

# **Final Report of NEAC International Subcommittee**

**October 13, 2017**

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Chair, NEAC International Subcommittee**

# International Subcommittee Members

- **Regis Matzie, Chair**
- **Matthew Bunn**
- **Thomas Cochran**
- **Marvin Fertel**
- **Sue Ion**
- **Thomas Isaacs**
- **Maria Korsnick**
- **William Martin**
- **Kenneth Peddicord**
- **Burton Richter**
- **Allen Sessoms**

# Charge to the NEAC International Subcommittee

- **Charge issued to NEAC on June 16, 2016, directing International Subcommittee to**
  - **Task 1 – examine and provide recommendations on how the Office of Nuclear Energy could further support USG international commercial nuclear energy policies and priorities**
  - **Task 2 – identify international nuclear facilities that the U.S. nuclear industry could leverage to support the further development of the GAIN Initiative and complement existing U.S. facilities**
- **Requested that the results of the reviews for the two tasks be documented in reports before the end of the year; actually completed March 2017**

# Background for Task 1

- **In the early days of civil nuclear power, U.S. was unquestionable leader both in technology and reactor deployment**
- **After 1972 oil embargo and Three Mile Island 2 reactor accident, the situation changed in the U.S. with respect to new nuclear project starts**
- **Today, nuclear energy supplies 19% of U.S. electricity, but will decrease as operating units shutter**
- **Foreign nuclear technology suppliers have emerged and have taken over civil nuclear leadership**
- **Approximately 60 new nuclear units are under construction today with the vast majority in Asia; China, Russia, India and South Korea suppliers are leading the way**
- **U.S. influence on nuclear matters, both civil and military, is waning because of U.S. government's overall approach to nuclear energy over the recent years**

# Civil Nuclear Energy Situation Today

- **Nuclear energy is of vital strategic importance because of the special relationship developed between suppliers and customers**
  - **Relationship can endure for 50 to 100 years**
  - **Recognized by U.S. competitors – most notably China and Russia**
- **International competition is generally from state-backed companies, disadvantaging U.S. suppliers and making it difficult for us to compete**
- **Department of Commerce estimates civil nuclear market will be \$500 to \$750 billion over next 10 years; each billion dollars of export sales supports 5,000 to 10,000 domestic jobs**
- **Currently, U.S. nuclear energy fleet is declining, and our domestic research and development (R&D) budgets are shrinking, sending the wrong signals to potential international customers**

# Task 1 General Findings

- **U.S. Government (USG) does not approach civil nuclear energy as a strategic policy issue as do other countries**
- **U.S. leadership on security, non-proliferation, and reactor safety is lessening – a disturbing trend**
- **It is often difficult for U.S. companies to obtain adequate financing for large international projects**
- **U.S. nuclear export regulations are generally complex, restrictive, and time consuming**
- **U.S. implementation of the Convention on Supplementary Compensation (i.e., international nuclear liability treaty) places a potential significant burden on domestic suppliers**
- **White House level coordinator for international nuclear energy policy is needed to help bring the strengths of the USG in support of foreign sales**

# Recommendations for Task 1

- **Make civil nuclear energy a foreign policy strategic imperative, with strong coordination across USG agencies**
- **Support continued safe and reliable operation of existing U.S. nuclear power plants and encourage construction of new plants**
- **Simplify and streamline U.S. nuclear export regulations and processes**
- **Expand and strengthen available export financing so that U.S. companies can compete with foreign state-backed companies**
- **Help new civil nuclear entrant countries set up appropriate international liability regimes**
- **Draw upon and integrate the strengths and capabilities of U.S. national laboratories, research universities, and training capabilities**
- **Increase funding and the use of new approaches to public-private arrangements for R&D to help regain U.S. global nuclear leadership**

# Background on Task 2

- **Gateway for Accelerated Innovation in Nuclear (GAIN) Initiative, headquartered at the INL, is based on three ideas:**
  - **Global demand for nuclear energy is increasing and U.S. leadership is eroding**
  - **Sense of urgency with respect to deployment of innovative nuclear energy technologies**
  - **Effective private-public partnerships are required**
- **GAIN Initiative will provide nuclear innovators and investors a single point of easy access to a broad range of capabilities across the DOE laboratory complex**
- **GAIN helps fund access to DOE's national laboratories and Nuclear Science User Facilities (NSUF) partners to conduct rapid turnaround experiments for advanced nuclear projects selected through open competitive proposals**
- **NSUF currently has both domestic (13) and international (3 plus 3 more in the works) members/collaborators**

# Task 2 Findings

- **Large number of international nuclear facilities are available to complement existing U.S. facilities and thereby leverage the GAIN Initiative**
- **Some of these potential international facilities are located in countries where changing political environments may make collaboration difficult and should not be considered reliable partners**
- **It is difficult to transport irradiated materials internationally, particularly special nuclear material**
- **Nuclear Energy Infrastructure Database (NEID) already exists within the U.S. nuclear complex, which would be a natural starting point for U.S. companies to look for best partners**
- **Processes and protocols exist for international collaboration, although different specific vehicles are typically used for each project**

# Recommendations for Task 2

- **Perform a gap analysis between domestic nuclear infrastructure capabilities and international facilities**
- **Establish a standardized and simplified process for collaboration between U.S. companies and potential international nuclear facilities; develop typical timelines for such collaborations**
- **Increase funding and scope of GAIN Initiative so that it can achieve its strategic goals**
- **Examine and resolve the impediments to transporting irradiated materials internationally for R&D**
- **Take advantage of the Generation IV International Forum (GIF) initiative for member countries self-identification of facilities that would welcome international collaboration; promote the NEID as the repository of this information**
- **Update NEID on a regular basis and establish a process to track who is using the database as a means of improving the usefulness of the database**

# Additional Information

- **Some recommendations are beyond the charter of the Office of Nuclear Energy (NE) and even DOE in some cases, but NE can serve as a catalyst to help make them happen**
- **There are more specific findings and more detailed recommendations in the Subcommittee Report**
- **Background information is also provided to understand what DOE is already doing in related areas to this charge**
- **Previous recommendations by the International Subcommittee that relate to Task 1 are included in an appendix**
- **A listing of the meetings held and the organizations questioned to obtain information in support of this report is included in an appendix**
- **The full NEAC is asked to approval the Subcommittee's report at this meeting**

# Questions?