FY2013 Plans of Activities

Since 1950 RERF has conducted the Life Span Study (LSS), a mortality and cancer-incidence study of a fixed cohort of about 94,000 A-bomb survivors in Hiroshima and Nagasaki and 26,000 not in the cities at the time of the bombs. The number of living members of the cohort has decreased over time to a little over 41,500 currently. The Adult Health Study (AHS) was initiated in 1958 as an LSS subcohort of about 17,000 individuals who were examined clinically. The AHS cohort is currently composed of about 4,600 individuals with an average age of over 78, with expectation of the decrease due primarily to death or to emigration from the area. In 2008, about 2,000 individuals exposed at ages of less than 10 years were added to the cohort and are being given biennial clinical examinations along with other AHS members. In addition, longitudinal clinical research of A-bomb survivors’ children was initiated in November 2010 and is progressing smoothly. It is expected that about 9,000 such individuals will undergo health examinations over a period of four years. Health examinations on four-year cycles will be continued in the years to come.

I. Major activity plans
1. Research projects on A-bomb survivors’ health
A. Radiation research based on the LSS, in utero, and AHS cohorts
FY2013 Plans
A number of studies will examine the associations of radiation exposure with cancer risk. They include a variety of collaborations among the various research departments.

♦ Radiation and the incidence of leukemia and other hematologic malignancies has been examined in detail with a 14-year update of data and will be published in a few months in a leading radiation journal.

♦ Since there are concerns about possible high risk for those exposed to radiation in utero, a paper on solid-cancer, leukemia, and non-cancer mortality for the in utero cohort will be prepared, comparing the risks following in utero exposure to LSS cohort members to those who were exposed during childhood.

♦ As part of RERF’s collaboration with the US National Cancer Institute, we will submit papers on the risk of radiation exposure for various histologic subtypes of thyroid and ovarian cancers and for malignant lymphoma and bone/soft tissue malignancies.

♦ In FY2013 we expect to begin work on major new analyses of updated tumor incidence data through 2005.

♦ Since breast cancer shows one of the highest radiation risks, an assessment of the risk for various breast cancer subtypes, based on their estrogen-receptor, progesterone-receptor and Her2 status, is underway. Also, a paper is being prepared regarding radiation and sex steroid hormone levels as co-factors in the association of radiation exposure with breast cancer.

♦ Manuscripts on hepatocellular liver cancer (HCC) will be submitted regarding the joint modeling of radiation and hepatitis infection on HCC risk, and on radiation and inflammatory and/or insulin resistance markers on HCC risk.

♦ A paper will be submitted on radiation, chronic gastritis and gastric cancer risk.

We anticipate significant progress for several studies of radiation and circulatory diseases, particularly ones oriented toward elucidating mechanisms of radiation-associated circulatory disease, including:

♦ Detailed analyses of various subtypes of circulatory disease mortality and radiation in the LSS cohort will be performed in conjunction with the RERF Cardiovascular Disease Working Group.
The contribution of chronic kidney disease as a co-factor to the observed association of radiation with cardiovascular disease is being estimated. An epidemiologic paper on this will be published and a clinical paper will be prepared.

Studies are underway in the AHS on radiation exposure in relation to physiological measures of arteriosclerosis and to biomarker measurements of cytokines and growth factors associated with the injury and repair of endothelial tissue damage in the arteries.

The diameters of retinal arteries and veins have been measured from retinal photographs, since vascular constrictions may be sensitive markers for microvascular damage related to radiation exposure.

An AHS study will be initiated using echocardiography to determine the effects of radiation on heart-failure, valvular fibrosis etc.

Studies are being conducted on diseases or conditions other than cancer or circulatory disease:

Mortality risks of radiation for respiratory and digestive diseases and the influence of co-morbidities on their possible associations with radiation are being analyzed in more detail than before. Two papers will be submitted.

Additional work will be completed on the role of genetic variation in ATM and other genes in susceptibility to radiation cataract. We will complete data collection and begin analysis regarding the degree to which radiation-associated opacities progress over time, a largely unanswered question in the radiation literature. A paper on radiation and the prevalence of glaucoma will be submitted for publication.

