Governor's Nuclear Advisory Council
Meeting Summary
Thursday, March 8, 2012

Gressette Building, Room 207, 1105 Pendleton Street
Columbia, South Carolina

Council Members in Attendance:

Ms. Karen Patterson, Chairman
Captain Claude Cross
Dr. Carolyn Hudson
Mr. Ben Rusche
Dr. Vincent Van Brunt
Mr. Tom Young

Ms. Rebecca Griggs, Committee Staff

Call to Order – Adoption of Minutes
Ms. Patterson called the meeting to order at 1:00 p.m. She updated the members and the audience on the previous quarter's activities. The Council met with the director and assistant director of the DOE Fissile Material Disposition office. They are responsible for disposing of the plutonium at the SRS. Ms. Patterson felt the meeting was very encouraging.
The Council, again, submitted comments on the second amended notice of intent to modify the scope of the DOE surplus plutonium disposition. Comments were originally submitted in August 2010 which requested forward movement with the process. The comments submitted in first quarter 2012 reiterated this request.
Ms. Patterson attended a leadership forum in Aiken County for CSRA community leaders.

NuHub
Katherine Hutton, Senior Project Manager
Ms. Hutton briefed the Council on the basics of the nuclear industry as a whole in South Carolina. The local nuclear industry currently boasts a supply chain larger than BMW's with more than $2.2 billion in payroll, earned income of nearly $5 billion and over 28,074 current jobs (direct: 14,986). NuHub is currently focused on the economic impact of the nuclear industry.

EngenuitySC and regional stakeholders have launched a collaborative called NuHub to maximize the economic and job creation impact of the nuclear renaissance on the midstate of South Carolina. NuHub serves as a nuclear research, development, demonstration, education and economic development collaborative that will work to strengthen the nuclear assets in the midstate and to contribute to the competitiveness of the Carolinas. NuHub is a public-private partnership composed of midstate industry, higher education, workforce development and local public and private sector leaders. The executive committee leadership includes: Steve Byrne, President of SCE&G Generation, Sonny White, President of

Midlands Technical College, Don Herriott, Director of Innovista Partnerships and Don Goldbach, Director of Manufacturing Strategy at Westinghouse.

NuHub has established the following focus areas to align with industry and regional needs and interests: 1) Innovation – this initiative is focused on identifying, launching and nurturing the growth of nuclear-related high tech and alternative energy companies and attracting and increasing research and development activity in the midstate. The current focus is on small modular nuclear reactor technology, 2) Workforce – the initiative is focused on developing programs to meet 100% of the nuclear workforce needs by establishing regional educational and workforce development programs focused on training today's clean energy workforce and growing the future clean energy workforce (K-12), 3) Industry Engagement – this initiative is focused on recruiting existing suppliers and fostering new suppliers into the nuclear supply chain as well as recruiting new and expanding existing nuclear manufacturing in the region and 4) Communications – this initiative is focused on developing marketing materials and communications strategies to promote the regional nuclear assets and opportunities in the midstate.

SCE&G and its state-owned partner, Santee Cooper, are building two AP1000, 1,100 megawatt units at the Jenkinsville power station in Fairfield County. Duke Energy may also join the project team via purchase of Santee Cooper's share. At an estimated $9.8 billion price tag, the new plant could bring as many as 3000 new jobs during the construction phase. The new builds will not only bring additional economic benefits and jobs to the region, but it will also help local suppliers grow and attract new suppliers to the area. NuHub is working to maximize the impact of the new builds and increase the concentration of suppliers and manufacturers in the region. One way NuHub is doing this is by recruiting international conferences to the region like Nuclear Energy Insider's Small Modular Reactor conference and Long Term Operations conference which attracted a combined 350+ attendees from around the world. NuHub is also working with the City of Columbia and the Columbia Chamber to interview local industry members and suppliers and determine how best the region can help them grow via the Business in Motion program.

