

< Reference >

Units 1-2 Torus Room Investigation at Fukushima Daiichi Nuclear Power Station

January 25, 2013

Tokyo Electric Power Company

1. Purpose and Background

Purpose

Acquire basic data on the atmosphere, accumulated water and sediments in Units 1-2 Torus Room to provide inputs for PCV investigation and repair equipment design as well as to confirm the diffusion of fuel debris into the Torus Room.

Background

[Unit 1]

In June 2012, data on accumulated water level/temperature, Torus Room temperature, atmosphere/accumulated water dose rates was obtained utilizing the existing pipe penetration on the floor in the first floor of the Reactor Building (though the dosimeter failed during the process).

[Unit 2]

In June 2012, investigation was postponed since some substances were found to be stuck in all the penetrations (sleeves) on the floor in the first floor of the Reactor Building.

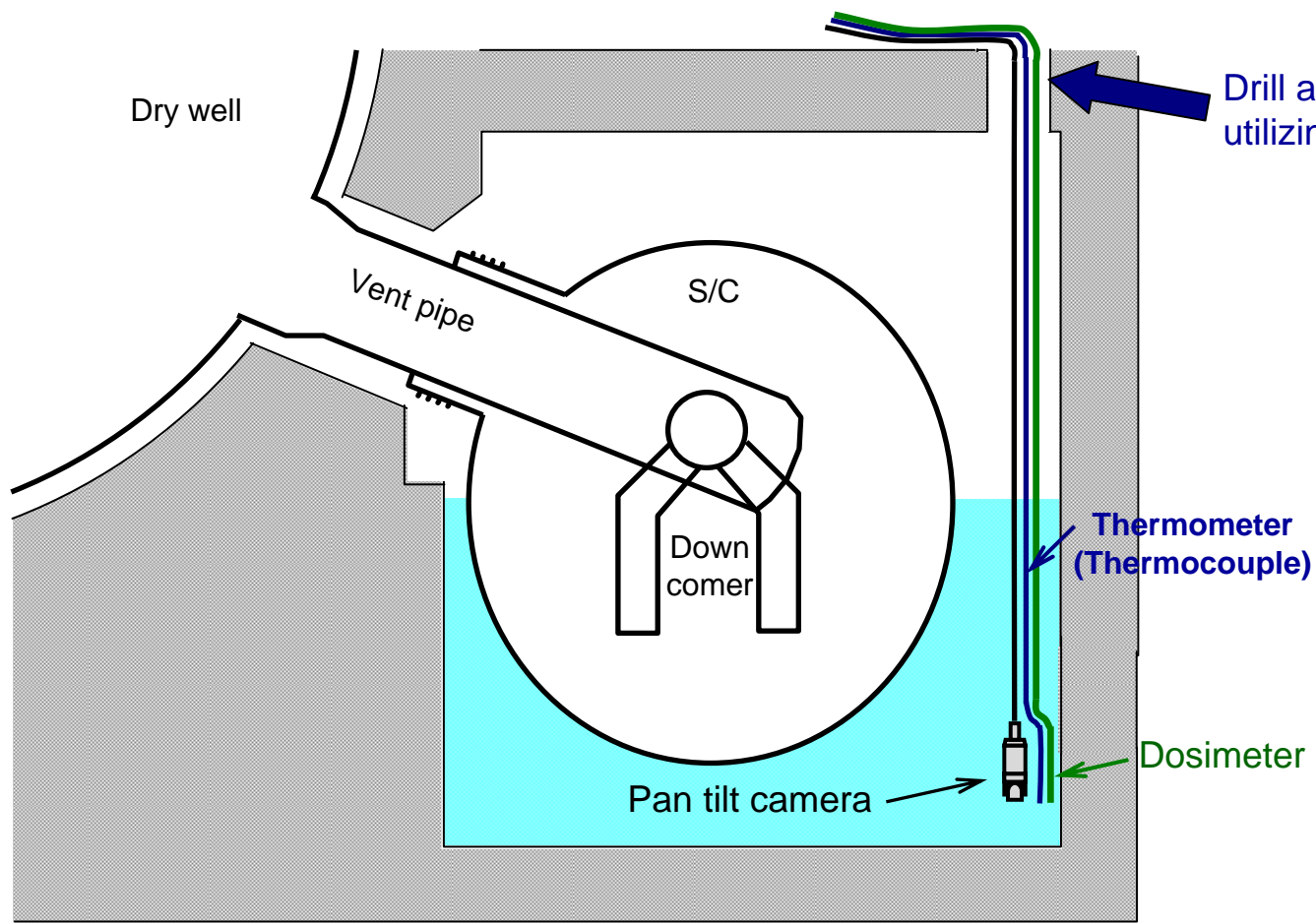
2. Investigation Items

Temperatures of atmosphere (in the air) and accumulated water (under water) and radiation doses are to be measured. Accumulated water and sediments will be sampled.

