CHAPTER 7

BOUNDARY CONTROL MEASURES:
PERSONS AND GOODS

Introduction

7.1 In general, the health risk arising from nuclear emergencies is usually restricted to the individual persons exposed directly to radioactive sources, such as the plume, ground shine or contaminated food and water. In the event of an off-site emergency at GNPS/LNPS, there is a possibility that the plume might cause certain radiological contamination of persons and goods in areas in close vicinity.

7.2 According to professional advice of the international health authorities, unlike pathogens of infectious diseases, radiological contamination is usually not readily transferable. It will not multiply over time. On the contrary, it will reduce significantly over time and distance owing to radioactive decay and basic personal hygiene measures. It is very unlikely for persons and goods, even if they are directly contaminated at locations outside the nuclear stations, to “contaminate” or cause harm to others. Therefore, in general, a radiological contamination of a person is more of an individual health risk, rather than a public health risk affecting the general population.

7.3 Moreover, activation of the on-site and off-site contingency plans by the plant operators and Mainland authorities will prevent and mitigate to a large extent such radiological contamination (through evacuation, sheltering and decontamination). There are checkpoint arrangements under the Mainland authorities’ plans to monitor outbound traffic from the accident site.

7.4 In sum, the public health risk to the Hong Kong population due to inbound persons and goods should be minimal in most cases, and there should be no general need to carry out mandatory measures at the points of entry. However, as a matter of prudence, the DBCP provides for a mechanism to pursue possible mandatory measures at the points of entry, which may be invoked where warranted. This is set out in the ensuing paragraphs. As regards possible assistance to contaminated persons, which may either be part of the mandatory measures or be provided on a voluntary basis to address individual health concerns or worries, it will be discussed in Chapter 8. As regards possible contamination of food and water, ingestion pathway countermeasures are separately discussed in Chapter 9.
Boundary control measures

7.5 In a nuclear emergency, relevant international organizations will respond to it according to their own mandates as well as a Joint Plan. The International Atomic Energy Agency (IAEA) plays a major overall coordinating role. Among various international organizations in support, the World Health Organization (WHO) has the directing and coordinating authority on international health work. The information and advice disseminated by these organizations need to be taken into account by national authorities in responding to the emergency.

7.6 The purpose and the scope of the International Health Regulations 2005 (IHR2005) of WHO are to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade. Consistent with its broad scope, IHR2005 covers not only communicable diseases but also public health risks caused by biological, chemical and radiological contamination. Public health emergencies, including those involving radiation and related health risks, are subject to the coordination and response-related requirements and mechanisms in the IHR2005. Part V of IHR2005 stipulates the appropriate boundary measures that WHO member states may implement on travellers, goods and conveyances passing through the points of entry, such as, medical examination, inspection, isolation, decontamination, treatment and refusal of entry.

7.7 WHO has advised that only a subset of events involving radiation would present public health risks that would in turn trigger the relevant provisions in IHR2005. Our general assessment set out above (paragraphs 7.1-7.4) is consistent with WHO’s advice. One mechanism is for Director-General of WHO, after being notified by a country of a rare but very serious event as such, to determine, after consultation with an Emergency Committee of external experts, whether the event constitutes a public health emergency of international concern before issuing time-limited temporary recommendations.

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2 Public Health Risk as defined in IHR (2005) means a likelihood of an event that may affect adversely the health of human populations with an emphasis on one which may spread internationally or may present a serious and direct danger.


4 See p42 of Appendix B of the Joint Plan in footnote 3.

5 See p45 of Appendix B of the Joint Plan in footnote 3.

6 See p44 of the Joint Plan in footnote 3.
for the application of appropriate health measures by Member States. The Director of Health (D of Health) will follow closely WHO’s advice and any temporary recommendations under Article 15 of IHR2005 regarding a response to a nuclear accident in considering the necessary enactment of subsidiary legislation under Section 9 of the Prevention and Control of Disease Ordinance (Cap. 599) to support the appropriate Government actions. Following this procedure would ensure compliance with our international obligations under the purview of WHO.

7.8 The above notwithstanding, at the PARTIAL ACTIVATION or FULL ACTIVATION level, the EMSC, in consultation with the HKOMAC and D of Health, may seek the advice of the S for S’s ITF or the CESG, as the case may be, who may decide to institute prescribed boundary control measures for contaminated persons and goods as set out at Annex 7.1. In so doing, the ITF or the CESG will take full account of the WHO’s temporary and other recommendations, advice or guidance by other international organisations including the IAEA, and locally the HKOMAC’s assessment of the risk of radiation fallout on Hong Kong and D of Health’s advice on public health protection.

Public Information

7.9 ISD will coordinate publicity in Hong Kong, as set out in Chapter 5, on the boundary arrangements. Given the small risk as assessed above in the vast majority of cases, the thrust is to explain the absence of public health risks and the need to follow the advice and recommendations of IAEA, WHO and other international organisations.