Since our early studies documented radiation-related neurocognitive deficits in childhood after in utero exposure, a long-term study has been initiated to examine late-life neurocognitive function and dementia among atomic bomb survivors exposed in childhood or in utero. This includes both questionnaire and clinical assessments of neurocognitive function.

Numerous activities are necessary to provide for future high-quality studies of cancer incidence and other health endpoints:

Updating the cancer registries in Hiroshima and Nagasaki cities and prefectures (completed through 2005 with an update through 2008 nearing completion), which can be utilized for various studies of the LSS, in utero, and F1 cohorts.

Work will continue to develop a comprehensive database of over 230,000 formalin-fixed paraffin-embedded tissues stored at RERF from 6,600 autopsies and many additional surgical procedures.

Obtaining collaborative agreements to establish a clear relationship with community hospitals and universities for joint access to their pathological materials on LSS subjects. Progress has been made in both Hiroshima and Nagasaki and it is hoped to complete the needed agreements.

To provide updated information on other non-radiation risk factors for disease, a new mail survey of the LSS cohort has been completed and the data are being cleaned and computerized; this information is needed to assure that the radiation risk assessment is not confounded by other risk factors. Importantly, it also will update and extend information on medical radiation exposures, to permit examination of whether such exposures may be confounders of the atomic bomb dose-response risk estimates. Analyses will be begun.

A new round of clinical examinations of the Adult Health Study (AHS) subjects is underway, including the re-examination of >1,950 new examinees who were under the age of 10 years at the time of the bombings and the in utero subjects
(2) Activities for promotion of the health and welfare of study participants

The Adult Health Study (AHS) and the F1 clinical study contribute to the promotion of the health and welfare of A-bomb survivors and their children through regular health examinations and health consultation via telephone contacts or home visits. At the health examinations, physicians provide guidance for disease prevention to study participants, report examination results to their attending physicians, or refer them to medical institutions when more detailed examination or treatment is necessary. Continued support activities provided on occasions other than such medical examinations include health consultation by public health nurses, assistance for the elderly or physically challenged in their hospital visits, advice on application procedures involving government allowances for A-bomb survivors, and provision of information regarding governmental consultation services related to welfare benefits. In addition, educational brochures for health promotion are distributed to study participants on a regular basis.

(3) Research on biological mechanisms related to health effects from radiation among A-bomb survivors

FY2013 Plans

Several studies are being carried out regarding radiation effects on somatic cells and tissues.

- Since DNA damage that is unrepaired is a central feature of radiation-induced disease, a study is being conducted to identify unique protein or biochemical signatures of unrepairable DNA double strand breaks. Some have been identified in vitro, and a paper will be submitted for publication.

- It has become clear that not all the damage from toxicants that promotes cancer or other diseases is due to DNA alterations. Therefore a preliminary study is underway regarding radiation and epigenetic effects: DNA methylation and histone modifications.

- In utero exposure and chromosome abnormalities: Lymphocytes from fetal irradiation of atomic-bomb survivors or mice do not show dose-related chromosome translocations, but mammary-tissue cells do. Therefore, a study of translocation frequencies in fetally irradiated mouse thyroid epithelial cells is being undertaken to confirm the mammary tissue results. These studies have potential implications regarding the nature of health risks from in utero exposure.

- A variety of studies are being conducted of the mechanisms of cancer induction by radiation. Rearrangements of the RET/PTC and ALK genes are being studied in papillary thyroid cancers from irradiated study subjects, with confirmation using a transgenic mouse model. Microsatellite instability and chromosome instability in colorectal cancers are being studied in relation to radiation dose. Radiation-related changes in gene expression will be studied in non-small cell lung cancer specimens.

- Studies of genes related to immunologic function and DNA repair are being conducted to explore the connections between radiation and cancer or other diseases. These include studies of cancers in relation to radiation and genetic variants related to double-strand-break DNA repair, immunocompetence, and somatic gene mutability. Reports are expected on genetic variants as modifiers of radiation risk for stomach cancer and colon cancer. A study of diabetes in relation to radiation and HLA- or other immune-related genes will be analyzed.

