

<Reference>

# **“Development of a technology to investigate inside the Reactor Primary Containment Vessel (PCV)”**

**-- Site test “Investigation B1” on grating around the pedestal inside Unit 1 PCV -**

**[For April 10]**

**April 13, 2015**

**Tokyo Electric Power Company**



**IRID**

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The content of this material includes the output of the International Research Institute for Nuclear Decommissioning (IRID)

# 1. Investigation overview

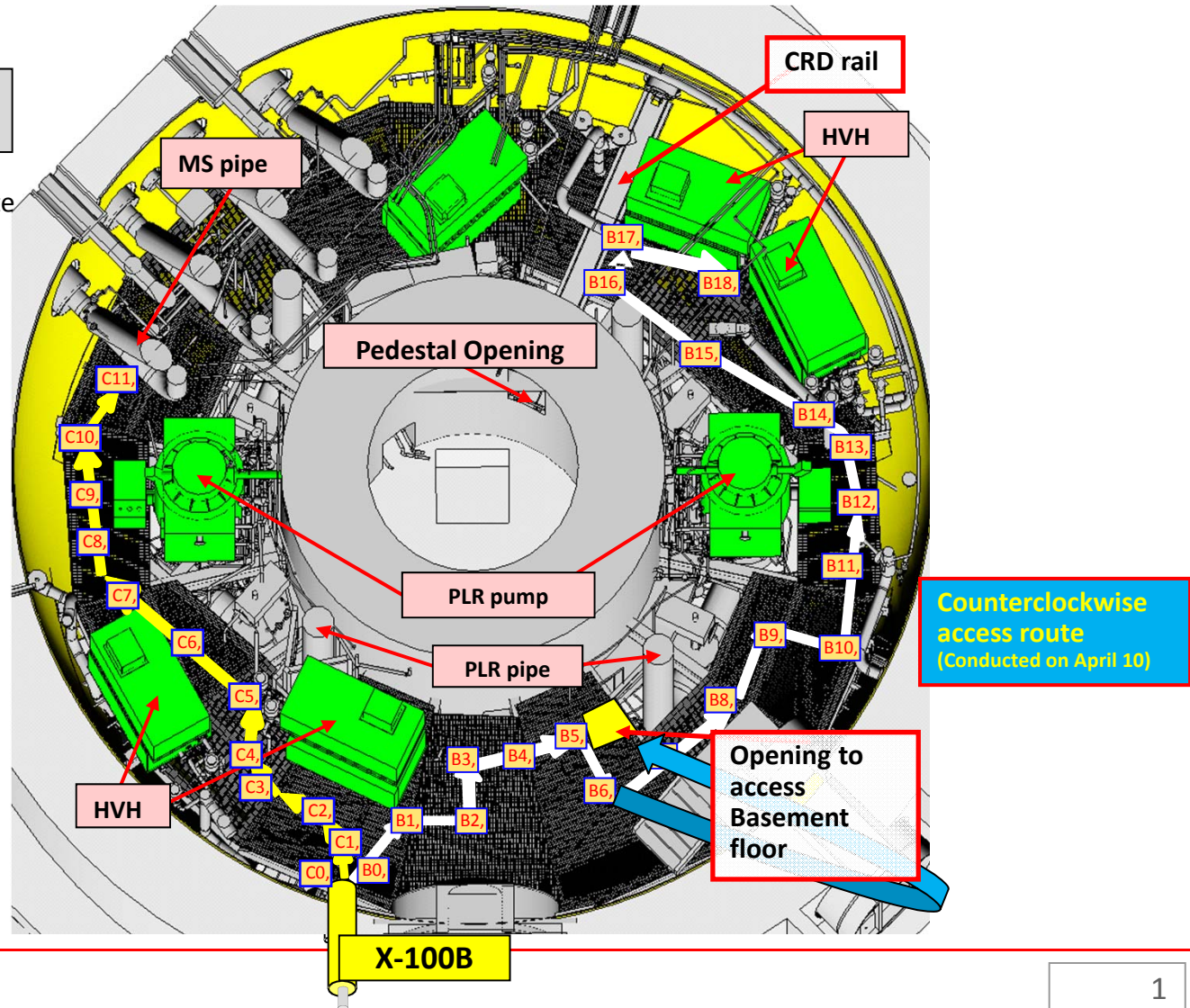
Purpose: For Unit 1, conducting an investigation in order to collect information on “the 1<sup>st</sup> floor grating inside the Primary Containment Vessel (PCV)” from the robot inserted through X-100B penetration pipe.