7.10 In case of pursuit of mandatory control measures, the emphasis of publicity will be Government’s commitment to protecting the people of Hong Kong and treating those in need and compliance with international obligations, as appropriate. EMSC will inform PEACO of the implementation of boundary controls for incoming persons and goods. At the local level, Boundary Liaison Officers will keep their Guangdong counterparts informed of the situation and enlist their assistance in regulating people flows. C&ED and Trade and Industry Department (TID) may need to make arrangements to answer queries from importers (Chapter 12). SB and CEDB may also arrange briefings for consulates and national chambers of commerce in Hong Kong (Chapter 5).

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7 Article 12 and Article 15 of IHR 2005.
8 Section 9 of Cap. 599 reads: “(1) The Director may, for the purposes of preventing the introduction into, the spread in and the transmission from, Hong Kong of any disease, by order published in the Gazette, prescribe any measure to be applied in the light of any temporary recommendation made by WHO pursuant to articles 15, 17 and 18 of the International Health Regulations. (2) An order under subsection (1) is subsidiary legislation.”
Annex 7.1

Possible arrangements for mandatory control measures

Introduction

7.1.1 In the rare event that mandatory control measures are justified, following the advice and temporary recommendations of WHO under IHR2005 to address a possible public health risk or otherwise, frontline departments will take corresponding actions to monitor and identify radiological contamination of inbound persons and goods. The following paragraphs outline the possible arrangements, with details set out in departmental plans.

7.1.2 The level of contamination to monitor will follow D of Health’s directive (including basing on the advice and the temporary recommendations of WHO under IHR2005). One possibility is to tie in with the general IAEA dose criteria for decontamination (paragraph 1.32). The relevant Operational Intervention Level (OIL), based on the Generic Criteria promulgated by IAEA as set out in Annex 1.5, is detailed in Annex 7.2.

7.1.3 In practice, given the abundance and volatility of the different fission products in nuclear reactors, the priority of radiological monitoring at off-site locations will be gamma dose rate and beta contamination. The equipment should be calibrated to trigger at a level equivalent to a beta surface contamination level of 1000 counts per second (cps) as measured by a portable surface contamination monitor averaged over 100 sq cm of the body surface, or at a level of 1 μSv/h as measured by a portable gamma dose rate meter at 10 cm from body surface. This level of contamination on the skin, as measured by the standard hand-held surface contamination monitoring instruments procured for the purposes of the DBCP with instrument coefficient of about 30 for moderate to high energy beta emitting radionuclides (such as Cs-137 and Sr-90), if not removed, may incur a skin dose of the order of 10 mSv.

Control of Inbound Travellers

7.1.4 At the FULL ACTIVATION level or earlier, when advised by EMSC with input from DH according to the alerting procedures at Annex 7.3, the Auxiliary Medical Service (AMS) will mobilize to take up the radiation monitoring duties at the points of entry and set up Monitoring Centres (MCs) in situ as soon as possible, with necessary support from the Immigration Department (ImmD) where necessary.

7.1.5 The general arrangements for conducting radiation monitoring will be as follows -
(a) Through an appropriate mechanism using notices, public address systems and declaration forms as appropriate, travellers from areas within 20 km of the GNPS/LNPS will be asked to queue up at designated areas. Radiation scanning will be conducted there.

(b) With walk-through screening portals, the persons should be instructed to walk at a slow pace through the detector panels. If the equipment is triggered, the person should be given a verification scanning using a portable surface contamination monitor.

(c) With portable surface contamination monitor, readings should be taken at 1 - 2 cm distance of hair, chest, back, palms and front of thighs. If the reading averaged over about 30 seconds at any of these locations exceeds 1000 cps, the person should be considered as contaminated.

(d) Details of reading results and place of origin of journey of each contaminated person will be recorded and results sent to AMS HQ. Consolidated results will be forwarded to DH and HKO as required (normally hourly). A summary will be sent to EMSC.

(e) Persons found contaminated will be given the option of returning to Guangdong. Otherwise they will be admitted to Hong Kong subject to meeting normal immigration requirements. Decontamination of these persons will follow.

(f) Contaminated persons will be directed to MCs set up in situ, and, where necessary, sent to other MCs with showering facilities and/or Emergency Radiation Treatment Centres (ERTCs) as appropriate. The Government Logistics Department (GLD) will provide transport, the estimated demand for which should be notified to GLD by AMS, copied to EMSC. MCs will carry out decontamination procedures. Injured persons, who may also be radiologically contaminated and requiring medical attention, will be conveyed by ambulances to public hospitals. ERTCs will provide further medical assistance as needed. (See Chapter 8 for details.)

(g) Random radiation monitoring of persons coming from elsewhere in Guangdong Province may be conducted.

(h) Accompanied luggage will be checked simultaneously for surface contamination with the owners. If found contaminated, it may be

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9 Subject to circumstances as may be warranted, radiological scanning might be conducted of all inbound travelers by walk-through screening portals. Declaration forms might still be required to record the travel history.
decontaminated or otherwise be disposed of in accordance with the Waste Disposal Action Plan (Chapter 10).

