Annex VI

Third Coordination Meeting of WHO Collaborating Centres
in Radiation Emergency Medical Preparedness and Assistance
(Leningrad, 21-24 May 1990)

ACCIDENT IN EL SALVADOR*

Irradiation Facility, Technology and Training of Personnel

The accident occurred in a privately owned plant that manufactures and sterilizes surgical and medical equipment and gera for Central America. For some of the sterilization processes it uses a ^{60}Co-irradiator, model JS6300, manufactured by Nordion International and installed in 1974. The product to be sterilized is loaded into tote boxes and transported by pneumatic cylinders around a centrally located vertical rectangular source rack. The rack is made up of two vertical modules, each of them with 54 steel pencils; 28 of them had been loaded in 1975 with 4.0 PBq (108000 Ci) of ^{60}Co encapsulated in slugs. Towards February 1989 this activity had decayed to 0.66 PBq (18,000 Ci). To ensure full sterilization of the products, the minimum dose of radiation given was 18 kGy ; the nominal dose being 20 kGy. The time needed for each container to change position was, at the time of the accident, 140 min.

The source rack is attached to a cable that holds it in irradiation position by a hydraulic system and returns it to the storage water pool - 5.5 m deep - by gravity. Safety interlocks were designed to prevent the source from being raised when personnel are in the irradiation room and prevent access when there are abnormal radiation levels in the room. Automatic safety features were also installed to lower the source and shut down the irradiator in the event of an electromechanical malfunction or when power is cut off.

Workers interviewed at the plant after the accident explained the routine operation of the irradiator as follows. Before going to the control panel, they activated a switch inside the "monitor cabinet". This switch had been originally installed in the irradiation room as a "safety" key switch with a delay timer, but then it was transferred to the monitor cabinet near the control panel to avoid entering the room each time the irradiator had to be started up. It is noteworthy that the week prior to the accident the reinitiation was necessary, on average, 8 times a day, mostly due to power shut offs. After activating the switch, the workers moved to the control console, where they turned the "power" key switch through the "on" position to the "reset" position with the "master" key and they released it. A yellow "reset" pilot light in the control panel would then illuminate and extinguish. They checked that the green light indicating "source down" was on, and they set the "master" and "overdose timers". Then they removed the "master" key from "power" key switch (leaving the key switch in the "on" position) to the "start" position.

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