→ : Access route (counterclockwise)  
 → : Access route (clockwise)

B0, ~ B18, Counterclockwise route  
 C0, ~ C11, Clockwise route

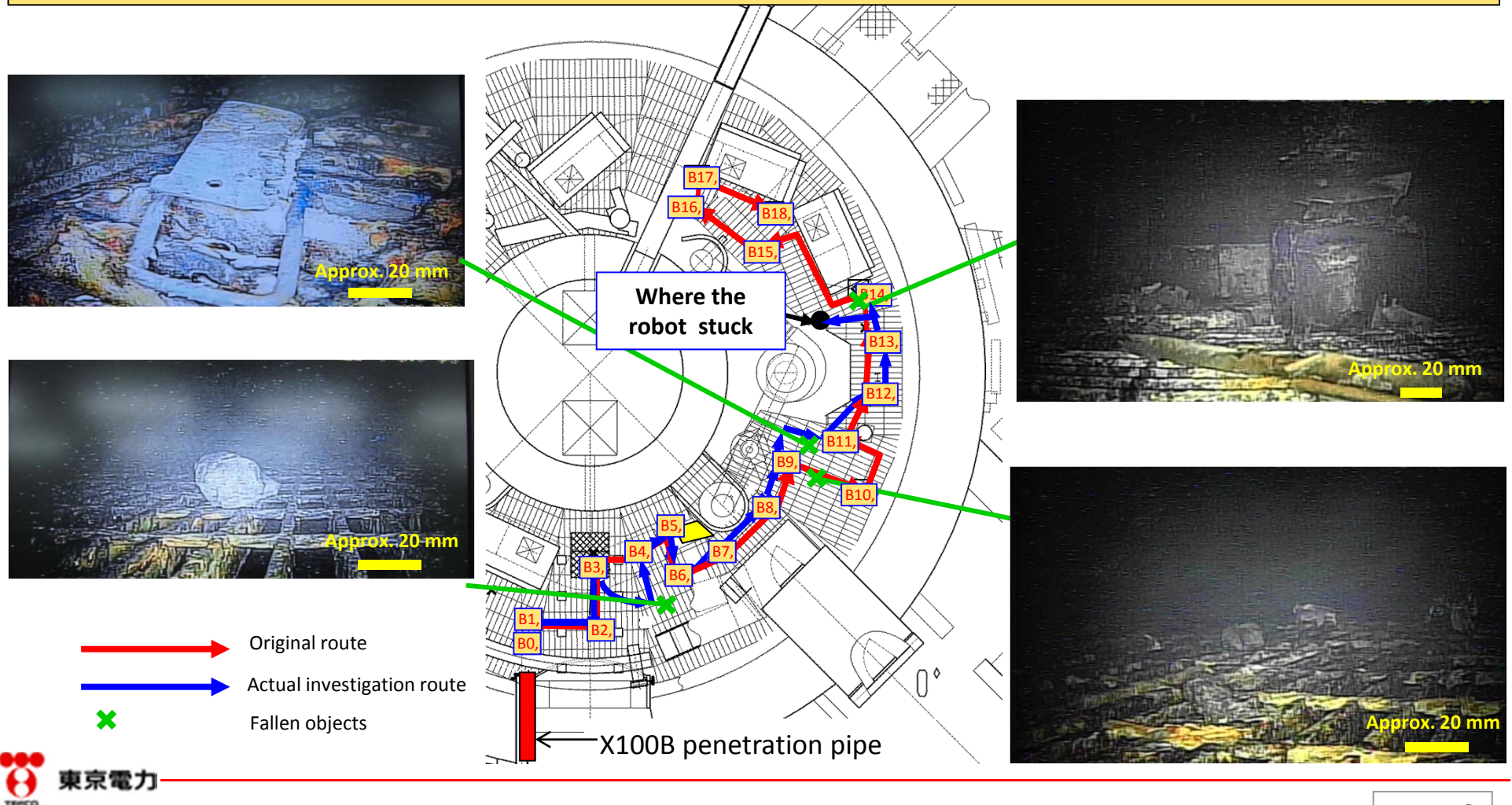
Access points (Planned)