With its recent program innovations in nuclear, mechanical and chemical technologies and skilled crafts, Midlands Technical College (MTC) is uniquely positioned to enhance the regional growth and profitability of the nuclear energy sector. MTC is the recipient of highly competitive significant federal grants, including $438,517 from the US NRC for curriculum development and scholarships in the college's Nuclear Systems Technician program. MTC is also part of a $3.1 million grant from the National Science Foundation focused on establishing a Regional Center for Nuclear Education and Training (RCNET), linking seven southeastern states, including South Carolina. MTC will lead South Carolina's efforts. Nearby SC State University offers a unique undergraduate program in nuclear engineering along with summer camps for high school students to attract them to careers in the nuclear industry. The Midlands Education and Business Alliance provides a door through which the industry can connect with middle and high school students by providing career information, resources and mentorship/shadowing opportunities. NuHub and SCANA recently partnered to fund the development of a future job shadow for nuclear energy jobs, providing a tool to help students explore career options at any age. NuHub's goal is to build the midstate's reputation as a global leader in nuclear training and develop an international training center. NuHub is working towards this goal by connecting these programs and their constituents together.

San Diego-based General Atomics gave $900,000 to establish the General Atomics Center for Development of Transformational Nuclear Technologies, part of a new SmartState Center of Economics Excellence at the University of South Carolina to develop strategies for improving and enhancing the use of nuclear energy. USC appointed Dr. Dan Gabriel Cacuci to be holder of the first of two endowed chairs in the nuclear sciences. The US Department of Energy's Savannah River Site has announced three public-private partnerships to develop deployment plans for small modular nuclear reactor technologies at SRS facilities near Aiken. NuHub's innovation goals are to position the midstate as a leader in nuclear energy innovation, to develop world class innovators and to recruit and retain nuclear scientists, entrepreneurs and innovators to make SC a preeminent location for the nuclear economy. NuHub is working to connect industry and academia and to market the region's assets through and beyond the state of SC.

NuHub and its partners are planning to compete for a $452 million US DOE grant to design and license one of the first Small Modular Reactor's in the United States. NuHub is looking to partner with one technology vendor to compete for the grant but has a goal for the midstate to become a hub for SMR activity. SMR's will create new workforce and training needs, expand supply chains, spur global export from the port and launch new manufacturing. The economic possibilities are big for the region. Holtec projects that its annual exports of units could be up to $100 billion per year as compared to BMW's $5 billion per year. The US DOE's funding announcement should go out by early April and has a 60 day response time. NuHub is currently forming the team that will respond to the grant proposal.

To become a global connection for nuclear opportunities, people need to know who NuHub is and what the region has to offer. NuHub is working to promote the regional assets and opportunities via the NuHubSC website, quarterly newsletters, press releases and industry conferences. To sell the region, audiences need to know what's happening in the region. NuHub focuses on various audiences from industry to the general public and from SC residents to global stakeholders.

Ms. Hutton highlighted regional industry leaders and suppliers which NuHub hopes to engage and work together to bring more activity and create more jobs in South Carolina.

NuHub offers:

- Visibility through NuHub and EngenuitySC media outlets which includes EngenuitySC and NuHub websites, quarterly newsletters and press releases when deemed appropriate
- Opportunity to participate in a diverse collaborative of public and private industry stakeholders with a network throughout SC and beyond (CEO round-table meetings, networking meetings/events and program committees)
- Opportunity to identify and define key issues for the nuclear industry in the midstate of SC and implement plans to move solutions forward through a number of resources
- Strong regional, state and federal political support and credibility
- Opportunity to participate in community outreach and speaking events
- Access to networking events and special industry conference discounts

How to get involved with NuHub:

- Visit NuHub's website to sign up for the newsletter and volunteer to serve on a program committee
- Or, email or call Katherine Hutton for more information

VC Summer Units 2 and 3
Ron Clary, VP New Nuclear Development

Mr. Clary updated the Council as to the project status of the VC Summer site's Units 2 and 3 and the Westinghouse AP 1000 pressurized water reactor which will be a part of these units. Currently at the site, the world's largest derrick crane and AP1000 simulators are being installed. These simulators are being used to train site operators on this new, all digital control room. The containment vessel lower bowl is currently being fabricated and the switchyard and cooling towers are being constructed.

