.org

Time Period	Visits*	Visits/Month (average)
June-Dec 2002	11,022	1,574
Jan- Dec 2003	86,555	7,212
Jan – Dec 2004	124,889	10,407
Jan – Dec 2005	184,150	15,345
Jan – Dec 2006	257,194	21,432
Jan – May 2007	121,076	24,215

*A visit is defined as a person going to the site, looking around and leaving.

OBJECTIVE 4: SUPPORT TO UNIVERSITY/INDUSTRY MATCHING GRANTS AND REACTOR SHARING

Assist in the administration of the University/Industry Matching Grant Program and the University Research Reactor Sharing programs and the development and maintenance of a website for nuclear engineering and health physics education. This assistance in the program areas included the preparation and distribution of program applications, the receipt and processing of these applications, the administration of a peer review for the program, including all logistical support and the recommendations of awards to DOE for program funding. University Laboratory was charged to provide the U.S. Department of Energy and the American Nuclear Society a report on each of these activities. All program policy guidance; recommendations and funding determination continue to rest with DOE.

Summary of Action/Analysis and Findings

The University Research Reactor Sharing Program and Matching Grants Program were ended on December 31, 2006. University/Lab Associates Consulting Services has prepared a report on both the Matching Grants and Reactor Sharing programs. These reports are included below.

U.S. Department of Energy Industry Matching Grant Program: A Six-Year Evaluation

Overview

This report provides a summary evaluation of the U.S. Department of Energy's Industry Matching Grant (MG) program. Specific information regarding the program funding from 2001-06 is given as well as information regarding the overall effectiveness of the program is discussed. This is provided through a review of financial data and a survey.

The Matching Grant program was designed to encourage collaborative support among university programs in nuclear engineering; the nation's nuclear industry; and the U.S. Department of Energy. In addition, the program was created to enhance nuclear engineering education within the United States, and to contribute towards maintaining a viable workforce for the nation's nuclear energy, security, and defense organizations. These objectives were to be accomplished through the establishment of a flexible funding base for the nation's nuclear engineering programs.

Financial support from DOE to an individual university nuclear engineering program was set at a maximum \$60,000 per year. All of DOE's contributions attempted to match private sector contributions. However, there was no limit on private sector

contributions, and for the most part these contributions exceeded the funds provided by DOE. The combined funds generated through this program were typically used to support the development of undergraduate and graduate curriculum, undergraduate scholarships, graduate fellowships, faculty development, research awards, and infrastructure development including improvements in the instrumentation and equipment used by nuclear engineering academic programs. Students supported by this program were frequently involved in internships at the sponsoring nuclear companies and at national laboratories. Nuclear industry personnel were encouraged and became frequent participants in campus programs. Overall the DOE Matching Grant program greatly enhanced the relations between private nuclear energy companies and the nation's nuclear engineering programs

The funding provided by the industry sponsors was required to be unencumbered. This meant that the universities could not be obligated to support the industry with students or research. As a result the universities were free to spend the industry and DOE funds in a manner which they (the universities) deemed to be the most important to the viability of their respective programs. This requirement also afforded DOE the confidence that the industry sponsors were not purchasing products or services, which would have been supplemented by the DOE funds. Any funds that were deemed to be "encumbered" were not counted toward the match provided to the universities by DOE.

The following chart indicates how the number of sponsors and the amounts of the sponsorships varied from 2001-2006. In 2004 the amount of funding provided by DOE was increased from \$800,000 to \$1,000,000.

Sponsors

	Utility	Contractors	Funding Requested	Funding Provided
2001	20	16	1,230,073	800,000
2002	18	19	1,309,115	800,000
2003	17	21	1,308,800	800,000
2004	17	14	1,253,750	1,000,000
2005	17	17	1,287,875	1,000,000
2006	17	19	1,487,528	1,000,000

Survey Results

A survey was sent to the universities participating in the DOE Industry Matching Grant program. The purpose of the survey was to measure the effectiveness of the program and to determine its relative value among other DOE nuclear science and engineering activities. Surveys were sent to 24 universities and at the time of this writing

18 have replied. The replies to the following questions demonstrate the strong support and the importance of the program.

The DOE/Industry Matching Grant Program was important to the viability of your nuclear engineering program.

17 respondents strongly agreed with this statement

1 respondent agreed with this statement

0 respondents disagreed

The DOE/Industry Matching Grant program helped our nuclear engineering program forge closer ties to our industrial sponsors.

16 respondents strongly agreed with this statement

2 respondents agreed with this statement

0 respondents disagreed with this statement

The DOE/Industry Matching Grant program provided an avenue for sponsorship of our nuclear engineering program, which would not have occurred if the program did not exist.

18 respondents strongly agreed with this statement

0 respondents agreed with this statement

0 respondents disagreed with this statement

The DOE/Matching Grant program was recognized by the Engineering Dean 12; Vice President for Research 8; Provost 6; President 4 of our university as an important element to viability of our nuclear engineering program.

Will your industrial support continue without the existence of the DOE/Industry Matching Grant program?

4 responded yes to this question

14 responded no to this question

In reply to the question of ranking the Matching Grant program among the seven other programs (Reactor Sharing Program; Fellowships; Scholarships; University Partnerships; Research Programs; Junior Faculty Awards) the Matching Grant program had an average ranking of 2.05 a range between 1-3 and ranked second only to research program in receiving 6 number 1 rankings. The research programs received 9 number one rankings.

There were several open-ended comments provided by the respondents. A sampling of these replies included the following.

- ***Our industrial sponsor will continue to support the program, but probably not indefinitely without a DOE match. In addition, the lack of a DOE match has a negative connotation with our Dean and VC for Research.***

- The matching grant program provided an incentive for our industrial partners to also provide support for our programs. They were very willing to support us when it was clear that their support would generate additional funds from DOE. We used these funds to improve the program in many ways through the purchase of new equipment and computers as well as financial aid for students that did not qualify for the available scholarships and fellowships. Having up-to-date equipment and computers is very important to a quality education. This program also has helped us attract some of the better students in the country to both our undergraduate and graduate programs. Without these funds, our ability to continue to attract these students will be jeopardized. This result is counter to the expected growth in nuclear stations as well as advanced reactors and generation IV reactors. The success of all of DOE's future programs depends on the availability of well-educated nuclear engineers at all levels. The lack of DOE support for university programs could force some programs into additional cost-cutting measures that will ultimately affect the availability of qualified engineers.
- The DOE/Industry Matching Grant program allowed Idaho State University to "jump start" its new Bachelor of Science in Nuclear Engineering degree. This is a new degree for Idaho. Previously, students interested in nuclear engineering at the undergraduate level could only major in "general" engineering with a "nuclear option." The new degree is more focused on nuclear. The first students with this new degree are graduating this May, 2007. Five of the six were attracted to this program specifically because of the financial aid provided by DOE under this program and by our industry sponsor, AREVA NP. All the students have indicated that they would not have entered the program without the financial incentives. They transferred from other engineering disciplines and often had to take additional coursework because of this. Several have either found jobs in the nuclear industry or are continuing in NE in graduate school.

For the coming 2007-2008 academic year we have reduced the number of students funded by our "2 + 2" Scholars" program, which is the program we established with the DOE /Industry Matching Grant monies. The cessation of DOE support means that we will reduce the funding amount per student or the number of student awardees or both in the next two years. We think that this may severely impact our ability to attract students to our undergraduate NE degree program.

We are hopeful that AREVA NP will not eliminate support for the "2 + 2 Scholars" program. However, AREVA committed money for five years on the strength of DOE's original five-year commitment to the Industry Matching Grant program. AREVA expected its five-year contribution to have a greater impact beyond its own money—in essence, a doubling of its support—since it was to be matched by DOE funds. This may well impact the ISU program that AREVA envisioned and supported.

- Matching Grant support was essential for attracting students to our program. It provided funds to support graduate students assistantships where research funded assistantships fell short. Each of these students thus supported, worked on projects directly related to the industry or at a national lab with laboratory

scientists on DOE sponsored research. Further, it provided funds for outreach to the community through the Student ANS chapter.

Also, it supported adjunct professors from industry or the national labs to teach a specialized course that was particularly relevant to the Industry and DOE Missions such as Nuclear Energy in the Hydrogen Economy and Nuclear Licensing and Regulation. The latter was a first of a kind course that covered materials related to the new application process for Combined Operating Licenses (COL) which is very important to the Industry in testing this new process. It received high marks and good comments from our Industrial Advisory Board. The former mentioned specialized course was instrumental in attracting undergraduates into the NE graduate program and resulted in some students seeking internships in NE related fields.

- The matching program is an excellent tool to develop strong relationship with the industry and leverage the DOE money multifold (3+). Most executives indicate that they feel it is the government's job to support university education in NE and that they would be more motivated to help if DOE is supportive of the NE programs. Otherwise they feel that they already contribute significantly to nuclear energy by their strong interest and millions of dollars of investment in new reactors.
- The Matching Grant program was effective in getting industry to recognize the issues facing academic programs in nuclear engineering and encouraging them to play a part in supporting the academic programs. The matching support was key to getting support as this opened the door to talk to the decision makers.
- This is the easiest program to understand and support!! Flexible money with minimal effort at modest costs to the government, Exelon was first to see this in 1992 and still sees it, thank God. This is the best DOE program next to the Fellowships and Scholarships.

U.S. DEPARTMENT OF ENERGY
REACTOR SHARING PROGRAM
A SIX-YEAR EVALUTION

OVERVIEW

The U.S. Department of Energy's Reactor Sharing program was established in the mid-1980s to support users from educational institutions where reactors were not located to take advantage of the unique resources offered by university research reactors. These resources varied from general knowledge about nuclear reactions to specific areas of research including nuclear forensics, neutronics, materials science, thermal hydraulic and many other areas of research. For the most part university research reactors are underutilized research facilities, which can have better utilization with relatively small amount of funding. The Reactor Sharing program was a product of this need and to a great extent opened up new avenues for faculty members and students to take advantage of these critically important research facilities.