Investigation device



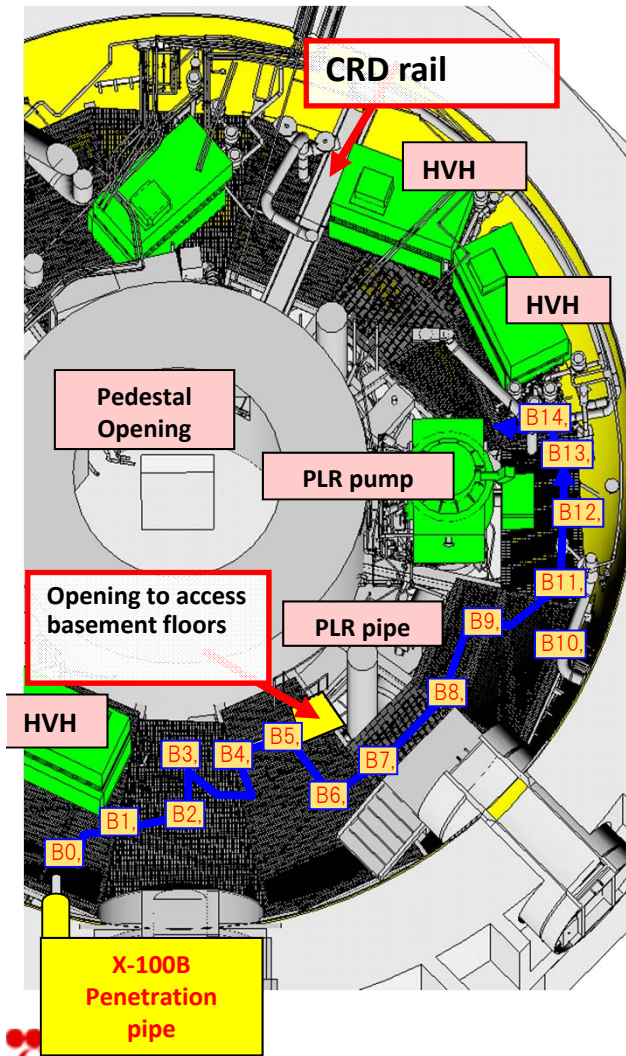
## 2. Access route (performance result)

- The investigation was conducted taking on a different route as some objects were found to be fallen on the original access route planned.
- The robot was stuck on the route between B14 and B15.



# 3. Investigation results

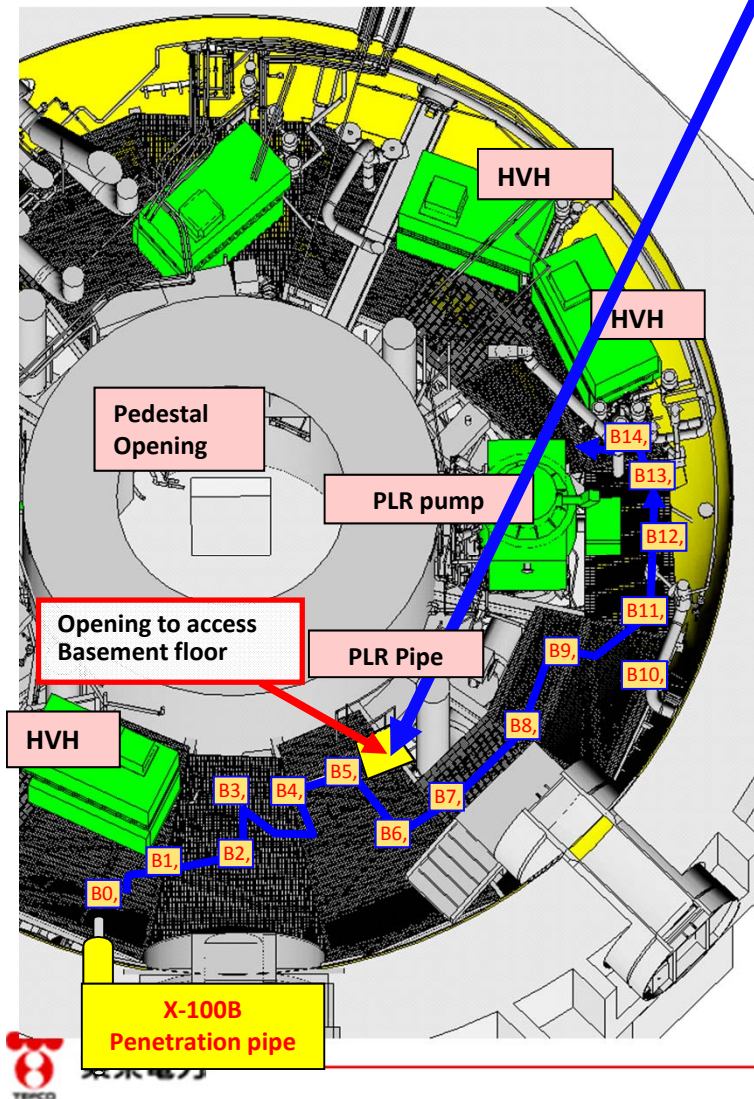
The following information were obtained for items ① to ③ of this investigation.



