Safety Management

1. Abstract

In accordance with the Act on Prevention of Radiation Hazards due to Radioisotopes, etc., the 45th and 46th applications for approval of changes in SPring-8 and SACLA facilities were approved on May 27, 2019 and November 26, 2019, respectively. Monitoring the environmental radiation inside the facilities and the surrounding area of the SPring-8/SACLA site confirmed that the radiation levels were well below the legally mandated limits. Additionally, management of radiation workers was properly conducted for the 6,842 registered workers. This included implementation of radiation training and 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 with radiation management in accelerators or facilities on the site in FY2019.

2-2. Applications for approval

The following applications for changes in the radiation facilities were submitted in FY2019:

46th application for approval of amendment
Application date: September 20, 2019
Approval date: November 26, 2019
(1) Changes in SR beamline BL05XU
(2) Changes in SACLA beamline BL3

2-3. Radiation Protection Committee

The Radiation Protection Committee met three times in FY2019:

29th Harima Radiation Protection Committee (May 29, 2019)
The revised proposal for the Regulations for Radiation Hazard Prevention in Harima was deliberated and approved.

30th Harima Radiation Protection Committee (September 11, 2019)
The content of the 46th application for approval of changes was deliberated and approved.

31th Harima Radiation Protection Committee (March 17, 2020)
The content of the 47th application for approval of changes was deliberated and approved.

2-4. Periodic inspections/facility inspections

Mandated periodic inspections/confirmations or facility inspections were not conducted in FY2019.

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 enter regularly, a maximum dose of 5.5 μSv/h was detected in a beamline hutch of the Experimental Hall of the Storage Ring. 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 0.03 mSv/3 months, which were 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 FY2019, there were 6,842 radiation workers. This included 5,108 SPring-8/SACLA users, which accounted for about 75% of all radiation workers. There were a total of 9,926 temporary visitors, which included 2,065 open house attendees.

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 not a 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, which were 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

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 FY2019, 53 projects (including 27 user projects) were conducted after being examined and approved by the Genetic Recombination Committee or the Bio-safety supervisor.

5-2. Animal experiments

In FY2019, 17 projects (including 16 user projects) approved by the Animal Experiment Committee were conducted. An on-site inspection of the facilities for breeding and keeping experimental animals conducted by the Hyogo-prefecture Animal Protection Center on July 22, 2019 did not identify any deficiencies.

5-3. Microorganisms

In FY2019, four projects approved by the committee were conducted.

5-4. Research involving human subjects

In FY2019, 22 projects (including 21 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 3,000 proposals underwent a safety review. The safety issues in 2019 A-term and B-term proposals were reviewed in December 2018 and June 2019, respectively. In addition, 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 addition to the full-time employees and contracted staff working on the campus, many people visited SPring-8/SACLA, including experimental users, visiting researchers, student trainees, and other part-time employees from external research institutions and companies inside and outside Japan. Therefore, every year, sufficient stockpiles is constantly secured for disaster prevention, including a large-scale earthquake. Additionally, the annual safety inspection was performed on October 7, 2019 to confirm the proper aseismic measures. Furthermore, on September 6, 2019 in cooperation with the Tatsuno Firehouse of Nishiharima Fire Department, a joint disaster drill was conducted with other organizations that have their offices on the campus. Specifically, there were exercises such as survivor rescue training from the roof of the Main Building and first-aid for injured persons.

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