This report examines the last six-years of the program. It also identifies some of its highlights as well explores what impact the program had between the years of 2001-06. As indicated in the chart below in 2001 there were 26 university reactors participating in the program. By 2006, that number had decreased to 20. Most notably during that timeframe reactors at the University of Virginia, University of

	Number of Universities	Amount Requested	Amount Provided
2001	25	1,301,866	600,000
2002	21	1,295,410	600,000
2003	19	980,038	600,000
2004	20	1,068,166	600,000
2005	21	1,034,187	600,000
2006	20	974,528	600,000

Michigan, Cornell University and the University of Arizona ceased operations and began the process of decommissioning. The amount of funding requested also varied from a high of \$1,301,856 in 2001 to a low of \$974,528 in 2006. The requested amounts appear to be a direct function of the number of universities requesting funds. The amount DOE provided for the program \$600,000 remained at that level for the six-year period. The program participants varied from grade school students to research faculty and as previously mentioned the activities supported by the program varied greatly.

This evaluation of the program attempts to measure the impact that its possible discontinuation will have on the utilization of these reactors. A survey was sent to the 20 universities that participated in the program in 2006. Twelve responded to the survey. Highlights of the survey included the following:

- Ten of the respondents stated that they "strongly agreed" that the DOE Reactor Sharing program was a valuable activity for the nation's university's research reactors. Two respondents stated that they "agreed" that it was a valuable activity; no respondent disagreed with this statement.
- In assessing the relative value of the Reactor Sharing program nine of the respondents said that it was in the top third of federally sponsored programs, three respondents said that it was in the middle third. No respondent said that it was in the bottom third.
- Ten of the respondents "strongly agreed" that the Reactor Sharing program helped the campus reactor forge closer ties with users from outside the university. Two respondents "agreed" with this statement and no respondents disagreed.
- Similar results were found in the ability of the Reactor Sharing program to assist in forging closer ties with users from within the university. Nine respondents "strongly agreed", three "agreed" and no respondents disagreed with this impact of the program.
- In determining the on-campus visibility of the program the survey showed that the Reactor Sharing program was recognized by nine College Deans; five University Provosts; six Vice Presidents for Research or their equivalent; and four university Presidents. This demonstrated visibility for the program among the higher ranking university officials.
- In reporting on the future use of the university reactor by users from other educational institutions, six of the respondents reported that those users would continue to use the reactor and six reported that they would not continue to use it. It was also reported that the use of these external users would be reduced by 75% by three respondents; 50% by two; and 25% by one of the respondents.
- In reporting on the future use of the university reactor by users from the same institution, seven of the respondents reported that those users would continue to use the reactor and five reported that they would not continue to use it. It was also reported that the use of these internal users would stay the same by two

respondents, be reduced 50% by three respondents; and be reduced to below 25% by two of the respondents.

A brief summary of the results of the survey indicate that the Reactor Sharing program was a relatively valuable program and that it was effective in meeting its stated objective of increasing both external (to the campus) and internal use of the participating university reactors. Overall, the program was recognized by university administrators as an important program. The discontinuation of the program will have a negative impact on the utilization of the reactors in that some will no longer use the reactors while other for the most part will decrease their use.

In reporting on the value of the program the survey respondents were asked to comment on the program. Verbatim comments are given below.

- *The reactor sharing program allowed us to support research programs to gather data for competitive research. Since there was no initial cost to researchers, it was extremely attractive to groups that had not even considered nuclear analytic techniques or thought that there was little potential – no cost, no penalty for failure if the trials did not pan out. The support allowed us to show what could be done to support research projects, and there has been some significant (for us) support from sponsored research that occurred because of work that was initially support by reactor sharing. There have also been many projects initiated because of recommendations and suggestions of reactor sharing participants.*

The public and precollege component was also very productive, although the fraction of operating time committed to these activities was small. The reactor sharing program permitted support that allows us to educate the general public; this is EXTREMELY important as studies conducted here show that high school students generally use parents and respected adults in career counseling and educating the advisors of tomorrows students is critical. The reactor sharing program permitted support that allows us to attract students. In the absence of reactor sharing support, any future effort in this area comes from faculty and research groups that do not understand or perceive benefits, and these efforts will at best be severely curtailed and at worst stopped entirely.

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In the absence of reactor sharing support, any future effort in this area comes from faculty and research groups that do not understand or perceive benefits, and these efforts will at best be severely curtailed and at worst stopped entirely.*

- *The Reactor Sharing program was the most useful program developed to encourage reactor utilization beyond any other program. The program allowed a level of educational outreach that is just not funded by any other agency. For example, week long high school summer programs could not be funded by the visiting school nor the university; but the student contact was invaluable. Anecdotal evidence can be seen, when students in the department say that part of the reason for why they went into nuclear engineering was because of the visit to the reactor facility during their high school career. Research utilization was also substantially enhanced because the funds were available for Proof-of-Principle tests and experiments that would be used in grant proposals to varying agencies (not just DOE). Without the seed money for a Proof-of-Principle test, most researches do not consider adding reactor based work in their proposals. Elimination of the program, really does hurt reactor utilization as well as research across multiple disciplines.*
- *We showcase our reactor to other educational institutions by conducting tours, labs and some research projects. The intent is to give university bound students the opportunity to seriously consider Nuclear Engineering as a major at our university. The number of undergraduate students in our university's Nuclear Engineering department has tripled in the last seven years. The Reactor Sharing program has played a major role toward recruiting these students. The next few years will determine if our facility can be as assertive toward recruitment of Nuclear Engineering students without Reactor Sharing funding.*
- *The reactor sharing program provided important trial funding for researchers who were interested in the experimental use of the reactor but had no funding available to support the research reactor facility and offset costs associated with the initial experimental evaluations. With the exception of the DOE INIE program, the University Reactor Sharing Program provided the only available grant funds for high schools and smaller research universities to perform experiments on the research reactors.*
- *The Reactor Sharing Program has been a critical element in our outreach program to schools, universities, and researchers. It has provided funding for many valuable student projects. It is major contributor to increased education and research at our facility.*
- *Concerning internal users, we always strive to support the campus regardless of support. What reactor sharing has produced locally is successful proposals based on work done under reactor sharing. Specifically, it was the funded opportunity (i.e., investment) that was highlighted and recognized as significantly contributing to the proposal.*
- *Reactor Sharing was a very unique and valuable resource for many in the reactor community. For us, it fostered the kinds of interactions that led to further utilization and research. We endeavored to view the funds as a well to draw from to create opportunities.*
- *The program has been instrumental in fostering the relationship between external and internal researchers, grad students and high-school seniors who are interested in nuclear engineering.*

OBJECTIVE 5: PILOT PROJECT - The first major step was to design, implement and evaluate the marketing pilot project in two states/regions to determine how best to develop the national marketing effort. The final selection of pilot project locations was driven by input from team members. The second major step was to develop a research tool to send to each member institution to determine the reasons behind the sharp spike in NE applications and matriculations in the last 18-24 months.

The pilot project was mandated to include two-year institutions and community colleges in its list of key audiences to target in reaching the overall goal. The pilot project key audiences were mandated to include secondary math and science teachers, not simply secondary teachers. The pilot project was mandated to include health physics and radiation sciences on the NE target major's list.

Design and implement an Internet-based survey to measure why the dramatic enrollment increases in nuclear science and engineering at many member institutions. Survey steps included:

- Design survey and pre-test;
- Contact all 25 institutions to determine best methodology for the schools/departments to contact freshmen students encouraging them to complete the survey; develop a string of reminders, encouragements, and incentives to maximize participation in the survey.
- Conduct survey, analyze data, and report back to the NE Marketing Team.
- Contact the pilot project schools in the two regions to begin project. Steps to include:
- Make initial contact with institution; determine staff contact for the project; detail how the pilot project will be run. Key steps include:
- On-campus analysis of how the department/institution now markets to prospective students. Meet with key department and faculty reps and key reps in admissions to understand the strengths, weaknesses, and opportunities in marketing NE majors.
- Work with the institutions to develop a more aggressive six-step marketing plan with the specific goal of increasing the number of students that major in NE fields. Steps include:
- Goals, which must be measurable
- Key audiences to target
- Review of all research
- Develop key messages
- Send continually and effectively in an integrated fashion
- Full evaluation
- Create a website and list serve to coordinate the marketing efforts between the two pilot project schools.
- Oversee the marketing effort; on-campus visits when necessary.
- Full evaluation at the conclusion.
- Determine next steps in exporting to other institutions.

Summary of Action/Analysis and Findings

The Pilot Marketing Project created by Simpson Communications LLC is in use. The Nuclear Careers DVD was released in January 2007 and 13,000 copies were produced for use by the DOE and ANS. More than 1,000 copies have been distributed already.

A report on the pilot project, prepared by SimpsonScarborough, follows.

National Marketing Effort Project Synthesis Report

Project Overview

Project Goal:

To increase awareness of nuclear engineering, science and technology and health physics as a viable college major and career for high school and college students.

Step One: Assess the Situation

To accurately assess the current situation facing nuclear engineering, science and technology (NEST) fields, SimpsonScarborough completed several research studies. These research activities, both primary research and synthesis and review of existing and secondary data, were completed for two purposes; 1) to more fully understand the viability, image and reputation of the NEST industry and of the major/career paths, and 2) to gather baseline data that can be used in future longitudinal analyses.

More specifically, to complete the research SimpsonScarborough:

- Conducted 20 focus groups with high school science teachers and students and used that data to administer a telephone quantitative study with 400 science teachers from across the country. We believe that science teachers are a key to the NEST career pipeline.
- Conducted four focus groups with NEST students at a national student meeting at Penn State. These data were used to gain a better understanding of the how, why, when and what interested them in the field, and what prompted them to study NEST majors. These data were used to construct the first nationwide quantitative study of current NEST students.
- Synthesized and presented focus group research conducted by Bisconti Research of 1151 current students in 2000.
- Reviewed and synthesized the Bisconti 2000 *Profile of Engineering Freshman* and executive interviews with 10 nuclear facility recruiters.
- Created – under the direction of the NEST Marketing Team (representing education, associations and industry) – administered, analyzed and presented the first national quantitative recruiting study of current NEST students. The purpose of the study was to understand:
 - How and when students first come into contact with the NEST and High Energy Physics (HP) fields
 - What prompts students to consider further study and/or a career in NEST/HP
 - Who influences their decisions to study NEST/HP
 - What major sources of information students use when choosing a college
 - What institutional characteristics/factors influence their college decision
 - What drives their interest in the field
 - A description of their area of interest within NEST/HP
 - What areas they anticipate working in or studying after graduation

This research, plus additional specialized research with the pilot projects discussed below, allowed us to gain a sound understanding of the students in NEST/HP and their teachers. This analysis formed the basis on which all marketing activities and plan were developed.

