

Guidelines for applying to the “Project of Decommissioning and Contaminated Water Management (Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures)” in the FY2014 Supplementary Budget

Date: June 23, 2015

Management Office for the Project of Decommissioning
and Contaminated Water Management

The Management Office for the Project of Decommissioning and Contaminated Water Management (hereinafter called “PMO”) solicits entities to implement with subsidies the "Subsidy Project of Decommissioning and Contaminated Water Management (Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures)" in the FY2014 Supplementary Budget. Details of the project are stipulated in these Guidelines; furthermore, the procedures for implementation of the project are stipulated in the “Grant Policy for Subsidy for the Project of Decommissioning and Contaminated Water Management.”

1. Purpose of Project

In this project, the projects which will support development of technologies contributing to decommissioning and contaminated water management of Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company will be conducted based upon the “Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station” (hereinafter called “Mid-and-Long-Term Roadmap”), so that the decommissioning and contaminated water management of Fukushima Daiichi Nuclear Power Station can be implemented smoothly and the level of science and technology in Japan can be enhanced.

2. Contents of Project

In order to retrieve fuel debris and internal structures in the process of decommissioning of Fukushima Daiichi Nuclear Power Station, the following projects were implemented last year:

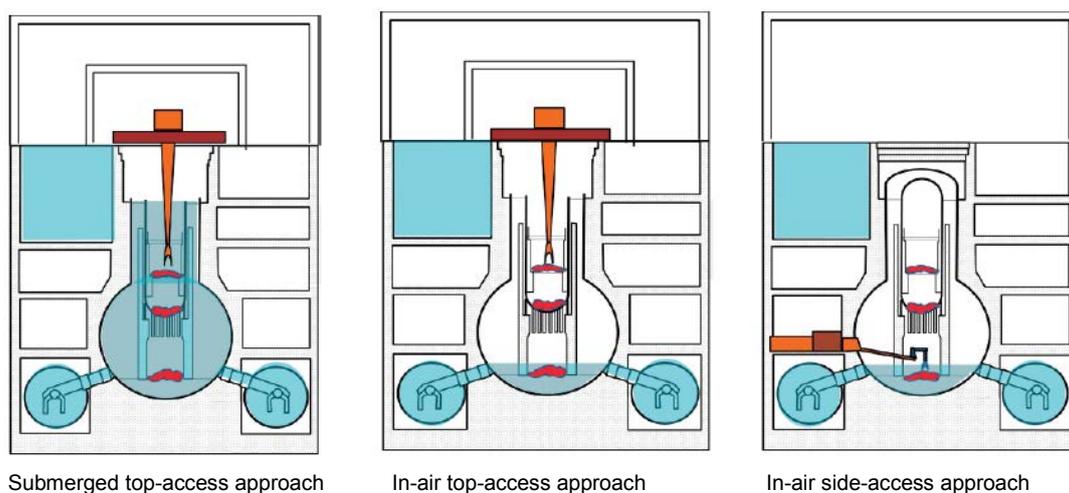
(1) Development of technology for retrieval of fuel debris and internal structures mainly focusing on the technology deploying submerged approach;

(2) Conceptual study of innovative approach for fuel debris retrieval and feasibility study including the approach deployed in air; and

(3) Consideration of feasibility of the elemental technologies supporting the above-mentioned item (2) (cutting and dust collection technology, as well as visual imaging technology and measurement technology).

The Mid-and-Long-Term Roadmap stipulates that fuel debris retrieval approaches of each unit will

be determined in around two years. In consideration of this schedule and based upon “Plan of technical strategy for decommissioning of TEPCO’s Fukushima Daiichi Nuclear Power Station - toward Mid-and-Long-Term Roadmap 2015” (hereinafter called “Strategy plan”) by the Nuclear Damage Compensation Facilitation Corporation (NDF), in this project development and evaluation of constituent technology elements necessary for evaluation of feasibility of each approach will be conducted for the following three approaches, i.e. the submerged top-access approach, the in-air top-access approach and the in-air side-access approach as fuel debris retrieval approaches (Refer to Figure 1).



Source: “Plan of technical strategy for decommissioning of TEPCO’s Fukushima Daiichi Nuclear Power Station - toward Mid-and-Long-Term Roadmap 2015” by the Nuclear Damage Compensation Facilitation Corporation (NDF), April 30, 2015

Figure 1: Outline of approaches of fuel debris retrieval

In implementing this project, it is necessary to evaluate the feasibility of each retrieval approach as a system; at the same time, constituent technology elements of each approach must be tested and demonstrated based upon technology proposals broadly from domestic and overseas countries. Therefore, with regard to the constituent technology elements of each approach, they will be selected through solicitation of various proposals including the ones offered by entities of partial proposals of this project. Furthermore, the entity of comprehensive proposal will be required to analyze and evaluate the results of each constituent elements test from the viewpoint of adoptability to each approach and feasibility of technologies constituent of the approach.

In principle, entity of comprehensive proposal must implement all constituent technology elements test stipulated in i) through vii) of (2). Entities of partial proposal are to implement one or some of the constituent technology elements test stipulated in i) through vii) of (2) (Refer to Table 1).

Table 1 Project Scope

	Project Scope	Cooperation between entities*
Entity of comprehensive proposal	<ul style="list-style-type: none"> ▪ As a general rule, to implement the items, (1), (2) and (4); ▪ However, it is acceptable to implement some parts of vii) in item (2) ▪ Item (3) applies commonly to all of the entities . 	<ul style="list-style-type: none"> ▪ At the commencement of the project, establish a comprehensive plan (of development conditions and development target) including constituent elements conducted by entities of partial proposal ▪ To organize results of entire composing elements including the results from entities of partial proposal as a compilation of test results
Entity of partial proposal	<ul style="list-style-type: none"> ▪ To implement one composing element of item (2); and ▪ To implement [3] through [10] of item (4) ▪ Item (3) applies commonly to all of the entities 	<ul style="list-style-type: none"> ▪ To cooperate with entity of comprehensive proposal in establishment of the comprehensive plan, in reporting of interim results and in reporting of the comprehensive results by entity of comprehensive proposal, such as sharing information on their own plan of constituent elements test and its results, etc. ▪ To discuss the adoptability of future constituent technology with entity of comprehensive proposal (including technical matching, dealing with commercial issues and IP), and report the result in conformity with the comprehensive consideration

*The PMO will coordinate and support the cooperation, if needed.

(1) Comprehensive coordination of each constituent elements tests and analysis of their results

Entity of comprehensive proposal must comprehensively coordinate each constituent element test including the ones done by entities of partial proposal taking account of the Mid-and-Long-Term Roadmap and the Strategy plan, the up-to-situation of each unit and needs to technology development, the steps defined in (3), etc. Furthermore, they must evaluate the results of each constituent element test for each approach for the purpose of judgment of adoptability to each approach and feasibility of technologies constituent of the approach, etc.

(2) Elements tests necessary for judgment of feasibility of an approach

In order to acquire necessary data and information for evaluation of feasibility of each approach for

fuel debris retrieval, the following elements tests must be conducted for submerged top-access approach, in-air top-access approach and in-air side-access approach.

- i) Technology for prevention of contamination spread in retrieving large structures (Technical specifications are described in Exhibit 1.)

The following element test will be conducted to prevent dispersion of radioactive dust including that attached to equipment surfaces in retrieval of large structures, as a part of retrieval of fuel debris.

- ① Scale model test on each operation step to confirm the technology for prevention of contamination spread

In the in-air top-access approach, a one-fourth scale test must be conducted on each operation step in order to confirm effects of technology for prevention of contamination spread.

- ii) Technology for prevention of contamination spread in retrieving fuel debris inside of RPV (Technical Specifications are described in Exhibit 2.)

The following element test will be conducted to prevent dispersion of radioactive dust in fuel debris retrieval inside of the RPV.

- ① Test of seals inside of and lower side of RPV for an access device in RPV for the in-air top-access approach

If fuel debris will be retrieved from the top, the lifting height of the access device from the operating floor to the bottom of the pedestal must be around 40 m. Furthermore, the function of prevention and barrier of dispersion of radioactive dust, etc. produced in fuel debris retrieval activities will be necessary. Hence partial mock-up tests for these elements must be conducted on a full scale.

- iii) Access technology to fuel debris (Technical Specifications are described in Exhibit 3.)

The following element test will be conducted as a test for access technology to fuel debris.

- ① Test on hydraulic manipulators

Characteristics test for placing control of hydraulic manipulators must be conducted, so that elementary data for design of fuel debris retrieval manipulator can be acquired.

- ② Test on access device in RPV for submersion approach

In order to retrieve fuel debris and internal structures in RPV deploying submerged approach, it is effective to set a platform to install, operate, and maintain processing equipment, manipulators, etc. The platform needs to have a supporting function against reaction force in conducting processing, etc. in RPV. Hence an access device which has the necessary supporting function must be developed.

- ③ Test on access device installed inside of pedestal in the in-air side-access approach

Robot arms and access rails for access to the inside of pedestal from the side of PCV must be developed.

- iv) Remote operation technology for fuel debris retrieval (Technical specifications are described in Exhibit 4.)

The following element test will be conducted as a test of remote operation technology for fuel debris retrieval.

- ① Test on flexible arms for remote operation

Flexible arms for remote operation must be developed with the assumption that it would be applied to remove pipes and equipment left at the bottom of PCV, which could interfere in the side-access approach.

- ② Test on handling device of fuel debris storage cans

For the top-access approach, elementary design of equipment dealing with fuel debris storage cans must be conducted; and elements tests of the mechanism (such as mechanism of opening and closing of the top cover) must be conducted.

- v) Technology for prevention of contamination spread for fuel debris retrieval (Technical specifications are described in Exhibit 5.)

The following element test must be conducted as a test of contamination spread prevention technology in fuel debris and internal structures retrieval.

- ① Test on platform/cell in the submersion approach

In retrieval of fuel debris and internal structures, the activities must be conducted while maintaining function of radiation barrier from RPV and contamination spread prevention function of radioactive substances. At present, barrier function is mainly maintained by shield plugs, and contamination spread prevention function is maintained by PCVs. In the process of retrieval activities in the submerged approach, these structures are planned to be removed or partly removed; therefore equipment replacing these functions will be necessary. For this purpose, the method using cells, which have barrier function and contamination spread prevention function by water installed at the top of RPV, and where retrieval activities can be done, must be developed.