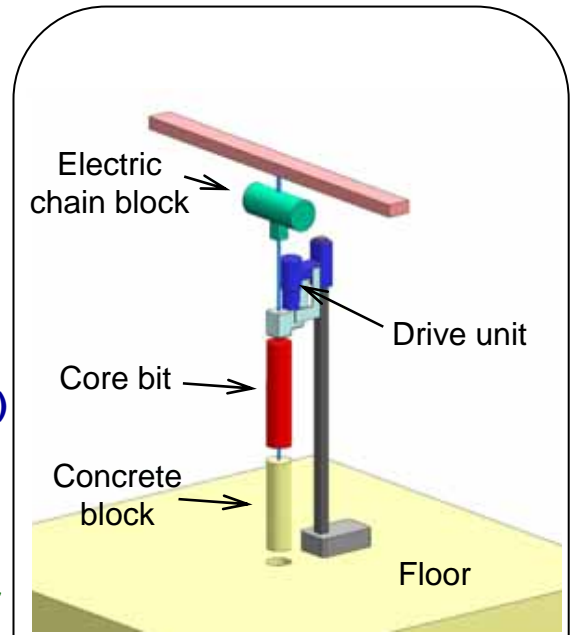
	Investigation item	Equipment used
In the air	Temperature	Thermometer
	Radiation dose	Dosimeter
	Visual inspection of structures	Camera
Under water	Clarity	Camera
	Temperature	Thermometer
	Radiation dose	Dosimeter
	Sampling of accumulated water	Accumulated water sampling device
	Sediments on the bottom	Camera
	Sampling of sediments	Sediments sampling device

3. Investigation Method (Temperature, Radiation Dose, Camera)

Drill a hole of a diameter of 300mm on the floor in the first floor of the Reactor Building utilizing a drilling equipment. A thermometer, a dosimeter and a camera are inserted through the hole to perform investigation.