Step Two: Build Bridges Across K-12, Higher Education, Targeted Associations and the NEST/HP Workforce

From the beginning of the project it was clear that a national marketing effort would have to involve more than just a loose network of contacts working in K-12 and higher education. Through the duration of the project, representatives from The U.S. Department of Energy, the American Nuclear Society, the Nuclear Energy Institute, the ANS Workforce Committee, national labs, health physics organizations and university nuclear education programs guided the effort through the NEST National Marketing Team.

In order to ensure the project was inclusive, SimpsonScarborough:

- Conducted regular calls with the NEST Marketing Team when constructing, revising or finalizing key deliverables.
- Met with the NEST Marketing Team in conjunction with several ANS Winter and Summer Meetings.
- Met with ANS, university and DOE representatives throughout the project.
- Reported to and discussed strategy with the NEDHO group of university nuclear education program department heads at ANS national meetings.
- Provided updates and discussed strategy with the ANS Workforce Committee at bi-annual meetings.
- Engaged in regular discussions with various university nuclear education administrators.
- Developed a hub of communications for the project. The project's "groupub" site created an online community for interested parties across the industry to view research and materials, post notes and download key project documents and tools.

The diligence given to gaining input and guidance through every step of the project has created an effective marketing synergy, dialogue and buy-in across the board that will be beneficial in the future.

Step Three: Conduct Two Pilot Projects with Select NEST/HP Programs

After conducting extensive research with a national sample of current NEST/HP students, the NEST National Marketing Team decided a more targeted marketing approach would be most effective. The research findings also showed that the university NEST/HP marketing programs had already begun to infiltrate several key audience segments. With this knowledge, the NEST National Marketing Team decided that the marketing effort should focus primarily on university outreach and how industry, associations and DOE could augment and better support these focused efforts.

In order to better understand the outreach, education and recruiting activities of the individual university departments, the NEST National Marketing Team conducted two pilot projects with select NEST/HP programs. The pilot projects included:

- Conducting more specialized research with current NEST/HP undergraduate and graduate students in those programs.
- Completing a communication analysis to better understand current practices in outreach, education and recruitment.
- Analyzing and presenting findings and recommendations to the NEST National Marketing Team and to the individual university departments participating in the project.
- Creating a model institutional marketing plan that other institutions across the country could use as a template – two different types of marketing plans were created to take into account the varying size and type of programs nationwide.

The institutions that participated in the program included: 1) North Carolina State University and University of North Carolina – Wilmington, 2) University of Massachusetts- Lowell and Three Rivers Community College, 3) Kansas State University, and 4) Oregon State University

Step Four: Develop the Nuclear Engineering, Science, Technology and Health Physics National Marketing Plan and Associated Tools:

The primary deliverable for the project was the NEST/HP National Marketing Plan. The six-step marketing plan served as the blueprint for the national marketing effort, including: the goal, specific objectives, identification of prioritized key audiences, review of research, marketing themes/messages, strategies and tactics to deliver the messages consistently and creatively over time and full evaluation of the plan. The plan, provided below in its most current iteration, is based upon all project activities, knowledge, research and industry-wide discussions to date.

This plan has been crafted, revised and finalized in conjunction with the NEST National Marketing Team. It has also been vetted and presented to the various organizations represented by the team. The final plan plus key tools associated with the effort, also listed below, were made available to a wide variety of NEST/HP professionals through the project's group hub site.

The National Marketing Plan

Goal:

To increase awareness of nuclear engineering, science and technology and health physics as a viable college major and career path for high school and college students.

Marketing Objectives:

1. To raise awareness of nuclear engineering, science and technology and health physics among high school students, counselors, and teachers; middle school students and teachers; and underrepresented populations at all schooling levels;
2. To coordinate the outreach efforts of key entities including member universities, the nuclear industry, the government, and trade associations which regularly communicate with constituents such as high school and college students;
3. To work with four pilot institutions (listed above) that have nuclear science studies to create a best practices marketing plan that can be exported to other nuclear programs nationally;

4. To offer market research to two additional institutions for specific research and messaging needs;
5. To share marketing and recruiting best practices with member universities, thus enhancing outreach capabilities;
6. To link marketing efforts at then national, program, industry and local levels; and
7. To increase the diversity of the college student population who major in the fields.

Key Audiences:

1. High school students
2. High school science teachers
3. Middle school science teachers
4. Middle school students
5. Underrepresented populations – middle and high schools
6. High school guidance counselors
7. College and university faculty and staff at institutions offering NEST programs
8. Two-year institutions that have, or are feeders for, NEST programs
9. Local ANS chapters
10. Key government, industry and association leaders

Research to Date:

1. Research was conducted by our firm nationally with high school math and science teachers; high school students; current undergraduate and graduate students in nuclear engineering, science, technology and health physic; directors at various engineering schools (national survey and focus groups); current undergraduate and graduate students at the six pilot institutions; and NEST/HP department heads, director of outreach programs, or recruitment coordinators nationwide.

Draft of Key Messages and Positioning Statements (based on the research results):

1. We use nuclear engineering, science, technology and health physics in myriad ways to improve lives.
 - There has been an exponential increase in uses for NEST/HP: health, research, power, etc...
 - There is a pending energy shortage (should describe positively, e.g. "increased standard of living as more countries industrialize").
2. There are a wide variety of careers and career paths that are available under the NEST/HP umbrella.
3. There are many benefits of careers in nuclear engineering, science, technology and health physics.
 - Solid job opportunities and high placement rates for graduates (Lisa Marshall at NCSU said their placement rates average 99% in the past 4-5 years).
 - High starting salaries and abundant opportunities for career advancement.
 - Ability to work in a problem-solving field that is always on the forefront of technology.
4. There is a way to get there through post-secondary study.
 - How to prepare in high school.
 - Where to get information on programs.
 - Where to get more information on careers in nuclear.

Strategies and Tactics:

1. Rollout the needs for NEST/HP program partnership in conjunction with the national marketing plan and explain the value of coordination on a national level to all parties involved.
 - a. Present plan for rollout and implementation with DOE and ANS and determine where other stakeholders fit.
 - b. Plan rollout meeting at ANS Summer Meeting in Reno (2006).

- c. Rollout and planning meeting:
 - i. Introduction.
 - ii. Overview of activities to date.
 - iii. National plan presentation.
 - iv. Introduction of marketing support materials (website, talking points, sample recruitment marketing plans, video).
- 2. Coordinate between college recruitment efforts and national efforts.
 - a. Draft sample recruitment marketing plans – created by the national research and honed by data from pilot project institutions.
 - b. Use the plan to help NEST/HP programs and other organizations coordinate efforts with the national marketing plan.
 - c. Produce common messages that will begin to resonate nationally if used consistently and creatively.
 - d. Create an internal hub of operations to make available research and marketing support materials available to NEST/HP and industry partners.
- 3. New Technology – Create a national website.
 - a. Create a NEST/HP website that has information, video clips, simulators, background information, career opportunity synopses and a wide array of links, including ones to the DOE, ANS, and INPO and also links to simulators, associations, colleges and universities.
 - i. Review the new website created in conjunction with DOE. ANS is finishing the site and will host it at the domain Aboutnuclear.org.
 - ii. Determine the specific goals and objectives and content modules that need to be on the site and house them elsewhere if not on the site.
 - iii. Determine if curriculum modules and other teacher resources should be house in central location or if there should be an updated hub for links.
- 4. New Technology – Update the DOE nuclear video.
 - a. Create a new video in a format that can be streamed on a central website, as well as partner websites (NEST/HP programs and nuclear organizations).
 - b. Make the video very eye-catching and upbeat.
 - c. Center it around the key messages in the national marketing plan that was derived from research.
 - d. Include a call to action and guide viewers to resources for more information.
- 5. On-Campus Visits – Create an on-campus visit tip guide.
 - a. Include best practices for conducting on-campus visits.
 - b. Include talking points that echo the marketing messages and positioning statements.
 - c. Make it general enough to weave in institution-specific information.
 - d. Base this on the invaluable data from the extensive research done around the country with prospective students.
- 6. Media Relations – Creation of talking points.
 - a. Generate possible topics for Op Eds that can be used by those who deal with the media (e.g. DOE, ANS, association leaders, local professional chapters/organizations, deans/program directors and key faculty of NEST schools).
 - b. Consider columns and Op Eds in key education trade publications and on key websites.
- 7. New Technology – Creation of electronic newsletter(s).
 - a. Create templates for institutional/organizations to use in maintaining relationships and recruiting.
 - b. The web is the highest-rated source of information for prospective students (next to an on-campus visit, which is more an activity than an information source). *This item is still under review due to some technical hurdles.*

8. Leveraging Existing Resources – build dialogue and create opportunities for partnership with local professional chapters and NEST institutions.
 - a. Determine how to utilize local organizations for student recruitment and build community awareness.
 - b. Work with organizations dedicated to increasing the number of underrepresented and female students. Note that the research has suggested that their presence and mention of career possibilities is crucial in the middle school years. Structural diversity, not mere representation, will have an impact on numbers of underrepresented populations.
9. Increased Communication Efforts – spark more communication between NEST groups, institutions and associations.
 - a. When ANS or individual institutions present workshops on NEST topics to teachers or other key audiences involve personnel and weave resources and information from the other organization into the presentation.
 - b. Materials should be widely available.
10. Ensure there is a constant flow of employment information from industry to programs and then funneled this to prospective students.
11. Marketing strategies and tactics from the institution-specific boilerplate marketing plans should dovetail with the national marketing plan. Strategies and tactics areas with the sample plans, will include:
 - a. New student recruiting tactics, First-year students.
 - b. New student recruiting – current enrolled students.
 - c. Early student recruiting – elementary and middle school outreach.
 - d. Retention – strategies for keeping students from first semester through enrollment in their first NEST/HP class.
 - e. Alumni development – to assist in recruiting students and maintain industry ties.
 - f. Industry connections – utilizing alumni and industry professional organizations to build partnerships.
12. More strategies and tactics to be added over the course of implementation – or added after college/industry feedback at summer ANS meeting.

