

## **POINT PAPER ON CURRENT HOMELAND PROTECTION AND PREPAREDNESS ISSUES**

### **POINT 1 - What are the most significant accomplishments in security that NRC has initiated since September 11, 2001?**

1) Immediately following the attacks, the NRC directed its licensees to go to the highest level of security and issued a number of advisories over the ensuing months, calling for additional security enhancements.

2) These advisories were expanded into Orders that were initially issued to power reactor licensees in February 2002. Orders have been subsequently issued to all major nuclear facilities and activities (including such things as spent fuel transportation) requiring enhancements designed to raise the level of security. These orders include requirements for increased security patrols, augmented security forces, additional security posts, increased vehicle standoff distances

3) On April 29, 2003, after extensive deliberation and interaction with stakeholders, the Commission agreed on additional enhancements to security and issued three sets of Orders. The first set of Orders imposed new safeguards and security requirements beyond the current DBT on individual licensees operating commercial nuclear power plants and Category I fuel cycle facilities. The second set of Orders imposed work hour controls on the security workforce at operating commercial nuclear power plants. The third set of Orders enhanced training and qualification requirements for security personnel at operating commercial nuclear power plants. On June 6, 2003, the Commission issued Orders to large panoramic irradiators. This Order required licensees to make enhancements to raise the level of security at their facilities.

4) On August 19, 2002, the NRC implemented its Threat Advisory and Protective Measures System, modeled on the Homeland Security Advisory System (HSAS). The new system for NRC licensees has been formally communicated to licensees, Governors, State Homeland Security Advisors, Federal agency administrators and other appropriate officials.

5) Force-on-force exercises, used to test the licensees' capability to respond to a terrorist threat were suspended immediately after September 11, 2001, but have recently been resumed with enhancements and increased frequency at nuclear power plants and certain fuel cycle facilities. They are to be conducted at each facility every three years, as opposed to every eight years previously.

6) Incident response capabilities have been enhanced by increasing the number of emergency exercises with other Federal agencies, including the recent Congressionally mandated TOPOFF-2.

7) The NRC's safeguards and incident response functions were consolidated in one office on April 7, 2002, called the Office of Nuclear Security and Incident Response.

8) The NRC and DOE participated in a working group to assess potential use of radioactive sources in radiological dispersal devices, identify necessary enhancements on the control of radioactive sources, and to identify radionuclides and quantities of concern.

9) NRC has enhanced its coordination with other Federal agencies, including the Department

of Homeland Security, Homeland Security Council, Federal Bureau of Investigation, and the Intelligence Community, to ensure greater awareness of threats and enhance the communication of threat information.

10) The NRC has assessed potential vulnerabilities at its facilities, including systems, procedures, and structures and identified appropriate mitigating measures. The Commission has completed the initial assessment of power reactor vulnerabilities to intentional malevolent use of commercial aircraft in suicidal attacks and has initiated a broad-ranging research program to understand the vulnerabilities of various classes of facilities to a wide spectrum of attacks.

11) The NRC has enhanced interactions with State and local governments, as well as with federal law enforcement and military authorities, for support of nuclear site security and response to incidents. This coordination has built upon the already close ties between NRC licensed facilities and the State and local agencies that would be called in to support them in a crisis.

## **POINT 2 - What are the current NRC legislative initiatives?**

The Senate has before it nuclear security legislation, S.1043, which includes several legislative proposals that reflect legislative initiatives by the NRC. The proposals developed by the NRC would:

- 1) provide broader weapons authority for licensees' guard forces and certificate holders so they can more effectively protect their facilities, equipment, and radioactive materials against terrorists with access to technologically advanced weaponry.
- 2) criminalize unauthorized introduction of weapons at selected classes of nuclear facilities.
- 3) criminalize acts of sabotage, during construction or operation, to a licensed facility if the act committed could affect public health and safety during the operation of the facility.
- 4) expand categories of persons subject to fingerprinting requirements for criminal history checks under the Atomic Energy Act.
- 5) broaden the NRC's authority over radioactive material to provide more comprehensive oversight on the security of such material, including accelerator-produced material, and discrete sources of radium-226 to enhance control over material that may be attractive for use in radiological dispersal devices.

