

<Reference Materials>

Results of Research Concerning Exterior Section under S/C (Suppression Chamber) at Unit 2

(Report on Verification Test Regarding a Device for Surveying Exteriors under S/C (Pressure Suppression Chamber) as a Part of “Developing Technologies for Surveying and Maintenance Involved in the Filling of the Primary Containment Vessel (Water Cutoff)”)

September 4, 2014

Tokyo Electric Power Company



東京電力

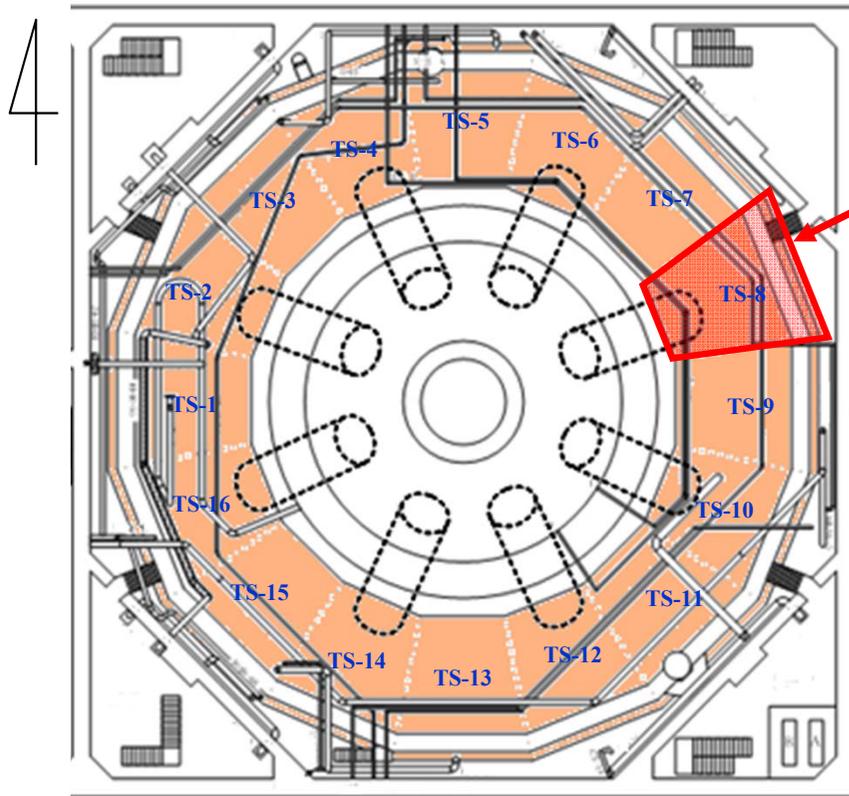
IRID

Data in this document was compiled from results achieved by the International Research Institute for Nuclear Decommissioning (IRID).

