

# Fukushima Daiichi Nuclear Power Station

## Unit 1 Primary Containment Vessel Internal Investigation (Non-submerged area)

### Causes and Countermeasures for Snake-like Robot Cable Issues

- On February 28, a small drone was used to perform an investigation of non-submerged area outside the pedestal of the Unit 1 primary containment vessel (hereinafter referred to as, "PCV") (first day of the investigation). During this investigation, we observed the condition of the PCV penetration (X-6 penetration), and the opening used to replace the control rod drive (CRD) and rails, etc. We have yet to see any substantial damage to equipment or structures within the scope that the investigation was conducted.
- During the internal investigation planned on February 29 (second day of the investigation), the snake-like robot was unable to reach the CRD replacement rails as intended due to issues with paying out the cable.
- As a result, the small drone investigation of the pedestal that was originally planned for February 29 will be performed after implementing countermeasures.

< Announced as of March 7 >

- After investigating the reason why we were not able to pay out the cable for the snake-like robot it was found that when the cable was being paid out, part of it wrapped around the installation bracket for the guide roller\* inside the sealed container thereby preventing the cable from being paid out to the PCV.
- Now that we have confirmed by March 8 that recurrence prevention measures are effective, we will implement the pedestal internal investigation using the small drones on March 14.
- We will move forward safely and carefully with these tasks so as to not impact the surrounding environment

※ Guide roller : A roller that secures and guides the route from the cable storage to the cable winch.

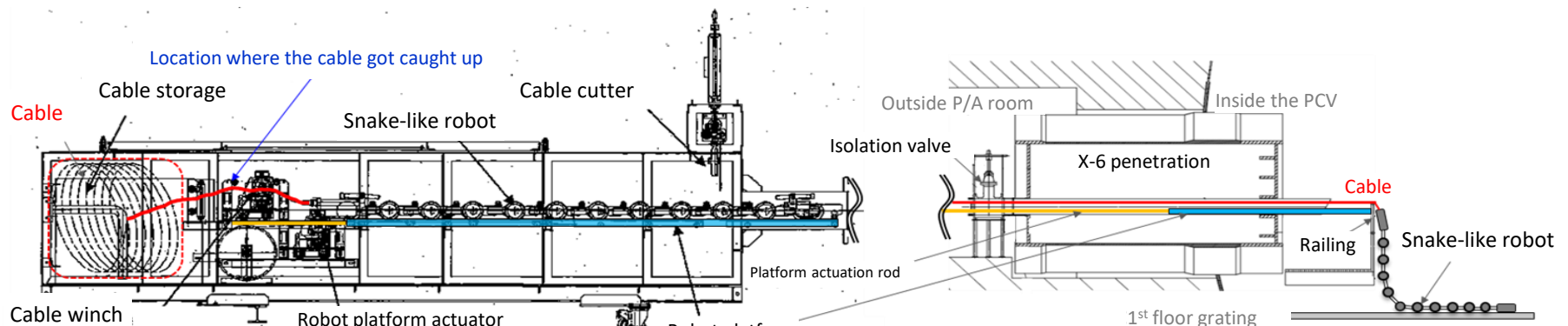


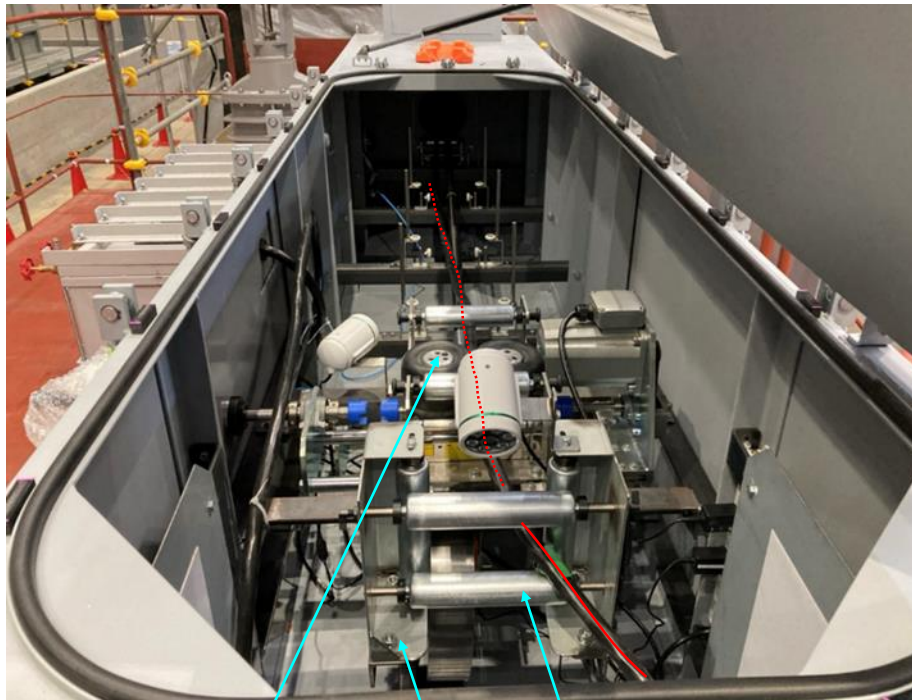
Diagram showing conditions when the event occurred