No.	Location	Investigation results
①	Opening to access basement floors	<ul style="list-style-type: none"> <li>B2 investigation* will be conducted next time. TEPCO confirmed <b>there is an opening accessible to the basement as well as no obstacles around it.</b></li> </ul>
②	CRD rail	<ul style="list-style-type: none"> <li><b>Yet to be reached at CRD rail.</b></li> <li><b>Images have been taken</b> with a camera facing towards CRD rail from the place where the robot reached at, <b>which is now under evaluation.</b></li> </ul>
③	On the access route	<ul style="list-style-type: none"> <li><b>No significant damages were found on the existing facilities.</b> (such as HVG, PLR pipe, the wall of Pedestal)</li> <li><b>Information on the temperature and radiation levels</b> has been obtained at each investigation point.</li> </ul>

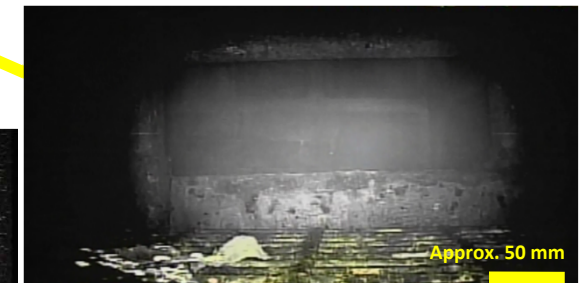
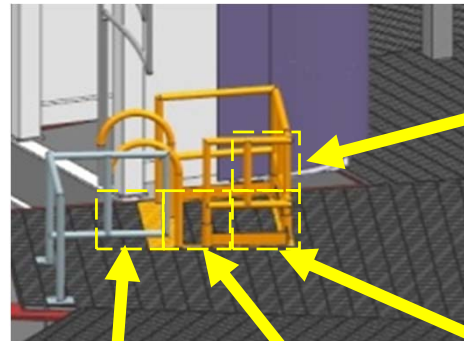
\* B2 investigation: Investigation on basement floor excluding the pedestal.

# 4-1. Images (Opening to access the basement)



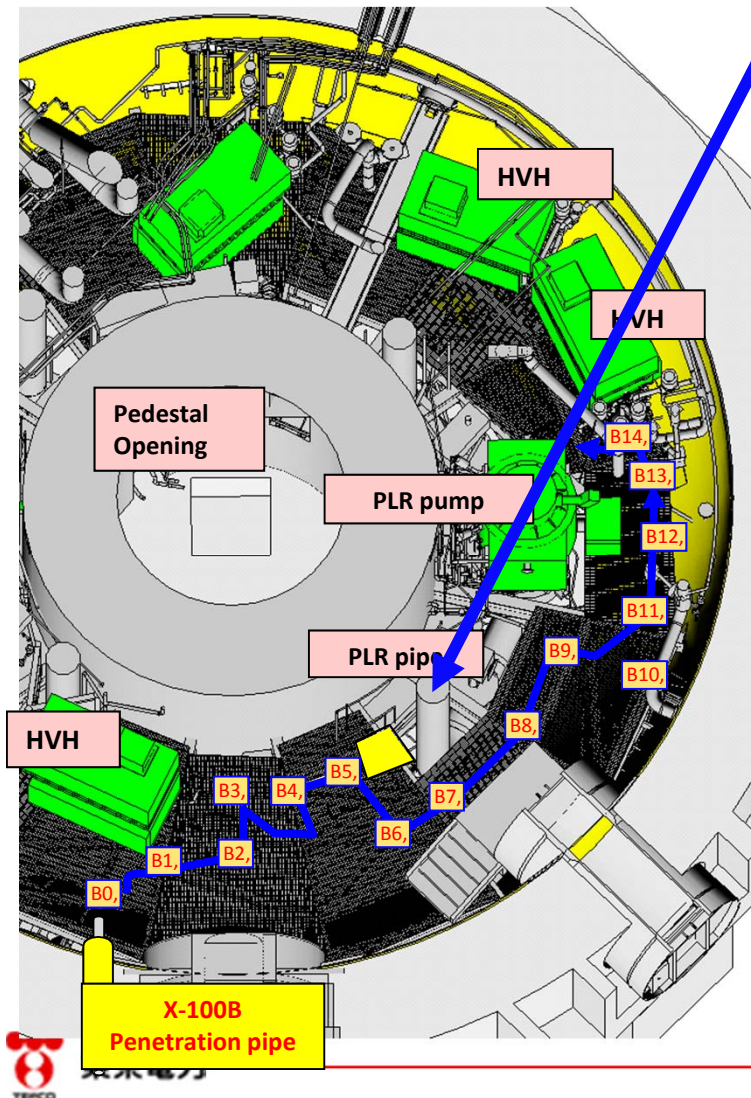
**B4**

With B2 investigation to be conducted next time, TEPCO confirmed there is an opening accessible to the basement as well as no obstacles around it.