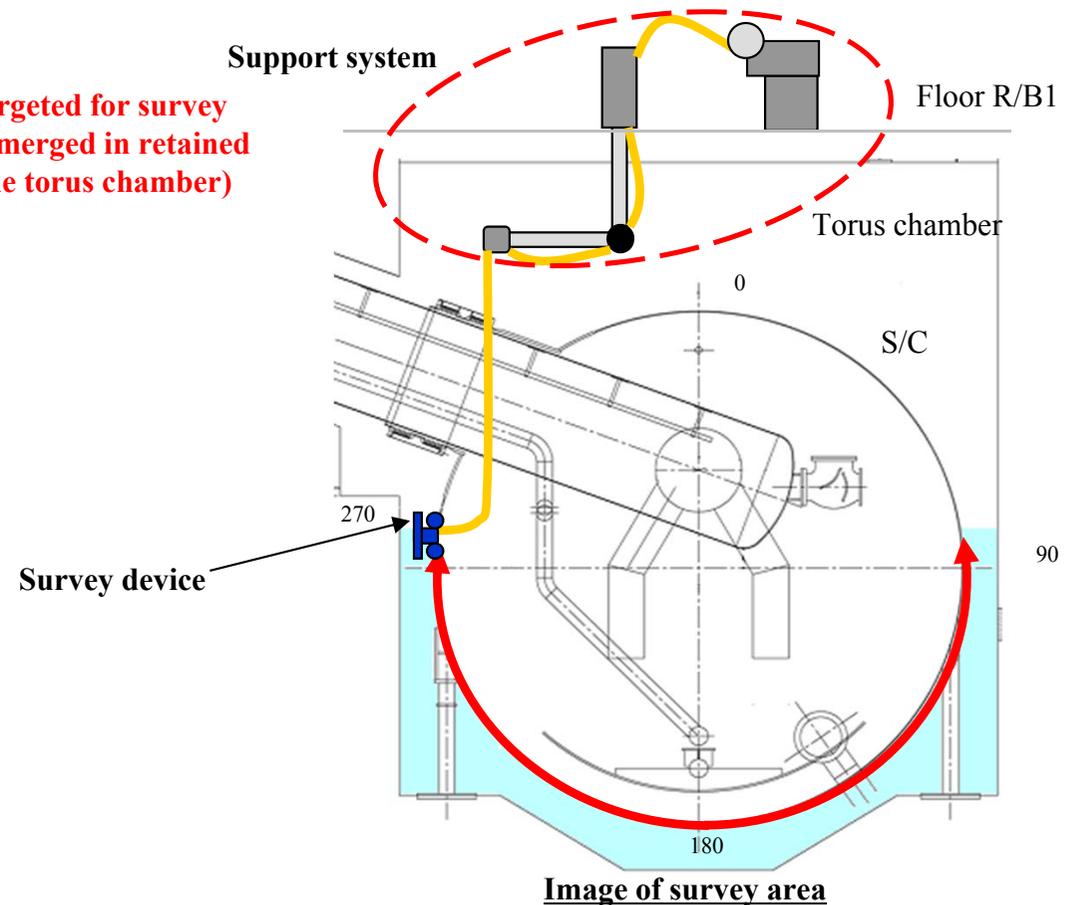
1. Research Overview and Objective

- Using a device for surveying exteriors under S/C (pressure suppression chamber) as a part of “developing technologies for surveying and maintenance involved in the filling of the primary containment vessels (water cut off)” project subsidized by the Agency of Natural Resources and Energy) that is currently being researched and developed, suitability was verified using an actual device and a check was conducted to determine whether there was an opening under a S/C (TS-8) submerged in retained water inside a torus chamber at Unit 2.

