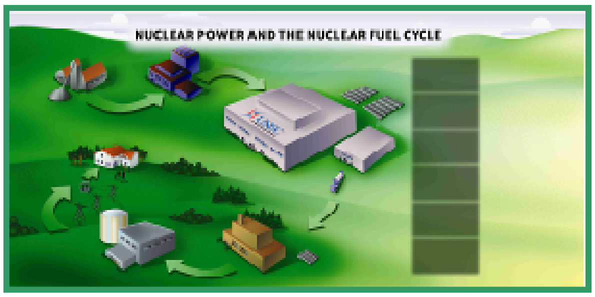
Go Nuke!

A newsletter from the North American Young Generation in Nuclear December 2006

Introducing the Fuel Cycle

In a continuing effort to inform young professionals about the many different aspects of nuclear science and technology, here are a series of short articles to explain the front end of the fuel cycle. Special thanks to NA-YGN members Marisa Vilardo of USEC, James Dobchuck of Cameco, and Ashley Tucker of Areva for writing these articles.



The Fuel Cycle

Uranium Mining

Uranium mining is widely recognized as the first step of the nuclear fuel cycle and as such serves as the beginning of each U235 atom's journey from the earth's crust to the core of a nuclear reactor. While uranium is more common in the earth's crust than other more familiar metals, such as gold or silver, it is rarely found in concentrations suitable for mining purposes.

Uranium is mined in many parts of the World but the bulk of primary production comes from Canada, Australia, Kazakhstan, Namibia, Niger, and Russia. Leading mining companies like Cameco, Areva, Rio Tinto, BHP Billiton, and KazAtomProm own and operate the mines that are responsible for the majority of world uranium production.

When a viable deposit of uranium ore is discovered and characterized, it is mined using one or more of three mining methods. For shallow deposits (<100 meters deep) traditional "open pit" mining is typically used. Open pit mining involves the removal of overburden (surface soil) and waste rock to expose the ore body. Historically, much of the world's uranium was mined from open pit mines. Over time, as many shallow deposits have been mined out, deeper deposits have been discovered.

Deeper deposits (>100 meters deep) are usually accessed using underground mining methods. Underground uranium mines are similar, in many respects, to other more common commodity mines. However, in case of extremely high-grade deposits, like Cameco's McArthur River mine in northern Saskatchewan, Canada, where the average ore grade exceeds 20%, mining methods are quite different from other underground mines. In these situations, the health physics issues associated with extracting rich uranium ore require adaptations of traditional underground mining techniques.

Lastly, certain sandstone hosted uranium deposits that are located in contained aquifers are "mined" using in situ leach (ISL) technologies. ISL operations recover uranium by injecting uranium dissolving solutions into a host aquifer and removing the solution and associated uranium through a series of extraction wells.

Although the extraction methods may vary, virtually all uranium ore is milled and processed into a concentrate commonly referred to as "yellow cake". This concentrate has a powder-like consistency and is packaged in 45 or 55 gallon stainless steel drums and transported to a uranium conversion facility where it is further purified and processed into UF_6 gas.

Introducing the Fuel Cycle continues on page 4.

Society of Nuclear Medicine
Young Professional Initiative

YPC stands for the Young Professionals Committee of the Society of Nuclear Medicine (SNM). The YPC was established about 5 years ago with the mission of providing a forum for Nuclear Medicine physicians and young research scientists who are in-training or graduated in the last 10 years to enhance their educational experience and participation in SNM.

Amol Takalkar, M.D.
YPC Chair

The specific objectives of the YPC were:

- Promote communication amongst residents/fellows, young professionals and scientists.
- Establish a bond between residents/fellows, young physicians and scientists and the SNM.
- Provide the opportunity for SNM to assist residents/fellows and young professionals to become better physicians.
- Contribute to the future of nuclear medicine and to the growth of SNM

The Young Professionals Committee consists of officers & executive members with various responsibilities in working towards achieving the objectives and goals of various projects of the YPC. They work voluntarily on the issues of concern to the broader young professionals' community in the US. More information about the YPC, its mission and objectives, current officers and future direction can be obtained by visiting the SNM website (www.snm.org) and going to the Young Professional's Committee webpage (under Resources for… Young Professionals).

