



## I. Introduction

### General

Among the various problems that the Great East Japan Earthquake still continues to cause, the tight electricity situation is one of the central problems. Once deactivated for periodic inspection, none of the nuclear power plants has so far been approved to resume operation under the austere inspection procedure newly implemented, thus making it difficult for electricity companies to stably supply electricity. Hence, the local electricity company requested large-scale power consumers, including SPring-8, to reduce their power consumption by 15% in the summer of 2012 as part of the measures to avoid large-scale blackout.

Consequently, SPring-8 had to halt the use of its X-ray beams in July 2012 and February 2013 to conform with the above request. Under such circumstances, however, SPring-8 endeavored to maximize the user time as much as possible by minimizing the time for studying and maintaining the accelerator complex and the beamlines, and by redesigning the facility logistics. In fact, SPring-8 was able to provide more than 4156 hours with a beam-loss time of only 39 hours.

### New Contract Beamlines

SPring-8 continue to dynamically evolve throughout the year of 2012, as it has since its inauguration in 1997. Three new contract beamlines were inaugurated, further diversifying the beamline portfolio of SPring-8. They are the (i) "RISING" beamline at BL28XU of Kyoto University to analyze rechargeable batteries, (ii) "Catalytic Reaction Dynamics for Fuel Cells" beamline at BL36XU of The University of Electro-Communications to conduct research activities indicated by its name, and (iii) "Laser-Electron Photon II" beamline at BL31LEP of Research Center for Nuclear Physics, Osaka University to challenge the frontier of quark-nucleon physics, focusing on pentaquarks.

### User Community

It is extremely important for the dynamically advancing SPring-8 to coherently work with a well-organized user community not only to make SPring-8 user-oriented for the present, but also to keep SPring-8 at the forefront for the future as well. At this time, therefore, SPring-8 would like to congratulate and

to express its respect to all its users for successfully establishing their own community, i.e., SPRING-8 User Community (SPRUC), which has more than 10,000 registered members.

Despite still being in the early stage, SPRUC exhibited enthusiastic initiative in organizing SPRING-8 Symposium 2012 with Japan Synchrotron Radiation Research Institute (JASRI) and RIKEN, held at Osaka University, August 25-26, where SPRUC proactively discussed the present/future position of SPRING-8 among other synchrotron radiation facilities in Japan. For Japan Synchrotron Radiation Research Institute (JASRI), it was fruitful to carry out an attitude survey of SPRING-8 users with emphasis on the upgrade/future plan of SPRING-8 in collaboration with SPRUC.

### **“Combinational Utilization” of SPRING-8, J-PARC, and K-Computer**

Since X-ray and neutron data for the same sample often become much clearer and convincing when complementally combined with each other, it is a natural consequence to attempt to establish such a utilization framework within which SPRING-8 users could employ neutron beams at the Materials and Life Science Experimental Facility (MLF) as J-PARC users, and vice versa. Collectively calling X-ray beams and neutron beams as Quantum Beams, such a utilization scheme could be named the Quantum Beam Platform. It is also clear that it should include K-computer utilization as well in order to accommodate hyper-science consisting of quantum beam science and computer science.

Being the Registered Institutions for Facilities Use Promotion of SPRING-8, J-PARC/MLF, and K-computer, respectively, JASRI, Comprehensive Research Organization for Science and Society (CROSS), and Research Organization for Information Science and Technology (RIST) signed a trilateral cooperation agreement June 1, 2012, in order to establish the above-described utilization scheme among the three advanced scientific infrastructures as early as possible. As the first step towards this direction, JASRI started inviting proposals for complementary use with J-PARC/MLF on a trial basis this year, in collaboration with CROSS. Successful proposals were carried out in the period of 2013A.

### **Industrial Applications**

Compared with other synchrotron radiation facilities in the world, it is a particular characteristic of SPRING-8 that industrial applications not only account

for ~20% of the proposals approved, but also cover a wide spectrum from electronics to health care. Since synchrotron radiation facilities are expected to directly contribute to society through industrial applications, it was a great pleasure for SPRING-8 to host the 3rd SPRING-8-Diamond Joint Workshop for Industrial Applications of Synchrotron Radiation, which was held on the SPRING-8 campus and at Kobe, May 21–23, 2012. In accordance with the guideline indicated by the UK-Japan Joint Commission on Cooperation in Science and Technology held November 28-29, 2011, London, the workshop covered a wide range of industrial applications conducted at SPRING-8 and Diamond Light Source with special emphasis on “Energy” in light of the lessons gained from the global energy agenda, and in particular, from the Great East Japan Earthquake.

### **International Collaborations**

As part of its continuous contribution to synchrotron radiation science communities in the Asia-Oceania region, SPRING-8 provided a venue for Cheiron School 2012, which was designed to offer useful and basic knowledge and perspectives of synchrotron radiation science and technology to young scientists and engineers in this region.

To facilitate international collaborations in synchrotron radiation science and technology, SPRING-8 concluded the Memorandum of Understanding (MoU) with Canadian Light Source (CLS) in Canada, November 2012. On the basis of this fruitful relationship, SPRING-8 extended the MoU with Paul Scherrer Institute (PSI) in Switzerland, October 2012, and Deutsches Elektronen-Synchrotron (DESY) in Germany, February 2013, including research collaboration in the field of free electron laser technology.

### **Reviews**

There were two external review committees organized by JASRI: (i) for research activities conducted by JASRI staff mainly using SPRING-8 public beamlines, to facilitate its utilization as part of the missions of JASRI as a Registered Institution for Facilities Promotion, and (ii) the Nanotechnology Support Proposal that was designated as one of the Priority Research Programs from 2007 for five years at SPRING-8 from the viewpoint of strategic importance in accordance with the Basic Program for Science and Technology decided by the Japanese Government.