Evaluation:

Use a variety of benchmarking and assessment metrics to measure the ongoing success of, the national marketing plan, and adjust when needed.

Associated Marketing Tools Made Available on “Grouphub”:

- National marketing plan.
- Media talking points.
- Two template marketing plans for university nuclear/HP departments.
- On-campus visit guide best practices.
- In-school high school and middle school talking points.
- Research presentations – nationwide studies and pilot project studies.

Step Five: Develop a National Recruiting Video to be Used by K-12 and Higher Education, Associations and the Workforce

A secondary component of this project was to complete a film that could be formatted as a DVD or streaming video. This goal was to use it for recruitment purposes across the industry. In a DVD format, it could be used by associations, the nuclear industry and educational professionals who are visiting groups to introduce NEST/HP to new audiences. As a streaming video, it would be used on association, industry and education websites.

The key messages in the video, which were created based on the research and outlined in the national marketing plan, are:

1. We use nuclear science and technology in myriad ways to improve lives.
2. There are many benefits of careers in nuclear engineering, science, technology and health physics? **Improve lives, opportunities and challenges.**
 - There are solid job opportunities and incredibly high placement rates for graduates in the field. (Interview personnel from NEST programs like Lisa Marshall at NCSU about their 99% placement rate over the past 4-5 years).
 - Graduates have high starting salaries and abundant opportunities for career advancement.
 - Graduates get to work in a problem-solving field that is always on the forefront of technology.
 - We are in the nuclear renaissance.
3. What specific careers are available?
 - List careers and go in depth on several options.
 - NEST work is not just found in power plants.
4. How to get there?
 - Post-secondary study – how to prepare, where to get information on programs and where to get more information on careers in nuclear.

These messages were to be communicated in a very visual, creative and exciting manner.

The video was scripted, produced, edited and finalized with guidance from a wide range of industry representatives. It was formally unveiled at the 2006 ANS Winter Meeting in Albuquerque, NM to great acclaim. Final edits were made and the video was delivered in early fall of 2006.

Recommended Next Steps

For the coming year, we will recommend the following "next steps" to continue the good work to date on the goals of this project:

1. Continue the existence of the NEST National Marketing Team to provide guidance to implementation of the national marketing effort.
2. Develop strategic partnerships/relations with key K-12 and higher education associations and organizations, including those in science, math, engineering, physics and other national curriculum-specific associations and organizations; begin regular communications leveraging their current memberships and infrastructures and educating their members on NEST opportunities nationwide.
3. Develop a 12-month plan to enhance and market the AboutNuclear.com website; frequently add new content to the site, thus driving teachers and other targeted key audiences to visit the site repeatedly; add curriculum content modules and experiments that teachers can download; capture emails of those who visit and develop a database for sending the monthly electronic newsletter described below.
4. Market the new DVD/video by sending copies of new video/DVD version and streamed video to all member universities and all nuclear associations and organizations to distribute and post on their websites. All should link back to the AboutNuclear.org website and others deemed beneficial; send, and follow up, copies of the new video/DVD, hard copy and streamed video, to key K-12 and higher education associations described above.
5. Reach out to member universities including 12-month recruitment packages/templates to every NEST program nationally. This should include a 12-month step by step recruiting "best practices" strategy for each institution, detailing the campus-visit script template; media and school visit

talking points and the email newsletter template and use instructions. The long-term goal is to use the research data, best practices from the pilot projects and the consulting firm's experience to significantly sharpen the marketing and recruiting functions of all member institutions.

OBJECTIVE 6: NUCLEAR ENGINEERING ENROLLMENT SURVEY AT UNIVERSITIES –

The scope of this short-term project is to develop and implement a web-based survey to collect enrollment, graduate, grant and minority data from universities with Reactor Programs. This information will be useful to Objectives 1-5.

Summary of Action/Analysis and Findings

The nuclear engineering enrollment survey was completed during the 2nd quarter of 2006. No follow up or annual surveys will be conducted with the end of the grant period.

The enrollment survey is found below.

**Department of Energy
University Working Group
Survey Results**

**Compiled by Christine Messer
May 24, 2006**

Background

The DOE University Reactor Infrastructure and Education Assistance (URI&EA) program monitors enrollment, graduate, and employment information to measure the effectiveness of the funding provided to universities.

The need for an annual survey was determined, and the survey requested this data for nuclear engineering and related disciplines from the Nuclear Engineering Department Heads Organization (NEDHO) universities. The survey also covered all the grants funded by the University Program.

Survey

A web-based survey tool was developed to assist the universities in completing the survey. All information was managed by a 3rd party, with data hosted on an external web server.

The intent is to use this same tool to collect this survey information annually.

Information was requested for academic years:

2000-2001
2001-2002
2002-2003
2003-2004
2004-2005

for the following information:

1. Enrollment
 - Undergraduate and Graduate Levels

- Nuclear Engineering, Health Physics, Radiochemistry, and Other Disciplines

2. Graduates

- Undergraduate and Graduate Levels
- Nuclear Engineering, Health Physics, Radiochemistry, and Other Disciplines

3. Employment

- BS, MS, and Ph.D. Levels
- Engineering firm, DOE, Medical, Military, NASA, NRC, University, Utility, Vendor, NonNuclear, Foreign, Continuing Education areas

4. Minority and Women

- Undergraduate and Graduate Levels
- Enrollment and Graduates

5. Grants

- Dollars received by a university from the DOE categorized into one of the following programs:

Health Physics Fellowships/Scholarships
Innovations in Nuclear Infrastructure and Education (INIE)
Matching Grants
Nuclear Engineering Education Research (NEER)
Nuclear Engineering Fellowships/Scholarships
Radiochemistry
Reactor Sharing
Reactor Upgrades
Other

- Outside Support Dollars received as a direct result of the DOE funding. This included:
 - a. Outside Contribution \$ - Non-university contributions from another agency, private organization, or trade group
 - b. University Contribution \$ - Internal university matching or supplemental funding to a DOE grant. Example would be establishment of a faculty position
 - c. Waiver of Overhead or Other University Department Expenses - many awards granted by the DOE are made on the basis of a university waiving part or all of their overhead costs
- Details on the type of benefits derived from DOE and Outside funding, such as new equipment purchases, new class creation, faculty and student support.

Participation

The following universities were surveyed:

Clemson University
Georgia Institute of Technology
Idaho State University
Kansas State University
Massachusetts Institute of Technology
North Carolina State University

Ohio State University
Oregon State University
Pennsylvania State University
Purdue University
Rensselaer Polytechnic Institute
South Carolina State University
Texas A&M University
University of Arizona
University of California-Berkeley
University of Cincinnati
University of Florida
University of Illinois
University of Maryland
University of Massachusetts-Lowell
University of Michigan
University of Missouri-Columbia
University of Missouri-Rolla
University of Nevada-Las Vegas
University of New Mexico
University of South Carolina
University of Tennessee
University of Texas
University of Utah
University of Wisconsin
Washington State University
Worcester Polytechnic Institute

Participation levels varied for each survey and for each academic year. Prior academic year data participation averaged at 20 universities participating across all survey sections. More recent year data participation (2004-2005 data) levels averaged at 23 universities.

Results

This survey will be beneficial in demonstrating how well the University Program is serving the needs of students and faculty and providing enhancements to the research reactors ensuring a strong nuclear education infrastructure. In addition to showing the investments made by the University Program, data on what other public and private investments have been generated by DOE funding has been acquired.

We consider the Grant data to be of medium quality, and believe the Grant data requested and provided by the universities can be enhanced in future years, asking for further detail in leveraging dollars.

Undergraduate Enrollment

The Undergraduate Enrollment trend is increasing, with Nuclear Engineering enrollment levels in 2004-2005 2 ½ times the size they were in 2000-2001.

While Health Physics enrollment doubled between 2003-2004 and 2004-2005 academic years, levels may still be too low to feed the employment pipeline in the future.

Graduate Enrollment

As with undergraduate enrollment, enrollees are predominantly in the Nuclear Engineering area. However, rate of increase for Graduate enrollments is much smaller than that of undergrads with a 24% increase between 2000-2001 and 2004-2005 academic years. After an improved increase of 10.7% between 2002-2003 and 2003-2004 academic years, rate of increase has slowed to 6.8% between 2003-2004 and 2004-2005.

Both Health Physics and Radiological graduate enrollment appears to be on the rise as compared to previous years.

Undergraduate Degrees

Undergraduate degrees in Nuclear Engineering are leveling off with a minimal increase of 2.9% between 2003-2004 and 2004-2005. However, Health Physics degrees have increased significantly at 57% between 2003-2004 and 2004-2005.

Graduate Degrees

As with Graduate enrollment, graduate degrees in all areas have increased between 2004-2005 and 2003-2004 academic years. The rate of increase for Nuclear Engineering is leveling off with only a 1.5% increase between the last 2 academic years. These figures could indicate that those receiving undergraduate degrees in these disciplines continue their studies, but focus on receiving another type of graduate degree outside these areas.

Minorities and Women Undergraduates and Graduate Levels

Minority and Women undergraduates enrolled in and graduating in the Nuclear disciplines has increased a significant 38% since 2002-2003. Women Graduate levels have doubled in recent years, indicating a huge success in attracting and retaining women in these technical disciplines at universities. However, based on pipeline statistics in the job market, women employment levels have not continued at this rate with actual shortages in women employment levels for these disciplines.

Undergraduate Employment

Undergraduate employment levels by the employer types listed have increased, but as expected, most undergraduates continue their education with 40+% share in the last 4 academic years.

There was a trend of military employment being high in the pre-2002 timeframe, but that trend is decreasing. Undergraduate employment at utilities is also another area that has maintained a reasonable percentage of the total employment. This utility percentage may increase in the next several years based on the recruitment efforts by utilities to engage a younger workforce.