(i) If a person is found contaminated and the conveyance carrying the person is seeking entry into Hong Kong, there will also be radiation checking of the conveyance. The conveyance operators or the Food and Environmental Hygiene Department (FEHD) will carry out decontamination as needed.

Control of Imported Goods

7.1.6 Throughout the emergency arising from an accident at Daya Bay, it is intended to keep the points of entry operating normally. One major exception is that all vehicles carrying food or live food animals to Hong Kong will be diverted by the Guangdong authorities to the Man Kam To Control Point (see Chapter 9). Special arrangements may also be needed to facilitate cross-boundary assistance (see Chapter 14).

7.1.7 At the FULL ACTIVATION level or earlier, when advised by EMSC under the alerting procedures at Annex 7.3, C&ED HQ will instruct officers in charge at the points of entry to implement the radiation monitoring programme for the control of incoming goods and lorry drivers at the points of entry. Full details are set out in the departmental plan.

7.1.8 The general arrangements for conducting radiation monitoring of goods and lorry drivers will be as follows -

(a) Through an appropriate mechanism using notices, public address systems and declaration forms as appropriate, C&ED will arrange that lorries and goods from areas within 20km of the GNPS/LNPS are directed to designated booths.

(b) Radiation checking of lorry drivers will be conducted by C&ED before immigration clearance at the designated booths.

(c) If the lorry drivers are found contaminated, C&ED will make a thorough radiation checking of the goods from lorries. Details of the reading results and place of origin of journey of each contaminated person will be recorded and results sent to C&ED HQ. Consolidated results will be forwarded to DH, HKO and AMS as required (normally hourly) and a summary will be sent to EMSC.

(d) Random checks will be made of the other goods and lorries from the areas within 20km of the GNPS/LNPS, and from elsewhere in

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10 Subject to circumstances as may be warranted, radiological scanning of all inbound lorries might be conducted. Declaration forms might still be required to record the travel history.
Guangdong. Consolidated results will be forwarded to C&ED HQ, DH and HKO; and a summary will be sent to EMSC.

(e) Contaminated goods will not be permitted to enter Hong Kong and will be returned to the Guangdong side.

(f) In the event that contaminated goods cannot be returned, they will be decontaminated or otherwise be disposed of in accordance with the Waste Disposal Action Plan (Chapter 10).

(g) Contaminated empty lorries will be decontaminated by FEHD using high pressure hoses of water wagon.

(h) Contaminated lorry drivers will be given the option of returning to Guangdong, but would otherwise be admitted to Hong Kong subject to meeting normal immigration requirements. Their subsequent monitoring and decontamination processes are set out in paragraph 7.1.5.
Annex 7.2

Operational Intervention Level 4 (OIL4)

<table>
<thead>
<tr>
<th>OIL</th>
<th>Value</th>
<th>Response action (as appropriate) if the value is exceeded</th>
</tr>
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<tbody>
<tr>
<td>Skin contamination</td>
<td>• Gamma (γ) 1 μSv/h at 10cm from the skin</td>
<td>• Provide for skin decontamination&lt;sup&gt;1&lt;/sup&gt; and reduce inadvertent ingestion&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>• 1000 counts/s direct beta (β) skin contamination measurement&lt;sup&gt;3&lt;/sup&gt;</td>
<td>• Register and provide for a medical examination</td>
</tr>
<tr>
<td>OIL4</td>
<td>• 50 counts/s direct alpha (α) skin contamination measurement&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

1. If immediate decontamination is not practicable, advise evacuees to change their clothing and to shower as soon as possible.

2. Advise evacuees not to drink, eat or smoke and to keep hands away from mouth until hands are washed.

3. Performed using good contamination monitoring practice.
BOUNDARY CONTROL MEASURES: ALERTING CHART

**Annex 7.3**

- **SB/EMSC**: Issue press release to the public and all government departments
- **PHQCCC**
  - **CP**: Set up MCs in situ to conduct radiation monitoring of inbound persons and passenger conveyances.
  - **ACP/Ops**: Monitor goods, lorries and lorry drivers.
  - **DDC**: Support AMS in the monitoring of inbound travellers and passenger conveyances where necessary.
  - **BORDIST**: Take over and process contaminated postal articles at points of entry.
  - **ImmD**: Assist in MC operations, convey injured contaminated persons and undertake decontamination measures where calamities are involved.
  - **AMS**: Escort contaminated persons. Assist in the monitoring of inbound travellers where necessary.
  - **C&ED**: Monitor imported food and live food animals and hose down empty contaminated conveyances (vehicles).
  - **Immd**: Advise on disposal of contaminated waste.
  - **HKPO**: Provide transport to take contaminated persons to Monitoring Centres
  - **FSD**: Provide laboratory services.
  - **FEHD**: Follow closely any WHO advice and temporary recommendations under Article 15 of IHR2005 regarding response to nuclear accident in considering the necessary enactment of subsidiary legislation to support the appropriate government actions.
  - **EPD**: HKO f.i.
  - **GLD**: HAD f.i.