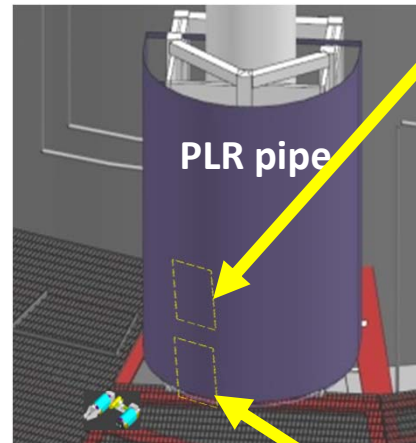
Spot where the robot can be inserted.

## 4-2. Images (PLR pipe)

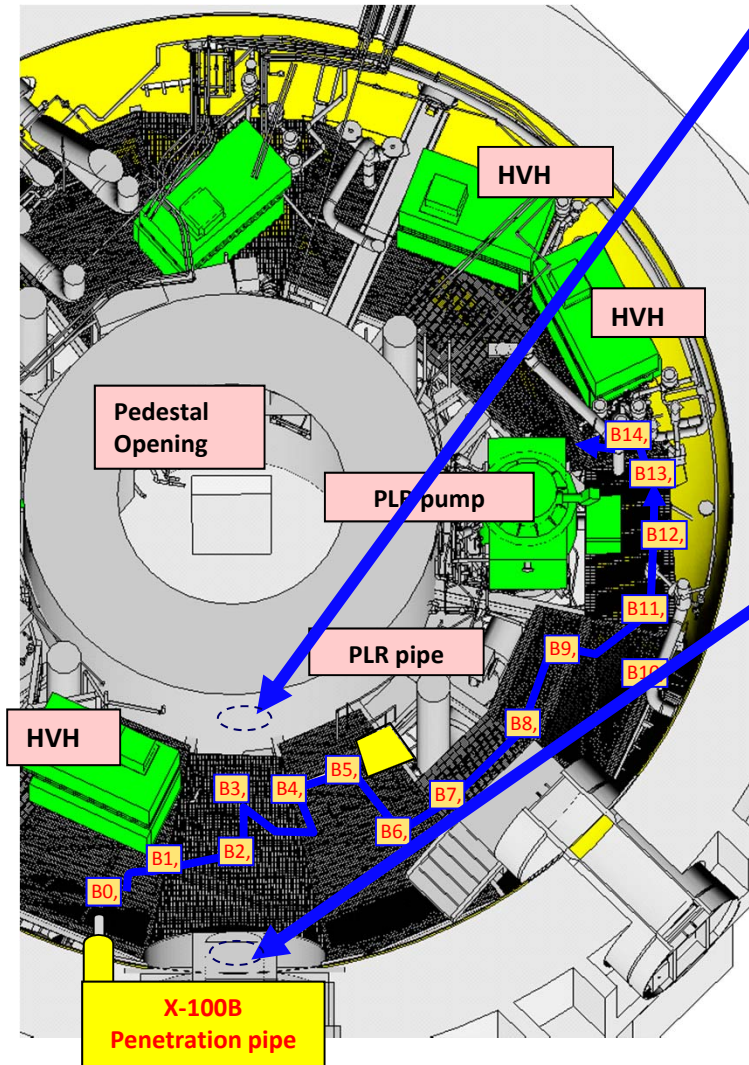


**B7**

- No significant damages were found on the PLR pipe (for heat retention).
- It was found that a part of the shield has been fallen off.



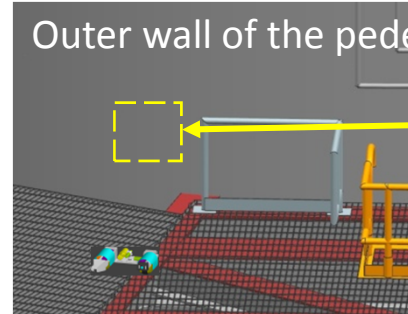
## 4-3. Images (Equipment hatch and exterior of pedestal)



### B3 Exterior of the outer wall of the pedestal

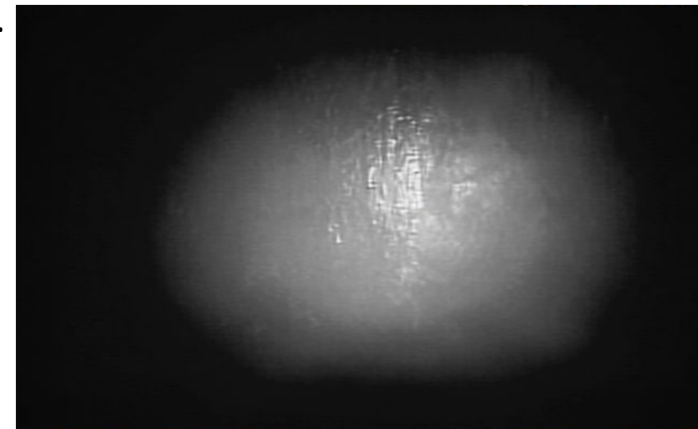
No significant damages were found on the outer wall of the pedestal.