- ② Test on PCV welding equipment for welding seals with remote operation in the in-air side-access approach

In accessing debris from the side of the PCV, it is necessary to make an opening there. In construction of a boundary between the PCV wall and the opening, the activities must be done with remote operation in a high-radiation environment; hence this equipment must be developed and validated in an early phase.

- iv) Dose reduction technology for retrieval of fuel debris (Technical specifications are described

in Exhibit 6.)

The following element test must be conducted as a test of dose reduction technology in fuel debris retrieval.

① Test on light-weight shielding whose shape is flexible deployed in the top-access approach

In the top-access approach, shielding whose weight can be light when it is not used and to which barrier function is easily added, and shielding which can flexibly change the places where it is used in accordance with the activity step of the approach must be developed and designed; and confirmation of its feasibility using a prototype must be conducted.

vii) Cutting and dust gathering technology as well as visual imaging technology and measurement technology in fuel debris retrieval

As tests of cutting and dust gathering technology as well as visual imaging technology and measurement technology in fuel debris retrieval, the following element test must be implemented.

① Performance test of fuel debris cutting and dust gathering technology

Implement cutting performance tests for the methods, which already have been applied to tests using blended material of ceramics, metal and concrete simulating fuel debris, and therefore have information on their cutting performance. If performance evaluation using common test pieces will be done for similar cutting methods, the entity of comprehensive proposal must offer the pieces. Dust gathering tests will be conducted after evaluation and confirmation (Refer to (3)) of the cutting tests by concerned organizations.

② Performance test of visual imaging technology and measurement technology

Constituent elements tests for improvement of ultimate capacity of radiation resistance by irradiation tests, for improvement of visual imaging and measurement performance, etc. must be conducted. The target technology is supposed to have radiation resistance of higher than 10 kGy/hr and accumulated dose of around 2 MGy, and have practical visual and measurement ability in RPV and PCV when it is applied to the fuel debris retrieval.

(3) How to conduct each constituent elements test, etc.

With regard to implementation of constituent elements tests in (2), the following consideration must be given. The constituent elements tests done by the entity of comprehensive proposal and ones by the entities of partial proposal must be implemented under the equal-footing development conditions and development targets. The tests must be conducted in accordance with the up-to-date on-site situation and needs for technology development of each unit. The tests must be conducted in accordance with the Mid-and-Long-Term Roadmap and the Strategy plan. Taking account of the above, the constituent elements tests are to be implemented according to the check and review procedure which the relevant organizations apply in review and confirmation of the important

progress of the steps*.

The actual steps of this project are as following (Refer to Figure 2):

- Establishment of development conditions and development targets by the entity of comprehensive proposal for each constituent elements test
- Establishment of draft constituent elements test plans by each entity
- Comprehensive coordination of draft constituent elements test plans
- Production of test equipment for constituent elements tests and implementation of the tests**
- Compiling of interim results of each constituent elements test
- Review and confirmation by the relevant organizations for decision making on moving forward to the next phase of each constituent elements test
- Results analysis of each constituent elements test
- Review and confirmation by the relevant organizations of compilation of results analysis of each constituent technology and of adoptability of each constituent technology for each approach, etc.

Additionally, in the process of evaluation and confirmation by the review committee and the concerning organizations, they might establish alternative options, reconsideration of the conditions, etc.

*The Nuclear Damage Compensation Facilitation Corporation (NDF) will form opinions on such subjects as the development conditions and development target, specifications of test and judgments of moving forward to the next phase, in consultation with METI/ANRE, TEPCO and if necessary, experts.

**It is expected that production of test equipment, implementation of tests, etc. will be conducted by gathering domestic and overseas best available technology and knowledge. For this purpose, implementing entities are to conduct procurement procedures through public bids in a planned way with enough time; and from the viewpoint of transparency and accountability, the information must be released through the entities' website and linked to the PMO's website, so that the information can be broadly disseminated.

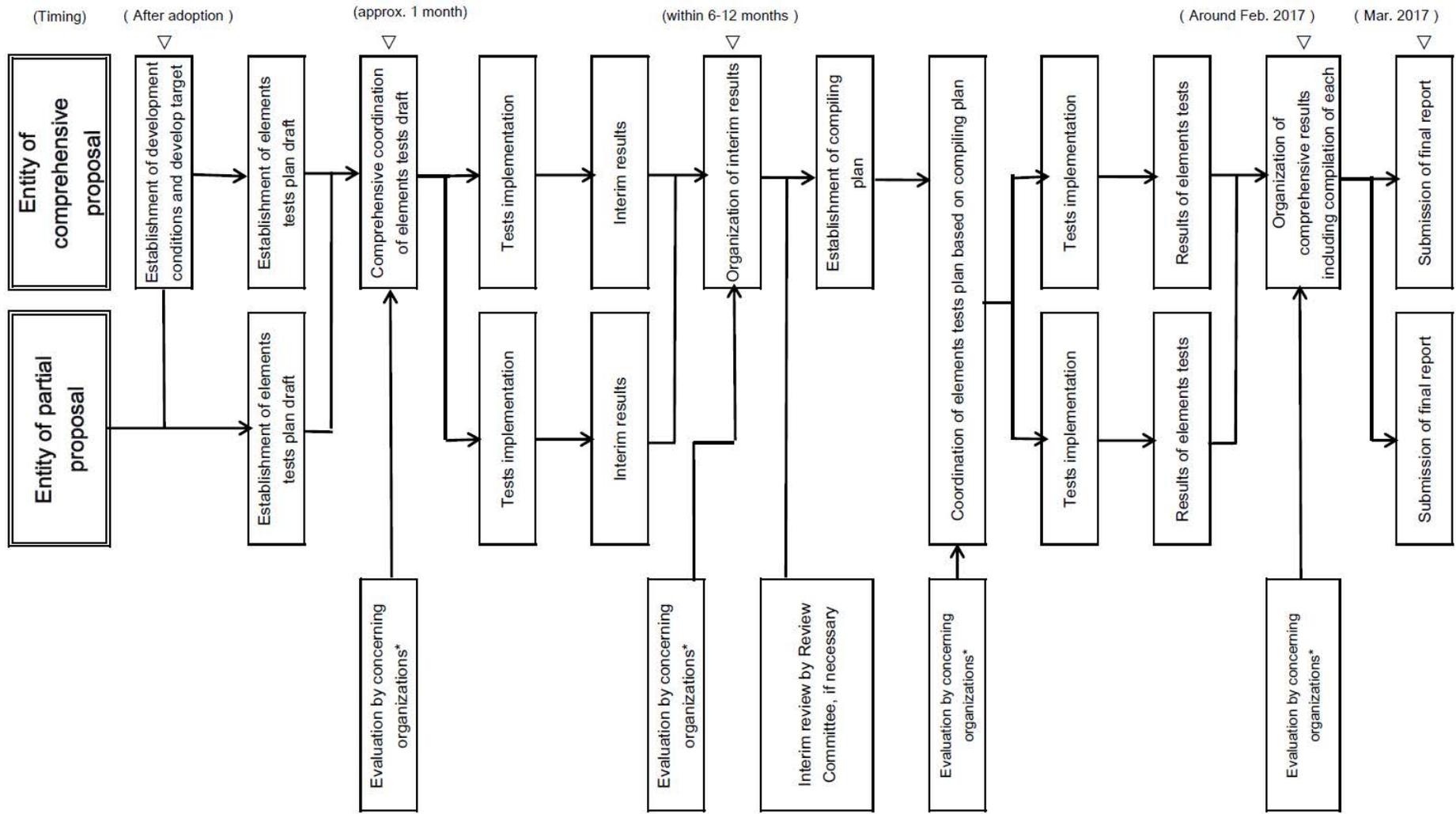


Figure 2 Schedule of subsidized project

(4) Operation of research and development

[1] Human resource development in the middle and long term

Entity of comprehensive proposal must make efforts to strengthen the relationship with universities, research organizations, etc. through implementing joint research, etc. from the viewpoint of human resource development in the middle and long term.

[2] Gathering domestic and overseas wisdom

Entity of comprehensive proposal must conduct projects by utilizing domestic and overseas wisdom. In particular, they must consider introduction of necessary technologies and knowledge both from domestic and overseas countries broadly. In case of development of machines and equipment, establishment of common basis of the machines and equipment (utilization of widely used goods and goods which have already been developed, etc.) must be taken into account as much as possible in order to promote reasonable development. Furthermore, in the development of evaluation method, it is important to be validated and reviewed objectively by third parties such as academic societies, etc. Hence, such validation and review must distinctively be placed in the development plan or be set as a milestone.

[3] Clarification of tests conditions and specifications for development

Consideration of requirement level necessary for implementing decommissioning activities must be done before commencement of elements tests and equipment design; furthermore, evaluation of to what extent existing technologies can be utilized must be done as quantitatively as possible. Based upon these, information on the target of the degree of the tests and equipment development compared to the requirement level must be shared with concerned parties, and the test conditions and design specifications must be established.

[4] Definition of criterion for judgment of degree of objective achievement

Comprehensible criterion which can be a measure for the judgment of objective achievement of the project must be defined using numerical values, etc. Furthermore, it must be validated whether or not the objective will have been achieved at the completion of the project.

Table 2 Definition of Technology Readiness Level (TRL)

Level	Definition corresponding to fuel debris retrieval	Phase
7	At the stage of completion of practical utilization	Practical use
6	At the stage of being demonstrated in the field	Field demonstration
5	At the stage of production of prototype with the scale of practical use, and demonstration in a simulated environment such as in a factory, etc.	Demonstration of simulation
4	At the stage of implementation of function tests at the level of trial production as a process of development and engineering	Research for practical use

3	At the stage of proceeding with development or engineering using application or combination of existing experiences. Or at the stage of proceeding with development or engineering based upon elementary data in the area with lack of existing experiences.	Application research
2	At the stage of proceeding with development or engineering in the area nearly without applicable existing experiences, and with setting up the specifications.	Application research
1	At the stage of clarifying elementary contents regarding development or engineering.	Elementary research

[5] Cooperation with decommissioning activities and other research and development

Clarify how results could contribute to decommissioning activities and other research and development, and positively cooperate with other organizations. At the commencement of the project, input/output information must be coordinated with other projects, comprehensive proposals and partial proposals among entities in a timely manner; and it must be shared with PMO and the concerned organizations (Reference Document 1). Furthermore, information on implementation of the project (such as progress situation, acquired data, challenges, etc.) must be shared with and offered to PMO and the concerned organizations in a timely manner. PMO will conduct the necessary coordination.

