Safety

1. Abstract

In accordance with the Act on Prevention of Radiation Hazards due to Radioisotopes, etc., the 47th and 48th applications for the approval of changes in SPring-8 and SACLA facilities were approved on July 21, 2020 and February 3, 2021, respectively. The environmental radiation inside the facilities and the surrounding area of the SPring-8/SACLA site was monitored, and it was confirmed that the radiation levels were well below the legally mandated limits. Additionally, the management of the 4,585 registered radiation workers was properly conducted. This included the implementation of radiation training and the management of their personal radiation exposure. Similarly, chemicals, high-pressure gases, biological experiments, cranes, and lasers were managed in compliance with all applicable laws and regulations.

2. Radiation safety management

2-1. Summary

There were no problems regarding radiation management in accelerators or facilities on the site in FY2020.

2-2. Applications for approval

The following applications for changes in the radiation facilities were submitted in FY2020:

47th application for approval of amendment
Application date: March 24, 2020
Approval date: July 21, 2020
(1) Modification of interlock system for Linac facility
(2) Changes in SR (storage ring) beamline BL02B1

48th application for approval of amendment
Application date: September 16, 2020
Approval date: February 3, 2021
(1) Changes in SR beamlines BL09XU, BL20B2, BL29XU, and BL35XU
(2) Removal and addition of sealed radioisotopes

2-3. Radiation Protection Committee

The Radiation Protection Committee met two times in FY2020:

32nd Harima Radiation Protection Committee (September 10, 2020)
The content of the 48th application for the approval of changes was deliberated and approved.

33rd Harima Radiation Protection Committee (February 25, 2021)
The content of the 49th application for the approval of changes was deliberated and approved.
The revised proposal for the Regulations for Radiation Hazard Prevention in Harima was deliberated and approved.

2-4. Periodic inspections/facility inspections

The periodic inspections and facility inspections conducted in FY2020 were as follows.
The facility of the SR Beamline BL05XU was inspected on April 20, 2020 and pronounced satisfactory on April 21.
SPring-8/SACLA was periodically inspected on July 13 to July 15 and on July 27 to July 29, 2020,

and pronounced satisfactory on August 12.

2-5. Radiation monitoring

Radiation measurements of all accelerator facilities (including the SR beamlines) of SPring-8/SACLA confirmed that the radiation levels were below the standards mandated by law. In controlled areas of SPring-8/SACLA where workers regularly enter, a maximum dose of 7.0 μSv/h was detected in a beamline hutch of the Experimental Hall of the SR. However, in places where SPring-8/SACLA users work, the measured radiation doses were less than 1.0 μSv/h (background level). Radiation doses at other measuring points were also much less than the legal limit of 1 mSv/week (duration of evaluation: 40 h/week). Similarly, periodic inspections confirmed that the radiation doses at the boundaries of the controlled areas during SPring-8/SACLA operations were well below the legal limit of 1.3 mSv/3 months (duration of evaluation: 520 h/3 months).

Measurements of the environmental radiation conducted at the boundaries of the site detected a maximum dose rate of 0.08 μSv/h and a maximum accumulated dose of 0.02 mSv/3 months, which was much lower than the legal limit of 0.25 mSv/ 3 months (duration of evaluation: 2,184 h/3 months). Quarterly measurements of the surrounding environment confirmed that SPring-8/SACLA operations did not affect the radiation levels in the environment surrounding the site.

2-6. Management of radiation workers and access control of facilities

In FY2020, there were 4,585 radiation workers. This included 3,445 SPring-8/SACLA users, which accounted for about 75% of all radiation workers. There were a total of 3,744 temporary visitors.

2-7. Management of personal radiation exposure

Personal dosimeters were issued to personnel who worked on the site as radiation workers. Each month the used dosimeters were collected to measure the exposure doses. Personal dosimeters were also issued to short-stay visitors such as public beamline users for the duration of their stay as well as to resident workers of external organizations for every month that they were stationed. These dosimeters were collected after use to measure the exposure doses.

Measurements of radiation doses conducted in SPring-8/SACLA verified that the exposure doses of all radiation workers were much lower than the limits mandated by related laws and regulations and the Regulations for Radiation Hazard Prevention. These observations demonstrated that there is no radiation problem.

3. Safety management of chemicals

Chemicals were controlled in a manner compliant with related laws and regulations. Biannual working environment measurements on specified chemical substances and organic solvents confirmed that they were handled appropriately in the working environments. Voluntary periodic inspections and necessary repair work on local exhaust devices to handle chemicals were conducted to ensure adequate performance. Narcotics, stimulants, and psychotropics approved for use were controlled in a proper manner. The required application and notification concerning these items were implemented in compliance with all related laws and regulations.

4. Safety management of high-pressure gases

The control of high-pressure gases and necessary applications/notifications were conducted in accordance with related laws and regulations.

5. Safety management of biological experiments

5-1. Genetic recombinant experiments

In FY2020, 53 projects (including 25 user projects) were conducted after being examined and approved by the Genetic Recombination Committee or the Bio-safety supervisor.

5-2. Animal experiments

In FY2020, eight projects (including seven user projects) approved by the Animal Experiment Committee were conducted. An on-site inspection of the facilities for breeding and housing experimental animals conducted by the Hyogo-prefecture Animal Protection Center on June 23, 2020 did not identify any deficiencies.

5-3. Microorganisms

In FY2020, five projects approved by the committee were conducted.

5-4. Research involving human subjects

In FY2020, ten projects (including nine user projects) involving human-derived materials were conducted after approval by the committee and the like.

6. Safety review of proposals

A total of about 2,000 proposals underwent a safety review. The safety issues in 2020A-term proposals were reviewed in December 2019. In addition, proposals related to COVID-19, second-term proposals for industrial applications, proprietary time-designated proposals, urgent proposals, proposals for SPring-8 measurement services, in-house proposals, and others were reviewed.

7. Emergency measures

In response to the COVID-19 state of emergency declaration issued on April 7, 2020, we stopped accepting users at SPring-8/SACLA from April 7 to June 14. However, the research projects related to COVID-19 were still conducted. After that, we took the following infection control measures in order to resume accepting users:

・placement of disinfectant at the entrance and exit of each building and facility,

・alteration of cafeteria seating to avoid face-to-face seating and request for eating in silence, and

・disinfection at the time of cleaning Guest House rooms and common space.

Also, from the point of view of preventing infection, the FY2020 Harima Safety Inspection was scaled down and joint emergency drills were changed from practical on-site training to only script-simulation-based administrative emergency communication report training.

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