* φ50mm or more: Approximate size needed to consider additional cutoff methods

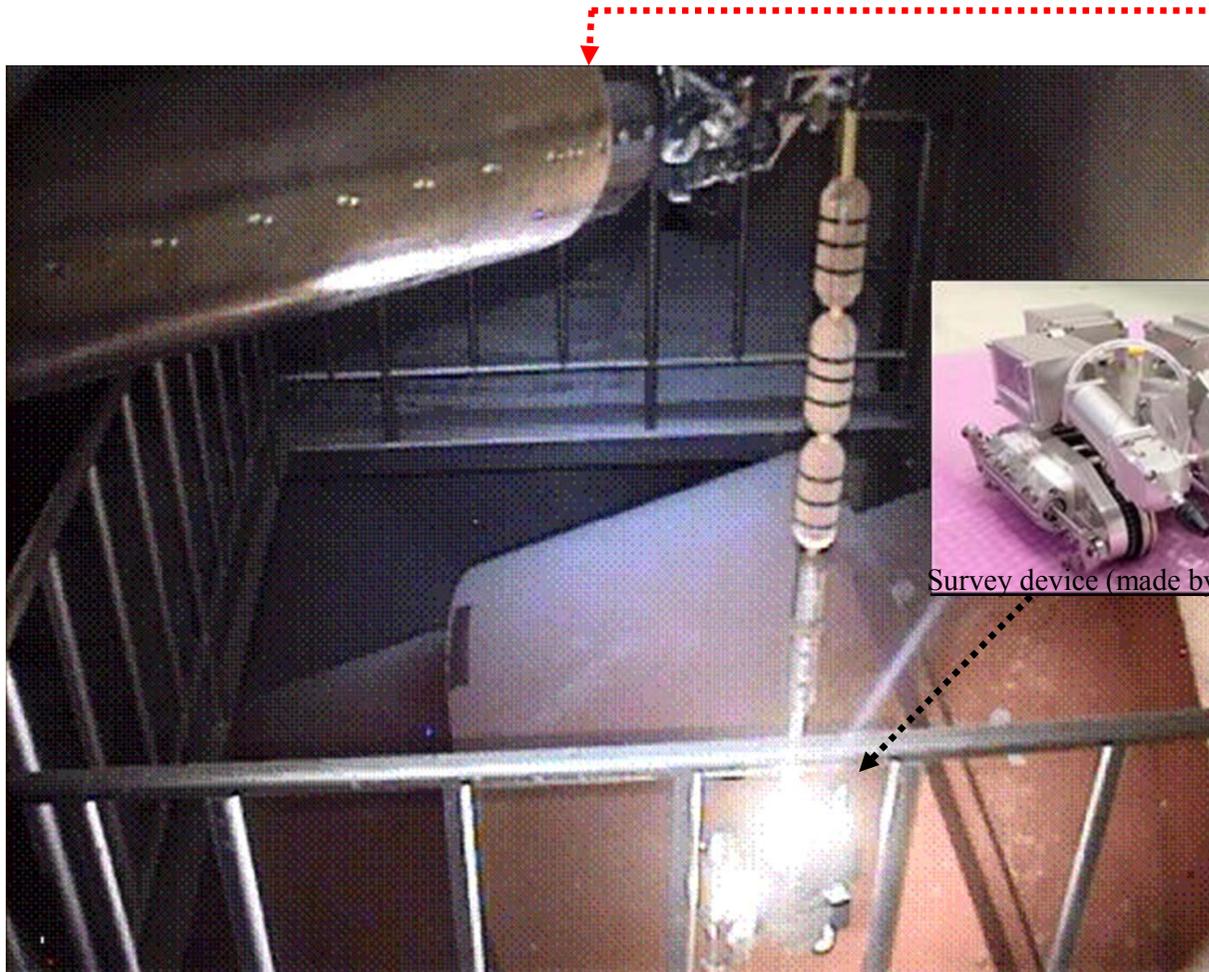


Area surveyed at Unit 2



2. Survey method

- The survey consisted of using a support device to lower the survey device down onto the top of the S/C in the torus chamber from floor R/B1, and run the survey device along the top of the S/C while taking images of the S/C outer surface for the submerged section and checking whether there were openings.



Survey using actual device at Unit 2
(Lowering the survey device)