Outer wall of the pedestal

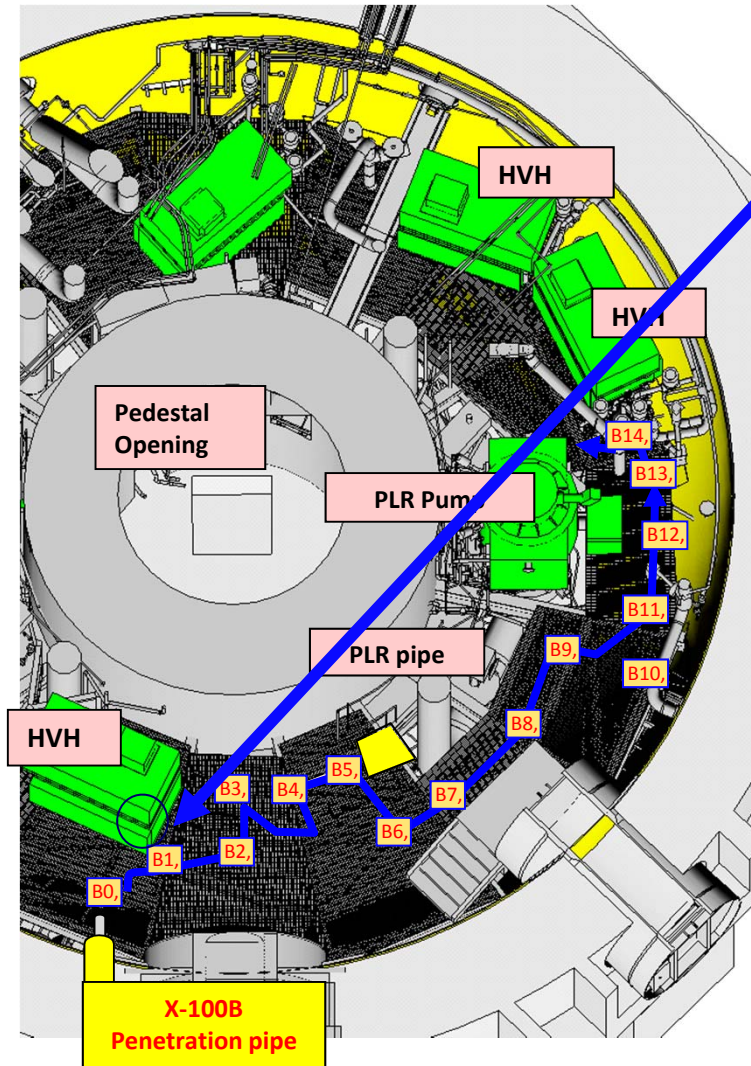


### B2 Exterior of the equipment hatch.

No significant damages were found on the equipment hatch.



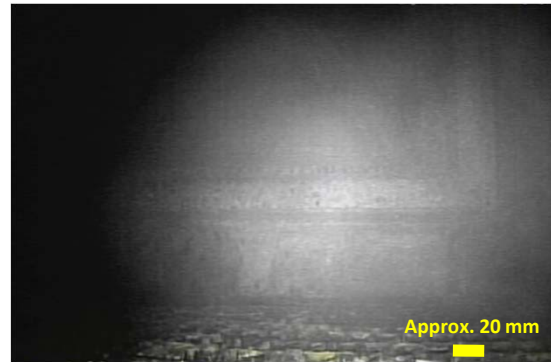
# 4-4. Images (HVH (D) )



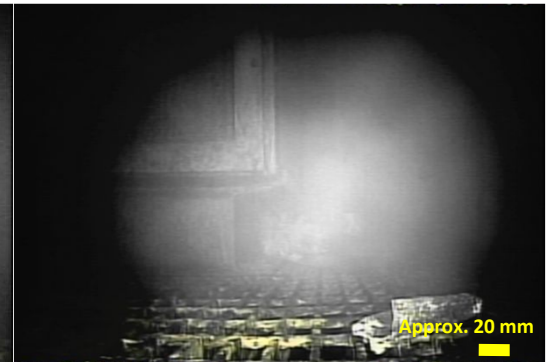
**B1**

No significant damages were found on HVH (D).

