Safety Management

1. Abstract

In accordance with the Act on Prevention of Radiation Hazards due to Radioisotopes, etc., the 43rd and 44th applications for approval of changes in SPring-8 and SACLA facilities were approved on May 10, 2018 and October 30, 2018, respectively.

Monitoring the environmental radiation inside the facilities and the surrounding area of the SPring-8/SACLA site confirmed that the radiation levels were sufficiently lower than the limits designated by law.

Management of radiation workers was properly conducted for the 6,914 registered workers. This included implementation of radiation training and management of their personal radiation exposure. Similarly, chemicals, high-pressure gases, biological experiments, cranes, lasers, etc. 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 all accelerators and facilities within the site in FY2018.

2-2. Application for approval

The following applications for changes in the radiation facilities were submitted in FY2018:

43rd application for approval of amendment

*Application date: April 25, 2018

*Approval date: May 10, 2018

(1) Removal of SACLA 50 MeV dump

(2) Changes in SR (storage ring) beamline BL10XU

(3) Modification of the XFEL-SPring-8 Experimental Facility

44th application for approval of amendment

*Application date: September 12, 2018

*Approval date: October 30, 2018

(1) Changes in SR beamline BL45XU

2-3. Radiation Protection Committee

The Radiation Protection Committee met three times in FY2018:

25th Harima Radiation Protection Committee (April 18, 2018)

The content of the 43rd application for approval of changes was deliberated and approved.

26th Harima Radiation Protection Committee (September 6, 2018)

The content of the 44th application for approval of changes, the revised proposal for the Regulations for Radiation Hazard Prevention in Harima, and the proposal for the Guidelines for Education and Training on Radiation on the Harima Campus were deliberated and approved.

27th Harima Radiation Protection Committee (December 5, 2018)

Proposals to unify the operation of the emergency stop buttons of SPring-8/SACLA and terminate radiation protection administrators were deliberated and approved.

2-4. Periodic inspections/facility inspections

No mandated periodic inspections/confirmations or facility inspections were conducted in FY2018.

2-5. Radiation monitoring, etc.

Radiation measurements of all accelerator facilities (including the SR beamlines) of SPring-8/SACLA confirmed that the radiation levels were within the standards designated by law.

In the 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 the 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 sufficiently lower 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 sufficiently lower than 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 0.05 μSv/h and a maximum accumulated dose of 0.02 mSv / 3 months, which were sufficiently 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 control of entering/exiting facilities

The total number of radiation workers in FY2018 was 6,914. This included 5,776 SPring-8/SACLA users, which accounts for about 84% of all radiation workers. The cumulative number of temporary visitors was 20,907, which include 10,638 open house attendees.

2-7. Management of personal radiation exposure

We issued personal dosimeters to personnel who worked on the site as radiation workers. Each month we collected the used dosimeters 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 all radiation workers had exposure doses much lower than the limits designated by related laws and regulations, and the Regulations for Radiation Hazard Prevention. These observations demonstrate that there is not a radiation problem.

3. Safety management of chemicals

Chemicals have been controlled in a proper 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 working environments. Voluntary periodic inspections and necessary repair work on local exhaust devices for handling chemicals has maintained adequate performance of the devices. Narcotics, stimulants, and psychotropics that were approved for use were controlled in a proper manner.

The required application and notification concerning these items were performed in compliance with 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

Forty-seven projects (including 23 projects of users) were conducted in FY2018 after being examined and approved by the Genetic Recombination Committee or the Bio-safety supervisor.

5-2. Animal experiments

Sixteen projects (including 15 projects of users) approved by the Animal Experiment Committee were conducted in FY2018. An on-site inspection of facilities for breeding and keeping experimental animals conducted by the Hyogo-prefecture Animal Protection Center on June 8, 2018 did not identify any problems.

5-3. Microorganisms

Five projects (including two projects of users) approved by the committee were conducted in FY2018.

5-4. Research involving human subjects

Twenty-one projects of users and the like involving human-derived materials were conducted in FY2018 after approval by the committee and the like.

6. Safety review of proposals

A total of 2,900 proposals underwent a safety review. The safety issues in 2019 A-term and B-term proposals were reviewed in June 2018 and December 2018, respectively. Second-term proposals for industrial applications, proprietary time-designated proposals, urgent proposals, proposals for SPring-8 measurement service, in-house proposals, and others were also reviewed.

7. Emergency measures

In addition to the full-time employees and contractor staff working on the campus, many people visit SPring-8/SACLA, including experimental users, visiting researchers, trainees, and other part-time employees from external research institutions and companies inside and outside Japan. In FY2018, we secured a storage space of stockpiles for disaster prevention in the SPring-8 Guest House, which is used by short-stay experimental users, and prepared an adequate amount of emergency supplies such as emergency food, drinking water, and sleeping bags. We also placed helmets to protect heads in each room of the Guest House. Furthermore, in cooperation with the Tatsuno Firehouse of Nishiharima Fire Department, we conducted a joint disaster drill with each organization that had their office within the campus on September 7. Examples include a drill to rescue a survivor in need of assistance from the roof of the Main Building and training on the relief and protection of injured persons.

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