The YPC has made considerable progress and has now reached a critical phase where it is being embraced by the SNM leadership. SNM believes that the future of Nuclear Medicine is closely related to its young professionals and it is keen to address issues related to them. In addition, SNM is trying to actively encourage involvement and participation of young professionals in various educational, research and leadership activities at SNM and other organizations. The SNM leadership and its various councils and committees are considering having YPC representatives on board to actively engage them and have their input.

The YPC recently concluded a strategic planning meeting at the SNM headquarters in Reston, VA. In this meeting, the mission and objectives of the YPC were slightly refined in keeping with the changing dynamics of the field of nuclear medicine and molecular imaging. These will be published soon in the new YPC newsletter that will be implemented late this year. The YPC will continue to work towards issues most pressing to their members: job situation and CT certification. Along with the SNM leadership, YPC will also closely work with ABNM to address issues related to certification, re-certification and maintenance of certification for young professionals.

The coming year will be an exciting one for the young professionals. The YPC is working on several initiatives to help further the professional development of its members in various ways, including:

1. An internship program is being considered for various YPC members to participate in various councils.
2. A mentoring committee is being organized for which YP representatives can volunteer.
3. Leadership programs are planned in the future utilizing the endowment from the late Dr. Robert Lull who was actively involved in dealing with issues of concern to the young professionals.
4. The YPC will continue to actively participate in other forums (AUR, AMSA, AMA, RSNA, AMI, SMI, NIH, etc) to further its goals.
5. The YPC will also strive to incorporate more research scientists in its membership and to identify and address issues of concern to them.
6. The YPC will continue to host its traditional luncheon at the annual SNM meeting next year.

In addition to the YPC, a few additional programs the SNM has for promoting and facilitating young professionals in the field of Nuclear Medicine include a recently started young professional group for the technologist section, a "student day" at the SNM annual meeting for the technologist students and an outreach program for the medical students.

2006 Recruitment & Retention Benchmarking Results

Young professional recruitment, retention, and development are issues currently challenging the nuclear industry. Our aging nuclear workforce has a considerable impact on the young generation's careers. In order to facilitate progress on these issues, the North American Young Generation in Nuclear (NA-YGN) has undertaken a first-of-a-kind benchmarking study.

The online survey was available throughout the month of August 2006. The survey was open to all international NA-YGN members, who numbered 2100 at the time, and was publicized through local chapters.

A total of 388 responses—approximately 18.5% of the international NA-YGN membership—were recorded. Of these responses, 29 were from Canadian members and were included in the salary analysis after confirming data was translated into US Dollars. However, since survey respondents were not identified, their NA-YGN membership could not be confirmed.

Average starting salaries, benefits, and development opportunities were tabulated by the NA-YGN Benchmarking Sub-Committee and Professional Development Chair, Ryan Stone, debuted these results at the annual INPO CNO conference in November.

Of the 388 total responses collected, 218 were used in calculating starting salary results, as these respondents began their careers within the past three years. The overall average starting salary in the nuclear industry is $52,866, with a standard deviation of $8,624.

Results from the survey showed that for recruitment young professionals listed location most frequently as a major deciding factor in accepting an employment opportunity.

At least half of all engineering respondents participated in work-study programs, including internship and co-op positions. However, participation in work-study programs did not seem to have an impact on starting salaries in any of the job functions examined.

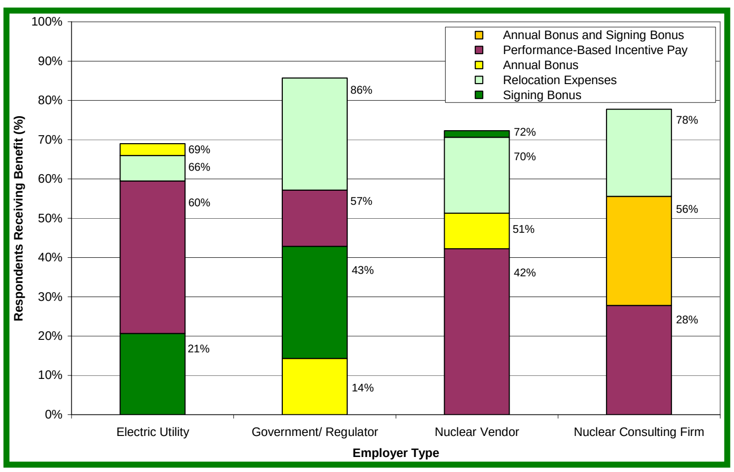
For development opportunities, the survey found that the majority of employers offer an Educational Reimbursement program, and approximately 59% of all respondents have participated or plan to participate in this program.