HVH (In the center at the bottom)



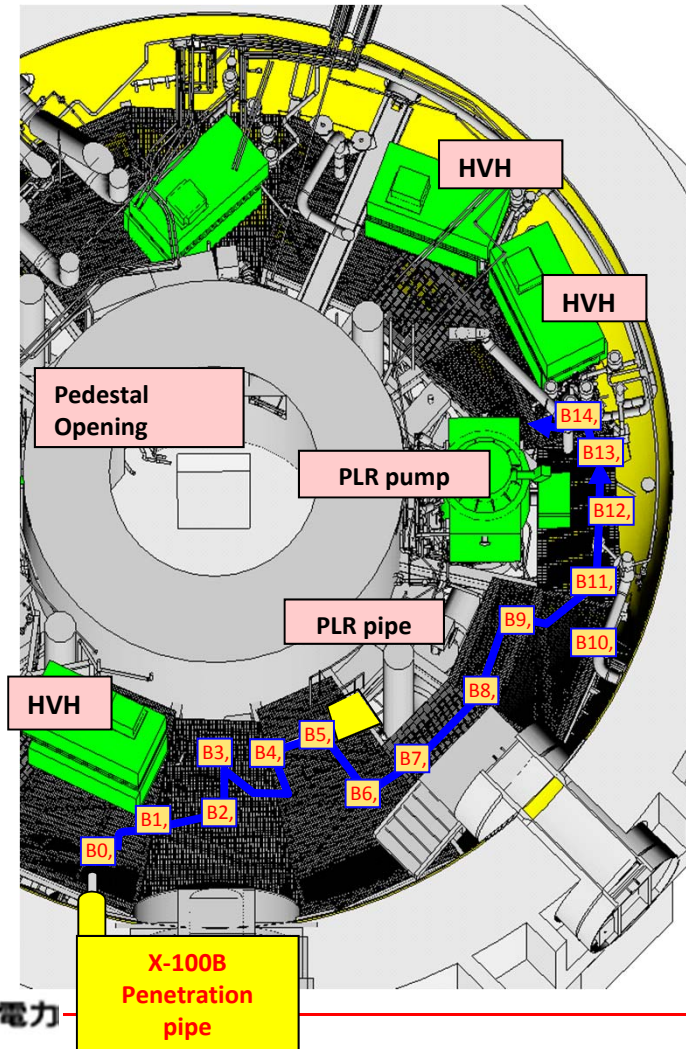
HVH (At the edge of the bottom)





## 5. Investigation results (Temperature/ dose rate)

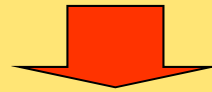
Temperature and dose rate were measured at the following points.



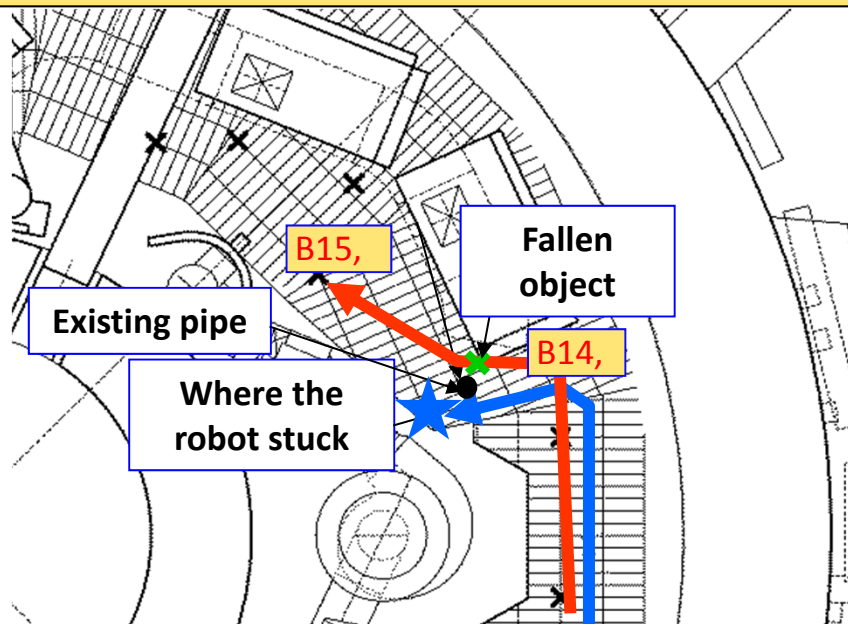
	Dose rate (Sv/h)	Temperature (°C)
B3	<b>7.4</b>	<b>17.8</b>
B4	<b>7.5</b>	<b>19.2</b>
B5	<b>8.7</b>	<b>19.4</b>
B7	<b>7.4</b>	<b>19.5</b>
B11	<b>9.7</b>	<b>19.2</b>
B14	<b>7.0</b>	<b>20.2</b>

## 6. Investigation robot stuck on route

- Object was found to be fallen on the planned route between B 14 and B 15 where was the narrowest part of it.
- Following the procedures, the investigation continued by choosing an another route avoidable the objects.



