Drop in Water Levels in the Fukushima Daiichi Unit 1 and Unit 3 Primary Containment Vessels (Continued report Ⅱ)

<Reference Document>
March 18, 2021
Tokyo Electric Power Company Holdings Inc.
Fukushima Decontamination & Decommissioning
Engineering Company

- The following is an update on the status of the drop in water levels in the primary containment vessels (PCV) of Units 1 and 3 that was announced on February 19.

- The current conditions are as follows: [as of 11 AM, March 18]
  Unit 1: Current water level is between the installation locations of temperature gauge T2(T.P.+5,964mm) and water level gauge L2 (T.P.+5,664mm). (The elevation of the bottom of the PCV is T.P.+4,744mm)
  Unit 3: Current water level is between the installation locations of water level gauge L3(T.P.+10,064mm) and water level gauge L2 (T.P.+9,264mm). (The elevation of the bottom of the PCV is T.P.+4,044mm)
  ※ Water level inside the PCV (calculated by converting the head water pressure of the suppression chamber pressure): T.P.+9,542mm
  (As of 11 AM, February 13: T.P.+9,900mm
  As of 5 PM, February 19: T.P.+9,623mm)
  Trends will be continually monitored.
  No significant fluctuations have been seen with temperatures at the bottom of the PCV's, containment vessel gas management system radiation or monitoring posts at site boundaries.

- We had originally anticipated that the PCV water level of Unit 1 would decrease to the height of water gauge L2 as early as around March 5, and if the water level fell below water gauge L2, additional cooling water would be injected (increased from the current rate of approximately 3.0m³/hour to approximately 4.0m³/hour). However, as of March 18, the PCV water level has remained between temperature gauge T2 and water level gauge L2 and we estimate that it is decreasing slowly.

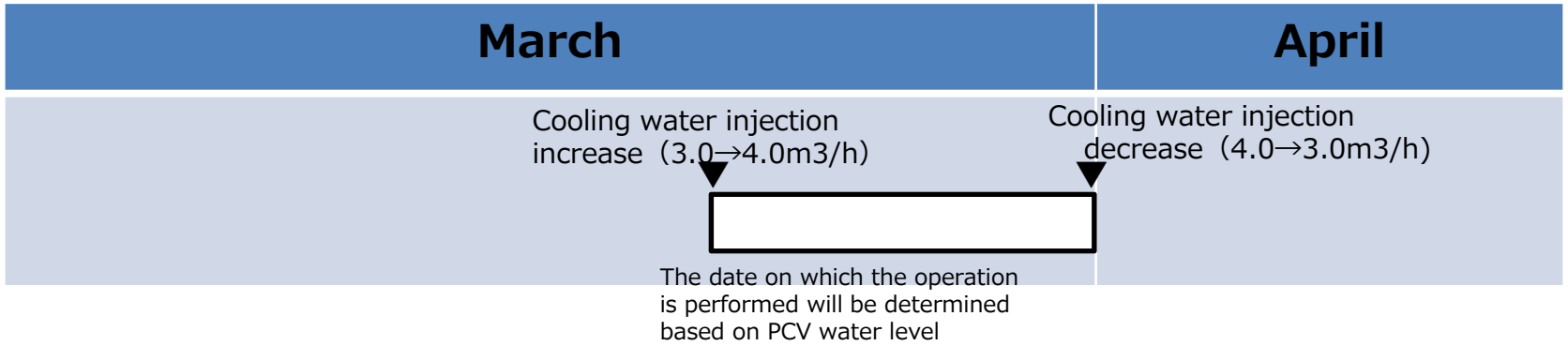
- Furthermore, our calculations have shown that the water level of the Unit 3 PCV is stable for the most part, so we will continue to monitor trends.

- Since there have been no significant fluctuations in plant parameters during the approximate one month since the earthquake, we plan to gradually recommence work* in the reactor buildings for Units 1 3 that had been suspended just to be safe.
  *Unit 2/3 digital recorder replacements, Unit 2 PCV gas pipe equipment filter replacement, countermeasures for nonconformances that occurred during the investigation of obstructions that may hinder the Unit 1 PCV internal investigation, etc.