Although not statistically determined, free response questions indicate a growing concern amongst young professionals that developmental opportunities are available only to individuals willing to move across departments, leaving departments with weak technical expertise.

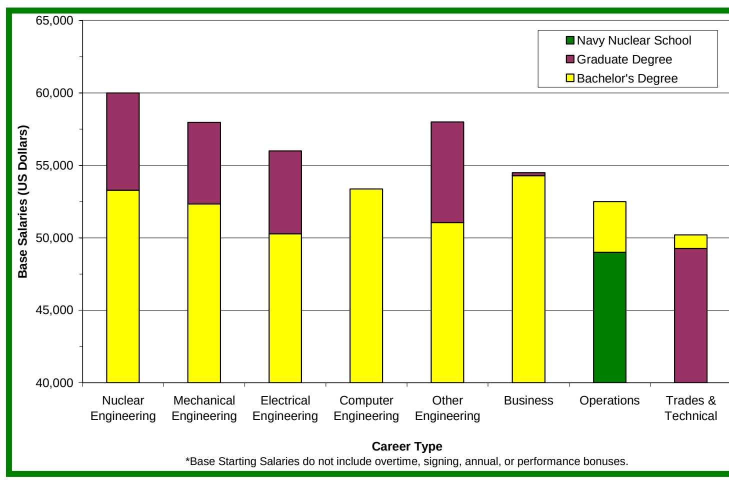
Furthermore, young professionals feel that they are unable to receive supervisory roles because of the large number of baby boomers who remain in the nuclear workforce. This raises concerns that once the aging workforce retires, the individuals who remain will be unable to fulfill the necessary leadership needs.

Full results are available in the 2006 Benchmarking report available online.

Benefits by Employer Type



Average Starting Salaries by Career Type



Introducing the Fuel Cycle Continued

Uranium Conversion

Today's enrichment technologies require natural uranium to be in gaseous form before it can be enriched. The process of moving natural uranium from a solid form (i.e., powder) to a gaseous state is commonly referred to (in the front-end of the fuel cycle) as "conversion".

Slurry transport truck at Cameco's McArthur River

Natural uranium concentrates are converted to natural uranium hexafluoride (UF_6) in the Western World at each of four facilities located separately in Canada, the United States, the UK, and France. The resulting natural UF_6 is transported in cylinders to enrichment plants where the U235 isotopes are separated from the more abundant U238 isotopes to create enriched UF_6 that is further transformed into enriched powder and fabricated into fuel pellets.

From an over-all fuel cost perspective, conversion services tend to make up a relatively modest portion of assembled fuel costs, but the providers of conversion services comprise a critical niche in the nuclear fuel cycle chain. Cameco Corporation, Areva, and Honeywell are responsible for providing and/or marketing the bulk of uranium conversion services to utilities in the United States, Europe and Asia.

Historically, supply disruptions at conversion facilities have had a dramatic impact on the uranium fuel market. The four Western World converters not only facilitate the production of UF_6 which is required to feed the world's enrichment plants but they also house sizable inventories of U_3O_8 (the feed required by converters) and UF_6 in storage on behalf of Utility customers. These disruptions have highlighted the importance of this stage of the fuel cycle and encourage some suppliers to evaluate expanding capacity at, or replacing, existing facilities.

Uranium Enrichment

Uranium enrichment is a critical step in transforming natural uranium into nuclear fuel to produce electricity. Natural uranium contains U-235 and U-238 isotopes. Only the U-235 isotope is fissionable but natural uranium only contains about 0.7% U-235. The fuel assemblies that power a commercial nuclear reactor generally need uranium with a 4% - 5% concentration of U-235. Enrichment is the process of increasing the concentration of U-235 and decreasing that of U-238.

Enrichers increase, or enrich, the concentration of U-235 in natural uranium hexafluoride (UF_6) and sell the fuel to utility customers. The majority of the world's enriched uranium is produced and/or marketed by four companies: USEC, Areva, Urenco, and Tenex.