# 1. Causes (Cable conditions when the event occurred)

- Usually, cable is routed through guide roller to the cable winch.
- In this case, cable route was different from the normal route due to the flexure in the cable. As a result, cable was caught in the installation bracket for the guide roller, unable to be paid out.

↖ Direction of cable payout (PCV) side

— : Cable route      ↑ Direction of cable payout (PCV) side

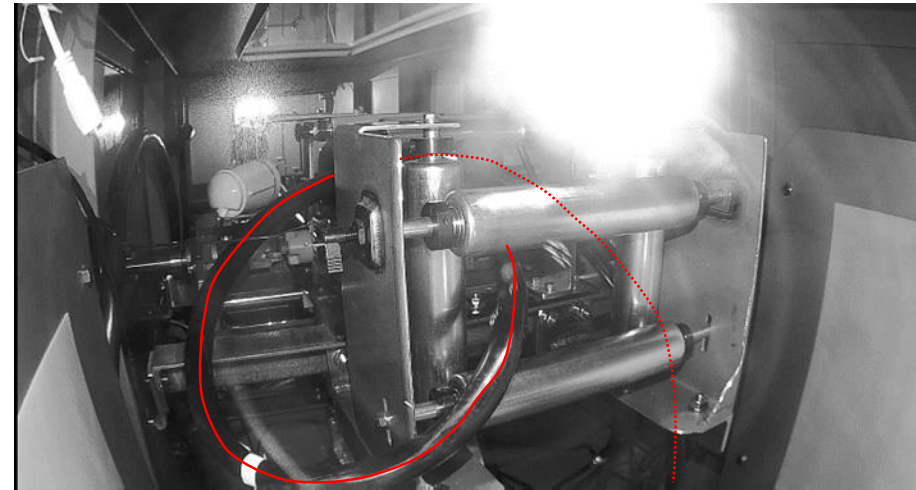


Cable winch

Cable guide roller

Guide roller installation bracket

Normal conditions (photo taken during the mockup)



(Different angle)

— : Cable route

Conditions when event occurred

## 2. Recurrence prevention measures

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- Although no similar cases have been observed in previous mockups, we will implement following measures to prevent recurrence.

① **Cable recoiling**

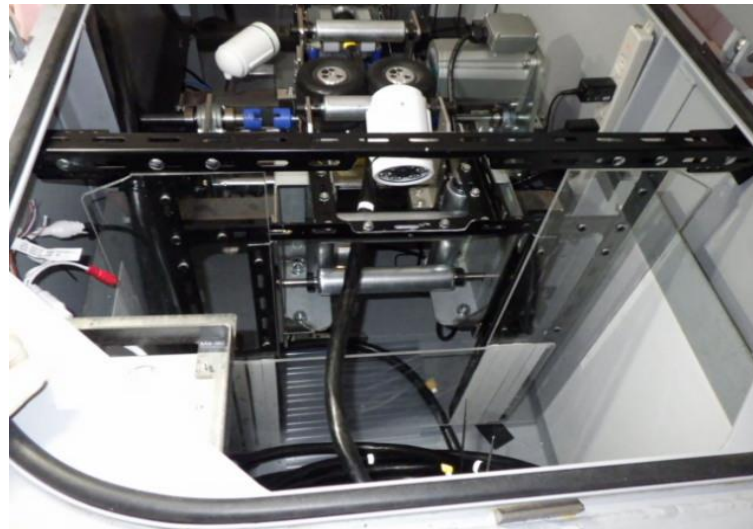
Since it is getting more probable that the cable will take a different route when paid out repeatedly, the cable will be recoiled to reduce the possibility of it taking a different cable route.

② **Restricting the range of mobility of the cable**

A guard panel will be installed to restrict the range of mobility of the cable to prevent it from getting caught up on, or wrapping around, the guide roller installation bracket even if the cable behave differently than normal.

③ **Strengthening monitoring of abnormal behavior and clarifying procedures for handling issues**

While the cable has always been monitored by cameras, we will add additional monitoring personnel who monitor only the cameras in order to strengthen monitoring of cable conditions and quickly detect signs of abnormalities. Furthermore, if signs of abnormalities are noticed, the instruction to halt the operation is given, and the procedures is clarified so that the cable winch is operated in a way that improves the situation.



After the installment of the guard panel