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ON THE NEED FOR A NATIONAL RADIOLOGICAL RESPONSE PLAN IN EGYPT

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SUMMARY

In response to the increasing possibility of radiation accidents in or near Egypt, the government is preparing the *Egyptian Emergency Response Plan for Radiological Accidents* to coordinate the response efforts of the national agencies. This plan, which is now being finalized, provides information on agency roles and responsibilities during a response. The plan will also provide a basis for initiating training, planning for emergency public information, and developing public education efforts.

I. INTRODUCTION

Use of radioactive materials and sources is increasing within the Arab Republic of Egypt. With this increase comes a need to prepare for accidents involving these materials. For years there has been an informal agreement between the National Centre for Nuclear Safety and Radiation Control (NCNSRC), one of the four centers operated by the Atomic Energy Agency (AEA), and the Civil Defence Authority (CDA) to cooperate in a radiological emergency. CDA currently has the responsibility for responding to all types of emergencies. The increasing use of radioactive material and the complexity of the response required by accidents creates a need for a more formal arrangement.

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II. RADIOACTIVE SOURCES AND USES

Egypt has a variety of radiological sources. Although no nuclear power reactors have yet been built, there are two research reactors used for experimental reactor and nuclear physics research. There is an operating 2-MW water-moderated reactor; a 22-MW Argentinean reactor should be finished in September 1997. The more powerful reactor will also be used for isotope production. These reactors are located in the Nuclear Research Centre at the Inshass Site, 40 km (25 miles) northeast of Cairo.

Radioisotopes are used throughout the country for medical diagnosis and treatment, and in industrial applications, such as gamma radiography. An approximately 14 PBq (370,000 Ci) cobalt sterilization facility operates at the National Centre for Radiation Research and Technology in Cairo. Radioactive materials arrive regularly by plane. These radioisotopes and other radioactive sources are transported throughout the country.

Egypt has an additional unique problem—the Suez Canal. Radioactive cargo traveling through the canal includes new and spent reactor fuel and about 1000 metric tons of uranium hexafluoride each year. Futhermore, nuclear-powered ships pass through the canal several times each year, escorted by Egyptian vessels.

III. PLANNING PROBLEMS

Egypt has densely populated cities along the Nile River and coast, with sparsely populated areas in the remainder of the country. Three cities are along the Suez Canal: Port Said, Suez, and Ismailia. Port Said is a free

trade zone and typically contains many non-residents. The greater Cairo area has about 16 million inhabitants. Although many people do not have private vehicles, the traffic is usually congested. To complicate the problems, many Egyptians are somewhat fatalistic and do not realize that there are actions they can take to protect themselves from a radiological accident.

IV. RADIOLOGICAL PLAN

NCNSRC took the lead in developing a national plan, the *Egyptian Emergency Response Plan for Radiological Accidents*. The first draft of the plan was prepared in English in 1992 with assistance from the International Atomic Energy Agency (IAEA). Since that time, NCNSRC has worked with other national agencies to define each agency's role during a response and to obtain memoranda of agreement. The first tabletop exercise was conducted in December 1995. A draft plan was prepared in Arabic in late 1996 for final review by the other agencies.

Four national agencies will sign the completed plan. These agencies are the AEA, the Ministry of Interior (MOI), which contains the CDA, the Ministry of Defence (MOD), which operates the Crisis Management Centre (CMC), and the Suez Canal Authority (SCA). AEA and CDA are the principal response agencies. A Supreme Council of Civil Defence, composed primarily of cabinet ministers, has the decision authority in the response. This relationship is shown in Fig. 1. AEA, CDA, or CMC will serve as the lead technical agency during the emergency; this agency will coordinate all the agencies' response. The designation of the lead agency will depend upon the size and nature of the response.

NCNSRC will serve as the radiological expert and coordinate all radiological monitoring. AEA personnel from its other research centers will assist with the NCNSRC's monitoring efforts if needed. NCNSRC has a counting laboratory and background radiation data from all over the country, as well as a mobile radiological laboratory. There is a network of 29 radiological monitoring stations in place throughout the country. This network is currently being expanded to 57 stations. Monitoring stations now measure ambient gamma levels, and, after the new stations are installed, the network will also measure ambient beta radiation and gamma levels in water. These stations transfer their data remotely to the NCNSRC offices and can provide an early warning of a large accident.