[6] Research management

A flexible scheme must be established so that it can reflect the results of discussion regarding the Mid-and-Long-Term Roadmap, meetings of Secretariat of the Team for Decommissioning and Contaminated Water Countermeasures Cabinet Office, NDF, etc. In implementing the project, the fact that the target of this project has been set to accomplish other prioritized goals must always be taken into consideration.

[7] Work management at Fukushima Daiichi Nuclear Power Station, etc.

If you plan to implement some activities such as on-site investigation or demonstration tests at Fukushima Daiichi Nuclear Power Station, etc., you have to negotiate sufficiently with TEPCO beforehand; and constitute a management scheme in accordance with the negotiation and based upon the understanding obtained through the negotiation which you have to observe and take heed of, so that adequate safety measures can be implemented.

[8] Progress report

Report implementation plan, progress situation, project results, etc. to PMO in response to the request by using implementation schedule, etc. (Reference Document 2) After completion of the project, results report must be established and submitted.

[9] Enhancement of outreach

Comprehensible explanation to the public regarding the project contents and results must be enhanced.

[10] Preparation of other options

Alternative options must be prepared for the case that the project cannot be proceeded with

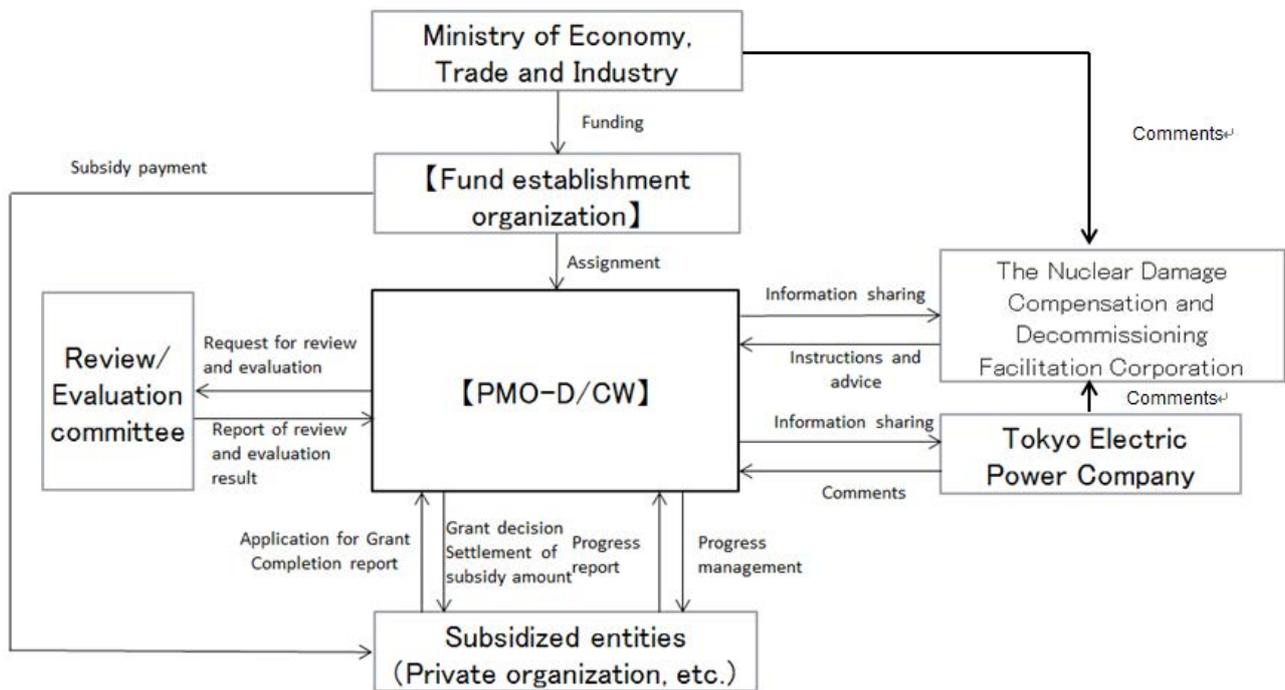
as planned during the project term. If the alternative options are prepared or revised, the information must be notified to PMO.

3. Project term

Starting on the day of grant decision and terminated on March 31, 2017

The research and development are supposed to be continued until the Fiscal Year 2016. If you participate in this project as an entity of partial proposal, you have to submit a grant application the contents of which are until the interim results and implement your project accordingly; and based upon the evaluation and confirmation of your interim results by the concerned organizations and interim review which will be conducted if necessary, it will be judged whether or not you can move forward to the step of the next step of production of tests equipment and tests implementation. Further continuation of the projects after the FY 2017 shall be judged in consideration of the results of the projects, budgetary situation of Government, etc. comprehensively.

4. Implementing Scheme



5. Application Requirements

The private companies, etc. satisfying all of requirements (1) to (8) shown below are qualified to apply for the subsidies. Applications from consortia are also acceptable. In that case, a managing legal entity must be appointed out of each consortium and submit the project proposal. (Please note that no managing legal entity may recommit the entire work to another legal entity.)

- (1) Possessing the organization for properly conducting the relevant subsidized project.
- (2) Having the capacity, knowledge and experience required for conducting the relevant subsidized project.
- (3) Having the management foundation required for smoothly conducting the relevant subsidized project and sufficient ability to control the funds and other resources.
- (4) Being able to follow the appropriate accounting procedures in accordance with the “Grant Policy for Subsidy for the Project of Decommissioning and Contaminated Water Management” and “Subsidized Project Administration Manual”. With regard to overseas entities, being able to prepare the evidenced documents in Japanese or English, and present them in Japanese territory on demand from the PMO.
<http://en.dccc-program.jp/files/20150623man.pdf>
- (5) Not foreseen to be subject to Articles 70 and 71 of the Cabinet Order concerning the Budget, Auditing and Accounting.
- (6) Not fulfilling any of the conditions stipulated in the “Guidelines for the suspension of subsidies controlled by the Ministry of Economy, Trade and Industry and the suspension of designation relating to the contracts”.(January 29, 2003, No 1)First column, the second items in Attachment
- (7) Admitting that the results obtained through this project can be utilized by TEPCO, etc. if they request to do so under the condition that each party is in agreement. Not preventing the utilization by behaviors such as not allowing to use the technology intentionally, asking for unreasonable compensation, etc. in spite of receiving the request.
- (8) In order to make sure of the above-mentioned item, preventing a situation where the results from this project are not be able to be utilized for measures for decommissioning and contaminated water management at the Fukushima Daiichi NPS by ceding the above-mentioned condition in (7) to the successor if the applicant hands over the result to a third party and loses their own right to utilize it accordingly. In the case of a conflict which makes the applicant unable to make sure of the items in (7), the concerned parties must solve it by their own responsibility.

6. Requirement Conditions for Grant Decision

- (1) Number of proposals to be adopted : More than one
- (2) Subsidy rate and amount

Settled amount calculated in JPY

Comprehensive proposal:

Upper limit: 4,000,000,000 JPY (Project budget: 4,000,000,000 JPY)

Partial proposal:

Upper limit: 500,000,000 JPY (Project budget: 500,000,000 JPY)

The contents of the project, amount of the subsidy, etc. will ultimately be settled only after

coordination with PMO.

(3) Time of Payment

In principle, the subsidies are paid after the project is completed.

*Please note that cases where the payment (i.e. the payment by estimate) before the completion of the project is permitted are limited.

(4) Confirmation of the amount of payment

The amount to be paid is decided based on the result report which is submitted by the operating entities after the project is complete as well as the results of the survey at the verification site and/or the office.

The amount to be paid will be the total of the expenses to be covered by the subsidies, which do not exceed the granted subsidy amount. For this reason, the account ledgers, receipts and other documents are necessary for supporting all the expenses. All the expenses will be strictly inspected and the expenses are strictly evaluated. Thus, the expenses not meeting the conditions mentioned above may be rejected.

7. Application Procedure

(1) Application Period

Commencement: Tuesday, June 23, 2015

Deadline: Midday of Tuesday, July 21, 2015

We will not accept any proposals after this deadline.

(2) Information Session

Tuesday, June 30, 2015 14:00 – 16:30

Venue: TKP GardenCity Nagatacho (Tokyo Hirakawacho Building, 13-12, Hirakawacho 2-chome Chiyoda-ku, Tokyo)

<http://www.kashikaigishitsu.net/facilitys/gc-nagatacho/access/>

If you would like to attend the session, please inform the contact point written in “12. Contact” by 17:00 on Monday, June 29 via email.

When making contact, please title your e-mail “Register for attendance to the information session for ‘Project of Decommissioning and Contaminated Water Management’ in the FY2014 Supplementary Budget” and include the “corporate or organization name,” “name of the attendee,” “department,” “phone number,” “fax number,” and “e-mail address” in the main text.

Please note that the capacity of the venue is limited.

(3) Application form and other documents to be submitted

[1] Please submit the following documents as one file. Please title your file “Application for the subsidy program ‘Project of Decommissioning and Contaminated Water Management (Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures)’.

- Application form (Form 1)

- Outline of Subsidy Project (Form 2)
- Certificate of Conformance (Form 3)
- Input/Output information (Form 4)
- Other documents
 - Outline of Corporation or Organization (such as brochure, etc.)
 - The financial results, and statement of revenues and expenses (for the last year)
 - The articles of association or the act of endowment
 - Other supporting documents

* In the case of hand-carry or mail, you must prepare 15 copies of the application documents using A4 paper. You can describe them in Japanese or English. Besides the hard copies, you must submit a CD ROM saving the electronic data of the application documents. As a general rule, the file format must be Ichitaro, MS-Word, MS-PowerPoint or MS-Excel. If you have unavoidable reasons not to be able to use these formats, please contact us.

If your proposal is adopted, there is a possibility that Input/Output information will be released to other entities.