Uranium enrichment is sold as separative work units (SWU), which represent the level of effort required to increase the concentration of U-235 in natural uranium. Commercial uranium enrichment currently employs one of two technologies: gaseous diffusion or gas centrifuge. Both use UF6 as the chemical form of uranium for processing, in part because UF6 readily becomes a gas when heated. Both technologies rely on the mass differences between U-235 and U-238 to achieve separation, either through a semiporous membrane (diffusion) or by spinning at high speed (centrifuge). A third technology using lasers to separate isotopes is under development by Silex in Australia but it is not in use commercially at this time.

USEC Fuel Canister

Gaseous diffusion technology is currently used by Areva in France and by USEC in the U.S. The process separates the lighter U-235 isotopes from the heavier U-238 by forcing the UF_6 gas through a series of porous membranes with microscopic openings. Because the U-235 is lighter, it moves through the barriers more easily. As the gas moves, the two isotopes are separated, increasing the U-

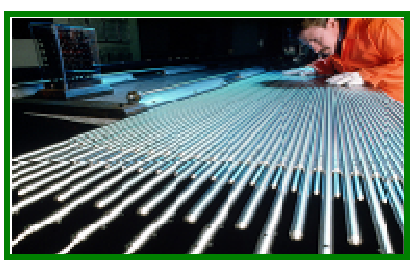
235 concentration and decreasing the concentration of U-238.

USEC and Areva are both transitioning from gaseous diffusion to centrifuge partially because the gaseous diffusion process consumes large amounts of electricity and as electricity prices have risen significantly in recent years, gaseous diffusion has become less attractive. Centrifuge technology is currently in use by Tenex and Urenco. With centrifuge technology, gaseous UF6 is fed into a rotor that spins at high speed inside an evacuated casing. Centrifugal force causes the heavier U-238 molecules to move closer to the wall of the rotor, producing partial separation of the U-235 and U-238 isotopes. The UF6 feed material is introduced near the middle of the rotor, and enriched and depleted streams are removed near the ends. Since the desired enrichment level cannot be achieved in one centrifuge, several machines must be connected in what is called a "cascade".

Once the enrichment facility has enriched the UF6 to the necessary level by gaseous diffusion or by centrifuge, it is cooled and then shipped in cylinders, most often by truck, to a nuclear fuel fabrication facility for further processing.

Fuel Fabrication

The fuel fabrication process begins with UF6 from enriched natural uranium sources, down-blended enriched uranium powder, or uranium extracted from other sources. Following receipt of the uranium canisters, the material is taken through several stages of processing, including dry conversion and blending into powder. The entire conversion process is carefully monitored through each phase, and controlled from a central location. The blended powder is then stored in canisters to await pellet production.



Areva personnel inspecting fuel pins.

After conversion and blending, the uranium powder is prepared for pellet production. Pellets are pressed out and loaded into trays for sintering – or firing, like ceramics – then inspection. Next, they are sent for grinding to ensure exact size, and inspected again. These pellets can now be used to fabricate either PWR or BWR fuel. Fuel designs vary, but the fabrication process is much the same.

A conveyor transports the pellets into the pellet room, where they are removed and inspected. Prior to loading a rod, a stack of fuel pellets is weighed. That weight is recorded in a computer system which marries the weight to a rod serial number, enabling the manufacturer to track the amount of uranium in each rod.

The fuel rod cladding is placed into a fuel rod transfer cart, where it is bar coded with a rod serial number that stays with the rod throughout its life cycle. The transfer cart is then coupled to the fuel rod loading station. Using a chain mechanism, a piece of tubing is brought up on nylon holders, placed on a track, and air-tested for internal debris. Rods are then loaded with both ends open using an automated or vibratory loader, each rod containing about 300 pellets. Once loading is complete, the end caps are attached by welding. Fuel rods are carefully inspected throughout the process.

The fuel rod now travels on the conveyor to the fuel rod gamma scanner, which verifies that all pellets inside have the same enrichment and that no gaps exist within the fuel column. The fuel rod then travels through a washer to thoroughly clean the rod exterior. Following visual inspection, the rods are loaded into trays for assembly insertion.