SCANA is actively involved with state colleges and universities to help train and develop potential recruits for the new units. Clemson, SC State, Francis Marion and USC currently have internship programs for health physics and engineering.

Mr. Clary also updated the Council on SCANA's licensing process. Westinghouse has completed their process and received certification in December 2011 of the AP 1000. SCANA completed the draft Safety Evaluation Report in December 2010, the Final Environmental Impact Statement in April 2011 and the final Safety Evaluation Report in September 2011. Hearings were completed in October 2011 and the COL (Construction and Operating License) is expected in early 2012 (subsequent to this presentation, the COL was issued).

Mr. Clary highlighted SCANA's efforts to hire the majority of site contractors from within South Carolina. They currently employ approximately 1,000 people but expect to increase their workforce to over 3,000 once the project is up and running. They anticipate this increase in jobs to provide an economic boost to the local area.

An aerial view of the site taken in May 2010 allowed the Council to understand the layout of the new units. Mr. Clary highlighted the Modular Assembly Building which was modeled after a lesson learned from a horizontal assembly building in China. This new building allows for indoor, vertical assembly of the modules. He also highlighted the excavation site for Unit 2. All work to this unit's site has ceased until they receive their license which will allow them to move forward. Excavation of the site for Unit 3 is continuing as they have not yet reached the point that requires the license to move forward. The heavy lift Derrick Crane site could also be seen on the aerial view.

Mr. Clary provided several aerial views of the construction site which included the switchyard. He also provided close-up photos of the excavation sites as well as the bottom bowl of the containment vessel. He discussed the Derrick Crane and its function and noted that it only requires one person to operate. He provided photos from the site in China which has very similar units. These photos detailed the installation process of the containment vessel.

Mr. Clary's stated the pre-construction and fabrication process at the site is progressing well. The project is staffed and ready to move forward with construction upon issuance of the COL, which is expected in early 2012. NRC Fukushima requirements will be met and no supply chain disruption is expected from the Japanese earthquake and tsunami. Lastly, the project in China is making good progress and they are following every aspect of what is happening in China.

Capt. Claude Cross inquired as to the expected date for the units to be online. Mr. Clary stated he expects the first unit to be online by 2016 and the second one in late 2018/early 2019. However, these

dates are contingent upon the issuance of the COL. Capt. Cross also inquired as the workforce required to operate the new units. Mr. Clary estimates approximately 750 people total are needed.

SC DHEC Update
Shelly Wilson, Federal Facilities Liaison, Environmental Quality Control
Ms. Wilson provided the Council with general updates on DHEC over the past quarter. Catherine Templeton was selected as the new director by the DHEC Board and confirmed by the Senate on February 28, 2012. She will begin her new position on March 15, 2012. The FY 2013 DHEC budget is in the early development process and Ms. Wilson expects it will be stable in terms of state dollars. There may be an increase for health money but she hopes it will end up stable on the environmental side. Ms. Wilson expects there will be a reduction in federal dollars received by DHEC, approximately 3%.

Ms. Wilson updated the Council on the high level waste at SRS. DHEC keeps a very close focus on the HLW due to the fact that there are 36 million gallons of liquid waste that are highly radioactive and toxic and tanks at the site are aging and have leaked in the past. One of DHEC's main goals is for the waste to be treated and the tanks closed to reduce risk. DHEC has approved the closure module for Tanks 18 and 19. The public comment period ran from October 31, 2011 to December 15, 2011. Comments were received from four entities. A public meeting was held in Aiken on November 15, 2011. Final approval of the closure model was March 7, 2012. The closure milestone for Tanks 18 and 19 is December 31, 2012.

Currently, the H Tank Farm General Closure plan is under review by DHEC.

