

SUBJECT: Nuclear Regulatory Commissioner Magwood's Visit to Mexico

1. SUMMARY: Commissioner William Magwood of the U.S. Nuclear Regulatory Commission (NRC) visited Mexico February 14-17 to strengthen the NRC's institutional relationship with Mexico's nuclear regulator, the Comision Nacional de Seguridad Nuclear y Salvaguardias (CNSNS), learn more about Mexico's ongoing nuclear power and research programs; and discuss nuclear engineering education with Mexican university students and professors. In his meeting with nuclear officials from the Ministry of Energy (SENER), SENER expressed interest in joining the Nuclear Suppliers Group and signing a Section 123 nuclear cooperation agreement with the United States. Commissioner Magwood welcomed these developments and post will coordinate with the appropriate agencies in Washington to follow up to on these two items. During the visit, Commissioner Magwood also toured Mexico's nuclear research facility at the Instituto Nacional de Investigaciones Nucleares (ININ) and the Laguna Verde Nuclear Power Plant (LVNPP), describing both as "state-of-the-art". He also met with the American Chamber of Commerce's climate change and energy committee to discuss the future of nuclear energy post-Fukushima and met with nuclear engineering students at the Universidad Nacional Autonoma de Mexico to learn about the nuclear engineering program and to hear about the students' and faculty's ongoing research. End Summary.

Mexico Interested in Nuclear Suppliers Group and Section 123 Agreement

2. (SBU) NRC Commissioner Magwood visited Mexico February 14-17, and was accompanied by NRC staff Elizabeth Lisann and Karen Henderson, and ESTHCOUNS. During Commissioner Magwood's February 14 meeting with Sergio Ajuria, Director for International Nuclear Affairs for the Ministry of Energy (SENER), Ajuria expressed SENER's interest, on behalf of the Mexican Government, in negotiating a Section 123 nuclear cooperation agreement with the United States. Mexico, the U.S. and the International Atomic Energy Agency (IAEA) have a trilateral nuclear supply agreement which enabled the purchase of the U.S.-origin Laguna Verde nuclear power plant. This agreement, if signed, would replace the trilateral agreement and would facilitate the direct sale of nuclear technology exports. Ajuria acknowledged that it would take several years to negotiate, but that Mexico already complies with most of the legal requirements typically in such an agreement, including a safeguards agreement and Additional Protocol. Mexico is also interested in joining the Nuclear Suppliers Group and is working on the legal framework to set up a national export control system. Ajuria also reported that Mexico provided to the Department of Energy comments to the proposed changes to Title 10 of the U.S. Code of Federal Regulations Part 810 (10 CFR Part 810), which regulates U.S. technology transfers for foreign atomic energy activities.

3. (SBU) Commissioner Magwood welcomed the news of the interest in negotiating a Section 123 agreement, saying that Mexico is a strong partner and having such an agreement would make technology transfer easier. He also asked for a copy of SENER's comments to 10 CFR Part 810. Ajuria also noted that SENER is pushing to reform Article 27 of Mexico's national nuclear law, to address such issues as physical protection, nuclear safety, and the independence of the CNSNS. He also noted that while the Fukushima accident was followed in Mexico as it developed, it did not generate much public concern, in part because Laguna Verde is on the east coast, well away from the known fault lines on the west coast of the country.

Enclosure

#### Mexico wants added nuclear capacity...

4. (SBU) Ajuria briefly noted additional activities going on in Mexico in February the nuclear sector, including the exchange of highly enriched uranium (HEU) for U.S. provided-low enriched uranium (LEU) under the auspices of the IAEA; the celebrations for the 45<sup>th</sup> Anniversary of the Tlatelolco Treaty which created the world's first nuclear weapons-free zone in Latin America and the Caribbean. Reflecting on the upcoming March Nuclear Security Summit in Seoul, Ajuria said he was very excited that the South Koreans wanted to talk about nuclear safety as well as nuclear security. He noted that, in response to the Fukushima nuclear accident, Mexico's Laguna Verde Nuclear Power Plant has undertaken various stress tests. He expressed pride in the plant and the CNSNS, saying that he would like both to become stronger and independent. He asserted that nuclear energy is competitive from a financial point of view. Mexico has 52,000 MW of installed generating capacity, but expects to require 20,000 MW more over the next 20 years. Mexico is committed to increasing capacity by 10,000 MW using currently available resources (e.g., oil, gas, renewable sources), but they are unsure how additional capacity will be generated. Although Mexico is pushing renewable energy, it is not baseload. Mexico wants to increase geothermal capacity, but they only have 4-5 high-temperature fields, Ajuria stated. He noted that "there are no innocent kilowatts," a reference to the use of all forms of energy having consequences.