Drill a hole of a diameter of 300mm utilizing a drilling equipment



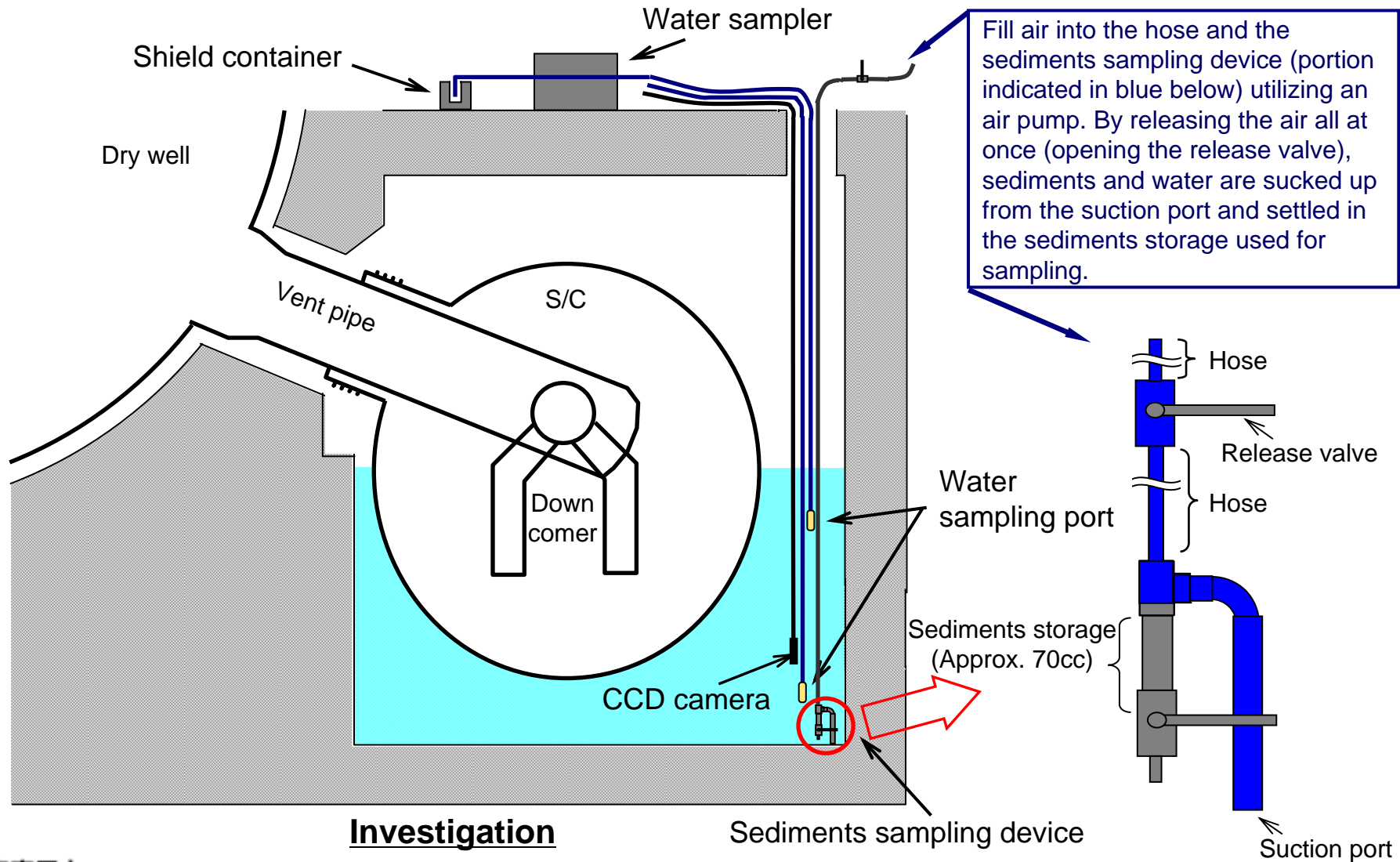
Drilling equipment

See page 7 for drilling procedure.