[2] All the application documents submitted will not be used for any purpose other than the evaluation in the course of the selection process. Please note that the application documents submitted will not be returned. We take the utmost care to preserve confidentiality. However, if your proposal is adopted, the information except the non-disclosure information (i.e. the personal information, the information detrimental to the legitimate interests of legal entities) may be disclosed under the “Act on Access to Information held by Administrative Organs” (Act No. 42 enacted on May 14, 1999).

[3] The costs spent for issuing the application documents and other documents will not be included in the expenses. Also, the costs spent for issuing those documents will not be compensated for regardless of whether the proposal is adopted or not.

[4] The matters described in your proposal are considered to be the fundamental policies which should be observed during the project. Consequently, please be sure to describe only the matters which are feasible within the budget. Also, please note that even if your proposal is adopted, it may be rejected later on if you make a significant change to it at your discretion.

(4) Place of submission

The application documents must be delivered to the following address via hand-carry, mail or email, etc.

Toranomon Toyo Bldg. 8th Floor
 4-2, Toranomom 1-chome, Minato-ku,
 Tokyo 105-0001, JAPAN
 Contact: Mr. Nakajima, Mr. Ashida and Mr. Tsukada
 Email address for submission: dr-apply-al@mri.co.jp

- * Please DO NOT send the application documents via fax. Incomplete documents will be rejected and not subject to evaluation. Therefore, please carefully read and follow the procedures for application to correctly fill out the documents.
- * Any application documents submitted after the closing date will not be accepted. If you send the documents by postal mail, they may not be delivered by the designated time on the closing date. Consequently, you are advised to mail them sufficiently ahead of the closing date.

8. Evaluation and Adoption

(1) Method of Evaluation

Applications will firstly be evaluated through paper screening, so that the applicants for the presentation to the review committee can be selected. Depending on the capacity of the venue, the number of the participants to the presentation may be restricted. Furthermore, hearings and on-site investigation may be conducted as required; and submission of additional documents may be requested.

(2) Evaluation Criteria

Applications are to be comprehensively evaluated based upon the following criteria. However, the applications which have been judged not to meet the criterion [3] and [4] shall be disqualified regardless of evaluation of the other criteria.

[1] Project purpose, details and implementation method

Whether or not the Project purpose corresponds to the project purpose described in the “Guidelines for applying” is to be evaluated.

Whether the details of the project are consistent with the project purpose and described in detail or not is to be evaluated.

Whether the implementation method of the project is consistent with the purpose and details of the project is to be evaluated.

[2] Project implementation schedule

Whether or not the project implementation plan (timeline) is appropriate to the purpose and details of the project, etc. is to be evaluated.

[3] Project Implementation Scheme

Project implementation scheme, specialty as an organization, expertise of engaged employees, experiences of similar projects, etc. are to be evaluated.

[4] Project Cost

Whether or not project costs are appropriately allocated to the project purpose and contents, etc. is to be evaluated.

[5] Financial basis and Management System for Implementation of Project

Whether or not the applicant organization has a financial basis and management system enabling them to implement the project is to be evaluated.

[6] Technical Contents

Whether or not the technical contents proposed are consistent with the technical specification, etc. is to be evaluated.

(3) Decision and Announcement of Results

PMO will release the adopted entities on our website. The adopted entities will be notified of the result.

9. Granting of Subsidy

The project shall be initiated after the adopted entity submits a grant application for the subsidy to PMO and PMO has sent a notice of grant in return.

It should be noted that there may be changes in the details, composition and scale of the project as well as its budget between the determination of adoption and grant, as a result of consultation with the PMO. Also, please be aware that the subsidy may not be granted if the granting requirements are not met.

Although subsidized project operating entities may be provided with information required to implement the project after the determination of grant, they may be requested to observe the confidentiality depending on the nature of the information.

10. Allocation of Expenses

(1) Classification of Expenses Covered by Subsidy

The expenses covered by the subsidy shall be those directly required for the implementation of the project. The specific items are listed below.

Items of Expense	Description
Labor Costs	Expenses for personnel required to implement the subsidized project.
Operating Costs	Expenses for raw materials, consumables, design/fabrication/processing, facility/equipment, goods purchase, research, outsourcing, travel, remunerations, rent/depreciation and other necessities.

(2) Expenses not to be Included in Expenses Covered by Subsidy

- Office supply equipment (furniture such as desks, chairs and bookshelves, office machinery and so forth) with which the applicants should already be provided when considering the nature of the project.
- Expenses for handling accidents and disasters that occurred during the project. (However, cancellation fees incurred by reasons not attributable to subsidized project operating entities may be directly included as an expense. Please consult the person in charge on this matter.)
- Expenses unrelated to the project

(3) Exclusion of Consumption Tax from Expenses Covered by Subsidy

If general and local consumption taxes (hereafter referred to as “consumption tax”) are included in the subsidy amount, the applicants shall be requested to submit a report after the settlement of tax amount, according to the granting guidelines.

This is so specified as to demand, at the time of filing an income tax return, that subsidized project operating entities should report and return the amount to which the subsidy has been applied, out of the amount of deduction for taxable purchase, so that the amount for which the subsidy has been allocated out of the amount of deduction for taxable purchase shall not be detained.

However, because the report mentioned above is based on an income tax return that will be filed after the settlement of the subsidy, occasional delinquency in reporting due to lapse of memory has been found. Also, in order to avoid the complicated office procedures that need to be followed by subsidized project operating entities, the consumption tax shall be handled as follows.

When determining the amount of subsidy applied for in the grant application, the consumption tax must be excluded from the expenses covered by the subsidy before calculating the subsidy amount and submitting the application.

However, to avoid hindrance to the implementation of the subsidized project, such subsidized project operating entities as those listed below shall be permitted to include the consumption tax in the expenses covered by the subsidy when calculating the amount of subsidy.

- [1] Subsidized project operating entities who are not classified as taxpayers under the Consumption Tax Act
- [2] Subsidized project operating entities who are tax-exempt business entities
- [3] Subsidized project operating entities who are business providers subject to simplified tax
- [4] National or local governments (limited to cases when project is conducted with a special account), or subsidized project operating entities who are corporations listed in the attached Table 3.
- [5] Subsidized project operating entities who are using the general account of a national or local government
- [6] Subsidized project operating entities who are taxable business providers that choose a refund of consumption tax, following confirmation of consumption tax and purchase tax deductions, for instance due to a low amount of taxable sales

11. Miscellaneous

- (1) Any expenses incurred before the date when the decision on grant of the subsidy is made (including expenses for order placement) shall not be covered by the subsidy program.
- (2) In the event that the subsidized project operating entity desires to make a purchase or other contract related to material procurement or involving an occurrence of cost, it shall invite open

competitive bidding, as a general rule, from the viewpoint of cost effectiveness. If the subsidized project operating entity desires to outsource part of the subsidized project to a third party or conduct the project in partnership with a third party, it shall in advance make a contract on the implementation and report this to PMO.

- (3) Once informed that the decision on grant of the subsidy is made, the subsidized project operating entity shall not change the subsidy budget distribution or the details of the subsidized project nor interrupt or terminate the project without prior approval from PMO.
- (4) The subsidized project operating entity shall promptly report the progress of the subsidized project and so on whenever required to do so by PMO.
- (5) After the subsidized project is completed (or the project termination is approved), the subsidized project operating entity shall submit a project result report to the management office.
- (6) The subsidized project operating entity shall keep accounts on any expenditures for the subsidized project with dedicated account books accompanied by all written evidences in a way that is clearly differentiated from the other accounting to ensure that all incomes and expenditures are meticulously accounted for. The entity shall maintain the account books at least five years after the fiscal year in which the date of completion (or the date of approval for termination) is included so that they can be accessible whenever requested by METI, fund establishment organization and PMO.
- (7) With respect to the assets acquired or the utility of which has increased through the subsidized project (hereinafter referred to as "the Acquired Assets, etc."), the subsidized project operating entity shall manage them with due care of a prudent manager even after the completion of the subsidized project, and strive to effectively make use of them in accordance with the purpose of the grant of the subsidy. All applicable Acquired Assets, etc. shall be properly controlled using an Acquired Asset Ledger during the asset disposal restriction period, which will be separately set forth.
- (8) If the subsidized project operating entity needs to dispose of (i.e., use, transfer, loan or offer as collateral assets contrary to the purpose of the grant of the subsidy) any Acquired Asset having a unit price equal to or higher than 500 thousand yen (tax excluded) during the asset disposal restriction period separately set forth, they must obtain prior approval. In this case, the entity shall pay part of or the entire subsidy amount as a general rule. (The maximum payment does not exceed the subsidy amount for the appropriate asset to be disposed of).
- (9) After the completion of the subsidized project, the Board of Audit may visit the premises of the subsidized project operating entity for inspection.

12. Contact

Toranomon Toyo Bldg. 8th Floor
4-2, Toranomom 1-chome, Minato-ku,

Tokyo 105-0001, JAPAN

Contact: Mr. Nakajima, Mr. Ashida and Mr. Tsukada

E-mail: hairo26-2nd-ml@mri.co.jp

FAX: +81-(0)3-3591-9117

Contact us through e-mail or FAX. We regret that no inquiries will be accepted via telephone.

(Form 1)

No. Leave blank.	
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Management Office for the Project of Decommissioning and Contaminated Water
Management

Application for the subsidies for the “Project of Development of Fundamental Technologies for
Retrieval of Fuel Debris and Internal Structures” in the FY2014 Supplementary Budget

Applicant	Company/Organization Name		
	Representative (Full Name and Title)		Seal or Signature
	Address		
Contact	Contact Person (Full Name)		
	Section/Department		
	Title		
	Telephone (Extension, if any)		
	E-mail		

(Exhibit)

1. Name of the subsidy project

2. Objective and contents of the subsidy project

**Describe your own understanding of the background of the project, the purpose of the project and its contents briefly.*

3. Scheduled commencement and completion dates of the subsidy project

(Scheduled commencement date):

(Scheduled completion date):

4. Entire costs needed for the project

JPY

5. Costs subject to subsidy

JPY

6. Subsidy amount to be applied for

JPY

7. Allocation amount of the costs for the subsidy project, costs eligible for the subsidy and subsidy amount to be applied for

The contents are the same as (2) Expenditures, I. Summary table of “2. The income and expenditure budget of the Subsidized Project” of the Form 2, “Brief explanation of subsidized project”.