Masters Employment

Masters employment by these employer type areas has slowed to 5% increase between 2003-2004 and 2004-2005 as compared to a significant increase of 20% between the 2002-2003 and 2003-2004 academic years.

As with undergraduate employment, most masters graduates continue their education to the Ph.D. level. However, DOE employment remains a strong 2nd with medical fields in 3rd. Utility employment has decreased – perhaps indicating a reduced need for this level of degree in this type of industry.

Ph.D. Employment

Ph.D. employment increases by these employer types has risen above 20% for the first time in several years. Most become employed at universities or the DOE – most likely in research positions. However, as with other health care industry statistics, there is a trend towards increased employment in the medical field.

Another area of increased employment noted is in the foreign industry. It is not clear if the employment in foreign industry is of minority/foreign students, or if it is related to an increase in nuclear power plant construction outside the United States.

Grants

While the number of grants received by the universities from the DOE has decreased, the dollar value associated with these grants have increased by 35% between the 2003-2004 and 2004-2005 academic year.

Health Physics grants are minimal in number and dollar value, perhaps indicating a correlation with lower increases in HP enrollment.

Grants

Outside Support dollars received because of a DOE-type grant has increased, mostly in the INIE grant types. However, this surge from 2003-2004 to 2004-2005 of 37.5% could also be related to more readily-available data records for recent years.

The ratio of Outside Support dollars received to Grant Dollars received remains at 36%.

Grants

The chart below quantifies the return on investment of outside support benefits in a non-dollar format.

Most grant dollars received go towards new Equipment purchases or upgrades, along with various student support across all levels of degrees.

Education, Recruiting and College Programs rank in the lower half of grants, along with new class creation and faculty support and hiring.

Grant Benefits									
<u>Construction</u>	<u>Equipment</u>	<u>Student Support - BS, Grad, PhD</u>	<u>Education, Recruiting, and College Programs</u>	<u>Student Trips & Student Research Projects and Support</u>	<u>General Student Support and Supplies</u>	<u>New Class Creation</u>	<u>Faculty Support and Hiring</u>	<u>Additional Grants/ Fellowships</u>	<u>All Other Benefits*</u>
2002-2003									
5	17	20	8	10	12	2	7	15	2
2003-2004									
6	20	26	8	14	9	3	6	13	3
2004-2005									
4	20	26	11	14	9	3	10	12	6
15	57	72	27	38	30	8	23	40	11

*All Other Benefits include Student Work Support, Lab Management, R&D/Patents, and Women and Minority Programs

Background: Since the 1960's, U.S. universities had been world leaders in nuclear engineering technology. Yet, in the past ten years there has been some slippage in that leadership role. The number of nuclear engineering students and trained personnel has decreased since the mid-1980's.

On the other hand, the need for trained nuclear personnel has again increased in the areas of national security, biotechnology, new generation reactors, and other technical fields. DOE has committed funding to help universities and colleges increase the number of nuclear engineers and reactor physicist graduates. ANS was selected to conduct a program to help build interest in nuclear engineering among high school and college students. ANS has coordinated and sponsored through its network of members an ongoing outreach program to inform and educate students and teachers about nuclear science and technology. ANS also will coordinate the pilot project and nuclear educational programs web site.

Conclusions:

All facets of the project worked together to provide resources (people, materials, educational opportunities) that increased interest in nuclear science and technology among entering college students and prospective college students.

There is evidence from Nuclear Engineering department outreach programs that there are linkages between high school student participation in classroom visits or summer camps supported by the project and enrollment in nuclear engineering programs. While factors other than project activity could be influencing the growth of NE enrollments, it is evident that support from the project assisted with student recruitment.

The participation of a large number of volunteers at the local level made it possible to reach a large number of teachers and students with nuclear information at very reasonable cost levels.

The teacher workshop program provided a growing cadre of trained educators who can continue to provide students with messages about nuclear science and technology and the myriad of related career opportunities. This provides the potential for ongoing stimulation of student interest. However, this group is more likely to continue teaching nuclear topics when it gets ongoing stimulation. When this and faculty turnover are taken into account, there is a need for an ongoing program to stimulate teacher knowledge and interest and continue the momentum developed during this project.

To monitor trends in enrollment, the survey of university enrollments should be done annually.

Patents: not applicable

Publications: not applicable

Milestone Status Table: Included in Exhibit 1.

File Location
DOE – 2007 Close out folder

Summary - Workshops & Other Outreach Events

Exhibit #1
Event Listing - Jan. 1, 2004 - April 2, 2007

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
1/13/04	IL	Chicago	science fair	section	ILL, South Suburban Science Fair	~600
1/26/04	FL	Gainesville	Boy Scout event	ANS member	Boy Scout Event Workshop	24
2/3/04	MI	Ypsilanti	Wkshp - multi-day	section	EMU PreService Teacher Workshop	12
2/7/04	OH	Middlefield	Wkshp - multi-day	section	Kent State Teacher Workshop	18
2/20/04	CA	Berkeley	6 hour wkshp	section	ANS-HPS-UC Berkley Workshop	27
2/21/04	PA	Pittsburgh	Career Day Activity	section	Carnegie Science Center Outreach	~300
2/21/04	IL	Wheaton	Boy Scout event	section	Boy Scout Merit Badge Clinic	92
2/24/04	FL	Gainesville	science fair	student section	Science Fair/Exhibit	600
2/26/04	OH	Toledo	exhibit	section	SECO Convention 2004	780
2/27/04	FL	Jensen Beach	6 hour wkshp	Org Mem	ABCs of Radiation workshop	20
2/28/04	IL	Wheaton	Career Fair	section	Engineers Week Career Fair for Wome	~175
2/28/04	TX	College Statio	Career Day Activity	student section	Spring 2004 Engrg Day at the Mall	~225
2/28/04	FL	Ft. Pierce	Career Fair	Org Mem	Career Fair	500
3/2/04	SC	Clemson	science fair	branch	Regional Science Fair	~1250
3/4/04	MI	Lansing	exhibit	section	MSTA 2004 Convention	445
3/5/04	NC	Raleigh	6 hour wkshp	student section	Nuc Sci Apps Teacher Workshop	13
3/5/04	IL	Lisle	classroom visit	ANS member	Kennedy Jr. High - visit	29
3/5/04	IL	Joliet Region	science fair	section	Reg 11 -St. Francis Univ, Joliet	~650
3/6/04	MI	Lansing	90 min wkshp	section	MSTA 2004 Radiation Workshop	34
3/7/04	IL	Chicago	science fair	section	Chicago Non-Public	~800
3/11/04	OH	Akron	90 min wkshp	section	Teacher workshop	21
3/11/04	MO	Columbia	Career Fair	student section	Engineers Wk Open House Exhibit	330
3/12/04	IL	Argonne	Career Fair	ANS member	Science Careers Event	~425
3/14/04	FL	Jensen Beach	other	Org Mem	"Happy Birthday, Mr. Einstein"	185
3/20/04	IL	Chicago	science fair	section	Heritage Christian Science Fair	~1000
3/25/04	IL	Chicago	classroom visit	ANS member	Class visit - Chcgo Acad. for the Arts	~24
3/26/04	IL	Chicago	science fair	section	Chicago Public Science Fair	~400
3/29/04	MI	Brighton	classroom visit	section	Classroom visit	119
3/30/04	TX	Lake Jackson	Career Day Activity	Org Mem	So. Brazoria County Jr. Career Day	~225
4/1/04	GA	Atlanta	NSTA Exhibit	ANS Hdqtrs	NSTA National Convention	12,000
4/3/04	IL	DeKalb	science fair	section	Northern Illinois Science Fair	700
4/5/04	IL	Hinsdale	classroom visit	ANS member	Classroom presentation	21
4/9/04	VA	Lynchburg	classroom visit	ANS member	Classroom presentation	102
4/16/04	ID	Idaho Falls	other	section	Fly Fishing Expo	~3000
4/17/04	OH	Columbus	other	student section	Girl Scout Interest Project	~125
4/22/04	TX	College Statio	Career Day Activity	student section	TAMU Earth Day pro-nuc rally	~150

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
4/22/04	FL	Gainesville	6 hour wkshp	student section	Teacher workshop	16
4/22/04	VA	Falls Church	Career Day Activity	ANS member	Career presentation	~160
4/24/04	VA	Dulles	Girl Scout event	section	Girl Scout Day at the NASM	~9000
4/28/04	OH	Stark County	90 min wkshp	section	Teacher Workshop	24
4/30/04	ID	Boise	Career Fair	section	Engineering Expo	975
4/30/04	TX	Dallas	Career Day Activity	student section	Spring 2004 Career Day	~200
4/30/04	IL	Darien	Career Day Activity	ANS member	Career Day presentation	160
5/1/04	UT	Salt Lake City	6-hour wkshp	student section	Utah Science Teachers workshop	9
5/7/04	IL	Champaign	science fair	section	Illinois State Essay Contest	~800
5/8/04	IL	Champaign	science fair	section	Illinois State Projects Science Fair	~1500
5/12/04	IL	Champaign	classroom visit	ANS member	Classroom visit	21
6/12/04	PA	Pittsburgh	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop	33
6/14/04	TX	Galveston	Wkshp - multi-day	student section	TX Energy Ed Development Camp	150
6/21/04	MO	Columbia	Wkshp - multi-day	student section	NS&E for Secondary Science Teachers	24
6/30/04	WI	Madison	Career Day Activity	student section	Career Event for Women	40
7/10/04	WA	Vashon Island	other	ANS member	Strawberry Festival Outreach	~10,500
7/12/04	PA	University Park	Wkshp - multi-day	student section	University Teacher Workshop	16
7/15/04	MS	Jackson	6 hour wkshp	section	Teacher workshop	9
7/18/04	MO	Rolla	Wkshp - multi-day	student section	Nuclear Engineering Summer Camp	59
7/19/04	TN	Spring City	6 hour wkshp	section	Watts Barr Plant Tchr Wkshp	24
7/26/04	NM	Albuquerque	Wkshp - multi-day	student section	Teacher workshop	11
7/31/04	VA	Newport News	6 hour wkshp	section	Science Teacher Workshop	12
8/5/04	OH	Wilberforce	90 min wkshp	section	Teacher Workshop	17
8/31/04	TX	College Station	classroom visit	student section	Classroom Visits (14) - many dates	2688
9/12/04	MI	Ann Arbor	other	section	Sally Ride Science Festival	~825
9/14/04	GA	Augusta	Career Fair	section	Career & College Night Fair	6018
9/23/04	ID	Idaho Falls	exhibit	section	Science & Engineering Expo	~10,000
9/24/04	CA	Livermore	6 hour wkshp	ANS Hdqtrs	Teller Science & Technology Symposiu	12
10/1/04	LA	New Orleans	exhibit w/wkshp	section	Teacher Workshop	
10/8/04	OH	Kent	6 hour wkshp	section	KSU/NOCHPS Tchr Wkshp	5
10/12/04	WI	Madison	classroom visit	student section	La Follette visit	20
10/13/04	CA	Riverside	other	ANS Hdqtrs	STEP Conference	~3000
10/16/04	SC	Aiken	Career Fair	section	SEED (Sci Educ Enrichment Day)	~4500
10/18/04	WI	Janesville	classroom visit	student section	Parker High visit	444
10/18/04	WI	Marshall	classroom visit	student section	Marshall High visit	56
10/20/04	WI	Madison	classroom visit	student section	Memorial High visit	151