Ms. Wilson updated the Council on VC Summer and new Units 2 and 3. They have completed the 404/401 process related to new intake structure. DHEC is currently working on the wastewater treatment permit (National Pollutant Discharge Elimination System Permit Application). They have been reviewing additional information that has been submitted and expect to release the draft permit soon. The public notice period will likely be in April 2012. This application is subject to an EPA review as well. DHEC has not yet received any water related construction permit applications but feels they are on track.

Dr. Van Brunt questioned the impact of reduced federal dollars on nuclear activities associated with DHEC. Ms. Wilson feels the reduction would not be in the environmental area but other, unrelated areas.

Surplus Plutonium EIS Update
Sachiko McAlhany, Senior Technical Advisor, Office of Fissile Materials Disposition (NA-26)
Ms. McAlhany presented information concerning the surplus plutonium disposition supplemental environmental impact statement. DOE's purpose and need remains the same as stated in the original Surplus Plutonium Disposition (SPD) EIS (1999); to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the US in an environmentally safe and timely manner. Surplus plutonium is plutonium no longer needed for defense or other programmatic purposes. Actions are needed to ensure that surplus plutonium is converted into a form that cannot be used in a nuclear weapon. Ms. McAlhany highlighted the NEPA process for the SPD Supplemental EIS.

Currently, the EIS is being prepared as required by NEPA. The Amended Notice of Intent to prepare SPD Supplemental EIS was published in the July 19, 2010 *Federal Register* which began the NEPA process. Tennessee Valley Authority (TVA) is a cooperating agency. Public comments, both oral and written, received during the scoping period will be considered when making decisions about the issues and alternatives to be analyzed in an EIS. The scoping period for the first amended Notice of Intent began with publications of DOE's Amended Notice of Intent to prepare the EIS on July 19, 2010 and ended on September 17, 2010. DOE is now re-opening scoping to consider additional, cost-effective alternatives for the pit disassembly and conversion capability. The scoping period for the second Amended Notice of Intent began on January 12, 2012 and will end on March 12, 2012. The draft EIS should be available for the public sometime summer 2012. All comments, including the GNAC's letter, will be incorporated into the draft. There will be a comment period on the draft document. Once the comment period closes, the final document will be prepared; possibly early 2013.

Ms. McAlhany gave a brief overview of the history of the document. At the end of the Cold War, in the early 1990s, the federal government was left with plutonium surplus to their defense needs. As such, they had to determine how to dispose of this surplus. The *Storage and Disposition of Weapons-Usable Fissile Materials Programmatic EIS* determined various methods to dispose of plutonium. In 1997, DOE issued a Record of Decision which identified two different strategies for moving forward with disposal of plutonium. One was an immobilization technology for disposal of some or all surplus plutonium in a geologic repository. The other was a fabrication of some surplus plutonium into MOX fuel for irradiation in domestic commercial reactors.

In 1999, DOE issued the *Surplus Plutonium Disposition EIS* which further analyzed the alternatives as well as possible locations for these capabilities. In 2000, DOE issued a Record of Decision to construct and operate three facilities at SRS. The first being Mixed Fuel Fabrication Facility to fabricate up to 33 MT of surplus plutonium into MOX fuel. The DOE also decided to construct a pit disassembly and conversion facility to disassemble nuclear weapons pits and covert the plutonium material into an oxide form for use as feed material to the MOX fuel fabrication facility. The third decision was to construct the plutonium immobilization facility using can-in-canister technology. In 2002, DOE issued an amended Record of Decision which cancelled the immobilization project. This cancellation left some plutonium that is not suitable for MOX without a disposition path.

In 2003, DOE affirmed the MOX approach for disposition of 34 MT of surplus plutonium, including 6.5 MT of non-pit plutonium. Skipping ahead to 2007, DOE announced that it would consolidate surplus non-pit plutonium at SRS, pending disposition. In 2010, DOE issued an Amended Notice of Intent to develop a Supplemental EIS related to surplus plutonium disposition. The scope of the Supplemental EIS was primarily to dispose of 6 MT of non-pit plutonium that was now left without a disposition path due the cancellation of the immobilization project. In addition, in 2007, DOE also declared an additional 9 MT of pit plutonium surplus.

