Fukushima nuclear powerplant accident - lessons learned

Dr Anthony Evans
Chief, Aviation Medicine Section
International Civil Aviation Organization
Montreal, Canada

Cairo, December 2011
Plan

- International Reaction to Fukushima
  - From ICAO viewpoint
- Plans in place at time of accident
- ICAO’s action during crisis
- Formal proposals by ICAO resulting from accident
- Lessons learned
What if:
• An aircraft flies through the plume?
• An aircraft is parked overnight downwind?
• An exposed individual wants to fly for treatment?
• Should Japan be screening departures?
  Cargo?
  People?
• Should other countries be screening for arrivals?
  Cargo?
  People?
• What levels are acceptable?
• What equipment/training/PPE is needed?
• Etc....
Nuclear Power Plants – where are they?
Reaction to accident - Haphazard

• Information difficult to obtain
  – IAEA and other UN agencies need invitation to intervene

• Some border controls used security scanner results (very sensitive).
  – Levels used variable and of uncertain validity

• Some States screened containers

• Throughout, IAEA did not recommend screening

• Note similarity to response to H1N1
  – WHO did not recommend screening – over 50% of countries instigated screening
Predicted atmospheric spread

Is it safe to fly through the plume? What are the deciding factors?
Concern by crew about levels in food and water

Is it safe to upload food and water from Japan? At all airports in Japan? Where do airlines obtain information?
Are crew members safe? Any precautions? Do aircraft need to be decontaminated? How?

Measurement of Radiation Dose around the Metropolitan Airports

<table>
<thead>
<tr>
<th>Measurement points</th>
<th>Apr.19 PM</th>
<th>Apr.20 AM</th>
<th>Apr.20 PM</th>
<th>Annual exposure calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narita Airport</td>
<td>0.120 µGy/h</td>
<td>0.110 µGy/h</td>
<td>0.107 µGy/h</td>
<td>≈0.000107 mSv/h</td>
</tr>
<tr>
<td>Haneda Airport</td>
<td>0.081 µGy/h</td>
<td>0.079 µGy/h</td>
<td>0.080 µGy/h</td>
<td>≈0.000080 mSv/h</td>
</tr>
</tbody>
</table>

1) According to the website of Tokyo-Electric Power Company, the unit is converted as follows; 1 micro-Gray/hour (µGy/hr) = 1 micro-Sievert/hour (µSv/hr).

2) “Annual exposure calculation” is the estimation under the condition that the hourly radiation dose measurement at the measurement point is accumulated for 24 hours throughout the year.

3) 1 mili-Sievert (mSv) = 1000 micro-Sievert (µSv)

According to the Ministry of Education, Culture, Sports, Science and Technology, examples of exposure level of radiation in daily life are as below.
- Chest X-ray (once) 0.05 mSv
- Roundtrip between Tokyo and New York by air 0.2 mSv
- Stomach X-ray (once) 0.6 mSv

According to the WHO, a person is exposed to approximately 3.6 mSv/year on average.

References:

○ NARITA INTERNATIONAL AIRPORT CORPORATION Website

☆ Kanagawa Environmental-radiation Monitoring-system Website (Japanese only)
  http://www.atom.pref.kanagawa.jp/cgi-bin2/telemeter_dat.cgi?Area=1&Type=W
Association of European Airlines

Alert Levels

- **Below Level I (< 4 Bq/cm²)**
  *No action*

- **Level I (4 to 9 Bq/cm²)**
  *Airline expert called*

- **Level II (10-39 Bq/cm²)**
  *AEA communication system started*

- **Level III (>40 Bq/cm²)**
  *Protection for workers must be provided*
Plans already in place

- International Atomic Energy Agency *Joint Radiation Emergency Management Plan*
  - World Meteorological Organization provides information on spread of plume
  - ICAO provides air traffic routings
- Did not address the questions mentioned
- CAPSCA – Cooperative Arrangement for the Prevention of Spread of Communicable disease through Air Travel
  - Experience proved very useful
Interlinking guidelines developed through CAPSCA

WHO global Preparedness

IHR 2005

Guide to Hygiene and Sanitation in Aviation

Case management of Influenza A(H1N1) in air transport

ICAO SARPs & Guidelines

Airports Council International airport guidelines

International Air Transport Association airline guidelines

Electricity, ground transport, IT support, food, water, security, etc
BUSINESS CONTINUITY