- After that, although the robot stuck at a narrow point, it captured some images facing to the direction of CRD rail. (currently the images are under evaluation)



Original route planned  
Actual investigation route

### Possible cause and measures:

The robot got stuck with an existing pipe and some shut parts of the grating or uneven part at the joint, which resulted in making the route hard to run on.



Measures to be taken are under study.

# 7. Schedule

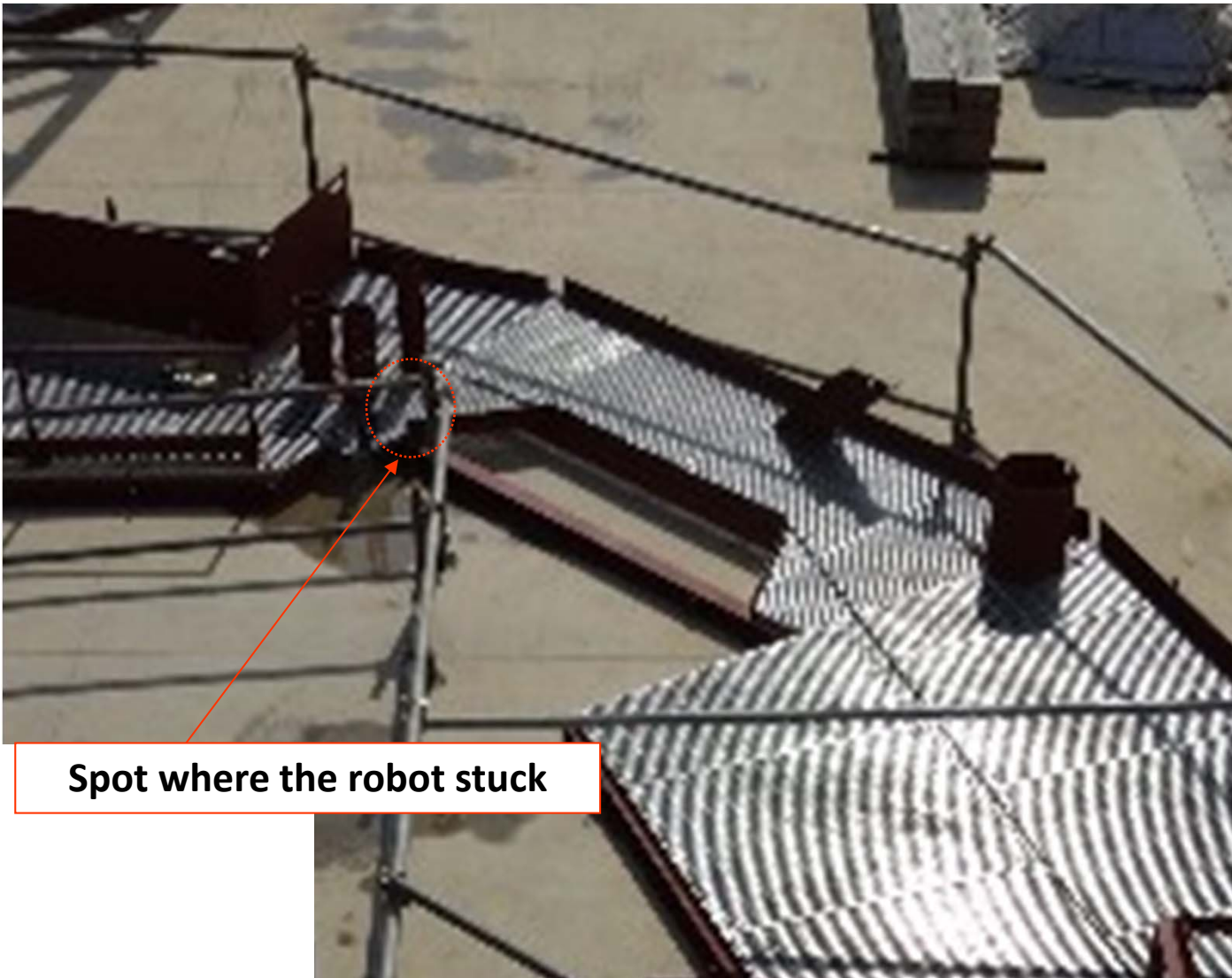
- Dose rates were obtained below 10 Sv/h.
- A knowledge was obtained that with the same amount of dose rates in “investigation on clockwise route”, the investigation camera which installed into the robot could tolerate two or three days without any problems .
- As for the case of an investigation on clockwise route, the plan is currently reviewed based on the knowledge obtained above.

		April 2015							
		10	11	12	13	14	15	16	17
		Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri
1. Investigation on counterclockwise route	Investigation								
	Robot collection review								
2. Investigation on clockwise route									

Under examination for the implementation period for the investigation on clockwise route.

# Reference: Mock-up

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**Spot where the robot stuck**

## Reference: Mock-up

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