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
10/20/04	WI	Singer	classroom visit	student section	Slinger High visit	182
10/21/04	WI	Janesville	classroom visit	student section	Craig High visit	113
10/22/04	TX	Amarillo	6 hour wkshp	ANS member	Teacher workshop	17
10/25/04	WI	Wautoma	classroom visit	student section	Wautoma High School visit	136
10/26/04	WI	Madison	classroom visit	student section	Madison East High visit	53
10/30/04	SC	Orangeburg	90 min wkshp	student section	Nuclear Engineering Tchr Wrkshp	8
10/30/04	TX	College Statio	science fair	student section	Chemistry Open House/Exhibit	~700
10/30/04	GA	Atlanta	6 hour wkshp	ANS Hdqtrs	ANS Hdqtrs Tchr Wrkshp	30
11/3/04	SC	Aiken	other	section	SC Science Council Convention	~1500
11/3/04	WI	Horicon	classroom visit	student section	Horicon High visit	11
11/3/04	WI	Racine	classroom visit	student section	Racine High School visit	152
11/7/04	NY	Fallsview	exhibit	section	STANYS Teacher Convention	1500
11/8/04	WI	Schofield	classroom visit	student section	Everest High visit	294
11/10/04	WI	Pittsville	classroom visit	student section	Pittsville High visit	21
11/10/04	WI	De Pere	classroom visit	student section	De Pere High visit	153
11/10/04	WI	Stoughton	classroom visit	student section	Stoughton High School visit	52
11/10/04	NC	Greensboro	ST.exhibit w/wkshp	student section	NCSTA Conference	13
11/11/04	IN	Indianapolis	NSTA w/wkshp	ANS Hdqtrs	NSTA Regional	20
11/13/04	MD	Bethesda	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop	22
11/18/04	WA	Seattle	NSTA w/wkshp	ANS Hdqtrs	NSTA Regional	40
11/18/04	PA	Bethel Park	Career Fair	section	High School Career Event	~350
11/18/04	TN	Franklin	90 min wkshp	section	Tn Science Teachers Assn.	10
11/20/04	WI	Madison	Boy Scout event	student section	Boy Scout Workshop	40
11/20/04	IL	Wheaton	Boy Scout event	section	Boy Scout Merit Badge Workshop	88
12/1/04	MS	Vicksburg	Boy Scout event	section	Cub Scout Troop Presentation	21
12/2/04	VA	Richmond	NSTA w/wkshp	ANS Hdqtrs	NSTA Regional	24
12/4/04	WI	Madison	Boy Scout event	student section	Boy Scout Workshop	104
12/4/04	OH	Toledo	90 min wkshp	section	SciMaTec	31
12/11/04	WI	Madison	Boy Scout event	student section	Boy Scout Workshop	94
12/13/04	MI	Farmington	classroom visit	section	Classroom presentation	247
12/15/04	MS	Brookhaven	classroom visit	section	Classroom presentation	27
1/9/05	NM	Albuquerque	other	student section	Am Assoc for Physics Teachers	10
1/12/05	TX	College Statio	classroom visit	student section	Flower Mound High School	493
1/12/05	TX	College Statio	classroom visit	student section	Cooper High School visit	129
1/14/05	TX	College Statio	classroom visit	student section	St. Joseph Academy visit	255
1/31/05	OH	Summit Count	90 min wkshp	section	Teacher workshop	22

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
2/4/05	TX	College Station	Career Day Activity	student section	VIPS (Very Important Prospective Student)	56
2/8/05	WI	Madison	science fair	student section	Science Fair	~100
2/10/05	OH	Columbus	exhibit	section	SECO	~750
2/10/05	OH	Columbus	90 min wkshp	section	SECO Teacher workshop	40
2/17/05	PA	Pittsburgh	Career Fair	section	Carnegie Science Ctr Career Day	~6500
2/17/05	GA	Columbus	exhibit	section	GA Science Teacher Convention	~1500
2/19/05	IL	Wheaton	Boy Scout event	section	Boy Scout Merit Badge Event	123
2/22/05	MS	Vicksburg	Career Day Activity	section	Engineers Week	144
2/24/05	MS	Vicksburg	Career Day Activity	section	Engineers Week Event	19
2/26/05	VA	Glen Allen	6 hour wkshp	section	Teacher workshop	42
2/26/05	WI	Madison	Boy Scout event	student section	Boy Scout Merit Badge Workshop	95
2/26/05	IL	Wheaton	Career Fair	section	Engineering Open House	~500
2/26/05	TX	College Station	exhibit	student section	2005 Engineering Day at the Mall	300
2/26/05	TX	College Station	Career Fair	student section	2005 AggieLand Saturday Eng. Activities	300
2/27/05	VA	Glen Allen	Career Fair	section	Engineers' Day	110
2/27/05	AZ	Tucson	6 hour wkshp	ANS Hdqtrs	ANS/WM Symposia Tchr Wkshp	37
2/28/05	WI	Madison	other	student section	Saturday Enrichment Program	18
3/1/05	TX	College Station	Career Day Activity	student section	2005 Spring Engineering Open House	40
3/3/05	MI	Detroit	exhibit	section	MSTA Annual Convention	230
3/3/05	SC	Clemson	science fair	branch	Regional Science Fair	~900
3/3/05	MS	Madison	Career Day Activity	section	Career presentation	27
3/4/05	TX	College Station	classroom visit	student section	Calhoun High School visit	303
3/5/05	WI	Madison	Boy Scout event	student section	Boy Scout Merit Badge Workshop	109
3/10/05	IL	Argonne	Career Fair	ANS member	Career Day	~475
3/10/05	TX	College Station	classroom visit	student section	Humble High School visit	777
3/11/05	LA	Baton Rouge	classroom visit	Other	Classroom visit	96
3/12/05	VA	Dulles	Girl Scout event	section	GS Day at Nat'l Air & Space Museum	12,600
3/16/05	MI	Allen Park	Career Day Activity	section	High School Career Presentation	153
3/18/05	CA	Berkeley	6 hour wkshp	section	ANS-NCS NCCCHPS Teacher Workshop	32
3/18/05	MA	Lowell	6 hour wkshp	student section	Physics Teacher workshop	7
3/19/05	GA	Decatur	exhibit	section	Technology/Aerospace Program	70
3/22/05	TX	College Station	classroom visit	student section	Harvey Mitchell Elementary School visit	31
3/23/05	NY	Whitestone	Career Day Activity	ANS member	Career Day	64
3/24/05	TX	College Station	classroom visit	student section	South Grand Prairie High School Visit	316
3/28/05	NV	Las Vegas	other	section	Critical Thinking Workshop	37
4/4/05	NV	Las Vegas	other	section	Critical Thinking Workshop	44

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
4/6/05	TX	College Statio	classroom visit	student section	Texas State University visit	32
4/8/05	TX	College Statio	Career Day Activity	student section	VIPS (Very Important Prospective Stdnt	24
4/11/05	NV	Las Vegas	other	section	Critical Thinking Workshop	28
4/14/05	WI	Madison	Career Fair	student section	Engineering Expo	4100
4/14/05	IL	Bourbonnais	classroom visit	Other	University Classroom Presentation	15
4/15/05	MN	Morehead	ST.exhibit w/wkshp	ANS Hdqtrs	MnSTANDSTA Conference	11
4/19/05	NV	Las Vegas	classroom visit	section	Critical Thinking Workshop	21
4/21/05	FL	Gainesville	6 hour wkshp	student section	Teacher workshop	12
4/22/05	FL	Jensen Beach	Wkshp - multi-day	Org Mem	Nuclear Energy Series Workshop	23
4/22/05	GA	Atlanta	other	student section	Earth Day Fair	300
4/22/05	PA	Bethel Park	Career Day Activity	section	Career Presentation	51
4/25/05	NV	Las Vegas	other	section	Critical Thinking Workshop	76
4/25/05	WI	Madison	other	section	UW Nuclear Reactor Outreach	37
4/27/05	TX	College Statio	Career Day Activity	student section	Humble High School Visit	39
4/28/05	PA	Berwick	other	section	Parent/Child Work Day	233
4/28/05	CA	San Diego	Career Day Activity	ANS member	Science Fair/Career Event	~360
4/29/05	ID	Moscow	exhibit	section	Engineering Design Expo	975
4/29/05	WI	Madison	other	section	UW Nuclear Reactor Outreach	6
4/29/05	TX	College Statio	classroom visit	student section	New Diana High School visit	55
4/30/05	GA	Atlanta	6 hour wkshp	section	Teacher workshop	20
5/4/05	OH	Medina Count	90 min wkshp	section	Detecting Radiation workshop	9
5/4/05	TX	College Statio	Career Day Activity	student section	Palestine High School visit	89
5/7/05	OH	Columbus	science fair	student section	OH Academy of Science Fair	450
5/16/05	IL	Naperville	classroom visit	ANS member	Advanced Science Class Lectures	61
5/17/05	TX	College Statio	classroom visit	student section	Waco High School	152
5/19/05	ID	Rexburg	other	ANS member	Public presentation	25
5/19/05	IL	Chicago	Career Day Activity	Other	Career Day Event	~90
5/19/05	TX	College Statio	Career Day Activity	student section	Saldivar Elem. Spring 2005 Career Day	163
5/20/05	WI	Madison	other	section	UW Nuclear Reactor Outreach	17
5/20/05	WI	Madison	other	section	UW Nuclear Reactor Outreach	14
5/29/05	TX	College Statio	classroom visit	student section	Carthage High School visit	73
6/4/05	CA	San Diego	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop - San Diego	47
6/13/05	KS	Emporia	6 hour wkshp	Other	Teacher workshop	10
6/13/05	TX	College Statio	other	student section	SHIP (Summer Honors Invitational Pro	181
6/15/05	IL	Argonne	Career Day Activity	ANS member	Career Presentation	6
6/20/05	MO	Columbia	Wkshp - multi-day	student section	NS&E for Secondary Science Teachers	24