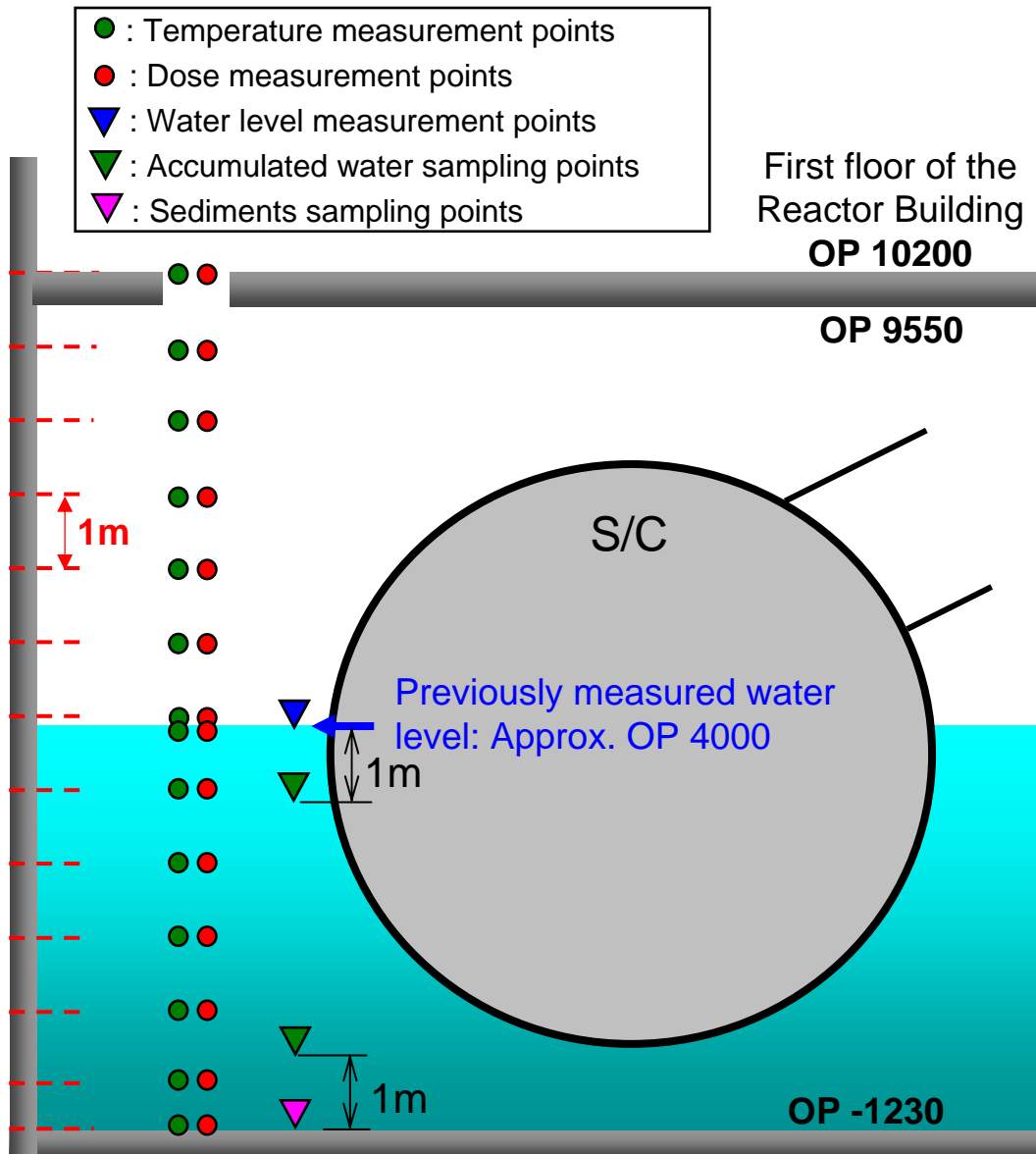
Investigation

4. Investigation Method (Sampling of Accumulated Water and Sediments)

A CCD camera, a hose used for accumulated water sampling and a sediments sampling device are inserted through the hole of a diameter of 300mm to perform investigation.



5. Measurement Points

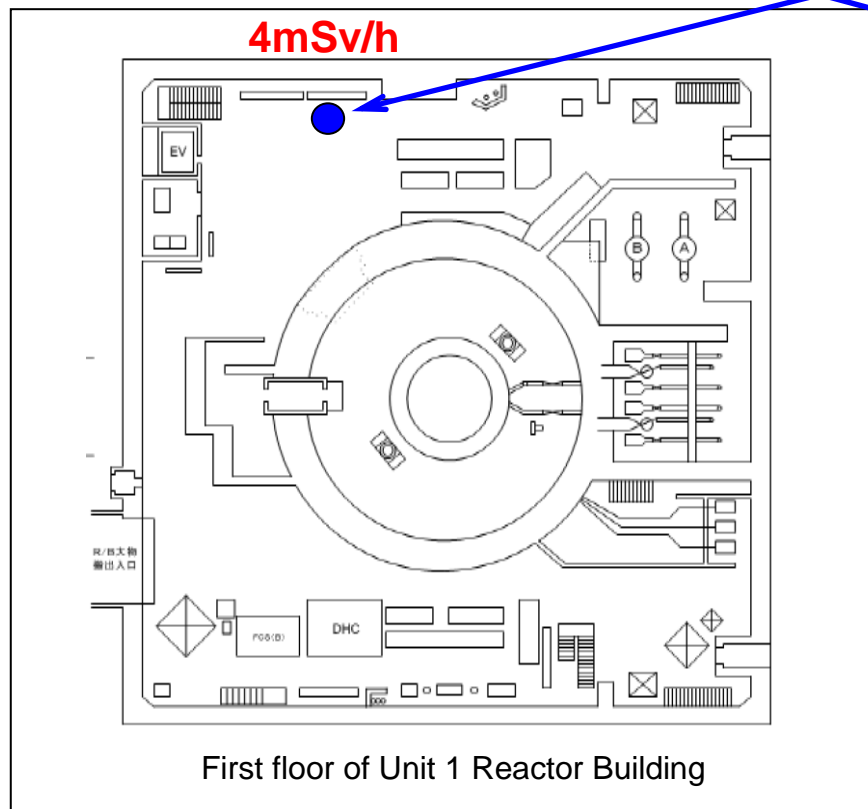


Point	Temp.	Dose
OP.10200		
Approx. OP.9200		
Approx. OP.8200		
Approx. OP.7200		
Approx. OP.6200		
Approx. OP.5200		
Approx. OP.4200		
Water level		
Approx. OP.3200		
Approx. OP.2200		
Approx. OP.1200		
Approx. OP. 200		
Approx. OP. -800		
Approx. OP. -1230		