In the cage assembly area, structural components of the assembly – most notably the spacer grids and guide tubes – are attached. The assemblies are visually inspected and a computerized measuring system verifies grid dimensions to help ensure integrity. The cage assemblies are moved to the upender, where end fittings are attached and checked. Another visual inspection of the overall assembly is performed, and information is entered into the computer for tracking. The cage assembly is then lifted over to the rod pushing system. Verified and inspected rods are lifted onto the rod pusher. This system controls the placement of the various enriched fuel rods for all types of fuel assemblies.

Once all of the rods are inserted and verified, the assembly is moved to a final testing and inspection area. Final dimensions, spacing, and overall quality are checked up and down the assembly.

After final successful inspection, the assemblies are stored in racks in protective wrapping until their shipment date. The assemblies are loaded into protective shipping containers in this same area, each container holding two assemblies.

The Global Nuclear Energy Partnership (GNEP)

Phillip J Finck
Argonne National Laboratory

There is a strong international consensus that nuclear energy will be needed to respond to future growth in energy demand while reducing emissions of greenhouse gases. Existing reactors already produce economically attractive and secure electricity for many countries. Future growth in the nuclear option must be accompanied by a parallel effort at making the enterprise sustainable: the oft-cited issues of global proliferation and misuse of nuclear materials, management of the growing stockpile of spent nuclear fuel, and sustainability of natural resources must be addressed in a timeframe commensurate with the threat they pose.

GNEP will address these three issues with an approach relying on an integrated strategic and technical framework:

- Strategically, GNEP proposes implementation of a fuel lease/take back model, where "Reactor" nations would get access to nuclear reactors and associated electricity, without the need and risks related to the front- and back-end of the fuel cycle. These nations would produce electricity from their reactors, but the fuel would not be produced or disposed of indigenously. "Fuel Cycle" nations would own and operate the full complement of fuel enrichment, fuel fabrication, fuel reprocessing, and transuranic burning facilities, and would provide these services to their own infrastructure and also to the "Reactor" nations.
- Technically, GNEP would rely on a combination of technologies described below that would separate very long lived isotopes from the spent nuclear fuel, and destroy them in an adapted "burner" reactor while generating electricity, thus reducing the overall proliferation risk (by destruction of potential weapons useable isotopes) and reducing the long term waste management burden (by destruction of key isotopes such as Pu-241, Am-241, and Np-237).

The GNEP technologies have been designed to minimize the proliferation risk and maximize the waste management benefits of the deployed system. They rely on three successive steps:

- First, a front end spent fuel treatment technology, UREX+1a, designed to optimize waste management capabilities, while increasing proliferation resistance. UREX+1a relies on aqueous separations technologies and isolates groups of elements that are either destined for long-term disposal (uranium, fission products) into durable waste forms, or are intended for transmutation in burner reactors (transuranics). The process will potentially improve greatly the utilization of the Yucca Mountain repository and will do so without producing high-level liquid wastes that would require underground tank storage.
- Second, the transuranics are formed into advanced fuel forms that will be burned in fast reactors ("burners"), effectively destroying the transuranics through fission while generating electricity.
- Third, the irradiated fuel is treated through specific processes to recycle the remaining transuranic elements and send the remaining fission products to long-term disposal in durable waste forms.

The combination of these technologies will offer the following benefits:

- Destruction of potential weapons useable isotopes;
- Potential increase of repository capacity by a factor of approximately 100; and,
- Development of the spent fuel recycling technologies that can allow vastly improved uranium resource utilization in the long term.

An applied research and technology development program is planned to bring these technologies to maturity, including the demonstration of the separations technologies and fast reactor technologies, and the development and demonstration of advanced fuel forms. A robust R&D program will be targeted at specific less mature technologies and will occur in parallel with a strong basic sciences program, which will improve our fundamental knowledge of key processes, and with a significant modeling and simulation program, which will provide engineers with the modern tools needed to design more advanced technologies.