8. Bases for Calculation for the above amount

The contents are the same as (2) Expenditures, II. Distribution of Costs of “2. The income and expenditure budget of the Subsidized Project” of the Form 2, “Brief explanation of subsidized project”.

9. If a group is formed to conduct the Project, the names of the group and the member companies

Note 1: The “costs required for the Subsidized Project” refers to the cost required for performance of the relevant project. As a general rule, the amount must be provided after deducting the amount of the national and local consumption taxes.

Note 2: As for the amount of the “Subsidized Costs”, as a general rule, the amount of the “costs required for

the Subsidized Project” eligible for the Subsidy must be provided after deducting the amount of the national and local consumption taxes.

Note 3: The “amount of the Subsidy applied for” refers to the amount of the “Subsidized Costs” for which grant of the Subsidy is requested, and the amount limit is the amount of the “Subsidized Costs” multiplied by the Subsidized Ratio (any amount less than JPY1 shall be rounded down).

Remark: The size of the paper used shall be the Japan Industrial Standards A4 Format.

(Form 2)

Address

Name (Name of Corporation and Title/Name of Representative Person)

Outline of Subsidy Project

1. The implementation plan for the Subsidized Project

(1) Contents and implementation method of the project

**Describe contents and methods in detail for each project contents.*

**Describe your proposal to enhance the project result in detail.*

**Describe the place where the project is to be implemented (address and name of the office).*

**Describe the technical contents based also technical specifications in Exhibit.*

(2) The implementation timeline

**Describe the monthly schedule of the implementation of the project for each implementation contents.*

**Describe the implementation procedure in detail. If the stages of the research and development are different (such as design, development, tests, etc.) in each item, describe the difference clearly.*

**If the persons in charge in the research and development are different in each item, describe the organization they belong to clearly so that we can distinctly understand who will actually implement the item.*

**Set the actual targets for achievement of the project purpose as milestones and describe them for each item.*

**In setting the milestones, they must be related to the points where delay of the project is foreseen.*

**In order to prevent delay, alternative options must be described for items with high risk.*

** Describe major output and input information so that correlation with other projects, comprehensive proposals, partial proposals, etc. can be grasped.*

**As a plan of the interim report, describe the outputs which will have been able to be achieved at the time of the report and further plan.*

**In reporting your progress, show your plan and actual progress in a comprehensible manner. Furthermore, describe the up-to-date situation and further work plan, etc. as a reference.*

(3) The organization for implementation

**Describe the implementation scheme, the number of the involved staff and their role as attached.*

**Describe the brief career, area of expertise, experiences in similar projects of the manager responsible for the project and those who are planned to be involved in the project as a project leader or other similar classes.*

**Describe outsourcing or commissioning, if planned.*

**Describe the name, outline, year, ordering party, etc. of similar projects. If the project was done as your own company's project, state it accordingly.*

**Clearly state the experiences of each participating party if you form a consortium.*

2. Plan of the income and expenditure of the Subsidized Project

(1) Income (in JPY)

Item	Amount
Own fund	
*Bond issuance or borrowing	
Other	
Subsidy	
Total	

*Attach the documents to show the funding plan relating to the relevant bond issuance or borrowing

(2) Expenditures

I. Summary table (in JPY)

Classification of costs	Costs required for the Subsidized Project	Subsidized Costs	Classification of the cost burden	
			The amount of cost borne by the Subsidized Project Operating Entity	The amount of the Subsidy applied for
Labor Cost				
Operating cost				
Total				

II. Distribution of Costs (provide the details by project item)

**Describe in this sheet or other separate sheets the name of the goods, unit price, man-hour, etc. as basis for the calculation.*

**If you form a consortium, clearly describe the breakdown of each company or organization.*

(Unit: JPY)

Type (Example)	The cost required for the Subsidized Project	Subsidized costs	Amount of the Subsidy applied for	Remarks
【Labor Cost】				
• • •				
Sub total				
【Project Cost】				
Raw material				
Goods purchase				
Outsourcing				
• • •				
Sub total				
Total				

(Note 1) The “cost required for the Subsidized Project” refers to the cost required to perform the relevant project. As a general rule, provide the amount after deducting the amount of the national and local consumption taxes.

(Note 2) As a general rule, provide the “cost required for the Subsidized Project”, which is eligible for the Subsidy after deducting the amount of national and local consumption taxes in the “Subsidized Costs”.

(Note 3) the “amount of the Subsidy applied for” refers to the amount of the “Subsidized Costs” for which grant of the Subsidy is requested, and the amount limit is the amount of the “Subsidized Costs” multiplied by the Subsidized Ratio (any amount less than JPY1 shall be rounded down).

Remark: The size of the paper used shall be the Japan Industrial Standards A4 Format

3. Financial basis and management structure

**Describe the outline of your organization; moreover, describe the grounds on which your organization has necessary management basis for smooth implementation of the project as attached.*

**Describe the grounds on which your organization is capable of managing funds, etc. (such as organization and storage of evidence documents for expenditures). Furthermore, describe the scheme of the management of the funds (responsible persons and their roles).*

**If you form a consortium, all of the above-mentioned items must be described regarding every organization.*

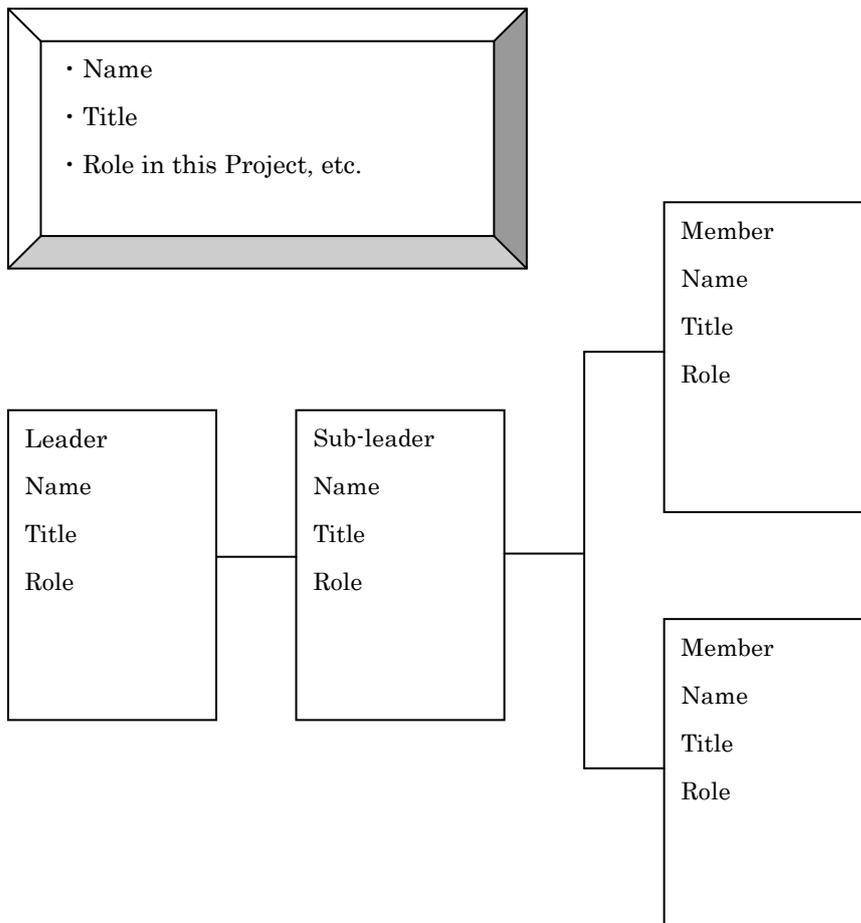
Implementation Organization Chart

<p>Content of the descriptions</p>	<ul style="list-style-type: none"> • Develop an organization chart to show the framework for implementation of the Project • The names, titles and division of roles of the personnel in charge must be contained in the implementation organization chart • The career background, expertise, area of specialty at work and other relevant information must be provided about the key personnel in charge contained in the implementation organization table
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Operational Implementation Organization

*A concrete description should be provided by showing an implementation organization chart containing the following information.

*Specify the name of the contact person in case of a joint application



(Annex) Outline of your organization

Note: If you form a team and apply, you must fill in this sheet for every participant.

*Fill in the data of the latest accounting year in non-consolidated base.

Company name					
Title/name of the representative person					
Contact information	Tel:		Fax:		
	E-mail:				
Head office's address					
Date of establishment	Date:	Account closing month		Small- or medium-sized company	○ or ×
Capital	JPY in thousands	Number of Employees		(indicate by a circle if the company is a small- or medium-sized company)	
Description of business					
Major shareholders (equity ownership)	○○○ (company limited) (60%) ▽□○ (company limited) (30%) □○○ (company limited) (1%)				

(The title and name of the person responsible for preparation: Head of the XX Department, XX XX

Seal)

*A personal seal may be used

Please provide the information about all officers in the list below:

Full name in Katakana Full name in Chinese characters	Date of Birth			Sex	Company Name	Title
	Japanese era name Year	Month	Day			
(Example) Taro Keizai Taro Keizai	S 35	01	01	M	Keizai Sangyo Co., Ltd.	President & Representative Director

- (Note 1) Add the columns as appropriate if the provided columns are not sufficient to provide full information.
- (Note 2) Use one-byte characters and put a space between the first and last names to provide the names in Japanese phonetic symbols (katakana).
- (Note 3) Use two-byte characters and put a space between the first and last names to provide the names in Chinese characters.
- (Note 4) The letters T, S or H should be used to indicate the Japanese era names for the date of birth and the year should be indicated by a two-digit number.
- (Note 5) Use M for male and F for female in one-byte characters to indicate the sex.
- (Note 6) For a foreign national, use the alphabet characters to indicate the person's full name in the "Full name in Chinese characters" and the pronunciation of the name in Katakana in the "Full name in Katakana" column.
- (Note 7) For a joint application or a Project C, provide the information about all officers of each and every member (company or otherwise) of the group.

(Remarks) The size of the paper used shall be the Japan Industrial Standards A4 Format.

(Other documents)

- (1) Outline of the company or organization such as a brochure, etc.
- (2) The financial results, and statement of revenues and expenses (for the past one year)
- (3) The articles of association or the act of endowment
- (4) Other supporting documents

(Form 3)

Certificate of Conformance to Qualification Requirements for the Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures

I confirm that the applicant satisfies the qualification requirements for this subsidized project.