#### ...but nuclear waste management is a problem

5. (SBU) One problem, Ajuria noted, is nuclear waste management. Mexico's nuclear research reactor (ININ) produces on average 15m<sup>3</sup> of solid waste and 4.5m<sup>3</sup> of liquid waste per year, mostly low-level waste from nuclear medicine and industrial applications. The CNSNS regulations currently prohibit underground storage; as a result, temporary, above-ground storage is located at a facility, which is 10 kilometers away from the Teotihuacan Aztec-era pyramids. CNSNS is reviewing the current storage arrangements, noting that it is located in volcanic terrain and the aquifer is only 300m from the surface. Mexico seeks to create a single national repository for nuclear waste, most likely in the desert located in the northern states of Chihuahua or Sonora. Mexican authorities are studying the possibility of a retrievable facility which would be able to hold waste and spent fuel from up to 10 nuclear power plants. Spent fuel from the Laguna Verde plant is currently stored at the reactor in pools. "Fukushima tells us we shouldn't do this", Ajuria asserted, adding that Mexico wants to build an on-site facility using concrete casks, located away from the reactor. Commissioner Magwood noted that we now know that the spent fuel in the pools at Fukushima was safe. He also mentioned that the NRC recently affirmed that spent fuel can be safely stored for at least 60 years beyond the life of the plant. He said that spent fuel is currently safe where it is, either in the pools or in dry cask storage which is an excellent option, and that the U.S. government does not plan to change its methodology on storing spent fuel.

6. (SBU) Ajuria noted that the European Commission has dedicated 3 million euros for a project with Mexico that would explore the possibility of managing high-level waste and spent fuel through dry cask storage. He added that he does not believe that spent fuel is a waste, and that he wants to leave the door open to the possibility of retrieval and reuse of the spent fuel. Commissioner Magwood noted that although the nuclear industry would like to explore this option, policymakers do not like the current technology due to proliferation concerns related to the separation of plutonium.

### Conversation with CNSNS Director General Eibenschutz

7. (SBU) On February 14, Commissioner Magwood had a dinner meeting with CNSNS Director General Juan Eibenschutz. During the dinner, Commissioner Magwood noted the interest in the U.S. and Canada to resume trilateral regulatory discussions with Mexico. He noted that the March 13-15, 2012, NRC Regulatory Information Conference (RIC) could provide an opportunity for representatives of the regulatory authorities of Canada, Mexico and the U.S. meet to exchange information regarding lessons learned from Fukushima. Such a discussion could also address issues likely to arise at the August 2012 Extraordinary Meeting of the Convention on Nuclear Safety, which will focus on lessons learned from the Fukushima events. Eibenschutz was open to this idea. He also noted that he plans to attend the March 19-23, 2012 International Experts Meeting which will take place at the IAEA in Austria shortly after the RIC. In discussing current activities at the CNSNS, Director General Eibenschutz noted that the power uprate at the Laguna Verde plant had been completed and approved at the uprated power until September of 2012 after steam dryers of both units were inspected, but the license amendment authorizing putting into action the 14 percent power uprate for the remaining time of the license i.e. until 2020 for Unit 1 and 2025 for Unit 2, will not be approved until all steam dryer integrity issues are resolved.

### Visit to Mexico's Nuclear Research Facility

8. (SBU) On February 15, Commissioner Magwood toured Mexico's nuclear research reactor at ININ, which included visits to the center's Applied Microscopy Unit (AMU), Gamma Irradiation Plant (GIP), Particle Accelerator, Hot Cells Laboratory, and the Research Reactor (a U.S.-origin Triga Mark III pool-type reactor). The delegation was hosted by the Director General of ININ, Jose Raul Ortiz Magana, along with other senior managers. During the tour of their Particle Induced X-ray emission Spectroscopy system, ININ officials noted that the AMU had collaborated in art conservation efforts with the Smithsonian Institute and New York's Metropolitan Museum of Art. The tour of the GIP revealed that it is mainly used to irradiate spices and medical supplies for commercial use and export. While visiting the research reactor, Commissioner Magwood had the opportunity to observe the unloading of, and preparation for use of the recently arrived LEU as a part of DOE's HEU-LEU fuel exchange. ININ officials noted that the reactor will be back in service by mid-March, and that they expect the facility to be able to operate for another 20-30 years. Officials also noted that the facility produces 80% of the radioactive sources in national use. Commissioner Magwood congratulated ININ for completing an important step in the conversion to LEU, a key international nonproliferation initiative.

9. (SBU) In terms of knowledge and human resource management, ININ noted, however, that over the last 10 years, 150 employees have left and have not been replaced. In addition, 30% of the employees have 30 years of service and can retire soon. To address this anticipated gap, ININ staff serve as instructors at the State University of Mexico and other universities to generate interest in work in the nuclear field, and approximately 100 university students a year conduct research at ININ. Of these, approximately 25 a year complete their dissertations based on their research at ININ.

