NRC NEWS

U. S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone 301/415-8200
Washington, DC 20555-0001 E-mail: opa@nrc.gov
Web Site: www.nrc.gov

S-03-020

Remarks of Chairman Nils J. Diaz

before

Florida's Public Health Workforce on Nuclear and Radiological Events

July 8, 2003
Tallahassee, Florida

Good Morning. I do not have slides or a Teleprompter, so bear with me. I do have a message. It is indeed my pleasure to address Florida's public health workforce on nuclear and radiological events. This is a timely program. Indeed, it seems that not a day goes by without someone mentioning the potential harmful effects to persons or property from a nuclear or radiological event. The probability of such an event is low. However, we are prepared for it. The radiological protection of the public health and safety has always been and will continue to be the mission of the Nuclear Regulatory Commission (NRC). I will discuss some of our recent activities and what we are doing in the areas of homeland protection and preparedness, together with our partner Federal agencies, State and local governments, and with our licensees.

The NRC is an independent agency with the Federal mandate to assure protection of the public health and safety, the environment and the common defense and security for civilian uses of nuclear energy and nuclear materials, as established by the Atomic Energy Act (AEA). NRC has the responsibility for licensing and regulating the use of nuclear fuel, radioactive materials and facilities. The NRC continues to have broad domestic authority for ensuring that all safety and security events from such AEA materials are appropriately responded to and dealt with. In short, the NRC's main responsibility has always been, and is, the radiological protection of our people, as well as that of the common defense and security.

We know you are concerned, and so is the NRC with the issues involved in protecting nuclear material and facilities against theft, diversion and sabotage. Let me summarize activities ongoing

at the NRC and in the nation. The infrastructure for homeland security was upgraded soon after 9/11. Many of these activities were coordinated from the Office of the President of the United States. The Department of Homeland Security (DHS) was established on January 24, 2003, with the purpose of streamlining and centralizing federal actions into one cohesive unit. DHS provides one point of contact for State and local groups and the private sector.

In this evolving area of homeland security, NRC understands that it may not always be able to draw a bright line between security responsibilities of NRC-regulated entities and those of defense and law enforcement authorities. Responses may overlap for certain threats when coordination or integration of the responses of the various private and government organizations is required. That is why the NRC, DHS, and other Federal departments and agencies, and the State and local authorities, are working closely together in developing integrated nuclear and radiological security contingency plans to complement licensee capabilities. The NRC believes that this integration is the ultimate responsibility of the Department of Homeland Security, and we are supporting DHS efforts in achieving integration. As we work to resolve the integration issues at the Federal level, we also encourage efforts at the State and local level to develop the specific response protocols that will best serve the nation in enhancing homeland security. I do not want to leave you with the impression that everything is perfect but I want to assure you that, if the need arises, there is but one single-minded goal and action plan: protect our people. There is to be no hesitation, no turf battles, and no limitations, but rather, one cause: protect our people. At the end of the line, health practitioners are key to this goal, if other measures fail to avoid health consequences of an event.

In the aftermath of the September 11 attacks, the NRC undertook a number of measures to improve security at nuclear facilities, including power reactors, fuel facilities, and facilities that possess large radioactive sources, for example, irradiators and facilities that manufacture radiopharmaceuticals for medical use. The NRC has issued over 60 advisories to its licensees to describe changes in the threat environment and provide guidance on ways to enhance security. Also, NRC issued orders requiring certain security enhancements to power plants, decommissioning reactors, fuel cycle facilities, spent fuel facilities, shipments of spent nuclear fuel, and large irradiators.

I believe that it is important to place the health effects of radiation in a proper context. Quite often, this is not the case. I am sure that most of what I point out is known to you, because radiation has been, and is, such a well known and useful tool in the practice of medicine.

Contrary to some public perception, there is strong evidence that ionizing radiation at lower doses is, at most, a relatively weak carcinogen. There would be no x-ray machines or nuclear medicine procedures if this were not a fact. But, let me go to two extreme, well publicized cases. For this purpose, I would exclusively use the most authoritative, peer reviewed data from world recognized organizations.