CAPSCA-Cairo December 2011
Do limits for cargo apply to contaminated individuals?
Do limits for post treatment individuals apply to those seeking treatment?
WHO involvement

*Public health emergency of international concern* – an extraordinary event that is:

- International
- Require a coordinated international response

[WHO did not declare the Japanese situation a PHEIC]

*IHR does not address all aspects related to travel e.g. advice for workers or risk to aircraft*
ICAO Transport Task Force

Weekly teleconference call
ICAO
IAEA
WHO
IMO
WMO
UNWTO
ILO
IATA
ACI

Output - Three press releases during the initial weeks

ICAO – International Civil Aviation Organization
IAEA – International Atomic Energy Agency
WHO – World Health Organization
IMO – International Maritime Organization
WMO – World Meteorological Organization
UNWTO – UN World Tourism Organization
ILO – International Labour Organization
IATA – International Air Transport Association
ACI – Airports Council International
Proposal to IAEA ministerial conference

• Amendment of the Joint Radiation Emergency Management Plan
  – Strengthen involvement of the international transport modal authorities e.g. International Maritime Organization and ICAO

• Creation of Inter-agency Transport Committee.

• Participate in “Logistics Cluster”
Global Cluster Overview

Humanitarian reform seeks to improve the effectiveness of humanitarian response by ensuring greater predictability, accountability and partnership. It is an ambitious effort by the international humanitarian community to reach more beneficiaries, with more comprehensive needs-based relief and protection, in a more effective and timely manner.

The Inter-Agency Standing Committee (IASC) has designated global sector leads in eleven areas of humanitarian activity.

What's New

- GCHA-HCSS Pakistan Mission Report
- Humanitarian Coordination Pool
- Cluster Roll-Out
- Country Level Implementation
- Global Capacity Building
- Global Capacity Building Information
- Information Management
- Inter-Agency Information Management

Latest Documents

- ETC plenary meeting October 2009 - Agenda
- Agenda ETC 10 June 2010 meeting.pdf
- ETC 8 Oct 2010 plenary meeting - Agenda
- GNC Annual Mtg 20-21 Oct 09 Agenda
- GNC Annual Mtg 2010 Agenda Final
- Agenda Education Cluster Coordination Workshop September 2008
- Agenda Education Cluster Working Group Meeting September 2008

Agreement (MOU)

- Education Cluster Memorandum of Understanding
- Education Cluster Working Group Terms of Reference

Training and Resources

- Resources & Tools section
- IASC Decisions Regarding the Use of the Cluster Approach (November 2006 - June 2007)
Lessons learned

- Communication, communication, communication
  - Between agencies/organizations
  - Agencies to public
- Management of fear: actual risks are small
  - For passengers in H1N1: Increased anxiety = increased information needs
  - No relation between anxiety and *actual* risk of illness
  - Lack of information = increased anxiety (regardless of actual risk)
  - Staff require special attention
  - Public health/medical staff – authentic source of information

Dickmann et al. (2011) New influenza A/H1N1 (“Swine Flu”): information needs of airport passengers and staff. Influenza and Other Respiratory Viruses 5(1), 39-46
Lessons learned

• Planning is crucial
  – Took a week to establish Transport Task Force after Fukushima accident
  – Pre-established networks are required

• Don’t rush to monitoring – cleaning is first protection
  – Hand washing analogy
Lessons learned

• Crisis management is generic
  – Networks established for CAPSCA (www.capsca.org) were useful

• Crisis management is usually multi-sectoral
  – Public and private e.g. IATA and ACI
Lessons learned

• Crisis management requires changes in work practices (at least for ICAO)
  – Crisis management room
  – Changes in work practices (24/7 availability during crisis)
  – Resources
    • Increased (but also more available)
Lessons learned

• Improved management of politicians
  (Who want to do something and be seen to be doing something)
  – Buy-in for preparedness planning at high level required: all levels - UN, governmental, industry
  – ICAO needs increased visibility in UN crisis management (MOU with WFP)
Summary

- Reviewed issues raised during the accident and its aftermath
- Considered plans in place at time of accident
- ICAO’s action during crisis
- Formal proposals by ICAO resulting from accident
- Lessons learned – Communication......
Questions?

(Example of poor planning......)

Psychic Fair
Cancelled
due to unforeseen circumstances
Fukushima nuclear powerplant accident - lessons learned

Dr Anthony Evans
aevans@icao.int