## **POINT 3 - What is the nature of emergency planning (EP) around nuclear reactor sites vis a vis its ability to react with flexibility to a terrorist attack with the potential for offsite consequences?**

The NRC staff is performing a post 9-11 review of the EP planning basis for nuclear power plants. It is the Commission's view that the EP planning basis for off-site emergencies remains valid in terms of timing and magnitude for the range of potential radiological consequences of a terrorist attack in the post 9-11 threat environment. Nuclear plant emergency plans which are in compliance with the EP planning basis provide reasonable assurance that adequate protective actions can be implemented to protect the public health and safety. This is true whether a

reactor accident is caused by equipment failure, human error, natural phenomena, or terrorism.

This assessment is based on multiple studies (some preliminary) performed by the staff and its contractors. These studies continue. Should the studies reveal that the EP Planning Basis is no longer valid, the NRC will promptly seek an appropriate solution.

**POINT 4 - What can we say about the ability of spent fuel pools to withstand a terrorist attack?**

Nuclear power reactor spent fuel pools are robust structures constructed of very thick, heavily reinforced concrete walls with stainless steel liners. They were specifically designed to withstand challenges from such natural phenomena as earthquakes, hurricanes, or tornadoes. Design of pools with fuel located below grade or shielded by other structures make them highly resistant to damage and unlikely to fail due to an aircraft impact. Current analysis is underway utilizing updated methods for analysis, building upon results of thermal hydraulic and severe accident research and experience from probabilistic risk assessments. Insights from current analysis suggests spent fuel is far more easily cooled than predicted in earlier NRC studies.

Preliminary insights from current analyses indicate that even in the unlikely event that water was lost and fuel was not cooled the consequences of the accident would be less severe than previously estimated in NUREG-1738, in particular:

- Radioactive release would be considerably smaller and begin much later
- Provides several hours for implementing effective protective measures, e.g., evacuation of the EPZ (emergency planning zone) and replenishing the water in the pool
- Significantly smaller health effects and land contamination

The new insights are based on best understanding from more detailed analysis of a BWR spent fuel pool and will undergo external peer review. The current model was developed based on an actual operating reactor pool with detailed information on fuel loading and design. Additional analyses are underway to address different scenarios.

**POINT 5 - What are current vulnerability studies telling us regarding the potential effect or consequence of a terrorist initiated event on the timing and magnitude of release from the plant as a result of the event?**

Preliminary results from our vulnerability studies do not indicate an increased radiation release or quicker release from terrorist-initiated events than is already addressed by the emergency planning basis required by NRC regulations.

**POINT 6 - How should the 1982 Sandia study be viewed in light of more recent analysis and vulnerabilities studies?**

Over the years, the NRC has performed a number of consequence evaluations to address regulatory issues. An example of an earlier NRC consequence assessment is documented in "Technical Guidance for Siting Criteria Development," NUREG/CR-2239, December 1982. We have considered the extent to which past analyses, often the subject of public statements by advocacy groups and the media, can be superseded by more recent analysis. With respect to past studies of reactor accidents, it is necessary to examine the specific assumptions in a

particular calculation before drawing conclusions on its validity, but a few general points can be made relative to past analyses. Past studies usually have considered, within their scope, a number of scenarios, which result in only minor consequences. The most limiting severe scenarios, which comprise a minority of the calculations and represent very low probability events, are the predictions typically cited in press accounts. Those scenarios have assumed, singly or in combination, very large radiation releases, bounding emergency response assumptions or bounding conditions (including weather) for the spread of the radiation. The combination of these factors produces large and highly unlikely results.

The Sandia Siting Study, NUREG/CR-2239, December 1982, was performed to develop technical guidance to support the formulation of new regulations for siting nuclear power reactors. A very large radiation release and delayed evacuation, among other factors, accounts for the more severe consequences in NUREG/CR-2239. As an overall conclusion, that report does not present an up-to-date picture of risk at nuclear plants and does not reflect current knowledge in probabilistic or phenomenological modeling.

Since September 11, 2001, the NRC has been performing assessments of the consequences of a terrorist attack on a nuclear power plant. These assessments are much more detailed than past analyses and reflect our improved understanding of severe accident phenomena. The more recent analyses have involved a more realistic assessment of the radiation release, emergency planning capabilities, radiation spreading, and health effects. More recent analysis indicates a general finding that public health effects from terrorist attacks at most sites are likely to be relatively small.