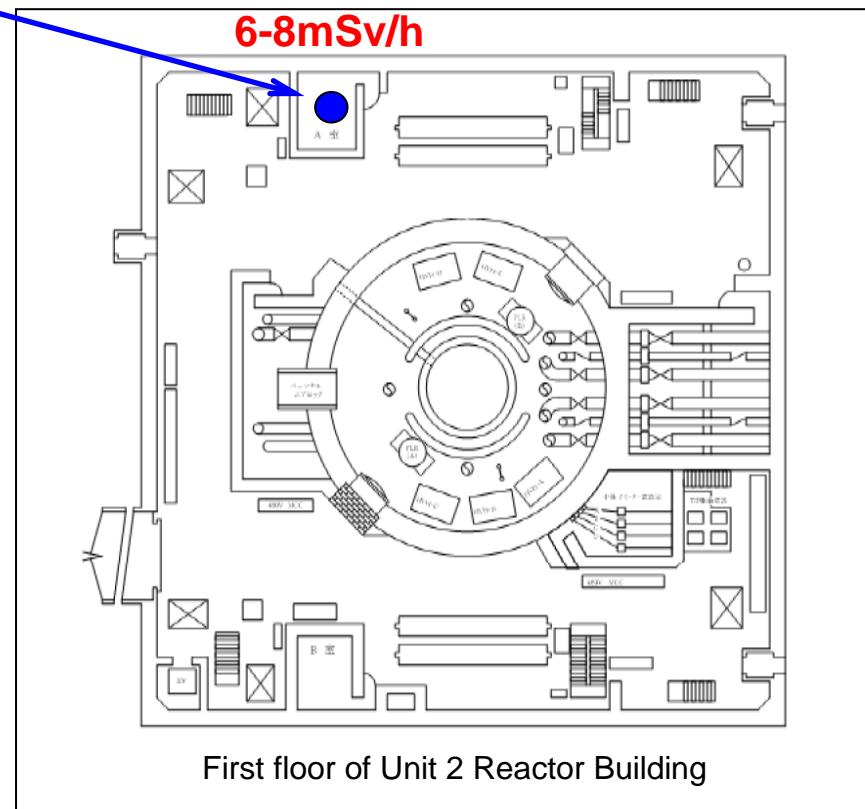
6. Investigation Locations

The following locations were selected for investigation at Units 1 and 2, as there is no obstacle which interferes with the investigation all the way down to the basement floor (such as piping) according to the design information. Unit 1: Near the north wall in the Northwest area of the Reactor Building, Unit 2: RHR (A) heat exchanger room in the north side of the Reactor Building.

Drilling hole location (Diameter: 300mm)