No.	Requirements	Verification, etc.
(1)	Possessing the organization for properly conducting the relevant subsidized project.	<State that the applicant satisfies the requirements with reasons in detail ><See Form 2 “1. (3) Project Implementation Scheme” when necessary.>
(2)	Having the capacity, knowledge and experience required for conducting the relevant subsidized project.	<State that the applicant satisfies the requirements with reasons in detail ><See Form 2 “1. (3) Project Implementation Scheme” when necessary.>
(3)	Having the management foundation required for smoothly conducting the relevant subsidized project and sufficient ability to control the funds and other resources.	<State that the applicant satisfies the requirements with reasons in detail ><See Form 2 “(3) Financial basis and management structure when necessary.>
(4)	Being able to implement the project in accordance with all the applicable laws and regulations enacted in Japan, and to follow the appropriate accounting procedures in accordance with the “Subsidized Project Administration Manual”. http://en.dccc-program.jp/files/20150623man.pdf	<State that you understand the statement on the left>
(5)	Not foreseen to be subject to Articles 70 and 71 of the Cabinet Order concerning the Budget, Auditing and Accounting.	<State that it does not apply to the applicant>
(6)	Not fulfilling any of the conditions stipulated in the “Guidelines for the suspension of subsidies controlled by the Ministry of Economy, Trade and Industry and the suspension of designation relating to the contracts”. (January 29, 2003, No 1) First column, the second items in Attachment	<State that it does not apply to the applicant>
(7)	Admitting that the results obtained through this project can be utilized by TEPCO, etc. if they request to do so under the condition that each party is in agreement. Not preventing the utilization by behaviors such as not admitting use of the technology intentionally, asking for unreasonable compensation, etc. in spite of receiving the request.	<State that it is possible>
(8)	In order to make sure of the above-mentioned item, preventing the situation that the results from this project are not able to be utilized for measures for decommissioning and contaminated water management at the Fukushima Daiichi NPS by ceding the above-mentioned condition in (7) to the successor if the applicant hands over the result to a third party and loses their own right to utilize it accordingly. In the case of a conflict which makes the applicant unable to make sure of the items in (7), the concerned parties must solve it by their own responsibility.	<State that you understand the statement on the left>

<Note for Filling out this Form>

In the verification columns, please write the reasons why you verified that the applicant meets the requirements. When filling it out, write “Attachment” if there are any verification documents attached to this form and if not, write “No attachment.”

(Form 4)

Input/Output information on Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures

**Please refer to the reference document 1 as an example.*

ID	Requested projects	Offered projects	Contents (outline)	Time when the project is necessary	How to use the information	Remarks
				<i>*Influences of delay (if any)</i>		<i>Such as measures for the case when you cannot ensure the accuracy, cannot keep the timeline, etc.</i>

(Reference Document 1)

Table 1 Organization of Input/Output information
Example for applicants of comprehensive proposal

ID	Requested projects	Offered projects	Contents (outline)	Time when the project is necessary	How to use the information	Remarks
1_1	Applicant of comprehensive proposal of Project of “Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures”	Applicant of partial proposal of Development of platform for accessing to inside of the reactor in submerged method	How to sustain the platform (such as suspending it from the operation floor, fixing by RPV flange), outline, weight, rough dimension	December 2015	Entire layout of equipment for fuel debris retrieval, plan for tests of retrieval equipment, evaluation of strength of PCV, etc.	
1_2						
1_3						
1_4		⋮	⋮	⋮	⋮	⋮

Table 2 Organization of Input/Output information
 Example for applicants of partial proposal

ID	Requested projects	Offered projects	Contents (outline)	Time when the project is necessary	How to use the information	Remarks
1_1	Applicant of partial proposal of technology for fuel debris processing and dust gathering in "Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures"	Applicant of comprehensive proposal of "Project of Development of Fundamental Technologies for Retrieval of Fuel Debris and Internal Structures"	Specifications of test pieces, environmental conditions of processing tests (in water, in air, spraying)	December 2015	Establishment of detailed plan of elementary tests	
1_2						
1_3						
1_4		⋮	⋮	⋮	⋮	⋮

(Reference Document 2)

Table 1 Example of implementation schedule with points of attention

Item	Sub item	Fiscal Year 201X						Fiscal Year 201Y						Remarks (Up-to-date situation)								
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		Oct	Nov	Dec	Jan	Feb	Mar		
Validation on XX	(1) Survey of on-site situation and relevant technologies			█	█	Compilation															○○○○	
	(2) Machinery design				█	█		Design completed														○○○○
	(3)Machinery production									█	█											Describe up-to-date situation and work schedule
	(4) Establishment of tests plan			█	█																	○○○○
	(5) Tests implementation												█	█	█	█	█					Result of machinery development
	(6) Evaluation of tests result																					★
	(7) Compilation of results																					█
Validation on XX (when alternatives are needed)	(1) YY																					Describe items for which alternatives are needed.
...	...																					Describe the available results foreseen at interim report and further plan
																						Completion of plan establishment
																						Commencement of demonstration test
																						Interim report
																						Interim report
																						Completion of demonstration test
																						Results report
Major milestones																						▲

(Reference document 3)

Regarding Subsidized Cost Items

Regarding the cost items defined in “The Decommissioning and Contaminated Water Management Project Implementation Guidelines”, please refer to the following table.

Cost item	Description	Correspondence with “Subsidized Project Administration Manual”
I. Personnel cost	Personnel cost for working hours of those engaged in the project.	3. Accounting process on personnel cost
II. Project cost		
Raw material cost	Expenses necessary for purchasing raw material or material necessary for implementing the project ※Here, “raw material” denotes what loses its nature and is used for production or manufacturing of entirely new ones; “material” denotes what does not lose its nature and is a constituent element of produced items or manufactured items only through being put to new application.	7. Accounting procedures regarding supplies expenses
Supplies expense	Cost for the purchase of goods necessary for performing the project but not belonging to raw material cost (however, only those verifiable for the use in the project)	7. Accounting procedures regarding supplies expenses
Design, production and processing costs	The thing which the subsidized entity cannot design, produce or process, or the cost necessary for outsourcing what is appropriate and does not belong to Facility and equipment cost to other entity. (contract for work)	8. Accounting procedures regarding outsourcing expenses
Facility and equipment cost	Cost necessary for purchasing, production or installation of facility or equipment necessary for undergoing the project ※The actual contents of the “facility and equipment” shall be “buildings and accompanying facilities”, “structures” and “machinery and equipment” stipulated in “Ministerial Order regarding depreciable life of depreciable assets, etc.” (Fifteenth Order of Ministry of Finance, 1965).	6. Accounting procedures regarding equipment expenses and rental and hire fees 8. Accounting procedures regarding outsourcing expenses
Procurement cost	Cost for the thing which is necessary for undertaking the project and does not belong to facility and equipment cost (at the same time, can be usable more than one year)	6. Accounting procedures regarding equipment expenses and rental and hire fees
Survey cost	The cost for outsourcing to another entity what the subsidized entity cannot survey or analyze by itself or is not suitable to be conducted by the subsidized entity itself (contract for work)	8. Accounting procedures regarding outsourcing expenses
Outsourcing cost	Cost for outsourcing to other business operator what subsidized company cannot implement on its own or not appropriate to do so and does not belong to design, production and processing costs, facility and equipment cost or survey cost (contract for work)	8. Accounting procedures regarding outsourcing expenses

Travel expenses	Cost for domestic business travels and overseas business travels necessary for performing the project.	4. Accounting process for travel expenses
Gratuities	Gratuities necessary for performing the project (gratuities for external experts who attended meetings, seminars, symposiums, etc., gratuities for giving seminars, writing of drafts, cooperation with research, etc.)	5. Accounting process for meeting expense and rewards
Rent and hire	Cost for lease and rental of machinery, equipment and the like necessary for performing the project	6. Accounting procedures regarding equipment expenses and rental and hire fees
Other expenses necessary for undertaking the project	Cost for other expenses necessary for undertaking the project which does not belong to any other items Examples Commission fee: the cost for outsourcing to other entities of the cost for assistant personnel or of the cost for temporary staffing, which cannot be done or what is not appropriate to be done by the subsidized entity	11. Accounting procedures regarding other miscellaneous expenses 12. Accounting procedures regarding expenses for commission 10. Accounting procedures regarding assistant personnel costs, etc.

1. Technology for prevention of contamination spread in retrieving large structures

Item 1) Scale model test on each operation step to confirm the technology for prevention of contamination spread

In operation steps of the In-Air Top-Access approach, confirm and inspect by scale tests on contamination spread prevention, large openable shieldings and the structure and operation procedures of remote equipment as well as the technology development for films and sheets to be applied to separations between areas to prevent the contamination spread.

Films and sheets to be applied should be confirmed as follows:

- They need to be connected to be applied to handling large structures. Targeted films and sheets can be connected.
- The joint strength should be the same as or stronger than that of the original materials.
- The materials should have the radiation resistance and take into account the work environment.

In the scale tests, the following items should be conducted.

- Under assumption of fuel debris retrieval, the operability should be confirmed by a one-fourth scale mock-up test of the real machine structure.
- In the mock-up test, the steps of fuel debris retrieval approach shall be simulated.

2. Technology for prevention of contamination spread in retrieving fuel debris inside of RPV

Item 1) Test of seals inside of and lower side of RPV for an access device in RPV for the in-air top-access approach

For the access devices for retrieving fuel debris and in-core structures in RPV of the in-air top-access approach, develop technologies for preventing or shielding dusts etc. induced during the retrieval of fuel debris, and conduct partial mock-up tests in which targeted parts are in full scale to determine the feasibility of those technologies. Specifically, the following items should be included:

- Sealing Mechanism inside RPV

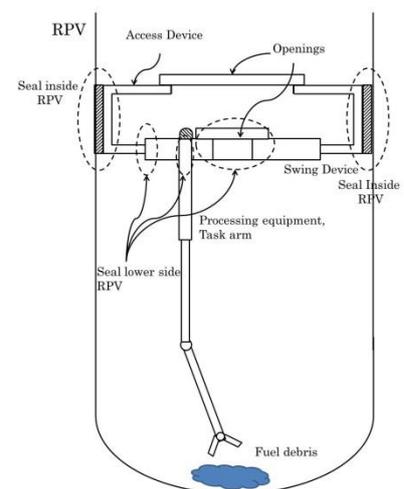
Develop the sealing mechanism inside RPV from outside of access devices and conduct a test and make prototypes.

