

ANNEX III: EXAMPLE OF A RADIATION PROTECTION PROGRAMME FOR AN AIR CARGO CARRIER

SCOPE

III-1. This RPP covers the acceptance, storage in transit, handling and transport of packages containing radioactive material carried on aircraft operated by XYZ Airlines (an air cargo carrier) that depart from or arrive at ABC Airport¹. XYZ Airlines typically carries approximately 5000 packages containing Class 7 goods per year from ABC Airport to consignees (users) all over the world. The packages carried are of all types, namely excepted packages, Type A and Type B(U)/(M). About 10% of the packages are category III-YELLOW, 30% of the packages are category II-YELLOW, 55% of the packages are category I-WHITE and 5% are excepted packages. The maximum TI encountered is 3.0, and these packages are a small fraction of those of category III-YELLOW.

ROLES AND RESPONSIBILITIES

III-2. The RPP is managed by Mr./Ms. X, who is a suitably qualified person. Mr./Ms. X will ensure that all of the elements of the RPP are implemented, including:

- (a) Training of workers and implementation of proper work procedures;
- (b) Assessment of worker exposures by workplace monitoring;
- (c) Emergency procedures.

III-3. Packages containing radioactive material are delivered to or collected from the airport cargo terminal of XYZ Airlines by road carriers. The role of the acceptance staff is to verify the following for each package/shipment for compliance with the applicable International Civil Aviation Organization (ICAO)/International Air Transport Association (IATA) requirements:

- (a) Transport documents;
- (b) Labelling and marking of the packages or overpacks;
- (c) Emergency procedures appropriate for the package/shipment.

III-4. The role of the cargo handler is to handle and to move packages including the following tasks:

- (a) Load/unload packages onto/from unit load devices (ULD)² and/or barrows that are transported to/from the aircraft. All packages are loaded on the floor of the ULD and on the floor of the barrow in accordance with ICAO/IATA requirements for segregation and securing of packages.
- (b) Drive the ULDs and/or barrows to/from the aircraft.
- (c) Load/unload packages and ULDs into/from the aircraft cargo compartment in accordance with the load plan.

¹ This annex provides an example in which employees of XYZ Airlines perform all of these activities. In cases where an airline operator contracts with a ground service provider to perform some or all of these activities, the ground service provider is responsible for developing, implementing and maintaining its own RPP. In this case, XYZ Airlines will audit the applicable ground service provider to verify that the RPP has been adequately implemented.

² A unit load device (ULD) is any type of freight container, aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an 'igloo', that is used to load freight on aircraft. An igloo is a contoured shell attached to an aircraft pallet to facilitate loading and provide protection for its contents but with the addition of a pallet net to provide restraint capability. A 'freight container' as defined in para. 223 of SSR-6 (Rev. 1) is not a ULD.

- (d) Implement emergency procedures, as appropriate.

DOSE ASSESSMENT AND OPTIMIZATION OF PROTECTION

III-5. XYZ Airlines employed the services of a qualified expert in radiation protection to evaluate the possible levels of individual exposure and to determine the monitoring programme. The evaluation was made on the basis of:

- (a) The number and type of packages handled;
- (b) The categories of package and the TIs;
- (c) The radionuclides in the packages;
- (d) The frequency of shipment;
- (e) The length of time that packages are stored prior to or following air transport.

III-6. The study (Document No. RRR) showed that the maximum radiation dose that any individual employee of XYZ Airlines would receive is less than 1 mSv in a year at the present workload. The qualified expert advised that a dose assessment programme (using individual monitoring or workplace monitoring) was not necessary. However, dose rate monitors have been recommended by the qualified expert for routine verification of dose rates. These monitors have been procured and are available to XYZ Airlines for regular use. These monitors are calibrated as recommended by the qualified expert. Packages and the workplace are monitored by Mr./Ms. X to verify the continued validity of the results of the initial evaluation.

III-7. Occupational exposures are kept as low as reasonably achievable by the following means:

- (a) Using a trolley to move packages that have not been loaded into a ULD between various locations (e.g. from the airport cargo acceptance area to the storage area; from the storage area to the loading area; and from the loading area to the aircraft).
- (b) Keeping the packages in the storage room in a shielded bay, if available, until it is necessary to handle the packages.
- (c) Prior to loading packages containing radioactive material into ULDs, ensure that the necessary equipment, such as shoring material and tie-down straps are positioned at the ULD before the packages are brought from the storage area.
- (d) Increasing segregation distances beyond the minimum ICAO/IATA requirements, where possible.
- (e) Minimizing the presence of workers within 5 m of the packages.
- (f) When carts and dollies carrying ULDs are coupled together in series and transported, ULDs containing packages of radioactive material are put in the position farthest away from the driver;
- (g) When practicable, packages and/or ULDs containing radioactive material will be loaded in the aircraft cargo compartment last and unloaded first.