- The study projects contained in a five-year international collaborative study (funded by the US NIAID) of the effects and mechanisms of radiation upon immune function are underway. Measurements will be completed on the project to compile measurements of a large number of plasma cytokines on AHS subjects, including longitudinal data measured 10 years apart, along with immunogenome data to construct an integrated index of immune competence in relation to radiation. The data from a study of how past A-bomb radiation exposure affects the adequacy of
the response to influenza vaccination will be analyzed and published. Measurements for set of mechanistic studies to determine radiation damage to hematopoietic stem cells and dendritic cells and the consequent effects on the numbers and function of various immune cells will be completed and manuscripts prepared.

- The A-bomb studies suggest that vascular diseases may be caused by radiation at moderate doses, at least doses on the order of half a Gy and upward. To help confirm whether this association is causal or an artifact, a study is nearly completed to irradiate SHRSP rats, a strain which is susceptible to hypertension and stroke, at doses of 4, 2 and 1 Gy compared with sham-irradiated controls. Outcomes include measurements of blood pressure and cytokine biomarkers, and a pathological evaluation of critical organs and tissues. Since those results were positive, funding was obtained to conduct an extended study with doses at 0.25, 0.5 and 0.75 Gy, and that study has begun.

2. Research projects on the health of A-bomb survivors’ children (F1)

(1) F1 mortality study and F1 clinical study

The epidemiologic F1 cohort (children of A-bomb survivors who were born during 1946-1984) includes about 77,000 study subjects, of whom 41,000 have parents who both have known doses. A clinical subcohort of about 12,000 F1 study subjects received health examinations during 2002-2006, and a longitudinal clinical follow-up of this subcohort was begun in 2010. An overlapping group of interest consists of over 1,000 F1 child and parent trios for whom we have cryopreserved blood cell specimens, which permits molecular genetic studies of trans-generational radiation effects.

FY2013 Plans

- Since the F1 epidemiologic cohort of 77,000 is still young and is only beginning to experience the diseases of mid- and late-life, a continued follow-up for 30 or more years is anticipated. A paper updating the mortality risk for an additional nine years will be completed, and analysis of an eight-year update of cancer incidence will be begun.

- We previously reported that radiation dose to fathers and mothers was not related to the risk of aggregated multifactorial diseases in the F1 generation based on our health examinations of about 12,000 F1 individuals. A manuscript is expected to be published on the relationship of radiation to F1 genetic effects on individual multi-factorial diseases or conditions, including diabetes, hypercholesterolemia, hypertension, stroke, angina pectoris, and myocardial infarction.

- The initial health examination study for multifactorial diseases in the clinical F1 cohort of about 12,000 children of A-bomb survivors has now been extended to become a longitudinal clinical study. The second four-year round of clinical examination begun in November 2010 is underway.

- We expect to begin a study of de novo chromosome aberrations in the F1 children of A-bomb survivors as an index of trans-generational genetic damage.

(2) Activities for promotion of health and welfare of F1 study participants

These activities are similar to the ones outlined for AHS study participants in Section 1.(2).

(3) Research on biological mechanisms related to the health of A-bomb survivors’ children

FY2013 Plans

- A proposal will be submitted for a study of the F1 offspring of A-bomb survivors using multicolor FISH (Fluorescent In Situ Hybridization) to detect chromosomal abnormalities: The objective of
the study is to investigate the genetic effects of A-bomb radiation by comparing the frequency of
children bearing chromosome abnormalities among the F1 offspring of highly-exposed and
unexposed parents.

♦ With a new genetically-modified mouse model, we are now able to see in situ germ-cell mutations
through expression of a mutant fluorescent protein (green fluorescent protein, GFP). Work will
begin on producing a GFP construct that can be used with a variety of genes, so that mutated
tumor oncogenes or tumor-suppressor genes can be studied in relation to radiation exposure.