### Efforts to Enhance Nuclear Safety at Laguna Verde

10. (SBU) On February 16, Commissioner Magwood, accompanied by CNSNS Director General Eibenschutz, toured the Laguna Verde Nuclear Power Plant, including its visitor's center, environmental monitoring station, training facility and off-site emergency response

center. LVNPP Plant Manager Rafael Fernandex de la Garza, led the comprehensive tour. LVNPP officials also gave a presentation explaining steps Mexico is taking to enhance nuclear safety at the plant in response to lessons learned post-Fukushima. Using the July 2011 NRC Task Force recommendations as a benchmark, LVNPP officials indicated they are upgrading the design basis of each operating reactor at the plant for seismic and flooding protection. They noted that they are buying from a Dutch company a \$600,000 diesel engine pump that will have the capacity to inject water from the sea, lagoon or tank into the reactor pressure vessel, PC, or spent fuel pool. They also looked at their vent designs, which at 12 inches in size, they believe can handle severe accidents without further backfit. When CNSNS Dr. Eibenschutz commented that he did not see a need for a filter for the vent, Commissioner Magwood noted that the Commission had asked the NRC staff to look at the issue, but agreed that there did not seem to be a safety basis for vent filters.

11 (SBU) LVNPP officials also noted they have completed the design phase for enhancing its spent fuel makeup, and that instrumentation for the spent fuel pool is still pending. They noted their reliance on extant systems for getting water to the plant in an emergency, including the use of a series of connected hoses. They noted that they conducted an exercise to test if their existing hoses could connect, and they discovered that they did not. However, they assured the Commissioner that the hoses they have now, both for makeup and spray systems connect properly. LVNPP officials indicated that they have drafted new Severe Accident Mitigating Guidelines (SAMGs), and they are waiting for Boiling Water Reactor Owner's Group guidelines, which are expected to be published by the end of 2012. Commissioner Magwood noted that the NRC is assessing the regulation of SAMGs in the U.S. LVNPP officials also asserted that they are implementing strategies to address multi-unit events. When Commissioner Magwood asked whether they are considering having more staff in case of a multi-unit event, Laguna Verde officials replied they would need additional staff to handle a multi-unit event. They added that a number of workers live in a complex 15 kilometers away, but acknowledged that the bulk lived in Veracruz (80 kilometers away). "This is the reason why we are trying to go to an 8-hour battery to buy time for personnel to get to the plant," LVNPP officials explained. They noted that they had received comments from INPO concerning the LVNPP focus on enhancing battery capacity.

#### Meeting with AMCHAM

12. (SBU) Commissioner Magwood also met with representatives of the American Chamber of Commerce's (AmCham) Climate Change Committee to discuss the future of nuclear energy post-Fukushima. The Commissioner noted that one of the lessons learned from the disaster was the importance of having the necessary equipment, training, and personnel to respond to a nuclear emergency. When asked about the future of the proposed Yucca Mountain nuclear waste repository, the Commissioner noted that a U.S. Blue Ribbon Commission reported recently that more research on disposition paths was needed, and that in the meantime, the only option is to store it. CNSNS Director General Eibenschutz noted the challenge of assuring the public that nuclear energy is safe and referred to the nuclear weapons used during World War II as nuclear energy's "original sin." He noted that the public is not nearly as concerned with hazardous waste that is even more dangerous than waste generated in nuclear activities, including arsenic and heavy metals. Commissioner Magwood noted the importance of educating the public regarding the risks and benefits of all energy options. On climate change, Commissioner Magwood noted that, from a practical standpoint, nuclear energy, along with renewable sources of energy, can help reduce the effects of climate change.

### Meeting Mexico's next generation nuclear professionals

13. Commissioner Magwood met with UNAM, Professors Arturo Reinking and Juan Luis Francois and their students to discuss their ongoing research in nuclear engineering. These students and professors make up UNAM's Nuclear Engineering Group, which has published a number of articles in international scientific journals, and is supporting the government's nuclear power and research activities (including for the CNSNS). Each student gave a presentation on their research including: the economics of nuclear power; a cost-benefit analysis of nuclear energy, renewables, and fossil fuels; the development of tools for decision making and risk analysis; an evaluation of power plant and reactor configurations; developing a training curriculum for current nuclear operators; a simulation of nuclear processes; advanced reactor design and analysis; emergency system design; and fuel management strategies. Commissioner Magwood shared his personal experiences in the field and gave advice and encouragement to each of the students and researchers that attended the session. During the meeting, the Commissioner learned that approximately 30% of graduate students in the nuclear energy field are women; and that many of the students have performed internships overseas, mainly in Germany.

### Comment

14. (SBU) Commissioner Magwood's visit helped to strengthen bilateral regulatory cooperation in nuclear safety with Mexico and to educate nuclear experts in industry, government and academia on lessons learned after the Fukushima nuclear accident. His visit also helped promote the study of nuclear engineering among would-be Mexican nuclear scientists. During the tour of ININ and Laguna Verde Nuclear Power Plant, the Commissioner was impressed by the state-of-the-art technology both facilities employed, and the professional accomplishments of the staff. Commissioner Magwood pointed out that few nuclear facilities in the world had the necessary resources to build the kind of emergency response, environmental monitoring station and visitor's center and training facility found at Laguna Verde. Post looks forward to working with the appropriate agencies in Washington (State and the Department of Energy) to follow up on the GOM's interest in joining the Nuclear Suppliers Group and beginning negotiations on a 123 nuclear cooperation agreement. End Comment.

15. Nuclear Regulatory Commissioner William Magwood cleared on this cable.