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
6/23/05	WI	Madison	other	section	UW Nuclear Reactor Outreach	20
6/23/05	TX	College Station	Boy Scout event	student section	Arkansas Boy Scout Camp	40
6/28/05	NC	Raleigh	Wkshp - multi-day	student section	Nuc Sci Apps Teacher Workshop	27
7/5/05	TX	College Station	Career Day Activity	student section	Victoria High School visit	40
7/10/05	MO	Rolla	other	student section	Nuclear Engineering Summer Camp	55
7/11/05	TX	College Station	Career Day Activity	student section	Engineering Insights	208
7/19/05	LA	St. Francisville	other	section	Employee Opportunity Day	~843
7/20/05	VA	Caroline Coun	Boy Scout event	Other	Nat'l Boy Scout Jamboree	1135
9/15/05	GA	Augusta	Career Fair	Other	CSRA College Night	2100
9/16/05	SC	Columbia	Career Fair	Other	Richland Dist. 1 Career Fair	1100
9/20/05	ID	Idaho Falls	science fair	section	INL Science & Engineering Expo	4400
9/20/05	FL	Gainesville	other	Other	Orientation - declared majors	34
10/6/05	ID	Boise	6 hour wkshp	section	Teacher workshop	51
10/8/05	WI	Madison	other	section	UW Nuclear Reactor Outreach	20
10/15/05	IL	Wheaton	Boy Scout event	section	Boy Scout Merit Badge Workshop	30
10/18/05	CA	Riverside	other	ANS Hdqtrs	STEP conference	~3000
10/19/05	MA	Burlington	other	student section	Chem Teacher InService	60
10/20/05	CT	Hartford	NSTA w/wkshp	ANS Hdqtrs	NSTA Eastern Area Reg. Convention	28
10/22/05	TX	College Station	90 min wkshp	student section	Detecting Radiation Workshop	6+25
10/26/05	ME	Presque Isle	other	Other	Teacher Resource Table	280
10/27/05	TX	Houston	exhibit	ANS Hdqtrs	CAST	~400
10/29/05	MI	Warren	exhibit	section	MDSTA	200
11/2/05	MA	Westford/Low	Career Day Activity	Other	Career Day Event	10
11/3/05	NC	Charlotte	90 min wkshp	ANS member	AISES Ann Conf Teacher Workshop	35
11/3/05	NC	Charlotte	Career Day Activity	ANS member	AISES High School Presentation	48
11/5/05	OH	Toledo	90 min wkshp	section	SciMaTech Workshop	24
11/6/05	NY	Fallsview	exhibit	section	STANYS	1650
11/9/05	NM	Albuquerque	other	Other	Science Crawl/Nat'l Atomic Museum	316
11/10/05	IL	Chicago	NSTA w/wkshp	ANS Hdqtrs	NSTA Midwestern Area Reg Conventio	41
11/10/05	NY	Rockville Cent	other	ANS Hdqtrs	Teacher Resource Day	65
11/12/05	MD	Bethesda	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop	26
11/12/05	OH	Youngstown	90 min wkshp	section	Workshop - Yountown St. Univ	26
11/17/05	PA	Cannonsburg	Career Fair	section	Career Fair	~325
11/21/05	OH	Medina	90 min wkshp	section	Detecting Radiation Workshop	3
11/22/05	TX	College Station	science fair	student section	Chemistry Open House/Exhibit	700
11/29/05	IL	Bourbonnais	other	Other	College presentation on Nuc Power	26

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
11/30/05	PA	Hershey	NSTA Exhibit	section	PSTA	~600
11/30/05	MI	Monroe	Career Day	Other	Career Day	67
12/1/05	FL	Gainesville	other	Other	Intro to Engineering	532
12/2/05	PA	Philadelphia	Career Day Activity	ANS member	Career Presentation	125
12/2/05	PA	Hershey	90 min wkshp	ANS member	PSTA Teacher workshop	12
12/3/05	TN	Nashville	NSTA w/wkshp	ANS Hdqtrs	NSTA Southern Area Regional Convent	29
12/3/05	OH	Toledo	Career Day Activity	student section	Career Workshop	50-70
1/11/06	OH	Columbus	6 hour wkshp	student section	Teacher workshop	13
1/18/06	UT	Salt Lake City	Career Fair	student section	Academic/Career Fair	~175
2/2/06	IL	Homer Glen	classroom visit	ANS Hdqtrs	Classroom presentation	8
2/7/06	WI	Madison	science fair	student section	Science Fair	200
2/8/06	IN	Indianapolis	ST.exhibit w/wkshp	ANS Hdqtrs	HASTI	52
2/9/06	MA	Lowell	classroom visit	student section	High School presentation	102
2/9/06	MA	Westford	Career Day Activity	student section	Career breakfast	15
2/10/06	OH	Portsmouth	6 hour wkshp	student section	Teacher workshop	14
2/10/06	FL	Jensen Beach	classroom visit	Other	Nuclear Energy at Work	12
2/11/06	UT	Salt Lake City	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop	31
2/11/06	WI	Madison	Boy Scout event	student section	Boy Scout Merit Badge workshop	25
2/13/06	IL	Homer Glen	classroom visit	ANS Hdqtrs	Classroom presentation	20
2/17/06	PA	Pittsburgh	Career Fair	section	Engineering Week Exhibit	~5500
2/18/06	IL	Wheaton	Boy Scout event	section	Boy Scout Merit Badge Event	44
2/25/06	IL	Wheaton	Career Fair	section	Engineering Open House	~200
2/25/06	FL	Stuart	Boy Scout event	Other	Boy Scout Merit Badge Workshop	55
2/26/06	AZ	Tucson	6 hour wkshp	ANS Hdqtrs	WM Symposium Teacher Workshop	41
2/26/06	VA	Richmond	Career Fair	section	Engineers Week Career Fair	210
2/27/06	IL	Homer Glen	classroom visit	ANS Hdqtrs	Classroom presentation	17
3/2/06	MI	Lansing	ST.exhibit w/wkshp	section	MSTA	23
3/2/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	68
3/3/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	36
3/4/06	WI	Madison	Boy Scout event	student section	Boy Scout Merit Badge workshop	80
3/4/06	LA	Baton Rouge	Girl Scout event	section	B.S.A. Merit Badge "College"	~100
3/6/06	OH	Cincinnati	other	Other	Class presentation & plant tour	18
3/9/06	AZ	Phoenix	Career Day Activity	Other	Career day presentation	45
3/11/06	VA	Lynchburg	6 hour wkshp	section	Science Teacher Workshop	19
3/11/06	NY	Schenectady	90 min wkshp	Other	Teacher workshop	2
3/11/06	NY	Schenectady	Boy Scout event	Other	Boy Scout Winterfest & Pinewood Derby	80

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
3/13/06	FL	Jensen	Beach classroom visit	Org Mem	Classroom visit series	56
3/14/06	FL	Jensen	Beach classroom visit	Org Mem	Classroom visit series	61
3/17/06	FL	Jensen	Beach classroom visit	Org Mem	Classroom visit series	47
3/21/06	ID	Idaho Falls	Career Fair	section	EITC Career Fair	100
3/23/06	IL	Argonne	Career Fair	section	Science Careers Conference	~525
3/24/06	CA	Berkeley	6 hour wkshp	section	ANS-NCS NCCHPS workshop	32
3/24/06	NM	Albuquerque	science fair	ANS member	Science Fair	44
3/25/06	WI	Madison	Boy Scout event	student section	Boy Scout Merit Badge workshop	90
3/25/06	VA	Dulles	Career Fair	section	Nat'l Air & Space Museum Career Exhi	>10,000
3/25/06	MS	Port Gibson	other	section	Port Gibson Heritage Festival	~200
3/28/06	TX	Lake Jackson	Career Fair	ANS member	College Career Fair	~320
3/30/06	NY	Troy	Career Fair	student section	Career/Recruiting Exhibit	~350
3/30/06	NY	Troy	Career Fair	ANS Hdqtrs	2006 ANS Student Conference	300+
3/30/06	FL	Jensen Beach	Career Fair	Org Mem	Annual Career Expo	~660
3/31/06	WI	Madison	other	student section	High School Essay Contest	500
4/2/06	NY	Orangeburg	Career Fair	section	Dominican College Engineering Expo	80
4/3/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	68
4/4/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	62
4/5/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	67
4/5/06	OH	Columbus	6 hour wkshp	student section	Teacher workshop	32
4/6/06	NM	Carlsbad	Career Day Activity	section	Classroom presentation	167
4/6/06	CA	Anaheim	NSTA Exhibit	ANS Hdqtrs	NSTA National Convention	535
4/6/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	53
4/7/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	58
4/10/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	68
4/11/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	50
4/12/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	60
4/12/06	IL	Joliet	classroom visit	ANS member	Joliet Catholic Academy	~150
4/13/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	63
4/18/06	FL	Jensen Beach	classroom visit	Org Mem	Classroom visit series	54
4/19/06	GA	Augusta	other	section	Community Educational Outreach	~200
4/20/06	MI	Ann Arbor	other	Other	LIR Lecture on Nuclear Energy	93
4/22/06	ID	Idaho Falls	other	student section	Earth Day Event	~2500
4/26/06	OH	Canton	90 min wkshp	section	Detecting Radiation Teacher Workshop	8
4/27/06	ID	Moscow	Career Fair	section	Engineering Design Expo	~200
5/2/06	SC	Anderson	other	ANS member	Kiwanis Club Presentation	19

