

Radiation Protection and Management

著者	Miyata T., Yamadera A., Nakamura T., Hashimoto M., Satake Y.
journal or publication title	CYRIC annual report
volume	1990
page range	259-261
year	1990
URL	http://hdl.handle.net/10097/49619

V. 4. Radiation Protection and Management

Miyata T., Yamadera A., Nakamura T., Hashimoto M. and Satake Y.**

*Cyclotron and Radioisotope Center, Tohoku University
Japan Radiation Protection Co., Ltd.**

(1) Unsealed radionuclides used in the center

The kinds and activities of unsealed radionuclides handled in the center in 1990 are shown in Table 1. The table includes the isotopes produced by the cyclotron, purchased from the Japan Isotope Association and took over from another RI institutes.

(2) Individual monitoring

The exposure doses of the workers in the center in 1990 is given in Table 2. They were less than the permissible doses.

(3) Monitoring of the workplace

Radiation dose rates inside and outside of the controlled areas were monitored periodically and as needed. They were below the legal permissible levels. Surface contamination levels of the floors inside the controlled areas were measured by smear method and with survey meters periodically and as needed. They also cleared the legal regulation levels.

(4) Wastes management

The radioactive wastes delivered to the Japan Radioisotope Association in 1990 are shown in Table 3. The concentration of radioisotopes in the air released after filtration from the stack was monitored with stack gas monitors. The levels were less than the legal regulation levels. The radioactive water was stored at the tanks at least for 3 days and then released to the sewerage after confirming that the concentration was less than permissible levels.

The treated volume of radioactive waste of organic scintillator was 1720 l by the incinerator made by Fujikogyo Co., Ltd.

Table 1. Unsealed radionuclides used in the center in 1990.(kBq)

1.	⁹⁰ Sr	1,112,947	3.	¹¹ C	135,479,650
	Total	1,112,947		¹³ N	26,640,000
2.	⁴⁵ Ca	88,529		¹⁵ O	12,910,300
	⁵⁴ Mn	769		²⁸ Mg	23,588
	⁵⁶ Co	240		³² P	751,445
	⁵⁷ Co	10		³⁵ S	344,023
	⁶⁰ Co	8,828		⁴⁷ Ca	25,713
	⁶⁵ Zn	17,894		⁴⁵ Ti	3,489,000
	⁶⁸ Ge	267,445		⁴⁸ V	980,846
	⁸⁵ Sr	12		⁵⁹ Fe	2
	¹²⁵ I	2,237,360		⁶⁴ Cu	20
	¹³⁷ Cs	1,412,068		⁶⁷ Cu	935
	¹⁶⁰ Tb	136,829		⁶² Zn	37,000
	²⁰⁷ Bi	110		⁶⁷ Ga	91,861
	¹⁴¹ Ce	10,000		⁷⁴ As	11
	Total	4,180,094		⁹⁹ Mo	74,000
				^{99m} Tc	74,000
				¹¹¹ In	164,300
				¹³¹ I	241,567
				¹³² Cs	10
				¹⁴⁰ La	490,696
				¹⁵³ Sm	157,057
				¹⁷⁷ Lu	144,946
				Total	182,120,970
			4.	³ H	1,179,516
				⁷ Be	8,509
				¹⁴ C	122,768
				¹⁸ F	240,246,582
				⁵¹ Cr	343,543
				Total	241,900,918

Table 2. Occupational radiation exposures at the center in 1990.

Dose range (mSv)*	Number of individuals
No measurable exposure	26
Measurable exposure less than 1.0	6
1.0 to 2.5	4
2.5 to 5.0	2
Total persons monitored	38

* Individual values exactly equal to the values separating exposure ranges are reported in the higher range.

Table 3. Radioactive wastes delivered to the Japan Radioisotope Association in 1990.

Wastes	Container	Number
solids		
combustibles	200 l drum	38
incombustibles	50 l drum	51
dried animals	50 l drum	24
special incombustible	50 l drum	2
liquids		
inorganic substances	25 l polyethylene bottle	18