CASE 1. The atomic bomb explosions at Hiroshima and Nagasaki. Without any doubt, these are the best studied health and epidemiological events in the history of mankind. Among the approximately 86,000 atomic-bomb survivors at Hiroshima and Nagasaki, who have been studied from 1950 to 1990, there has been an excess of 334 deaths from solid cancer (7,578 versus 7,244 expected) and there have been 87 excess deaths from leukemia (249 versus 162 expected).

CASE 2. The disastrous reactor accident and fire at Chernobyl. This is also a well studied health and epidemiological event. In Chernobyl, 31 persons at the reactor site died within a short time of the accident. No one died or was severely injured off-site. But the lessons from Chernobyl, although not yet completed, make a compelling case for emergency preparedness, including related health care, and are useful as a good case for understanding radiological effects. After more than 18 years since the Chernobyl accident, and in following specifically a population of over 300,000 workers with significant radiation exposures, no excess cases of solid cancer or leukemia have been found. I am not saying there are none, I am saying that whatever the number of these cancer types there are, they cannot be distinguished from the number of cancer cases expected to appear in the population. But there are about 1800 children with thyroid cancer that are beyond the norms. This result is as bad as it was avoidable. There is no reason for this to have happened; it is due to a failure of a society to take care of its people that these children are suffering from thyroid cancer. Lack of adequate and timely evacuation, lack of use of KI and lack of restrictions on food contaminated with radioactive iodine are the culprits, all avoidable. Radiation can not be seen, nor can most things that could harm you, but it is easily measured. In fact, the measurability of radiation is so good that we can use its measurement for prevention or mitigation.

When you hear about radiological exposures you tend to think of power reactor releases. However, no member of the US public has been seriously affected by a radioactive release from a reactor. The most serious accident, TMI, resulted in a minor radiological release with the largest dose to a member of the public of less than 90 mrem.

Our largest releases involving over exposures have been in the medical and industrial uses of radioactive material. For example, on June 28, 1995, at the National Institutes of Health in Maryland, a pregnant female unknowingly ingested between 820 and 1300 μCi P-32 from a tampered water cooler resulting in CEDE between 8 and 12.7 rem to herself and between 5.1 and 8.1 rem to the fetus. Twenty-six additional individuals had low levels of internal P-32 contamination. Another event occurred on June 13, 2000, at Southeast Missouri State University where a vial containing 5 mCi of Am-241 broke and contaminated several rooms. Two individuals had intakes. Individual #1 had 20 nCI intake resulting in 15 rem CEDE, and 263 rem CDE to the bone surface. Individual #2 had 9.4 nCi intake resulting in 4.2 rem CEDE, and 76 rem CDE to the bone surface. Every year there are medical misadministration events that result in unintended large radioactive doses to patients. We follow these cases carefully. While few in number, each is carefully reviewed and measures to prevent recurrence are implemented. Every year we have several cases of over exposure, some severe, from industrial sources. Overall,

however, in comparison with most any other industrial or medical activity, these uses have an excellent safety record.

Now I would like to discuss issues related to the protection of radioactive sources. As you can imagine there is a great deal of work and required coordination ahead in the area of protection of radioactive sources. On June 13, 2003, we issued orders to increase security for panoramic and underwater irradiators which are used for sterilization of food and medical supplies. These types of irradiators are authorized to possess greater than 10,000 curies of byproduct material in the form of sealed sources. We recognize that licensees may have already initiated many measures in the order in response to previously issued advisories or on their own.

In addition, the NRC has been working with other Government agencies, its Agreement States, and the IAEA to establish a consistent risk based system for the categorization of radioactive sources that could be used in a radiological dispersal device. The Commission recently approved the initial study of a joint NRC/DOE Working Group which provided action thresholds for radioactive material of the greatest concern. The report also addressed issues such as tracking and control of radioactive sources and recovery of unsecured radioactive material.