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
5/3/06	OH	Columbus	exhibit	student section	State Science Day & Exposition	1100
5/8/06	NY	Glenview	classroom visit	ANS member	Public presentation	12
5/8/06	IL	Chicago Heig	classroom visit	Other	Prairie State College Class Presentatio	21
5/11/06	NV	Gabbs	Career Fair	Other	Career/College Fair	81
5/20/06	NY	Burnt Hills	Boy Scout event	ANS member	Boy Scout Merit Badge Event	12
6/3/06	NV	Reno	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop	26
6/9/06	SC	Columbia	Career Fair	ANS member	Career Fair	300
6/13/06	NE	Peru	Wkshp - multi-day	Org Mem	Summer teacher workshop	16
6/17/06	MI	Ann Arbor	6 hour wkshp	section	Science Teacher Workshop	9
6/17/06	IL	Chicago	other	ANS Hdqtrs	ASCE Career Expo	175
6/26/06	MO	Columbia	Wkshp - multi-day	student section	NS&E for Secondary Science Teachers	20
6/27/06	NC	Raleigh	Wkshp - multi-day	student section	Nuc Sci Apps Teacher Workshop	15
7/12/06	OH	Columbus	90 min wkshp	student section	Teacher Workshop	21
7/16/06	MO	Rolla	Wkshp - multi-day	student section	Nuc. Engineering Summer Camp	50
7/19/06	VA	Richmond	Wkshp - multi-day	section	Teacher workshop	45
7/30/06	IN	West Lafayette	exhibit	ANS Hdqtrs	ChemEd 2006	375
7/31/06	ID	Idaho Falls	6 hour wkshp	Other	GNEP '06 Nat'l Physics Tchrs Wrkshp	62
8/18/06	NC	Salisbury	6 hour wkshp	ANS Hdqtrs	Livingstone College Teacher Workshop	31
8/19/06	PA	Luz County	Career Fair	section	Career Choice Day	252
8/23/06	FL	Gainesville	Career Fair	student section	Career/Student Recruitment	502
8/26/06	FL	Gainesville	90 min wkshp	Other	3rd Annual Science Teacher Workshop	22
9/15/06	FL	Jensen Beach	Wkshp - multi-day	Org Mem	Nuclear Energy Series Workshop	22
9/18/06	IN	West Lafayette	other	student section	Career Event	~2050
9/29/06	IL	Kankakee	classroom visit	ANS member	Classroom presentation	26
9/30/06	WI	Madison	90 min wkshp	student section	Teacher workshop	25
10/1/06	IL	Chicago	Career Day Activity	Other	Career Day Presentation	~100
10/4/06	ID	Eagle	6 hour wkshp	section	GNEP 2006 Tchr Wrkshp at ISTA	37
10/7/06	IL	Argonne	other	ANS member	ANL Open House	>18,000
10/10/06	IL	Morris	classroom visit	section	White Oak Elem presentation	302
10/13/06	NY	Loudonville	90 min wkshp	ANS member	Siena College Teacher Workshop	24
10/17/06	IL	Coal City	classroom visit	section	Classroom presentation	81
10/19/06	NE	Omaha	NSTA w/wkshp	ANS Hdqtrs	NSTA Regional-Midwestern Area	21
10/19/06	CA	San Francisco	NSTA Exhibit	section	California Science Teachers Conventio	2800
10/19/06	IL	Coal City	classroom visit	ANS member	Classroom presentation	162
10/20/06	IL	Coal City	classroom visit	section	Classroom presentation	75
10/21/06	WI	Madison	90 min wkshp	student section	Teacher workshop	25

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
10/23/06	MS	Jackson	NSTA Exhibit	section	MSTA 2006 Convention	450
10/23/06	IL	Orland Park	classroom visit	ANS member	Classroom presentation	269
10/27/06	IL	Orland Park	classroom visit	ANS member	Classroom presentation	248
10/28/06	TX	College Station	science fair	student section	Science Exhibit	1200
11/2/06	MD	Baltimore	NSTA w/wkshp	ANS Hdqtrs	NSTA Regional-Eastern Area	21
11/2/06	IL	Peoria	NSTA Exhibit	section	Illinois Science Teachers Convention	500
11/4/06	OH	Toledo	90 min wkshp	section	Detecting Radiation Workshop	21
11/4/06	NY	Schenectady	Girl Scout event	ANS member	Girl Scout Science Expo	85
11/5/06	NY	Fallview	exhibit	section	STANYS	1500
11/6/06	VA	Richmond	other	section	VAIS	22
11/6/06	IL	Homer Glen	classroom visit	ANS Hdqtrs	Classroom presentation	18
11/9/06	TX	Wichita Falls	ST.exhibit w/wkshp	ANS Hdqtrs	CAST	11
11/9/06	PA	Bethel Park	Career Fair	section	Multiple HS Career Fair	400
11/9/06	NC	Raleigh	ST.exhibit w/wkshp	student section	NCSTA Conference	57
11/11/06	WI	Madison	90 min wkshp	student section	Teacher workshop	24
11/11/06	NM	Albuquerque	6 hour wkshp	ANS Hdqtrs	ANS Teacher Workshop	46
11/11/06	MI	Ann Arbor	Career Fair	student section	Career Fair	~1000
11/14/06	NY	Rockville Cent	exhibit	section	Teacher Resource Day	TBD
11/29/06	PA	Hershey	NSTA Exhibit	section	PSTA Convention	~800
12/4/06	IL	Homer Glen	classroom visit	ANS Hdqtrs	Classroom presentation	16
12/7/06	UT	Salt Lake City	NSTA w/wkshp	ANS Hdqtrs	NSTA Regional	25
12/9/06	NJ	New Brunswick	other	ANS Hdqtrs	Physics Holiday Treats	120
12/13/06	IL	Homer Glen	classroom visit	ANS Hdqtrs	Classroom presentation	12
12/13/06	IL	Minooka	classroom visit	section	Classroom presentations	303
1/6/07	OH	Columbus	6 hour wkshp	student section	Teacher workshop	29
1/12/07	SC	Aiken	6 hour wkshp	section	Teacher workshop	14
1/22/07	NY	Ballston Spa	Boy Scout event	ANS member	Boy Scout Merit Badge event	35
1/27/07	VA	Lynchburg	Boy Scout event	section	Boy Scout Merit Badge Workshop	15
1/30/07	WI	Madison	science fair	student section	Glen Stevens Elementary Science Fair	220
2/7/07	IN	Indianapolis	ST.exhibit w/wkshp	ANS Hdqtrs	HASTI	22
2/7/07	CA	Campbell	Career Day Activity	ANS member	Career event	6
2/9/07	SC	Aiken	classroom visit	section	Classroom presentation	23
2/13/07	GA	Augusta	exhibit	section	Ft. Discovery Science Exhibit	3037
2/14/07	MO	Rolla	Boy Scout event	student section	Boy Scout Merit Badge Event	38
2/16/07	PA	Pittsburgh	Career Fair	section	Carnegie Science Ctr Career Fair	~6500
2/17/07	CA	San Diego	classroom visit	section	Patrick Henry High presentation	31

Summary - Workshops & Other Outreach Events

Scheduled Date	State	City	event	Sponsor Type	Event Name	# Attended
2/17/07	CA	San Diego	Career Day Activity	section	DePortola Middle School presentation	61
2/17/07	IL	Wheaton	Boy Scout event	section	Boy Scout Merit Badge Event	95
2/20/07	NY	Troy	Boy Scout event	student section	Boy Scout Merit Badge Event	76
2/22/07	IL	Argonne	Career Day Activity	Other	Introduce a Girl to Engineering Day	160
2/24/07	CA	Berkeley	other	student section	Educational Event	195
2/24/07	MO	Rolla	exhibit	student section	Engineers week event	~100
2/25/07	AZ	Tucson	6 hour wkshp	ANS Hdqtrs	Waste Mgmt Teacher Workshop	28
2/27/07	IL	Wheaton	Career Fair	section	IIT Engineering Career Fair	~500
3/2/07	SC	Columbia	Career Day Activity	section	College Career Event	33
3/3/07	WI	Madison	Career Fair	student section	Science Fair	75
3/3/07	VA	Lynchburg	6 hour wkshp	section	One-Day Teacher Workshop	15
3/8/07	IL	Argonne	Career Fair	section	Science Careers Exhibit	~460
3/10/07	NY	Albany	90 min wkshp	ANS member	St. Rose College Teacher Workshop	6
3/15/07	MA	Lowell	6 hour wkshp	student section	Physics Teacher workshop	6
3/15/07	MI	Grand Rapids	ST.exhibit w/wkshp	section	MSTA	38
3/17/07	VA	Dulles	Career Fair	section	Nat'l Air & Space Museum Career Exhi	~2300
3/17/07	DC	Washington	science fair	section	DC Math, Science & Technology Fair	325
3/17/07	VA	Arlington	science fair	section	No Virginia Regional Science Fair	240
3/17/07	VA	Fairfax	science fair	section	Fairfax County Regional Science Fair	350
3/17/07	MD	Gaithersburg	science fair	section	Montgomery Area Science Fair	350
3/17/07	WI	Milwaukee	exhibit	student section	Badger State Science Fair	40
3/21/07	SC	Columbia	other	section	Community Educational Outreach	~200
3/23/07	MA	Worcester	classroom visit	student section	Classroom presentation	34
3/24/07	MD	Columbia	science fair	section	Howard County Science Fair	250
3/24/07	MD	Largo	science fair	section	Prince George's Area Science Fair	250
3/25/07	NY	White Plains	Career Fair	section	Westchester CC Engnrg Expo	~1000
3/26/07	CA	Berkeley	6 hour wkshp	section	Science Teacher Workshop	16