Further measures to optimize radiation protection are given in the following sections.

SURFACE CONTAMINATION

III-8. The radioactive material to be transported is carried in appropriate packages in good condition. If packages are suspected of being damaged, the appropriate emergency specialist agency will be contacted. The area around the damaged package will be cordoned off to a distance appropriate for the type of package and its contents. The package will be assessed by the appropriate agency and

handled in accordance with applicable procedures. Areas that may have been contaminated by the package will be surveyed to ensure that no contamination is present and if contamination is present, will be decontaminated.

III-9. XYZ Airlines' [operations or other appropriate] manual describes the actions to be taken in the event of possible contamination of the aircraft cargo compartment due to a damaged package. A qualified person will, as soon as possible, assess the extent of contamination and the dose rates. The scope of the survey will also include any areas that may have been contaminated, e.g. the aircraft, aircraft equipment, the adjacent loading and unloading areas and if necessary, all other material which has been carried on the aircraft. The aircraft will remain out of service until it has been determined that the non-fixed contamination does not exceed:

- (a) 4 Bq/cm² in case of beta and gamma emitters and low toxicity alpha emitters; or
- (b) 0.4 Bq/cm² for all other alpha emitters.

SEGREGATION AND OTHER PROTECTIVE MEASURES

III-10. Packages are stored in the cargo terminal in a holding area that is 20 m from the airport cargo office. Packages, including those loaded onto ULDs, may be stored in the holding area for up to a maximum of 72 hours prior to being transported to the aircraft for loading. The maximum anticipated sum of TIs from the packages present in the holding area is 10.

III-11. The office workers are expected to receive the same level of protection as members of the public. With the limits placed on the storage of packages and the distance between the office and the holding area, the doses received by office workers are expected to be negligible.

III-12. All persons onboard the aircraft, including flight crew and cabin crew, are considered as members of the public and as such are not expected to receive an annual dose of greater than 1 mSv.

The location of packages in the cargo compartment is based on the application of the applicable segregation tables in the ICAO Technical Instructions and the IATA Dangerous Goods Regulations (i.e. ICAO-TI, Tables 7-3 and 7-4 and IATA DGR, Tables 10.9.C and 10.9.D). The loading location of packages that are loaded onto aircraft is determined by XYZ Airlines and is specified in written information provided to the pilot-in-command; compliance with the loading location is verified and confirmed by the person responsible for loading the aircraft.

EMERGENCY RESPONSE

III-13. In the event of an incident or accident that affects a package containing radioactive material at ABC Airport, XYZ Airlines will immediately advise the airport rescue fire-fighting service and the appropriate emergency specialist agency. The area around the package will be cordoned off to a distance appropriate for the type of package and its TI until the package has been assessed by the appropriate agency and either it has been determined that there has been no release of radioactivity, or the area has been decontaminated.

III-14. In the event of:

- (a) An aircraft accident or serious incident, where the flight is carrying radioactive material, XYZ Airlines will provide information, without delay, to emergency services responding to the accident or serious incident about the radioactive material on board, as shown in the information to the pilot-in-command. As soon as possible, XYZ Airlines will also provide this information to the appropriate authorities of the State where the principal place of business of XYZ Airlines is located and the State in which the accident or serious incident occur;
- (b) An aircraft accident or serious incident involving an aircraft carrying radioactive material, XYZ Airlines will activate the company Emergency Response Plan (ERP). The ERP includes

the following instructions:

- (1) Supporting the activities of the ABC Airport Emergency Response Plan;
- (2) Provision of information related to the flight by the incident commander.

III-15. These instructions are contained in the XYZ Airlines Airport ERP displayed prominently in the storage bay and the areas where packages are delivered and picked up in connection with ground transport so that the responsible member of the management of XYZ Airlines is able to implement these measures.

III-16. Emergency contact details:

Person responsible for this RPP (Mr./Ms. X):

Qualified expert in radiation protection:

Other contacts:

TRAINING

III-17. The persons listed below, being employees of XYZ Airlines engaged in the handling of packages containing radioactive material for transport, have received appropriate training that is commensurate with their duties:

Mr./Ms. (Acceptance Staff/Cargo Handler)

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III-18. The training that they have received fulfils the applicable requirements of the competent authority and of the ICAO/IATA regulations and the policies of XYZ Airlines. They will be subject to retraining every two years.

MANAGEMENT SYSTEM FOR PROCEDURES AND PRACTICES

III-19. The RPP and associated procedures are part of XYZ Airlines' management system, and are subject to management system processes, such as document/version control, document review, issuing and review of instructions and procedures, and follow-up of non-conformances.

The RPP, as described in this document, is approved.

Signature....., Date:

(Name and designation)