9. Safety

1. Abstract

In accordance with the Act on the Regulation of Radioisotopes, etc., the 53rd application for the approval of changes in SPring-8 and SACLA facilities was approved on December 13, 2023. 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 legal limits. Additionally, the 6,650 registered radiation workers were properly managed. 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 concerned laws and regulations.

2. Radiation safety management

2-1. Summary

There were no problems regarding radiation management in any of the radiation facilities on the site in FY2023.

2-2. Applications for approval

The following application for changes in the radiation facilities was submitted in FY2023.

53rd application for approval of amendment
Application date: September 26, 2023
Approval date: December 13, 2023
(1) Changes in the SR beamline (BL36XU)

2-3. Radiation Protection Committee

The Radiation Protection Committee met once in FY2023.

39th Harima Radiation Protection Committee (September 15, 2023)
The content of the 53rd application for approval of amendment was deliberated and approved.

2-4. Periodic inspections/facility inspections

The following facility inspection was conducted in FY2023.

The facility of the SR beamline BL31LEP was inspected on October 6, 2023 and pronounced satisfactory on the same day.

No mandated periodic inspections/confirmations were conducted in FY2023.

2-5. Radiation monitoring

Radiation measurements confirmed that the radiation levels were below the limit values required by law for all facilities where radiation is used in the SPring-8/SACLA site.

In controlled areas of SPring-8/SACLA where workers regularly enter, a maximum dose of 6.0 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 were well below the legal limit of 1.3 mSv per three months (duration of

evaluation: 520 h per three months) at the boundaries of the controlled areas during SPring-8/SACLA operations.

Measurements of the environmental radiation conducted at the boundaries of the site revealed a maximum dose rate of 0.08 μSv/h and a maximum accumulated dose of 0.02 mSv per three months, which was much lower than the legal limit of 0.25 mSv per three months (duration of evaluation: 2,184 h per three 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 to radiation areas

In FY2023, there were 6,650 radiation workers. This included 5,778 SPring-8/SACLA users, which accounted for about 87% of all radiation workers. There were a total of 11,011 people temporarily entering the radiation-controlled areas.

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 at Harima, RIKEN. 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 of specified chemical substances and organic solvents confirmed that they were handled appropriately in all working environments. Voluntary periodic inspections on local exhaust devices to handle chemicals were conducted to ensure adequate performance. Narcotics, stimulants, and psychotropics approved for use were controlled in the 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

In FY2023, 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 FY2023, 53 projects (including 29 user projects) were conducted after being examined and approved by the Genetic Recombination Committee or the Bio-safety Supervisor.

5-2. Animal experiments

In FY2023, 19 projects (all user projects) approved by the Animal Experiment Committee were conducted. An on-site inspection of the animal facility for experimental animals was not conducted

by the Hyogo-prefecture Animal Protection Center.

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5-3. Microorganisms

In FY2023, five projects were conducted after approval by the Safety Committee for the Handling of Microorganisms and Similar Materials.

5-4. Research involving human subjects

In FY2023, 22 projects (including 17 user projects) involving human-derived materials were conducted after approval by the Research Ethics Committees.

6. Safety review of proposals

A total of about 2,900 proposals underwent a safety review. The safety issues in 2023A-term and B-term proposals were reviewed in April 2023 and in June, September, and November 2023, respectively. Then, about 1,100 proposals in the 2024A term were also reviewed in December 2023 and March 2024.

In addition, General Proposals, Time-Designated Proposals, Measurement Service Proposals, In-house Proposals, and others were also reviewed. There were no applications for Urgent Proposals in the 2023A and B terms.

7. Emergency measures

In FY2023, a joint emergency drill was conducted on December 20, 2023 in the presence of the Kouto Branch of the Tatsuno Fire Department, under the assumption that an earthquake and fire would occur at the SPring-8 site.

Safety inspections of the SPring-8 campus were conducted on November 13, 2023, with the participation of inspectors from each campus.

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