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■ Note ■

NOAA's Response Plan for Nuclear Emergencies

Sun-Tae Hwang and Kil-Oung Choi
Division of Electromagnetic Metrology
Korea Research Institute of Standards and Science

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Abstract - With reference to nuclear emergency information concerning the national emergency plan for nuclear accidents, the response plan for the atmospheric nuclear emergencies of the U.S. National Oceanic and Atmospheric Administration (NOAA) was reviewed and described for introducing an overview on it to the Korean Association for Radiation Protection (KARP).
Key words : NOAA, nuclear emergency, RSMC, FRERP, radioactive materials, LFA

Introduction

NOAA has specific statutory responsibility to respond to a variety of environmental disturbances. Appropriate response to the majority of these incidents falls well within the capability of Line Offices (LOs) of the NOAA. These offices are equipped to fulfill their respective duties to the environment, public, state and other federal agencies. A nuclear emergency presents such an instance of large-scale response involving many elements of NOAA. In every aspect, the damage caused by a nuclear accident is potentially gigantic. There can be cumulative long-term effects on health as well as the more obvious consequences of acute exposure. Large expanses of countryside can be poisoned by deposited radionuclides, and affected urban areas and cities must be vacated perhaps for centuries. The post-Chernobyl experience illustrates the risk society takes if we are unprepared to respond. NOAA capabilities related to atmospheric transport, dispersion, and deposition forecasting are well organized for response to an international nuclear emergency, through the structure of the regional Specialized Meteorological Center (RSMC) operated jointly by the National Weather Service's National Centers for Environmental Prediction (NWS/NCEP) and the Office of Oceanic and Atmospheric Research's Air Resources Laboratory (OAR/ARL) under the auspices of the World Meteorological Organization (WMO). The U.S. RSMC is one of five such organizations recognized by WMO as providers of expert forecast guidance on plume transport, dispersion, and deposition following a nuclear emergency. The RSMCs were established by WMO and the International Atomic Energy Agency (IAEA) in response to the lack of coordination and reliable information evident after the Chernobyl accident in 1986. Their main purpose is to provide specialized dispersion predictions to the weather services of countries that do not have the technical capability to respond to such events. The other RSMCs are at Toulouse, France; Bracknell, UK; Montreal, Canada; and Melbourne, Australia. The way in which NOAA responds to an international nuclear incident is well prescribed in the WMO/RSMC documentation.

Policy and Statutory Authority

The extreme nature of nuclear emergencies makes it imperative that NOAA be prepare to arrange clearly all its resources promptly in order to protect public health, the environment, and national security. NOAA's policy is to form an organized emergency response capability that fully uses the capabilities of each line office. The adoption of procedures and directives for responding to a nuclear emergency will provide the necessary mechanism for

internal coordination and funding, thereby describing the potential of unnecessary loss of life, natural resources and property. It is also the policy of NOAA to provide related support as needed by other agencies within the constraints imposed by the availability of staffing and budgetary resources. For the present purposes, an atmospheric nuclear emergency is any civilian or military event that results in the release or potential release of hazardous radioactive materials into the atmosphere. The initiating event may be a mishap involving a nuclear reactor, the explosion of a nuclear device, or the injection of radioactivity into the air as ter- rorist act or as an inadvertent consequence of some accident or atmospheric event. From this point of view, prime authority lies in the Department of Commerce Organization Order 25-5 on September 30, 1994. Addtional authorities of this plan are given in References. The Federal Radiological Emergency Response Plan (FRERP), May 1, 1996, outlines contributions that federal agencies can make in the event of a domestic nuclear emergency. Different federal agencies are identified as Lead Federal Agency (LFA) for different kinds of emergency as follows:

A. Accidents involving a nuclear facility

◆ Nuclear facility licensed by NRC or an Agreement State ---------- NRC

◆ Nuclear facility owned or operated by DOD or DOE ---------- DOD or DOE

◆ Nuclear facility not licensed, owned, or operated by a Federal Agency or an Agreement State ---------- EPA

B. Accidents involving transportation of radioactive materials

◆ Shipments licensed by NRC or an Agreement State ---------- NRC

◆ Shipments by or for DOD or DOE ---------- DOD or DOE

◆ Shipments of materials not licensed or owned by a Federal Agency or an Agreement State ---------- EPA

C. Satellites containing radioactive materials ---------- NASA or DOD

D. Impact from foreign or unknown sources ---------- EPA

E. Other types of emergencies ---------- ---------- As appropriate: LFAs

In the event of acts of terrorism involving radioactive materials, however, the FBI serves as LFA. Any LFA may request NOAA's assistance in the event of an atmospheric nuclear emergency. In the event that a nuclear emergency interrupts NOAA's operations or that NOAA's capabilities to respond to a nuclear emergency are affected by some other interruption (severe weather, power loss, etc.), then appropriate NOAA's responsibility resides with the Office of Security. In addition, the followings reside solely within NOAA:

(1) Acquiring and disseminating weather data and providing weather forecasts in direct support of emergency response operation;
(2) Preparing and disseminating predictions of plume trajectories, dispersion, and deposition of radiological material released into atmosphere;
(3) Providing local meteorological support as needed to assure the quality of these predictions;
(4) Organizing and maintaining a special data archive for meteorological information related to the emergency and its assessment; and
(5) Providing guidance as needed to ensure that marine fisheries products available to the public are not contaminated.

Organization and Procedures

The NOAA's contributions outlined above are related to the needs of the overall multi-agency response effort as documented in the FRERP. To ensure that the NOAA's roles are fulfillled, there shall be a formally recognized Point of

Contact within NOAA and a NOAA Standing Committee on Nuclear Emergency Response.

A. Point of Contact

The initial point of contact within NOAA will be the Senior Duty Meteorologist (SDM) at NCEP. Once notified of a nuclear emergency, the SDM will immediately contact each member of the Standing Committee, and will initiate a special run of the most appropriate meteorological and dispersion/deposition model products.

B. Standing Committee on Nulear Emergency Response

There will be a formal NOAA Standing Committee on Nuclear Emergency Response, made up of one key representative of each Line Office, plus the Office of the Deputy Under Secretary, the Office of Finance and Administartion, the NCEP and the ARL. The members shall be responsible for identifying appropriate substitutes or representatives in the event of their own absence. This committee shall meet at least twice per year.

C. Line Offices (LOs)

Each LO representative of NOAA on the Standing Committee shall be responsible for ensuring a timely and adequate response from the LO, as outlined in the FRERP and/or modified by circumstances of particular emergencies. The LO's responses are as follows:

(1) National Weather Service (NWS) and Oceanic and Atmospheric Research (OAR)

- o NWS/NCEP, working with OAR/ARL, will immediately produce detailed transport, dispersion and deposition forecasts based upon all available source-term information and the most appropriate meteorological field derived from NCEP models augmented by finer-scale models focused on the source area.

(2) National Weather Service (NWS)

- o Local forecast offices will be called on to provide weather information and fore-casts for use in managing on-site response team actions.
- o Local forecast offices may be asked for assistance in the provision of experienced personnel, and the use of some specialized facilities, especially in the early stages of a response action.
- o It is anticipated that NOAA Weather Radio and other public information systems will be used to disseminate general warnings and safety information.

(3) Oceanic and Atmospheric Research (OAR)

- o The ARL/Special Operations and Research Division (SORD) response team will be placed on full deployment readiness, in anticipation of declaration of a formal nuclear emergency by Federal Emergency Management Agency (FEMA). The ARL/SORD team would be deployed together on-site meteorological inform-ation and provide site-specific forecasts for dispersion purposes, once a Federal Radiological Monitoring and Assessment Center (FRMAC) under DOE's leadership is set up.
- o ARL will immediately identify available experienced personnel to assist in the operations of the Emergency Response Center of Nuclear Regulatory Commision (NRC). ARL would provide staff assistance to NRC upon its request.
- o In the specific event of an accident involving terrorism, the ARL/SORD group would be deployed, through its role with the DOE and the Nuclear Emergency Search Taem.

(4) National Marine Fisheries Service (NMFS)

- o NMFS Seafood Protection Program will provide personnel for the radiological monitoring and surveillance of harvested fishery products intended for human consumption by assisting the Food and Drug Administration (FDA) which has statutory authority for the public health assurances of fish and fishery products.

Conclusions

After Three Mile Island and Chernobyl nuclear accidents, public awareness of emergency planning preparedness for commercial nuclear power plants was dramatically increased. The accidents led to massive regulatory changes and new requirements for preparing such an accident. In Korea, however, a Computerized Technical Advisory System for the Radiological Emergency (CARE) is consistently under research and development (R&D) at the Korea Institute of Nuclear Safety (KINS) for the national emergency management in the event of a radiological emergency in the nuclear power plant. At the final stage of the R&D hopefully in the near future, the CARE system of KINS shall monitor all of the nuclear power plants at four nuclear sites in Korea by utilizing the sophisticated internal and external surveillance systems. In the meteorological point of view, therefore, NOAA's Response Plan for Nuclear Emergencies described above will provide a good stock of information for the radiological accident management for emergency preparedness and response at the nuclear power plant.

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