VA-NAYGN - Teaching Teachers How to Teach Nuclear

The Virginia local sections of the North American Young Generation in Nuclear (VA-NAYGN) teamed up with the Virginia Sections of the American Nuclear Society (VA-ANS) and Health Physics Society (VA-HPS) to organize their first annual multi-day science teacher workshop on July 19-22, 2006, hosted by Virginia Commonwealth University's (VCU) School of Engineering in Richmond, Virginia. Fifty middle- and high-school science teachers from Virginia and other states (Idaho, Minnesota, New Jersey, Pennsylvania, Texas) attended the workshop! As part of their attendance the teachers received their very own Geiger meter to use in their classroom, as well as books on nuclear science and other teaching aides.

The mission of the workshop was to educate teachers about the concepts and beneficial applications of nuclear energy and radiation for just $50 per teacher. The teachers are now better equipped to teach their students about nuclear technology.

The teachers stayed on the VCU campus in the student dorms for three nights. The first night the teachers registered, got settled into their dorms and enjoyed a welcome dinner and opening speech by Andy Cook of AREVA at the VCU School of Engineering.

The next day consisted of classes starting with the basics of nuclear science and gradually becoming more complex. The teachers also had two labs that day. The first was on the Geiger meter and how to care for it and its uses in the classroom. The second lab was a demonstration of Gamma Ray counting and spectroscopy.

The teachers then headed to the VCU Medical facility for a lecture and tours of nuclear related departments. The day closed with a dinner and social at the Science Museum of Virginia, Whew!! What a day and this was only the first one!

The next day consisted of more classes. The focus of this day was on nuclear power. There was also a session on how to teach nuclear science, technology and radiation in the classroom. That night there was another dinner with a keynote speaker, Brent Dixon of Idaho National Lab. The dinner was opened to all VA-NAYGN, VA-ANS, and VA-HPS members. This enabled the teachers to meet people who work in the industry and network some more. The teachers then had the rest of the night to entertain themselves.

The third (and final) day consisted of an early wakeup call and drive to the North Anna Power Station (NAPS). The teachers arrived at the North Anna Nuclear Information Center (NANIC) where they received an introduction to North Anna Power Station, and an in-depth tour of the NANIC. They also had the opportunity to see a See-Thru Reactor and the NAPS Simulator. The teachers were almost done, but they actually had an online test (it was open book!) and a lesson plan to complete. Once they completed the test and had turned in their pre-workshop homework they received 3 continuing education credits (CEUs).

The Virginia sections of NA-YGN, ANS, and HPS hope that this was the start of yearly multi-day workshops. Future workshops will probably be longer in total length but overall shorter days (I get tired thinking about how much the teachers learned in three days - so imagine how they felt after learning all of that great information!!!).

Local Chapter Updates!

Exelon West Chapter Nuclear Science Merit Badge Report

On April 8, 2006 Byron station NA-YGN hosted a Boy Scout Nuclear Science Merit Badge Session. This was an opportunity for the local Boy Scout Troops to come to the station and to learn more about nuclear science. Five members of NA-YGN (Harris Welt, Andre Mitchell, Kyle McGuire, Steve Blackbourn, and Jim McBreen) and several other Byron employees were involved with teaching the merit badge. The event was a huge success. The boys completed all but two of the requirements. A tour of the maintenance training facility and the simulator was also given to help supplement and break up the classroom training. Some of the lessons learned were:

- The event took longer than expected.
- Many of the boys were younger and their attention spans were not long enough to last the entire day.
- Some subjects were too in-depth for the boys to grasp right away.

The research and preparation for the merit badge was easy once the Troops had been contacted and an official date had been set. All it takes is contact with one Troop leader and communications to get the word out!

Carolina Chapter Hosts a Public Speaking Workshop

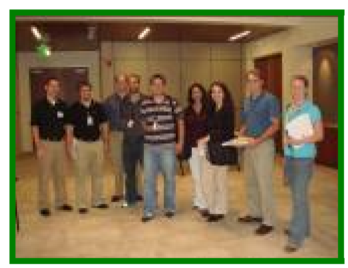
On August 16 the Carolina Chapter hosted a Spokesperson Workshop intended to educate our members on public speaking techniques. The workshop began with a one hour presentation by Tim Pettit, the Duke Energy Director of Public Affairs. Tim gave us the Duke Energy perspective on speaking with the media and members of the public regarding nuclear power. He taught us how to prepare our statements and answer pointed questions.

In the afternoon Prema Chandrathil, a Communication Specialist from the American Nuclear Society, gave a workshop on public speaking in stressful environments, focusing on helping speakers to be effective in creating and delivering third party messages about nuclear science and technology to different mediums.

