Basic Knowledge of Radiation and Radioisotopes

(Scientific Basis, Safe Handling of Radioisotopes and Radiation Protection)

Japan Radioisotope Association

Contents

Note

This text is for beginners who are to work in laboratories using radiation and radioisotopes. Chapters I to IV contain scientific and technical matters for radiation protection based on the internationally common understandings, while Chapters V and VI are compliant with Japanese Laws and Ordinances concerning radiation protection, revised in January, 2016.

Ⅰ. Introduction

1. The Role of Radiation Workers

The purpose of "the Act on Prevention of Radiation Hazards due to Radioisotopes, etc.", with relevant ordinances, cabinet order and notifications etc. (hereinafter referred to as "the Act and relevant Ordinances"), is not only to minimize the radiation exposure of individual workers and the public, but also to ensure the safety of people by preventing contaminations in both the workplace and the general environment. To satisfy this purpose, it goes without saying that facilities and equipments should be well maintained. But there are many areas where little can be achieved without the cooperation of the radiation workers themselves. That is to say, it is difficult to attain the purpose of the Law without appropriate handling of radiation and radioisotopes by radiation workers, no matter how much effort is put into maintaining facilities and equipments. Being aware of how to protect themselves, as well as the significance of their role in radiation protection management, each radiation worker must cooperate with others at his or her workplace.

1-1. What knowledge must radiation workers have?

In order to deal with radiation and radioactive materials safely at their workplace and to attain the goal of radiation protection, radiation workers must understand at least the following:

1) Basic provisions of the Act on Prevention of Radiation Hazards due to Radioisotopes, etc.;
2) Basic physics of the radioactive materials that they handle;
3) Biological effects of radiation;
4) Techniques for preventing contamination;
5) Methods for radioactive waste management; and
6) How to deal with abnormal and emergency situations.

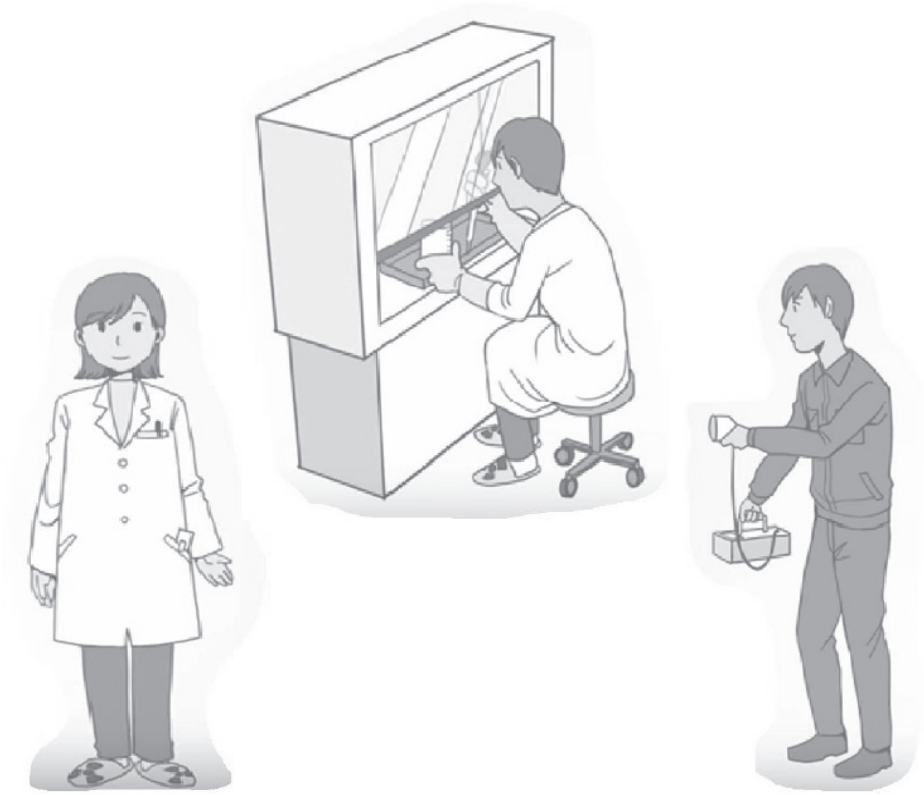

Fig. 1 What knowledge must radiation workers have?