

## Demonstration Project for Technologies for Capturing Radioactive Substances from Soil

### 1. Requirements for Project Implementation

An implementation plan should be made based on the details of the demonstration implementation described below, and the functional conditions of the equipment installed for the demonstration should be confirmed using the basic conditions, and necessary information should be written in the relevant items in Form 3(2).

In addition, it is required to attend public conferences and to report on the implementation plan, progress, and results of the project. Also, upon completion of the project, a report on the implementation of the project must be prepared and submitted.

#### < Details of Demonstration Implementation >

In order to verify the capturing capacity of the technology for radiological materials (mainly radioactive strontium) in the soil, demonstration experiments must be carried out in the environment of chloride ion concentration above 200ppm.

#### <Basic Conditions>

##### (1) Efficiency to capture radiological materials

The proposal must include the capturing efficiency for radiological materials (particularly radioactive strontium).

##### (2) Soil environment for the installation location

The proposal must include the description of the technology which works in the environment of chloride ion concentration above 200ppm.

##### (3) Concepts for maintenance

The proposal must include suggestions to reduce the maintenance frequency.

##### (4) Concepts for secondary waste

The proposal must include suggestions to reduce the secondary waste.

#### <Items for Additional Points>

##### (1) Capturing efficiency

Proposals with high performance in the capturing efficiency of radioactive substances will gain additional points.

(2) Sustainability of capturing effects

Regarding proposals that present views on the sustainability of the capturing performance, those with longer sustainability will gain additional points.

(3) Suppression of secondary waste generation

Regarding proposals that present views on the secondary waste generated, those with a smaller volume of generation will gain additional points.

(4) Presentation of experimental data

Points will be added to proposals that are able to demonstrate their feasibility with experimental data regarding the basic conditions or additional point items. Extra points will be added for the data presented if they have already been published in a peer-reviewed form, such as in an academic conference or journal, etc. Furthermore, additional points will be gained by proposals which are expected to shorten the time period necessary for validation based on the presentation of experimental data.

<Goals and objectives>

Technical feasibility and validity of the items concerning the basic conditions and the additional point items are to be confirmed during the contract term.

2. Project Implementation Period/Subsidy Amount

From the Decision Date of Grant to March 31, 2015

In this project, it is planned that the demonstration of technologies will be carried out for the one-year period of FY2014.

3. Point Rating Method

The proposal will be scored based on the point rating described in Form 3(1). A proposal which does not meet all of the basic conditions shall not be selected.

The amount of the subsidy is a fixed amount, and its upper limit is 400 million yen. The details of implementation, the amount of the granted subsidy, and other details shall be decided by negotiation with METI and the Project Management Office.

Name of proposer:

Title of proposed subject:

[Basic conditions]

Details of the proposal	Allocation of marks (Basic points)
<p><u>(1) Efficiency to capture radiological materials</u></p> <ul style="list-style-type: none"> <li>➤ The efficiency to capture radiological materials (mainly radioactive strontium) is presented.</li> <li>➤ The mechanisms to capture radiological materials are concretely described.</li> </ul>	5
<p><u>(2) Soil environment for the installation location</u></p> <ul style="list-style-type: none"> <li>➤ The technology which works in the environment of chloride ion concentration above 200ppm is presented.</li> </ul>	5
<p><u>(3) Concepts for maintenance</u></p> <ul style="list-style-type: none"> <li>➤ The devices to decrease the frequency of the maintenance are concretely described.</li> <li>➤ The sustainable periods of capturing efficiency are presented for certain conditions (groundwater flow rate, chloride ion concentration, etc.).</li> <li>➤ The mechanisms to confirm the sustainable period are concretely described.</li> <li>➤ The methods and the number of workers required for maintenance are concretely described.</li> </ul>	5
<p><u>(4) Concepts for secondary wastes</u></p> <ul style="list-style-type: none"> <li>➤ The mechanisms to suppress the secondary wastes are concretely described.</li> <li>➤ The methods to retrieve the secondary wastes are concretely described.</li> <li>➤ The methods to process the secondary wastes are concretely described.</li> <li>➤ The methods to store the secondary wastes are concretely described (methods and degree of ease).</li> </ul>	5

[Items for Additional Points]

Details of the proposal	Allocation of marks (Technical points)
<p><u>(1) Capture efficiency</u></p> <ul style="list-style-type: none"> <li>➤ The capture efficiency of the proposed technology is high. (7)</li> <li>➤ The kind of captured radioisotopes (radioactive elements) is much. (3)</li> </ul>	<p>10</p>
<p><u>(2) Sustainability of capture effects</u></p> <ul style="list-style-type: none"> <li>➤ The period to sustain the capture performance is long. (4)</li> <li>➤ The number of workers for maintenance is small. (2)</li> <li>➤ The methods for maintenance are easy. (2)</li> </ul>	<p>8</p>
<p><u>(3) Suppression of secondary waste generation</u></p> <ul style="list-style-type: none"> <li>➤ The amounts of secondary wastes are small. (4)</li> <li>➤ The volume of secondary wastes can be reduced easily. (2)</li> <li>➤ The secondary wastes can be withdrawn easily (The additional dose to the workers by this work is not high.). (2)</li> </ul>	<p>8</p>
<p><u>(4) Presentation of experimental data</u></p> <ul style="list-style-type: none"> <li>➤ The experimental data are with control samples and with data statistically processed and evaluated. (4)</li> <li>➤ The data are already published as peer reviewed in an academic conference, journal, etc. (4)</li> <li>➤ The experiment is conducted and the data are analyzed from various points of view to confirm the effect. (2)</li> <li>➤ Based on the presented data, it is expected to be shorten the time period for demonstration. (4)</li> </ul>	<p>14</p>

The evaluations for technical points are classified into four classes; A (factor is 5/5), B (3/5), C (1/5), D (0/5), and the technical points will be calculated by multiplying the allocated points with the factors of each class.

#### 4. References

(1) Chloride ion concentration around reactor building

Chloride ion concentrations in the groundwater around reactor building are between 200 and 1,300 ppm.

(2) Chloride ion concentration around revetments

Chloride ion concentrations in the groundwater around revetments are between 300 and 900 ppm.

(3) Efforts of TEPCO

TEPCO performs the investigations in Fukushima Daiichi NPS to evaluate the applicability of the technique using at Hanford site to prevent the flowing of radioactive strontium.