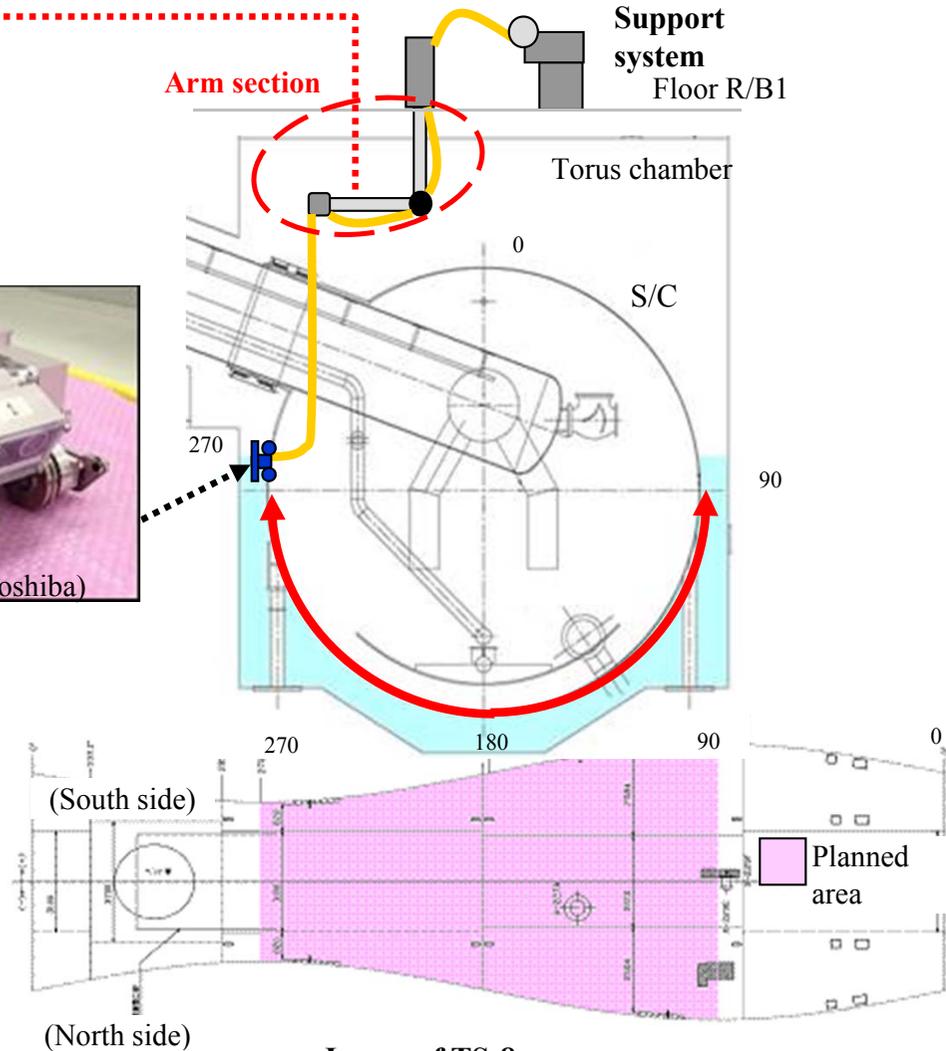
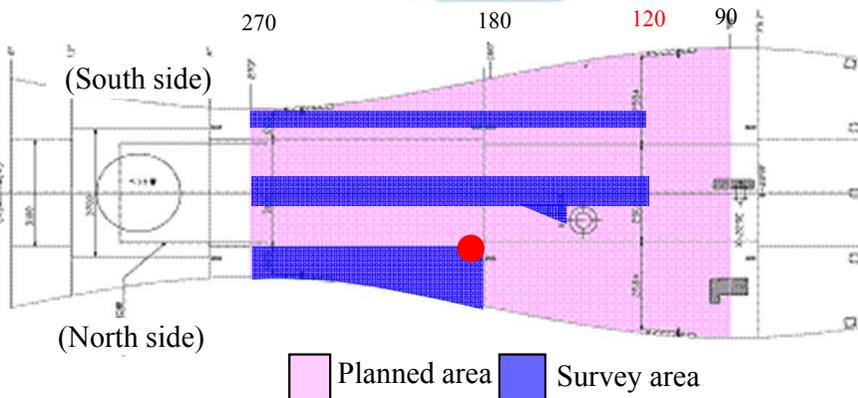
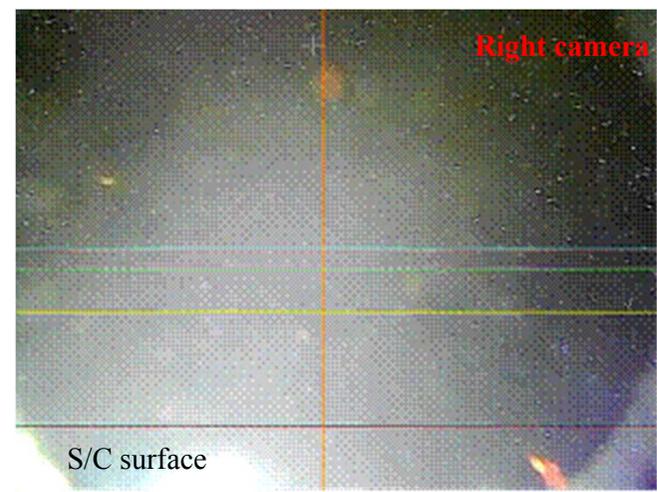
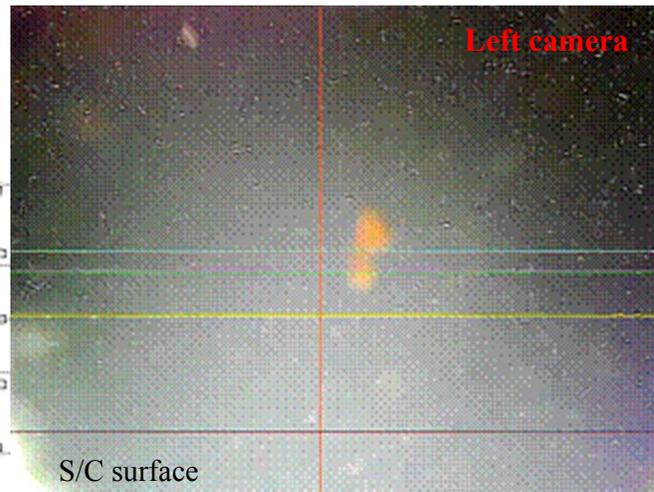