- Sealing Mechanism on Lower Side of Equipment

Develop the sealing mechanism and make prototypes and test them for dispersion prevention of radioactive dust, etc. in the opening on upper side of the access device (Note 1) and revolving superstructures (Note 2).

Note 1: It is for taking in and out processing equipment, task arms and recovery containers.

Note 2: Move voluntarily processing equipment and task arms.



3. Access technology for fuel debris

Item 1) Test on hydraulic manipulators

Develop and perform a test on hydraulic manipulators for applying to retrieval of fuel debris.

The hydraulic manipulators should have a hydraulic driving source and use small and high-power manipulators. In addition, manipulators should have the following capabilities:

- It can move straight forward and move on the flat as required for retrieving fuel debris.
- The position of its tip and posture can be controlled and it has 6 or more drive axes.
- It can provide interface data of control hydraulic equipment and detectors.
- The operation test has been conducted on assumption that the hose length of the actual plant equivalent is about 100 meters long.
- The operation test on assumption that the hose length of the actual plant equivalent is about 100 meter long has been conducted and the differences in capabilities between the above 100-meter-long hose and the real one have been found out.

Also, the following items should be conducted by using hydraulic manipulators which have the above-mentioned capabilities. For each approach, please specify the reasons for its feasibility.

- Putting a 15-kg load on the tip of manipulator and developing the stability of control at a tip movement speed of 2 mm/min. and at a tip position accuracy of ± 2 mm and conduct a test to confirm the stability.
- By the time of application to the real machine, make a plan to have the manipulator's resistance to radiation be 10 kGy/h or more and 2MGy or more.

Item 2) Test on access device in RPV for submerged approach

On the assumption of submerged approach, conduct the basic design of the access device which supports processing equipment, manipulators, etc. and hang them inside RPV and confirm the feasibility of such a device by making partial prototypes.

Consider how to install, operate, maintain and collect at time of emergency the access device including the following methods and make partial prototypes of one of these.

- Hang a work platform as the access device in RPV with wires and support it horizontally using the RPV wall.
- Hang a work platform as the access device in RPV with wires and support it horizontally by using the tensile force of wires.

Consider how to use the access device in accordance with the progress situation of submerged approach and make a plan for the entire period of fuel debris retrieval.

Under assumption of receiving a reaction force at the time of processing of fuel debris such as core boring, consider and design the resistance to such a force.

Item 3) Test on access device installed inside of pedestal in the in-air side-access approach

As an operation step of the In-air side-access approach, perform a test to confirm the feasibility of approaches for accessing inside pedestal through a CRD exchange opening in pedestal from PCV side. In addition, develop, inspect and confirm the feasibility of methods for laying rails on a CRD exchange opening from PCV side and access fuel debris in pedestal.

With a trial device which simulates the trial design of robot arms for accessing inside pedestal and the access rail in pedestal, the prototype and position of the real machine, conduct a movement test on a series of operations for installations to confirm the feasibility.

4. Remote operation technology for fuel debris retrieval

Item 1) Test on flexible arms for remote operation

Develop the flexible arms for remote operation on the assumption that the arms will be applied to removing pipes and equipment on the bottom of PCV which may interfere in the side-access approach.

Under the assumption that flexible arms targeted for the test access in pedestal from PCV side, it should have the following capabilities and features at the time of the commencement of this fiscal year's subsidized project:

1) Arms Structure

- It should be "task" arms with joints made from simple component parts such as hydraulic cylinders and springs.
- It should have radiation resistance and take into account the work environment by the time of application to real machines.

2) Transportability of Arms

- Arms for remote operation with one joint can support a 200-kg load vertically downward and from the position they can uplift the load by bending joints in any directions up to 30 degrees or 45 degrees at most.

3) Combination Movement of Arms

- By combining two joints, the arms can move to a horizontal level with a 100-kg load.
- Grapples can be attached to the tip of arms and they can grip portable objects firmly and transport them.
- Combine multiple joints and keep a cutting device on the tip and they can cut structures, etc. by absorbing reaction force or oscillation.

4) Arms' Interference with Obstacles

- When task arms interfere with an obstacle, the flexible joint parts absorb the impact and the arms can resume operation immediately.

Conduct tests and check issues under the assumption that fuel debris will be retrieved by using flexible task arms which have the above capabilities and features.

Item 2) Test on handling device of fuel debris storage cans

Conduct the basic design of handling devices for fuel debris storage cans and perform an essential test on the mechanisms to be developed (e.g. mechanisms for closing caps).

Develop a handling device for storage cans of fuel debris in RPV or PCV which meets the following requirements and confirm the completion by making partial prototypes:

- All the collection of fuel debris, the closure of storage cans and the export/transportation of storage cans can be remotely performed.
- Develop and design by checking the preceding examples of handling devices for TMI-2 storage cans and specifying how the design conditions differ.
- Conduct the basic design of handling devices of storage cans and test and inspect the completion by making partial prototypes.

5. Technology for prevention of contamination spread for fuel debris retrieval

Item 1) Test on platform/cell in submerged approach

Design and develop the device to maintain shielding and contamination spread prevention functions on the upper part of RPV in submerged approach and confirm the feasibility by making partial prototypes.

One of the following approaches shall be considered for the device for maintaining shielding and prevention of contamination dispersion function on the upper part of RPV:

- Place a platform on the upper part of RPV and put a cell which has shielding and contamination spread prevention functions on it and retrieve fuel debris inside the cell.
- Place an openable cover which has shielding and contamination spread prevention functions on the upper part of RPV.

In the consideration of the above items, the following points shall be taken into account:

- All the devices need to be remotely operated, maintained and recovered at times of emergency etc. In addition, they should be considered as a condition for maintaining the shielding and contamination spread prevention functions even at times of maintenance.
- Consider what should be done in accordance with the operation steps of in-core structures and fuel debris retrieval.

By taking the basic design of the device and results of the consideration into account, confirm the feasibility by making partial prototypes.

Item 2) Test on PCV welding equipment for welding seals with remote operation in the in-air side-access approach

Conduct a test on welding of the access opening on PCV side of the in-air side-access approaches.

There are the following issues for the development of the in-air side-access approach:

To access debris from the PCV side, an access opening needs to be made on the PCV side. The access from the PCV side may be conducted in air. However, it may be combined with the submerged approach and therefore the access opening needs to be a boundary which can resist hydraulic head pressure.

Develop and conduct a test by taking the following issues into account:

- For the boundary structure of the PCV wall and the access opening, develop the welding devices and procedures for welding construction to be operated remotely in high-dose radiation and inspect them by tests.
- The access opening, PCV wall and welding part which connects both of them shall have a strength which can resist 30-m hydraulic head pressure.

6. Dose reduction technology for retrieval of fuel debris

Item 1) Test on light-weight shielding whose shape is flexible deployed in the Top-access approach

Develop, make a prototype, and test water injection shieldings which can easily perform shape conforming and lightening at times when they are not needed, and confirm their feasibility.

For the above, consider the following items:

- Basic design, partial prototypes and test of water injection and drainage mechanisms.
- Use the detailed procedures for installation and operation of water injection shieldings as an actual case of the top-access approach and consider them as well as the following items:
 - Openable large shieldings at the upper part of RPV
 - Shielding during the work of removing the PCV head

Criteria for reviewing proposals and allocation of points for items to be reviewed

The “basic points” refers to the conditions which have to be met unfailingly. If any of the basic point items is missing, no additional points will be given.

Items to be reviewed (basic points, additional points)

1. Purpose, details and implementation method of the project (40 points)

1.1 Project purpose (total 5 points:5 basic points and 0 additional points)

Criterion for the basic points: Whether or not the Project purpose corresponds to the project purpose described in the “Guidelines for applying”.

1.2 Details of the project (total 15 points: 5 basic points and 10 additional points respectively)

Criterion for the basic points: Whether the details of the project are consistent with the project purpose, and described in detail or not.

Criterion for the additional points: Whether the proposal contains details which are meaningful for this project other than the details stipulated in the “Guidelines for applying” or not (novelty, originality).

1.3 Implementation method of the project (total 20 points: 5 basic points and 15 additional points respectively)

Criterion for the basic points: Whether the implementation method of the project is consistent with the purpose and details of the project.

Criterion for the additional points: Whether the implementation method of the project is considered in detail, and whether the method is effective, purposeful and feasible or not. Moreover, whether or not the proposal is creative.

Criterion for the additional points: Specifically, whether or not the concrete method is shown for satisfying the following six conditions regarding operation of the R&D activities described in the “Guidelines for applying”.

- Development of human resources in the medium term
- Gathering of domestic and overseas wisdom
- Setting up criteria for judging whether the objective is met or not
- Improvement of information dissemination
- Setting up and management of a third-party committee, etc.
- Cooperation with the decommissioning activities and other R&D activities

Criterion for the additional points: Whether the applicant has become certified to ISO 50001 or not.

2. Project implementation schedule (15 points)

2.1 Project implementation schedule (total 15 points: 5 basic points and 10 additional points respectively)

Criterion for the basic points: Whether or not the project implementation plan (timeline) is appropriate to the purpose and details of the project.

Criterion for the basic points: Whether or not the project implementation plan (timeline) shows the grounds for implementing the project appropriately (staffing, procedure, etc.).

Criterion for the basic points: Whether or not the procedure for implementing the project contains creativity to implement the project effectively.

3. Project implementation scheme (30 points)

3.1 Project implementation scheme, division of roles (total 10 points: 5 basic points and 5 additional points respectively)

Criterion for the basic points: Whether or not the project implementation scheme and the division of roles are consistent with the details of the project.

Criterion for the basic points: Whether or not staffing is sufficient to implement the project.

Criterion for the basic points: Whether the number of staff, scheme and division of roles are clearly described or not.

Criterion for the additional points: Whether or not the project implementation scheme is properly arranged to respond to requests from the management office promptly and flexibly.

Criterion for the additional points: Whether or not the project implementation scheme is properly arranged to commence the project immediately after the conclusion of the contract.