The NRC is proceeding in a risk-informed way to complete orders for the other classes of licenses possessing high-risk sources or materials, in particular, licenses with large quantities of cesium-137. To enhance coordination with the States, the NRC is establishing a Materials Security Working Group. This working group will be chartered to develop compensatory measures, coordinate with members of the Organization of Agreement States and the Conference of Radiation Control Program Directors to ensure adequate communication of security topics and issues, and support the training of licensees in the areas of Safeguards Information subject to handling requirements. Security measures will be developed for those licensees based on NRC's common defense and security authority, again using risk and practicality as guidance. NRC will issue compensatory measures directly to approximately 2100 NRC and Agreement State licensees authorized to possess materials that are likely to be used in a radiological dispersal device. These compensatory measures are intended to enhance radioactive source security during their possession and use within the United States, transfer of radioactive material above threshold levels within the United States, and import and export of radioactive material above threshold levels.

The impact of a "dirty bomb" has become a major concern for many. The question is: what can terrorists accomplish in setting off such a weapon? A dirty bomb or a radiological dispersal device (RDD) uses a conventional explosive to disperse radioactive material. It is a fact that the vast majority of sources, if used in a dirty bomb, will not result in a radiological hazard. The primary impact is likely to be societal disruption and economical damage. A "dirty bomb" is not a nuclear bomb and does not produce a nuclear explosion. As is now often quoted, the presumed purpose of its use would be therefore not as a Weapon of Mass Destruction but rather a Weapon of Mass Disruption. It would only become a Weapon of Mass Disruption if we allow it to because of misinformation and/or poor preparation. This is not an acceptable result; there is

much we have to do in the area of information, and again, your know-how becomes indispensable.

I must add that, just because a person is near a radioactive source for a short time or gets a small amount of radioactive dust on himself or herself does not mean he or she will get cancer. The additional risk will likely be very small. However, inhalation or ingestion of radioactive particles needs to be taken very seriously. Doctors will be able to assess the risks and suggest mitigating measures once the radioactive source and exposure level has been determined. Furthermore, treatments today are very effective for boosting the immune system; other important therapeutical processes have also been developed. I know you know, but I have to say that millions of Americans are injected with short-lived radio-isotopes every year.

The use of Potassium Iodide to prevent the uptake of radioactive iodide has been discussed. Its potential use has focused on a radioactive release from a nuclear power plant. It should be noted that Potassium Iodide would not be protective against an RDD except in a very unlikely event. Potassium Iodide only protects the thyroid from radioactive iodine, but offers no protection to other parts of the body or against other radioactive isotopes.

“Prussian Blue” is another drug that should be capable of protecting people against radiation exposure. Prussian Blue has been recommended for years for the treatment of cesium and thallium ingestion. The material, ferric hexacyanoferrate, has been used for years to promote the excretion of cesium and thallium when accidentally ingested, including the much publicized accident in Gioania. I understand that the material is not yet FDA-approved for this use because no one has requested it and there was no viable market until recently. While KI and Prussian Blue are aimed at “blocking” or excreting the radioactive isotope ingested, there is also a growing arsenal of medical treatments for radiological exposures.

Let me go ahead and give you an idea of what is happening currently for nuclear power plants. We have issued several security orders to enhance security at nuclear power plants which include: access authorization controls; fitness for duty; training enhancements; and design basis threat.

In the minds of people there are now two types of events: the accidental events that could occasionally happen in a power plant - an accident like TMI, and accidents that could happen due to a terrorist attack. Although they are definitely different in how they begin, we take a holistic approach to them based on the fact that there should not be much difference in emergency preparedness. Nuclear power plants are designed with defense-in-depth. The NRC believes that rapidly developing accident scenarios in nuclear power plants, whatever the initiator, are covered by the extensive emergency preparedness plans which are in place, and that the significant security improvements, plant mitigation strategies, and emergency plans and off-site communications, are all contributors to robust and enhanced protective measures for the public. Yet, emergency preparedness must cover a spectrum of radiological risks to our nation.

Homeland preparedness is a serious concern for the citizens of the United States; it is an issue to which we are all paying close attention.

In closing, the mission of the NRC is to ensure the protection of the common defense and security, the protection of public health and safety, and the protection of the environment. I firmly believe that this mission is well established and that it is being carried out fully.