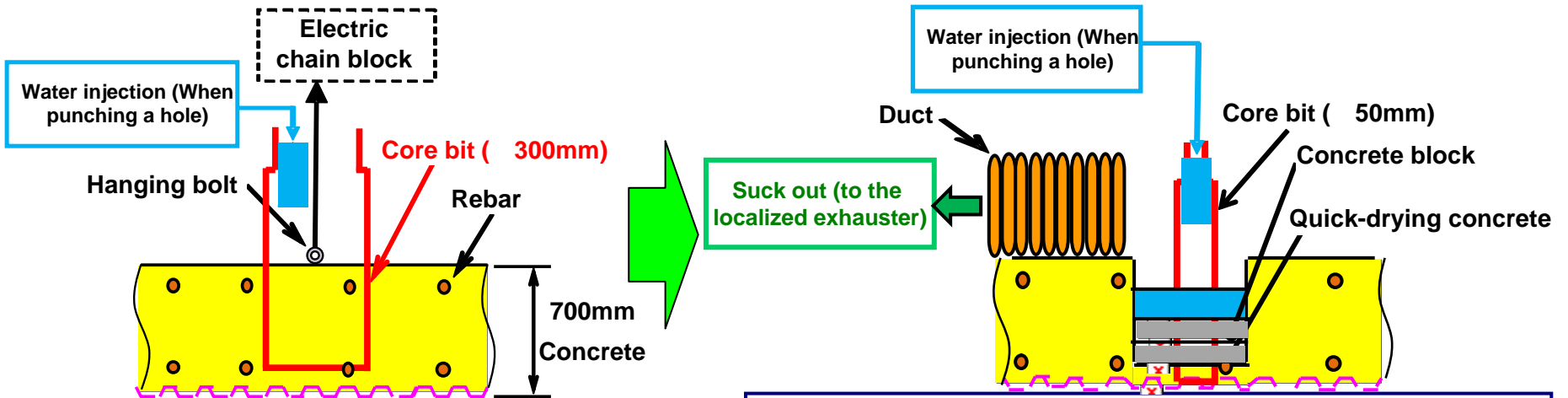


Drilling hole location in Unit 1



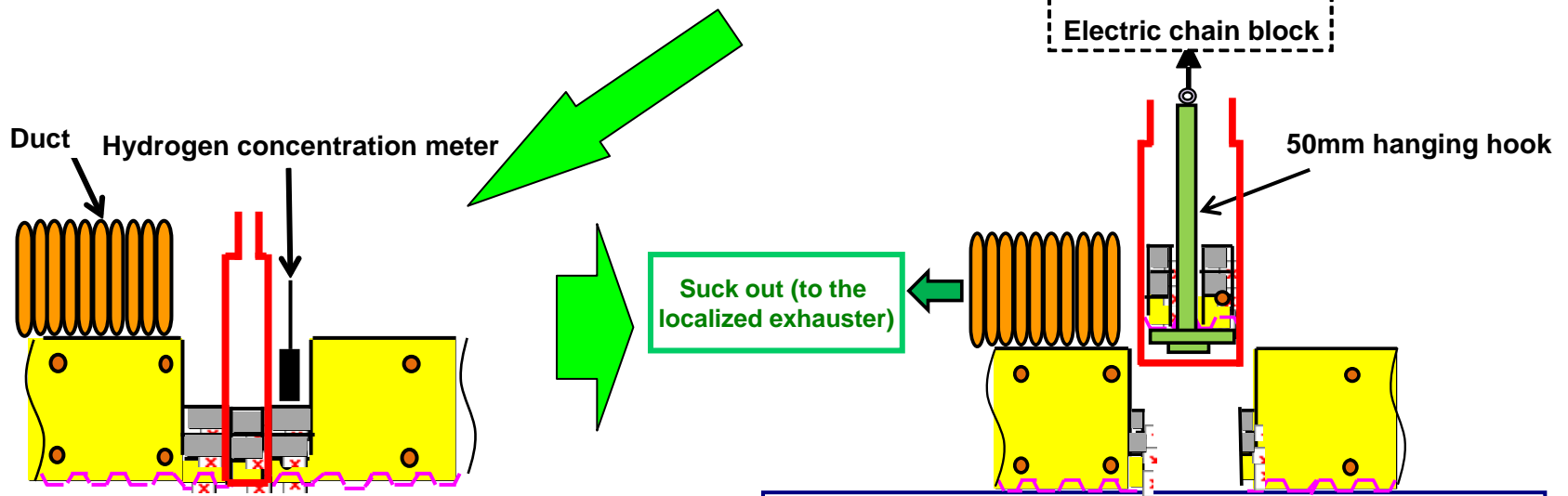
Drilling hole location in Unit 2

(Reference) Overview of Drilling procedure



Drill a 300mm hole down to the lower rebar while injecting water.

Flatter the concrete surface and flow water through the hole to check for proper penetration. Drill a 300mm hole while injecting water and sucking out to the localized exhauster.



Measure the hydrogen concentration after confirming water dripping through the partially penetrated hole.

Install a 50mm hanging hook and drill a 300mm or 200mm hole depending on the layout of the lower rebar. Then remove the concrete block.

(Reference) Assumed Risks and Risk Mitigation Measures

Assumed risk	Risk mitigation measures
Inability to drill a hole on the floor due to substances caught up in the core drill	<ul style="list-style-type: none"> - As for the upper rebar, drilling is to be done after checking its location utilizing a metal detector. - Remove the core bit right before hitting the lower rebar to check the condition. In the case that there are substances to be caught up in the core drill, reduce the hole size to 200mm.
Hydrogen explosion when drilling a hole due to the hydrogen accumulated in the basement (Torus Room)	<ul style="list-style-type: none"> - Perform hydrogen concentration measurement in the existing penetrations. - Confirm that there is no spark by using a mockup for drilling. - Inject water while drilling a hole.
Obstacles found in the location where a hole is to be drilled	Be sure to drill a hole on location without obstacles by looking at the design data.
Inability to perform sampling of accumulated water and sediments due to high radiation dose	Sampling is to be cancelled if the sample dose is 100mSv/h or more.
Inability to set the sediments sampling port on the bottom of the basement floor	Perform training on installation in advance using a mockup.