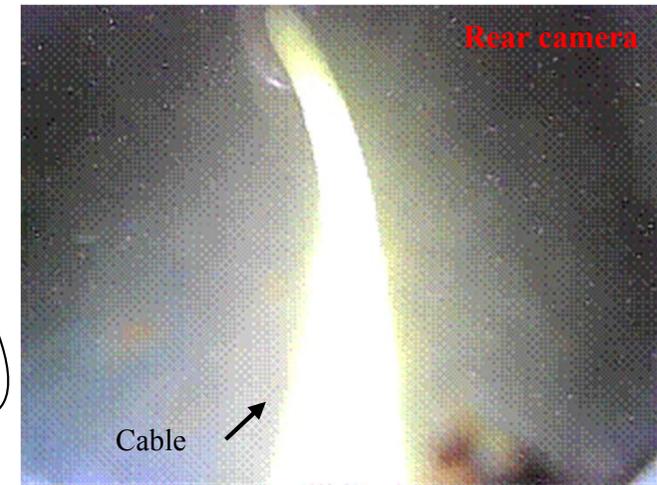
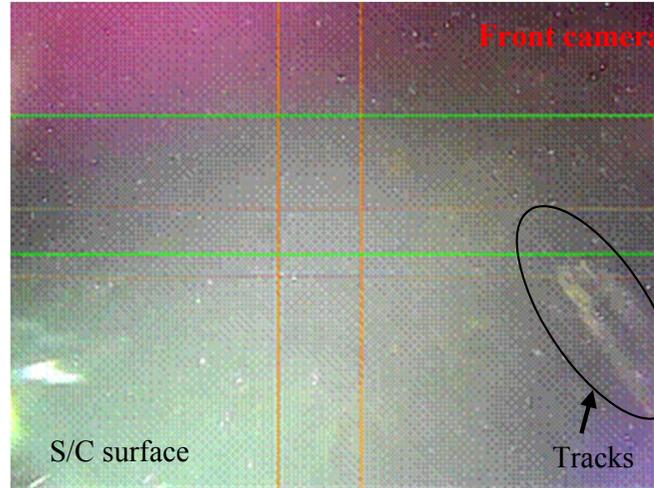
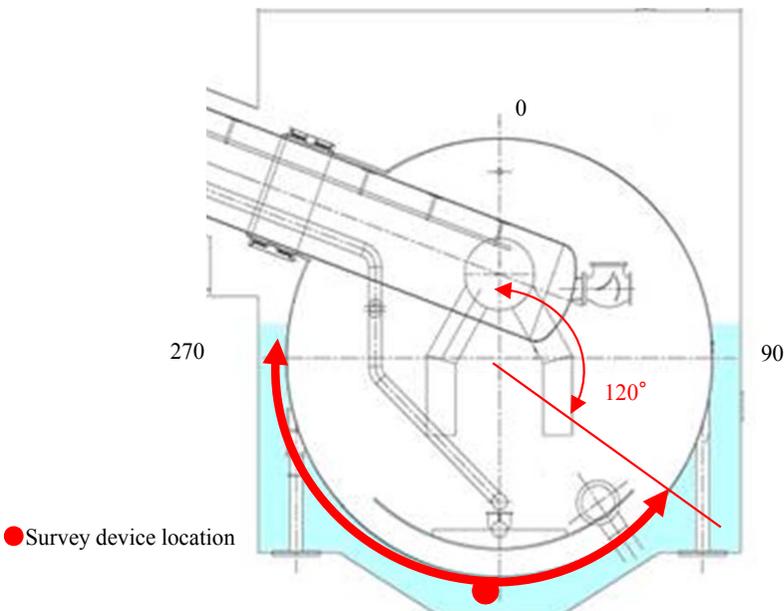