CDA coordinates all functions other than radiological assistance and can act on its own authority in responding to any emergencies throughout the country, without obtaining permission from the governorate authorities. CDA does not now have the technical knowledge to deal with a radiological incident by itself. The military's CMC enters the response only if CDA needs additional resources or specialized equipment and personnel that are not available from the other agencies. SCA becomes involved only if the radiological incident occurs in the Suez Canal. Their role is limited to notification.

Other agencies that may be asked to assist in the response include the Ministries of Agriculture, Interior,

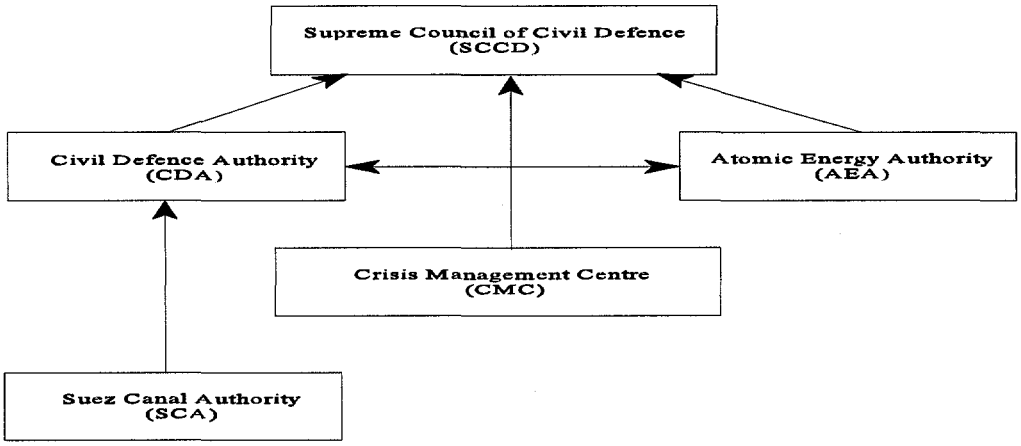

Fig. 1. Relationship of participating agencies under the *Egyptian Emergency Response Plan for Radiological Accidents.*

Health, Social Affairs, Information, Transport, Local Governing, Irrigation and Water Resources, Housing and Construction, Agriculture, and Foreign Affairs; Ain Sharms Specialized Hospital; Organization for Environmental Safeguarding; Red Crescent Society; and the Meteorological Authority.

Egypt has already made arrangements for the medical care of any people who are injured and contaminated or who have received large radiation exposures. There is an existing arrangement (August 1993) with Ain Sharms Specialized Hospital in Cairo to take such patients. Personnel at Ain Sharms have been trained for this task. The Institute de Protection et de Surete Nucleaire in France has agreed (July 1993) to accept more severe cases for treatment there.

One annex of the radiological plan contains a public information plan, recognizing the need for coordination in this important element. Technical people will be assigned to the Ministry of Information to assist in the communication efforts. A central location for releasing information will be established when possible. Many of the details of the public affairs efforts are still being developed.

NCNSRC will be developing training programs for a variety of audiences. As a first step, training in ionizing radiation and radiation protection is being provided to the CDA personnel, to make them familiar with radiation and more capable of handling small incidents without assistance. The first of these classes was held for CDA leaders from each of Egypt's 26 governorates in October 1996. Classes are to be held four times a year, if possible, to allow for rotation of personnel. Later education efforts will be directed towards the media and members of the public. Public education may begin with students.

V. CONCLUSION

Although the potential for a large radiological accident in Egypt is not very great at this time, the increasing use of radioactive materials means that the possibilities for accidents involving these materials will continue to grow. The most probable accidents at this time would not be associated with a fixed facility; thus, a national response capability is already necessary.

The Egyptian government is currently addressing these problems. The development of the *Egyptian Emergency Response Plan for Radiological Accidents* and the formalization of responsibilities is a good start toward developing an effective response capability. The next steps are the implementation of the plan, the increased training and public education efforts, and the development of the communications and response capabilities needed to make the response timely and effective.