♦ Two-dimensional DNA gel electrophoresis has been used to study genomic mutations in the
offspring of irradiated mice and rats. We will complete the molecular characterization of the
mutations identified and publish both the male mouse and female rat studies.

♦ A study estimating the radiation-induced mutation rate in F1 mice using a high-density CGH
microarray (>2 million probes) to detect de novo copy number variants (CNVs; genomic deletions
or duplications) is nearing completion. A paper on the results will be prepared.

♦ A-bomb genetic CGH study using an ultra-high density array of probes (1.4 million probes per
individual) to detect de novo genomic CNVs. The study, which is underway, will compare the
frequency of germline mutations in F1 subjects from highly-exposed and unexposed parents.

♦ Pilot study to detect F1 mutations using DNA sequencing technology. A pilot study using this
technology has been initiated and different bioinformatic platforms are being compared.

3. Research to elucidate individual radiation doses and the effects from atomic bombs

(1) Investigation of conditions required for dose estimates including survivor location, shielding
effects and organ dosimetry

FY2013 Plans (some of these will take several years to complete)

♦ Survivor location: Work has been completed under the RERF Dosimetry Committee to improve
survivor location information. New, more accurate, and more detailed maps of locations within
Hiroshima and Nagasaki have been completed, and LSS subject locations have been mapped onto
those locations with greater accuracy than was possible in the past. An electronic Geographic
Information System (GIS) is being used for this. Other aspects of the individual dosimetry
system (e.g., corrections for elevation and terrain shielding) are being updated.

♦ Improved organ dosimetry: Voxel-type phantoms will be used to improve existing organ doses and
provide estimates of doses to additional organs (e.g., heart, fetus, and teeth). It may also improve
dose estimates for partial body exposures such as those of Nagasaki factory workers who were
behind benches or other heavy equipment. Since this will require work by some external
consultants, we hope to obtain funding to begin this project in FY2013.

♦ Because residual radiation exposure from the A-bombs is a salient public issue, the Epidemiology
and Statistics departments will prepare a manuscript on potential LSS exposures to residual
radiation. From the limited and crude data available on early entry into the cities after the
bombing, uncertainty analyses will need to be conducted in linking those data to estimated
potential gamma doses from the neutron-activated soil near the hypocenters.

♦ The RERF data are sparse and not highly specific regarding exposures to radioactive fallout (in
“black rain”). However, because of high local interest in the fallout issue, a number of analyses
to determine if it accounts for observed health effects have been undertaken and will be
completed.

♦ The Genetics Department will conduct electron spin resonance (ESR) analyses of tooth enamel in
collaboration with the Statistics Department and Dr. A. Wieser (München) to estimate A-bomb
gamma-ray doses using correction factors for the posture of each survivor at the time of exposure
and the photon-energy dependence of the tooth enamel ESR.

- A manuscript will be submitted, in conjunction with a former RERF investigator (Dr. D. Pierce) and an expert biophysicist (Dr. A. Kellerer), to evaluate the range of uncertainties in the RBE (relative biological effectiveness) of neutron doses based on the data from atomic bomb survivors.

(2) Research on statistical methodology needed for risk analyses of atomic-bomb radiation

- Gain further understanding of sources and types of uncertainties in atomic-bomb radiation dosimetry and the impact of uncertainties on risk estimates, and develop ways to take these into account statistically. Several groups of external collaborators are approaching the issues in various ways that include using simulations and biodosimetric information. During 2013, we anticipate a first manuscript based on collaborative work with Dr. C.Y. Wang of the Fred Hutchinson Cancer Research Center that develops a semi-parametric, functional-analysis approach. Dr. Wang was awarded a US NIH grant for his collaborative work with us.

- Conduct methodological research on statistical modeling of intermediate risk factors and causal pathways, particularly in designs with complex sampling such as nested case-control and case-cohort designs for which statistical methodology is not available. A paper will be submitted on aspects of this.

- Because of the importance of risk assessment in relation to both radiation exposure and smoking, more sophisticated analyses will be conducted of the LSS radiation and smoking data in relation to lung cancer risk.