Image of TS-8 survey area
(Development diagram looking at the S/C from the bottom up)

3. Survey (Verification) Results (1)

- It was confirmed possible to use the support device to attach or remove the survey device from the outer surface of the S/C.
- No openings were found within the survey area.

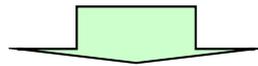


[Supplementary] Underwater field of view (front camera) is 100~200 mm (initial plan was roughly 350 mm)

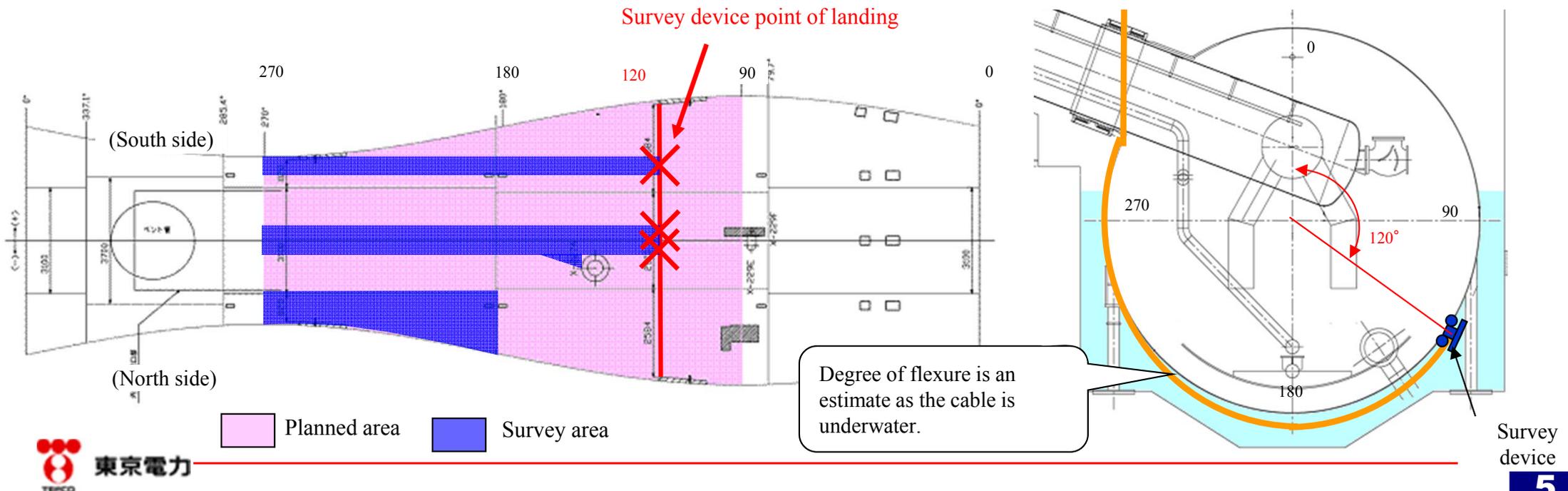
Outer surface of S/C bottom (near 180°)

3. Survey (Verification) Results (2)

- As the survey device fell down repeatedly (3 times) near “approx. 120° ” on the S/C, the range of approx. 90~120° on the outside wall of the S/C could not be surveyed. (The cause is currently being investigated)
- As suspended matter made the field of view underwater worse than expected, the survey required more time for completion.



Pause the survey, consider countermeasures, and decide whether to survey unsurveyed areas.