3.2 Specialty as an organization, track record of other similar projects (total 10 points: 5 basic points and 5 additional points respectively)

Criterion for the basic points: Whether or not the applicant has an accumulation of indispensable expert knowledge, know-how etc. to implement the project as an organization.

Criterion for the additional points: Whether or not the applicant has ever implemented other similar projects as an organization.

Criterion for the additional points: Whether or not the applicant has an accumulation of technical knowledge or expert knowledge concerning the details of the project as an organization.

Criterion for the additional points: Whether or not the applicant has experiences of implementing projects which can contribute to implementing this project, and/or a network with specialized organizations useful to implementing this project as an organization.

3.3 Expertise and experiences of similar projects of engaged employees (total 10 points: 5 basic points and 5 additional points respectively)

Criterion for the basic points: Whether or not employees to be engaged in the project have an accumulation of indispensable expert knowledge, know-how etc. to implement the project.

Criterion for the additional points: Whether or not employees to be engaged in the project have ever implemented other similar projects.

Criterion for the additional points: Whether or not employees to be engaged in the project have an accumulation of technical knowledge or expert knowledge concerning the details of the project.

Criterion for the additional point: Whether or not employees to be engaged in the project have experiences of implementing projects which can contribute to implementing this project, and/or a network with specialized organizations useful to implementing this project.

4. Project costs (total 10 points: 5 basic points and 5 additional points respectively)

Criterion for the basic points: Whether or not project costs are appropriately allocated to the project purpose and contents.

Criterion for the additional points: Whether or not project costs are allocated as appropriately as possible.

5. Specialty as an organization, track record of other similar projects (total 10 points: 5 basic points and 5 additional points respectively)

Criterion for the basic points: Whether or not the applicant has an accumulation of indispensable expert knowledge, know-how etc. to implement the project as an organization.

Criterion for the additional points: Whether or not the applicant has ever implemented other similar projects as an organization.

Criterion for the additional points: Whether or not the applicant has an accumulation of technical knowledge or expert knowledge concerning the details of the project as an organization.

Criterion for the additional points: Whether or not the applicant has experiences of implementing projects which can contribute to implementing this project, and/or a network with specialized organizations useful to implementing this project as an organization.

3.3 Expertise and experiences of similar projects of engaged employees (total 10 points:5 basic points and 5 additional points respectively)

Criterion for the basic points: Whether or not employees to be engaged in the project have an accumulation of indispensable expert knowledge, know-how etc. to implement the project.

Criterion for the additional points: Whether or not employees to be engaged in the project have ever implemented other similar projects.

Criterion for the additional points: Whether or not employees to be engaged in the project have an accumulation of technical knowledge or expert knowledge concerning the details of the project.

Criterion for the additional point: Whether or not employees to be engaged in the project have experiences of implementing projects which can contribute to implementing this project, and/or a network with specialized organizations useful to implementing this project.

Point rating method

- A(Excellent) ×1, B(Good)×0.7, C(Average)×0.5, D(Below average)×0.3, E(Poor)× 0
- Point rating method : Each item to be evaluated will be ranked A through E respectively, and the total points of the applicant will be calculated by multiplying the points allotted for each item by the above-noted weighting factors for each rank.
- The full points are 100. The basic points are 45, and the additional points are 55.
- However, a proposal shall not be adopted unless the basic score reaches at least 45.

**Project of Development of Fundamental Technologies for Retrieval of
Fuel Debris and Internal Structures**

Table of the Criteria for Technical Examination and Allotment of Points

The “basic points” refers to the conditions which have to be met unflinchingly. If any of the basic point items is missing, no additional points will be given.

Essential tests for determining the approach feasibility

i) Prevention of contamination dispersion in retrieving large structures

Item 1) Scale model test on each operation step to confirm the technology for contamination dispersion prevention

Contents of Proosal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The development condition and target for films and sheets to be used as to partitions 	60

<p>between areas are described in detail.</p> <ul style="list-style-type: none">• The specifications of targeted films and sheets are described in detail and appropriately.• Test methods are described in detail and appropriate. <p><Additional points></p> <ul style="list-style-type: none">• The contents of confirmation and inspection of the scale test are described in detail.• Major issues and measures for the technology development are described in detail and feasible.	
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ii) Prevention of contamination dispersion in retrieving fuel debris inside of RPV

Item 1) Test of seals inside of and lower side of RPV for an access device in RPV for the in air
—top access approach

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · In air-top access method, development conditions and targets for contamination expansion prevention technology of the access device to retrieve fuel debris and in-core structures in RPV are described in detail. · Test methods are described in detail and appropriate. <p><Additional points></p> <ul style="list-style-type: none"> · Details of confirmation and inspection for partial mock-up tests are described. · Major issues and measures for the technology development are described in detail and feasible. 	60

iii) Access technology for fuel debris in RPV

Item 1) Test on hydraulic manipulators

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · Development conditions and targets of the hydraulic manipulators which is applied to fuel debris retrieval are described in detail. · Specifications of targeted manipulators are detailed and appropriate. · Test methods are described in detail and appropriate. · Plan to have the manipulator's resistance to radiation to 10kGy/h or more and cumulatively 2MGy or more by the time of application to the real machine is described. <p><Additional points></p> <ul style="list-style-type: none"> · Details of confirmation and inspection for tests are described. · Major issues and measures for the technology development are described in detail and feasible. 	60

iii) Access technology for fuel debris in RPV

Item 2) Test on access device in RPV in submersion approach

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · Development conditions and targets of the access device in RPV are described in detail. · Consideration of the access device in RPV is detailed and appropriate. · Facilities and contents of partial prototype tests are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Details of confirmation and inspection for tests are described. · Major issues and measures for the technology development are described in detail and feasible. 	60

iii) Access technology for fuel debris in RPV

Item 3) Test on access device installed inside of pedestal in the in air- side access approach

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ Development conditions and targets of the access device in pedestal are described in detail. ▪ Methods for laying rails on a CRD exchange opening from PCV side are described in detail. ▪ Facilities and contents of tests on the access device in pedestal are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Details of confirmation and inspection for tests are described. ▪ Major issues and measures for the technology development are described in detail and feasible. 	60

iv) Essential tests on remote operation technology for fuel debris retrieval

Item 1) Test on flexible arms for remote operation

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ Development conditions and targets of flexible arms for remote operation are described in detail. ▪ Specifications of targeted flexible arms are described in detail and appropriate. ▪ Facilities and contents of the test on the flexible arms are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Details of confirmation and inspection for tests are described. ▪ Major issues and measures for the technology development are described in detail and feasible. 	60

iv) Essential tests on remote operation technology for fuel debris retrieval

Item 2) Test on handling device of fuel debris storage cans

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · Development conditions and targets of handling device of fuel debris storage cans are described in detail. · Description of partial prototype of handling device of fuel debris storage cans is detailed and appropriate. <p><Additional points></p> <ul style="list-style-type: none"> · Details of confirmation and inspection for tests are described. · Major issues and measures for the technology development are described in detail and feasible. 	60

v) Essential tests on technology for contamination dispersion prevention for fuel debris retrieval

Item 1) Test on platform/cell in submersion approach

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · Development conditions and targets for platform/cell in submersion approach are described in detail. · Consideration methods of platform/cell are described in detail and appropriate. · Facilities and contents of partial prototype test are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Details of confirmation and inspection for tests are described. · Major issues and measures for the technology development are described in detail and feasible. 	60

v) Essential tests on technology for contamination dispersion prevention for fuel debris retrieval

Item 2) Test on PCV welding equipment for welding seals with remote operation in the air—side access approach

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ Development conditions and targets of PCV welding equipment are described in detail. ▪ Facilities and contents of the test on PCV welding equipment are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Details of confirmation and inspection for tests are described. ▪ Major issues and measures for the technology development are described in detail and feasible. 	60

vi) Essential tests on dose reduction technology for workers of fuel debris retrieval

Item 1) Test on light weight shielding whose shape is flexible deployed in the in-air top access approach

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · Development conditions and targets of shleadings which can easily perform shape follow-up and lightening at unneeded time are described in detail. · Facilities and contents of the test on shielings which can easily perform shape follow-up and lightening at unneeded time are described in detail. · Test methods are described in detail and appropriate. <p><Additional points></p> <ul style="list-style-type: none"> · Details of confirmation and inspection for tests are described. · Major issues and measures for the technology development are described in detail and feasible. 	60

1. Performance test on cutting fuel debris and dust collection technologies

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> · Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> · Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> · Deploy a cutting method which has information on its cutting performance obtained through tests using blended material of ceramics, metal and concrete simulating fuel debris · Dust collectors appropriate to the cutting method are described. <p><Additional points></p> <ul style="list-style-type: none"> · Properties, etc. of the secondary waste generated during the cutting is assumed and the concept of disposal is established. · For cutting system, a consumable tip device can be easily put on and taken off remotely and easily. · Remote maintenance is possible. · For radiation resistance of facilities, the dose rate is 10kGy/h or more and the cumulative dose rate is 2MGy/h or more. 	60

2. Essential test on visual and measurement technologies

Contents of Proposal	Points
<p><u>1. Basic Principle of Proposed Technologies</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The basic principle of structure of proposed technology and system organization are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Proposed technology has advantages and uniqueness as compared with other technologies. 	10
<p><u>2. Applicability to Fukushima Daiichi Power Plant</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The present condition of Fukushima Daiichi Power Plant is fully taken into consideration. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Issues and measures based on the present condition of Fukushima Daiichi Power Plant is appropriate. 	15
<p><u>3. Actual Performance of Proposed Technology</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ The relation of proposed technology and possessed technologies which serve as the basis of the proposed technology are described in detail. <p><Additional points></p> <ul style="list-style-type: none"> ▪ Submitted actual performance has been published in an academic conference or journal, etc. 	15
<p><u>4. Compatibility to Technical Specifications</u></p> <p><Basic points></p> <ul style="list-style-type: none"> ▪ Under the circumstance of 10kGy/h, the system has been validated to be usable 200h with a cumulative dose of about 2MGy. <p><Additional points></p> <ul style="list-style-type: none"> ▪ It can be remotely and easily put on, taken off and maintained. ▪ Essential tests on technology for improving the visibility in high-dose radiation are described. ▪ Conducting limit tests by irradiation experiment to evaluate the ultimate capacity of radiation resistance in detail are described. ▪ Essential tests on technology for increasing the current radiation resistance are described. 	60