Prema talked about the Do's and Don'ts of public speaking, such as to be overly kind and don't address hypothetical questions. She also discussed what different audiences like to hear from a technical expert, including what an anti-nuclear group enjoys. The workshop ended with a hands-on exercise where the attendees broke up into groups and crafted a response to a reporter's question. One member of each group delivered the response and their performance was critiqued.

Our chapter has utilized the lessons learned from this workshop on several occasions when we attended anti-nuclear events. The lessons can be applied to both speaking and the print media, as we also applied our knowledge in a letter to the Chapel Hill Town Council.

Prema expressed her interest in giving a similar workshop to other NA-YGN chapters. She can be contacted at (708) 579-8224 and at pchandrathil@ans.org. Our chapter would highly recommend this training to any interested parties.



From left to right: Matt Cameron, Adam Strange, Andrew Donato, Dave Fischli, Nicolas Hernandez, Prema Chandrathil, Sarah Chisholm, Andrew James, Meredith Reeves

Carolina NA-YGN Attends Chapel Hill Town Meeting

Members of the Carolina Chapter of NA-YGN attended a Chapel Hill Town Council meeting in which the Town Council was proposing a resolution to recommend to the NRC that they "refuse to consider any 'early relicensing'" of Progress Energy's Shearon Harris plant until the plant has been brought into full compliance with NRC fire regulations. This resolution was unanimously passed at the end of the meeting.

The anti-nuclear activists at the meeting emphasized Shearon Harris' reliance on temporary solutions to comply with federal fire protection regulations, including the fire watch and "heroic acts" by the operators to shut the plant down during an emergency. They also seemed to over-exaggerate the severity of the 1975 Browns Ferry fire. In addition, it appeared that neither the anti-nuclear activists nor the Town Council understood what the term "full compliance" means in this situation.

We did not speak at the meeting; however following the meeting, Carolina NA-YGN wrote a letter to the Chapel Hill City Council in which we expounded on our personal knowledge of NFPA 805 and the NRC's expectations for licensees in complying with the new fire regulations. Specifically, we explained that plants transitioning to NFPA 805 still have to meet interim fire standards based on rigorous technical analyses and that any non-compliance with these standards must be addressed immediately.

The Council is considering holding a Public Forum with Progress Energy and NC WARN et al to encourage open discussion about the new fire regulations. The Carolina Chapter plans on sending representatives to this meeting should it occur.

Core Responds!

Hi Liz,

I am giving a presentation to PENC (Prof. Engineers of NC) on Nov. 27 and was hoping to present on behalf of NA-YGN instead of AREVA for more (better?) credibility. Is there anything in particular I need to do for that? Basically talking about the need for new nuclear, new designs, etc.

Andy Huffman
Mechanical Engineer, New Plants Engineering
AREVA NP Inc

In the past NA-YGN has approved individuals to speak on behalf of the organization at ESP/COL public meetings that were not Core members. This is extremely rare, but necessary to ensure that NA-YGN meets its goal for public advocacy.

In order to present on behalf of NA-YGN international you need to send in your presentation to the Core and have it approved. Then the Core will vote on whether or not to give you permission to speak on behalf of the international organization.

If for some reason they decide no, you can always present as a member of the NC chapter of NA-YGN. We don't interfere with local chapter activities.

Have a wonderful day,

Elizabeth McAndrew-Benavides
Communication Chair
NA-YGN

EVENTS

National and International Events

January 21 – 24, 2007 HPS Midyear Topical Knoxville, TN www.hps.org

February 15, 2007 NA-YGN Awards Applications Due naygn@na-ygn.org

February 28 – March 1, 2007 CNA Annual Seminar Ottawa, ON www.cna.ca

May 22-23, 2007 NA-YGN PD Seminar Miami, FL www.na-ygn.org

June 24 – 28, 2007 ANS Summer Meeting Boston, MA www.ans.org

July 8 -12, 2007 HPS Annual Meeting Portland, OR www.hps.org

September 6 – 12, 2007 NA-YGN Canadian PD Seminar williams@na-ygn.org

November 11 – 15, 2007 ANS Winter Meeting Washington D.C. www.ans.org

NA-YGN

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