Ms. McAlhany also gave a brief overview of the Surplus Plutonium Disposition Program Schematic. The weapons are dismantled at the Pantex Plant. The surplus plutonium pits are then stored at the Pantex site on an interim basis. The plan is for the metal pits to be taken from Pantex to be disassembled and converted into an oxide form. The oxide would feed the MOX Fuel Fabrication at SRS. The consolidated non-pit plutonium would be held at the storage site at SRS. Some of this non-pit plutonium could be sent to the pit disassembly and conversion facility for disposition while the other would be sent to the

plutonium processing for non-pit plutonium at SRS. After this process, the plutonium oxide that is acceptable will be sent to MOX Fuel Fabrication while the non-acceptable plutonium will be sent through other disposition paths such as dissolving at H-Canyon at SRS, Immobilization at SRS or for disposal at WIPP in New Mexico.

The scope of the Surplus Plutonium Disposition Supplemental EIS would consider options to disassemble pits and convert plutonium metal into an oxide for disposition; however, because construction on the disassembly and deconversion facility has been canceled, DOE is reviewing other options to perform the same functions. Another focus of the EIS will be to consider irradiating Mixed Oxide (MOX) fuel in TVA reactors.

The scope of the Surplus Plutonium Disposition Supplemental EIS will not reconsider previous decisions to disposition surplus plutonium other than the decision to construct a standalone Pit Disassembly and Conversion Facility (PDCF) as well as the evaluation of additional reactors for irradiation of MOX fuel.

The four main options for pit disassembly and conversion include: 1) a standalone facility in F-Area at SRS, 2) utilizing a current facility by installing the capability in K-Area at SRS, 3) expand the capability at the Los Alamos lab in the PF-4 Facility and 4) looking at H-Canyon/HB-Line in H-Area at SRS in conjunction with one of the three other options. The two current options that are being considered for pit plutonium are converting it into MOX fuel at which case it would be irradiated through commercial reactors, and to immobilize it into a glass form in the can-in-canister technology and sent to DWPF. The remaining two options address non-pit plutonium disposition options.

A preferred alternative was identified for these four options. The MOX fuel alternative is DOE's preferred alternative for surplus plutonium disposition. DOE's preferred alternative for disposition of surplus plutonium that is not suitable for MOX fuel fabrication is disposal in the Waste Isolation Pilot Plant in New Mexico. DOE's preferred alternative for pit disassembly and the conversion of surplus plutonium metal to feed the MFFF, is to use some combination of facilities at TA-55 at LANL, K-Area at SRS, H-Canyon/HB-Line at SRS and MFFF at SRS, rather than to construct a new standalone facility. This would likely require the installation of additional equipment and other modifications to some of these facilities.

In summary, DOE must disposition US surplus weapons-usable plutonium in a safe, secure and environmentally sound manner. Plutonium must be in proliferation-resistant forms that can never again be readily used in nuclear weapons. The Surplus Plutonium Disposition Supplemental EIS will evaluate options for disposition of an additional 7 MT of pit plutonium and 6 MT of non-pit plutonium. Public involvement is an important component in the EIS decision-making process.

The public can provide comments through various avenues including oral comments at public events, comment forms, e-mail, facsimile and US mail. However, in order to be considered for scoping, comments must be submitted by the deadline of March 12, 2012.

Nuclear Safety Culture
Mike Mikolanis, Acting Chief Engineer, DOE-SR Office of the Manager

Mr. Mikolanis updated the Council on SRS's renewed focus as a result of the DNFSB report on a "Safety Culture at the Waste Treatment and Immobilization Plant" (WTP at Hanford). The three sub-recommendations addressing safety culture issues include two sub-recommendations specific to the Hanford Site and one sub-recommendation applies to the balance of DOE/NNSA sites. The Safety Culture concept has been around for a quite some time. The secretarial implementation plan designates the Deputy Secretary of Energy to manage the implementation and believes that maintaining a strong safety culture is essential for mission completion.