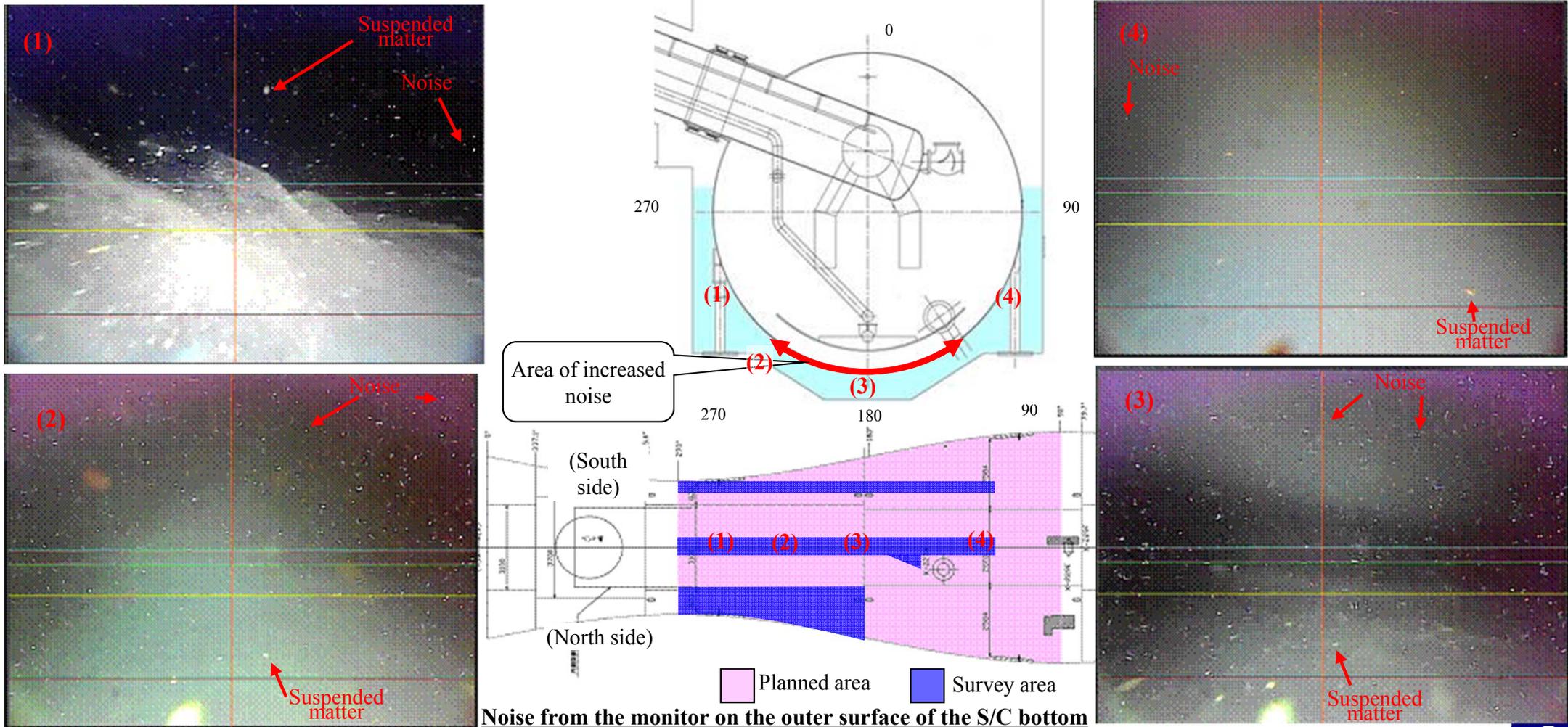


3. Survey (Verification) Results (3)

- It was discovered that **noise thought to be caused by the dose level shown on the monitor screen increased** as the survey device moved towards the S/C bottom.

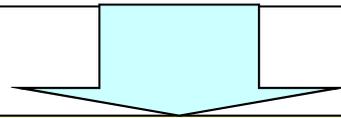
[Increased noise in the area of the S/C bottom could mean the dose level is high]

- Noise in the monitor image will be checked and radiation dose level at the S/C bottom will be assessed.



4. Future Actions

- The **causes of the survey device falling** from a location near approx. 120° on the outer surface of the S/C **needs to be investigated and an improved survey device created.** (Preparations are currently underway to investigate causes in the field)
- As it is possible that the radiation dose level that the S/C bottom is high, **a measure to reduce survey device dose level is needed.**
- **Due to poor field of view underwater and subsequent lengthened survey times, a substitute method must be examined.**
 - Projected survey period (shortest): 8 days (1 bay) → Projected survey period based on verification test results (shortest): 16 days (1 bay)
 - Planning assumes underwater field of view of roughly 350 mm. About 100~200mm for verification tests.



After examining the above, planning for a survey of the remaining S/C bottoms (all 16 bays) will begin.