- Foster an inter-departmental working group on bioinformatics for high-dimensional data (e.g., proteomics, genomics) which the RERF basic science departments are increasingly generating and which require new forms of statistical analysis.

- In conjunction with the Data Management and Documentation Committee, the Statistics Department has begun to implement a procedure for effective documentation, storage, and retrieval of analytical datasets and analysis scripts. This will aid in the availability and transparency of RERF data.

- The Statistics Department will continue its primary role of providing high-quality statistical consulting and oversight on most of the research projects conducted at RERF. That will involve design and statistical power considerations and culminate with the analysis and interpretation of the data.

- Work will begin on an integrated biosample database that is fashioned for research needs as well as basic biosample management.

- To permit more efficient data management, various standalone electronic data servers will be consolidated onto virtual servers that simplify and further coordinate data management tasks.

4. Project to release research results and to collaborate with other scientific organizations

RERF will release research results regarding the association of radiation exposure with the health of A-bomb survivors and their children. In addition, with attention paid to the protection of personal information, the foundation will release to the extent possible the data used in the analysis of published study results to allow for third parties to engage in their own analysis.

Efforts also will be made to stimulate research activities through partnerships, collaborations, and other joint projects with domestic and international organizations and researchers working in the field of radiation effects.

(1) Collaborative research projects
FY2013 Plans

i) Research project on radiation-related immunity under contract with the U.S. National Institute of Allergy and Infectious Diseases (NIAID)

To define the effects of ionizing radiation on immunological function and elucidate underlying mechanisms, RERF initiated in September 2009 a five-year collaborative study with four Japanese and five U.S. institutions under a research contract with NIAID. This study aims to provide a wealth of fundamental biologic information on the impact of radiation on immunosenescence and on other health effects. During FY2013, the fourth year of the contract, data collection and measurements will be completed on all of the full-scale subprojects within this study, and analyses and papers will be initiated. This project involves collaboration with a number of Japanese and U.S. institutional investigators.

ii) Other ongoing international collaborative research projects

- Collaboration with the U.S. National Cancer Institute
  Site-specific cancer incidence studies (female breast, skin, thyroid, lung, ovary, lymphoid tissue, uterus, soft tissue/bone). Several collaborative papers will be published during FY2013 from those studies, and research activities and mutual feedback will continue in the future.

- Collaborative research programs in the areas of radiation epidemiology and statistics to increase opportunities for the foundation to recruit researchers in epidemiology and biostatistics to work at RERF. Studies are ongoing with Kurume University investigators.

iii) Facilitation of international collaborative studies. We currently have over 40 international collaborative studies ongoing. All the research departments at RERF are engaged in such studies. We anticipate that a number more collaborative studies will be developed during FY2013 and beyond as opportunities, ideas or needs develop.

5. Training programs for domestic and overseas specialists

RERF will hold a training seminar for non-epidemiologist radiation researchers to learn the basics of epidemiological research and increase understanding of radiation health risks. In addition, RERF will train persons capable of working in the fields of radiation protection, radiation emergency medical care, and radiobiological research.

Activity plans for this fiscal year

i) For biologists in Japan, RERF will hold an epidemiological training seminar again this year for enhanced understanding of results from epidemiology research on A-bomb survivors.

ii) RERF will accept overseas research trainees to support the activities of such organizations as the Hiroshima International Council for Health Care of the Radiation-exposed (HICARE), the Nagasaki Association for Hibakusha’s Medical Care (NASHIM), and the Japan International Cooperation Agency (JICA).

iii) RERF will accept overseas research trainees to support the collaborative activities between the International Atomic Energy Agency (IAEA) and HICARE.

iv) Besides the above activities, RERF will accept students from domestic and overseas schools/universities for facility tours, and will provide training sessions on the foundation’s research activities.

v) RERF will prepare some of the training materials to provide to IAEA for radiation protection specialists and other personnel.
6. Public information programs

RERF will provide radiation-related information to the public by explaining radiation and its effects in an understandable and easily accessible manner through educational support to classes for the general public and students, public seminars, the Open House event, and the provision of relevant information on the Internet and in the form of pamphlets. We will also respond to questions and inquiries submitted from within Japan and from overseas.

