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Preparedness for Nuclear Emergencies affecting Agriculture
(Prepared by the Joint FAO/IAEA Division)

1. The Chernobyl nuclear power plant accident highlighted the impact and long-term consequences of a major transboundary release of radioactive material. More effective regulatory mechanisms, training of operators and design modifications have improved the safety of nuclear power plants. Yet there remain continuing safety and security concerns related to the control of radioactive sources. Despite the level of attention given to this problem since September 2001, many countries still lack programmes, resources and legal frameworks to properly respond to the threat of nuclear and radiological emergencies.
2. As at 31 August 2004, there were 439 nuclear power reactors in operation in 30 countries and an additional 26 units are under construction in 10 countries¹. The five nuclear-weapon states are estimated to have 16 000 operational and 36 500 active and inactive warheads². These have institutional security systems to protect them from theft and malevolent use. However there is concern about the possible use of a radiological dispersal device or 'dirty bomb' that could contaminate land and/or facilities. Radioactive materials for such devices are available from a wide range of less secure facilities, including those in industry, hospitals, medical and research laboratories, universities and waste dumps. Given widespread public anxiety about nuclear material in any form, the mere threat of such use of radioactive materials could be a potent terrorist tool. The same considerations would apply to attacks on nuclear power facilities, reprocessing facilities or on shipments of nuclear materials.
3. The immediate (24 hours) and short-term (one-month period) impact of a nuclear emergency can be effectively mitigated if emergency response plans in relation to food and agriculture are in place. Scientists estimated that of 2000 thyroid cancers that occurred among children contaminated after Chernobyl, 90 percent would have been avoided if consumption of contaminated milk had been banned. By controlling the ingestion of contaminated fresh vegetables, a further reduction of 50 percent would have been obtained, pushing down the number of excess thyroid cancers to 100. It is therefore essential that Member Countries plan in advance how contaminated milk, fresh vegetables, mushrooms and berries will be taken out of consumption and/or be stored in appropriate facilities for eventual disposal or destroyed through appropriate procedures.
4. In the medium- and longer-term, sustaining acceptable living and working conditions in contaminated areas will require practicable and cost-effective strategies for restoring and managing contaminated agricultural land and food products. These strategies need to consider a wide range of factors: timing and nature of countermeasures; site-specific factors such as soil properties, root systems and land uses quantity and composition of the radionuclides in the release (particularly long-life

¹ <http://www.iaea.org/programmes/a2/index.html>

² <http://projects.sipri.se/nuclear/world.pdf>

radionuclides); pathways of radionuclide exposure for each population group, and; cost and duration of countermeasure application. The practicability of these strategies and their acceptability to Stakeholders should be considered beforehand.

5. The Safety Requirements for Preparedness and Response for a Nuclear or Radiological Emergency³ set out requirements on the establishment of intervention levels. The competent management authority should specify intervention levels for use in emergency situations in advance. Appropriate remedial action should be taken if the maximum permissible level is exceeded or is predicted to be exceeded, the. The Joint FAO/WHO Codex Alimentarius Commission is the international standards setting body responsible for the protection of human health and facilitation of international trade in foodstuffs. The current Codex Guideline Levels for Radionuclides in Foods Following Accidental Nuclear Contamination for Use in International Trade (CAC/GL 5-1989), which apply for one year following a nuclear accident, are currently being revised to cover a wider range of situations and to serve as a generic intervention levels for a year or more following a nuclear or radiological event⁴.

6. FAO is a full party to two conventions: (i) the notification convention which requires the Accident Country to notify and provide information to potentially affected Countries and the IAEA. The IAEA must report the notification and provide information to Member Countries and International organizations; and (ii) the assistance convention⁵ which enables any national Government to request emergency assistance including: assessment and advice; field assistance, including monitoring, and; medical treatment. The IAEA provides/brokers assistance through ERNET and relevant international organizations, including FAO. The Joint Radiation Emergency Management Plan of the International Organizations is a high-level management document that describes the inter-agency framework for preparedness and response to an actual, potential or perceived nuclear emergency and specifies the roles and responsibilities of each international agency. The practical arrangements between FAO and IAEA for notification, information exchange and provision of technical support in relation to food and agriculture in the case of a nuclear or radiological emergency and its aftermath have been described in the FAO/IAEA Cooperative Arrangements (appended), which were signed into force on April 25, 2003.

7. To fulfil its commitment, the FAO is undertaking a series of activities aimed at internally strengthening its support to member countries in the case of such an event:

- an operational nuclear crisis unit in the Special Emergency Programmes Service (TCES) of the Emergency Division (TCE) is being set up, linking to the Joint FAO/IAEA Division in Vienna and the Emergency Response Centre of IAEA that acts as the focal point for preparedness and response to a nuclear event. This activity consists of (i) formalizing a team of technical experts dealing with nuclear or radiological event in relation to food and agriculture, (ii) setting up a crisis management room and (iii) developing procedures for the running of this unit in the case of an event.
- FAO is giving priority to making all relevant existing information (research results, practical decision support tools including first actions for Member States who may require assistance, FAO databases that are relevant to the application of agricultural countermeasures i.e. soil types, nutrition patterns, land-use, etc) easily accessible to member countries. A CD Rom containing over 100 datasheets describing potential agricultural countermeasures and incorporating all criteria that decision-makers might consider when evaluating different agricultural countermeasures will also be made available.

8. Since Member States have the ultimate responsibility to protect life, property, the environment and quality of life on their territories, preparedness plans are essential and involve planning how to

³ http://www-pub.iaea.org/MTCD/publications/PDF/Pub1133_scr.pdf

⁴ ftp://ftp.fao.org/codex/ccfac36/fa36_35e.pdf

⁵ The Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency (<http://www.iaea.org/Publications/Documents/Conventions/cacnare.html>)

respond and network resources effectively in the event of a nuclear emergency. Research and case studies have so far been limited to countries affected by Chernobyl and developed countries. There is a need to focus now on developing countries. While it is recognized that agricultural countermeasures would differ from one country to another, depending on national capacity, existing regulations, production systems, location of nuclear plants, FAO can assist member countries to develop a strategy for promoting and enhancing preparedness for any nuclear event in relation to food and agriculture. To date, the primary mechanism has been workshops on practical agricultural countermeasures and web/CD-ROM information resources. Increasingly harmonized distance learning materials will complement these approaches.

9. In conclusion, there has been a shift in priority from recovery to preparedness, with more emphasis being placed on the need to protect in advance of a nuclear emergency. At present there are only 92 States party to the Early Notification Convention and 89 States party to the Assistance Convention or less than half FAO Member States. Thus an important first step in strengthening international nuclear emergency preparedness is the ratification of the early notification and assistance conventions by all FAO and IAEA Member States. The next step is the implementation of national emergency preparedness plans to minimize gaps in regional food safety and security.

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