There is a strong safety culture at SRS, but there is always room to improvement. Major actions that will be taken as a part of the implementation include institutionalizing the Secretary's expectations for what it is to have a strong safety culture. DOE will also train on safety culture attributes and management behaviors, perform safety culture self-assessments of contractor and federal organizations, perform independent reviews of safety culture on select major projects and sustain safety culture improvements through town hall style meetings and establish site-specific safety culture sustainment tools.

An annual safety survey will be conducted for federal employees. Past surveys indicated SRS is an environment where issues can be voiced without fear of retaliation. Cultural growth initiatives will be implemented to encourage the development of the 'questioning attitude'. Personnel Performance Management Plans will include specific safety and cultural growths expectations.

Contract employees will participate in the Voluntary Protection Program (VPP) Surveys and Employee Concerns Program Feedback which should encourage contract employees to voice any concerns without the fear of retaliation. Mr. Mikolanis reviewed the safety performance indicators which indicated that lost work days at SRS fell well below the industry average.

Currently, SRS's Contract Performance Evaluation Plan establishes a safety expectation level by maintaining focus on the contractor's safety toolbox. SRS's Integrated Safety Management System continues to train management on safety management functions that are required at SRS. They also employ a 'Just Safety Culture' which is a process that encourages the reporting of mistakes or problems. This process has provided a lot of data points toward safety improvements.

The current campaign, Enterprise SRS Safety Culture, is a safety-first campaign. It encourages employees to 'see something – say something'. This expectation is reinforced at the highest level of management.

In summary, SRS plans to implement safety culture attribute training. Managers and employees have had discussions of the Secretarial safety culture expectations. By July 2012, the actual training will be developed. By December 2012, training delivery is expected. With respect to SRS Safety Culture Self-Assessment, assessment guidance development is expected by July 2012. SRS self-assessments are expected to be performed by March 2013 while independent oversight of self-assessments is expected by April 2013.

Public Comments

Ms. Patterson asked if there were any public comments.

Mr. Tom Clements, a member of Alliance for Nuclear Accountability, requested to speak about MOX program. He is concerned with the costs associated with this program. He feels NNSA and AREVA are not communicating to Congress or other agencies in Washington about where this program is headed and about the cost projections. However, he can assure that questions will start being asked, particularly about funding. He indicated he feels AREVA is trying to get around testing the MOX fuel in Browns Ferry and they also do not want to conduct irradiation testing in Sequoyah. He feels there are big implications for this and the NRC has noticed.

Mr. Clements feels it is unclear how long a MOX plant will be needed, which has huge cost implications. He pointed out the annual operating cost increase that occurs after 13 years in operation. He expressed sincere concern for these costs. He feels NNSA is not communicating this time and cost issue to Congress.

In closing, Mr. Clements noted that the Nuclear Waste Technical Review Board is having it spring meeting right now. He does not believe the MOX issue has come up thus far. On December 30, 2011, the NWTRB sent a letter to Peter Lyons, assistant secretary for nuclear energy at US DOE. This letter pointed out one thing TVA presented concerning MOX fuel. He read a paragraph from that letter which states:

> Mr. Daniel Stout from the Tennessee Valley Authority described the process that his utility is employing to determine the implications of using MOX fabricated surplus-weapons plutonium at one or more of its reactors. He noted that the decay heat of a spent MOX fuel assembly would be between 1.3 and 1.7 times higher than that for an equivalent spent-uranium fuel assembly. Consequently, the used MOX would need to be kept in dry cask storage for an additional 56 years to have the same thermal impact on a repository at the time of emplacement. For certain repository designs, that difference could be consequential.

Mr. Clements feels the NNSA needs to address this issue in their draft document due for release later in 2012.

Closing Remarks

Ms. Patterson made a special point to thank Sheron Smith, with SRS, for her assistance and help with the GNAC over the years and wished her well in her retirement. Ms. Patterson then thanked everyone for their information and adjourned the meeting.