Activity plans for this fiscal year

i) RERF Open House event

RERF will hold its 19th and 17th Open House events in Hiroshima and Nagasaki, respectively. The event features various programs, including exhibitions, and lectures, and will be held in Hiroshima and Nagasaki on August 5-6 and August 8-9, respectively.

ii) RERF Public Lecture

RERF this year again will hold public lectures to provide the general public with an opportunity to enhance their understanding of the foundation’s research and to learn more about radiation’s health effects.

Dates: Hiroshima (undecided); Nagasaki (scheduled for July)

iii) Permanent exhibition at the Hiroshima and Nagasaki Laboratories

Our permanent exhibitions at the Hiroshima and Nagasaki Laboratories introduce the history of ABCC-RERF, the organization’s research activities, its domestic and overseas collaborative activities, and contributions RERF has made to society.

iv) Updating of public relations materials

RERF will update its various public relations materials. Specifically, “Basic Guide to Radiation and Health Sciences” and “A Brief Description” will be revised. A new leaflet introducing RERF’s activities will be created and distributed to schools and other organizations.

v) Enhanced RERF website

RERF will provide information on its research activities in a more prompt and readily understandable manner using its public website, by posting short commentaries of new papers and other such efforts. The existing Q&A section will be updated and systematized. Educational slides for the general public will be prepared and posted on the webpage.

vi) Other public relations activities

- RERF will actively promote the foundation’s important papers to the domestic and overseas media via press releases.
- RERF will organize forums for media representatives in Hiroshima and Nagasaki.
- RERF will develop a proactive collaboration system incorporating its professional and general staff in a unified manner.
- In terms of its facility tours, RERF will seek an approach that is less burdensome to the staff members in charge. Use of Facebook and Twitter will be investigated and introduction of such media will be considered.
- RERF will continue the joint lecture series with Hiroshima Jogakuin University launched last year.
II. Activities necessary for the above projects

1. System improvements incidental to enforcement of the Articles of Incorporation

In accordance with last fiscal year’s enforcement of the Articles of Incorporation as a public interest incorporated foundation, RERF will take the following actions this fiscal year as the foundation continues its efforts toward establishment of an improved operational structure.

(1) In conjunction with RERF’s change of status to a public interest incorporated foundation, the current regulations will continue to be reexamined and revised as necessary.

(2) Upon approval by the Board of Directors and the Board of Councilors of the activities report and settlement of accounts, the documents to be submitted on a periodic basis, including the activities report, balance sheet and Board of Councilors roster, will be submitted to the prime minister of Japan by June 30, 2013, in accordance with Article 9-4 of the Articles of Incorporation.

(3) Maintain documents (Articles of Incorporation, plans of activities, budget estimates, list of property, balance sheet, statement of changes in net assets, report of activities, and roster of officers) so that such documents are available upon request. Publicly report the RERF balance sheet. Both actions are required in terms of accountability and transparency required of a public-interest corporation.

2. Review of Secretariat reorganization necessary due to continued personnel reductions

Based on the 12th personnel reduction plan, which came into effect over a period of five years starting in FY2010, RERF is again facing a reduction of five employees in FY2013, with the expected number of general employees at the beginning of FY2013 decreasing to 173.8. Review of the Secretariat’s reorganization that started last year involving the abolishment of the current sections and the grouping together of similar duties in order to establish a structure befitting the employee numbers will be continued. In response to the interim report by the Working Group on Secretariat Reorganization in FY2012, a revision of regulations in conjunction with the changes made to the current job-rank system will be made, aiming to transition to a reorganized structure by the end of FY2013, with the Secretariat as the first section to introduce the new system.

3. Establishment of system involving Biosample Center

The Biosample Center, the establishment of which has been coordinated during the course of FY2012 by the Preparatory Committee for Establishment of Biosample Center, will be officially inaugurated on April 1, 2013, as a new in-house RERF body. The center will be staffed by one center director, two vice directors (one in Hiroshima and Nagasaki, respectively), two research scientists (one in Hiroshima and Nagasaki, respectively), 10 technical staff members (two full-time staff members and three staff members to be assigned on a concurrent part-time basis in Hiroshima, as well as five staff members to be assigned on a concurrent part-time basis in Nagasaki), and two administrative staff members to be assigned on a concurrent part-time basis. During FY2013, the necessary preparatory work will be conducted for complete transfer to the center of biosamples currently in the custody of the individual research departments by the end of FY2014. One center facility will be located each in Hiroshima and Nagasaki. In Hiroshima, the entire first floor of Building G will ultimately be converted into space for the center. During FY2013, about 32.9 million yen will be appropriated to the electrical work and remodeling of the area to be used for installation of deep freezers and liquid nitrogen tanks, as well as the center office. During FY2013, the center staff, while assisting the ongoing duties related to biosample storage in the research departments, will engage in preparatory work for transfer to the center of biosamples and related duties, such as construction of center database systems and creation of various forms and documents for efficient transfer of biosamples among departments as well as between departments and the center, with the aim of achieving full-scale operations in FY2014.
4. Update of information processing system

In FY2011, the Information System Review Task Force was established based on the system analysis and assessment reported by an outside specialist firm in FY2010. This task force assessed the current status of each department and will report its review results to the Scientific Advisory Committee in March 2013. Efforts for improvement will continue, such as downsizing of the information-processing environment based on use of virtual servers and other such devices, documentation of program specifications, enhancement of security countermeasures, and replacement of internal network cables.

5. Facility upgrades

(1) Renovation of the first floor of Building G (about 83 m²), the floor currently used by the Supply and Property Section, into space for installing deep freezers and liquid nitrogen tanks is scheduled at the Hiroshima Laboratory in conjunction with establishment of the Biosample Center. Preceding the above renovation, remodeling of the vacant space on the second floor of Building G, to which the Supply and Property Section will be relocated, is necessary (1.2 million yen).

(2) The service life of the devices for cubicle-type high-voltage power-receiving units installed on the roof of the Nagasaki Laboratory has passed. The first and second stages of the four-stage construction plan were implemented in February 2010, and the third and fourth stages are scheduled for FY2013. The construction costs are about 9 million yen, for which RERF is expected to bear about 4.5 million yen after splitting the costs with the Nagasaki Prefectural Educational Association. The Nagasaki Laboratory has three emergency power generators, and one of them, installed in February 2008, is used as the main generator (150 KVA) and the other two as backup generators (95 KVA and 38 KVA). This fiscal year, the 38 KVA generator will be upgraded to a larger power generation capacity of 95 KVA. This upgrade will be able to cover the electricity required over the next ten years for 20 deep freezers, on the assumption that the number of freezers will increase by two units every year. The necessary costs for the generator upgrade are estimated to be about 13 million yen.

6. Introduction of comprehensive software package

There are literally hundreds of programs being run in the Secretariat, many set up independently from one another. These programs, most of which were developed internally by RERF’s ITD, have been in use for years at the General Affairs, Personnel, Accounting, and Supply & Property Sections. Many are designed to perform a single, sometimes very minute, task only and were developed by ITD staff individually. These programs are not only inefficient but risky in that only specific ITD members know the details of such programs. They also require continual support from ITD whenever changes are required to reflect the needs of the Secretariat.

Considering the continuing personnel reduction and stagnation in new hires, the Secretariat reorganization and streamlining of administrative work are crucial. Several systems involving all relevant sections therefore need to be improved. Replacement of the payroll system should be reviewed especially because a considerable amount of time has passed since its initial development. In addition, many problems exist in transferring data to the preparation of financial statements using the software related to the Accounting and Supply & Property Sections.

We are and will continue to review the introduction of a comprehensive commercial software package that can be used throughout the Secretariat, allowing us to link data and streamline all administrative work to the extent allowed by the new software, should we ultimately decide to purchase it.