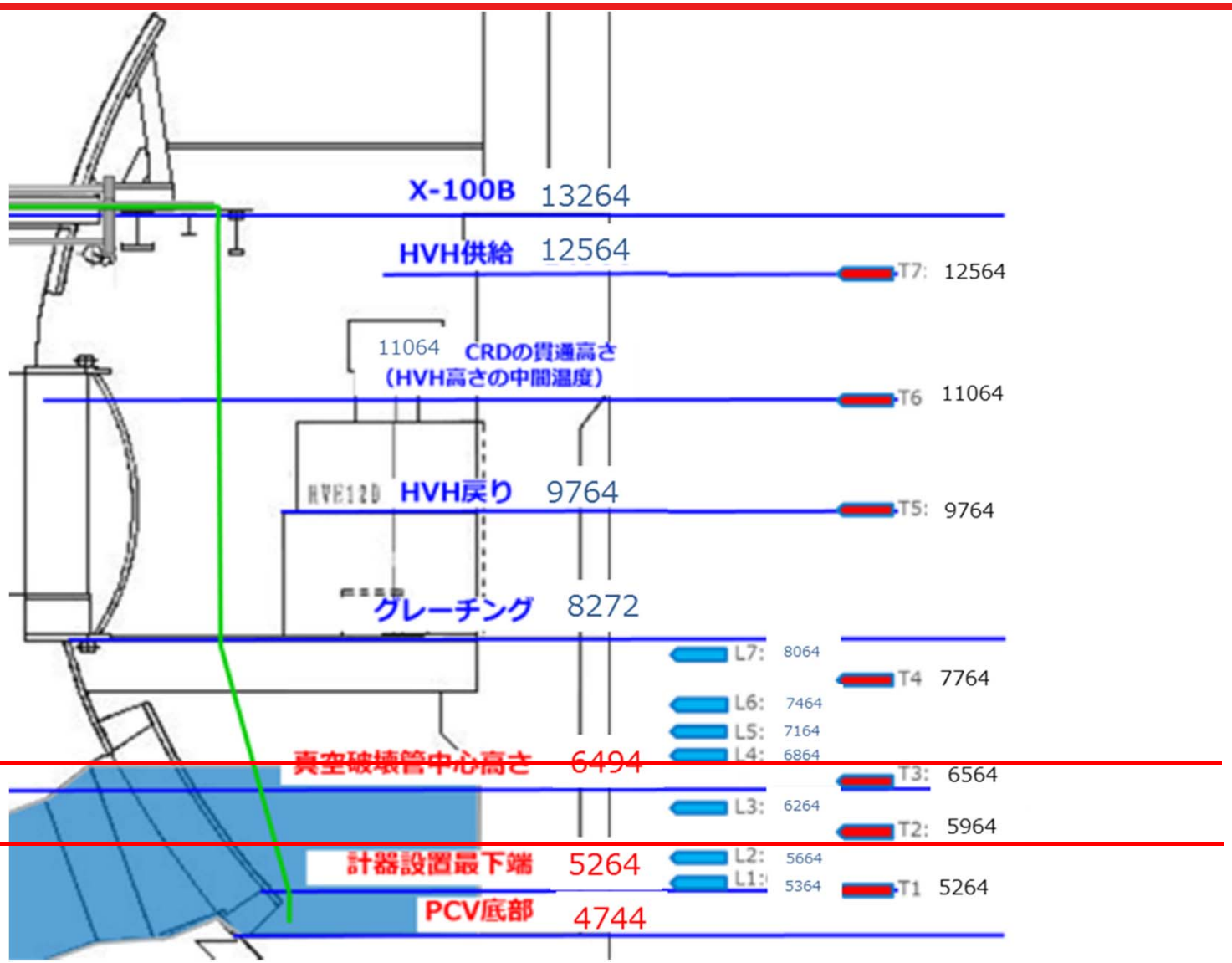
Confirming PCV water level by injecting additional cooling water into Unit 1

- In order to confirm that there are no problems with fuel debris cooling, we don't just rely on PCV water level but also check primarily the amount of cooling water being injected, temperatures at the bottom of the RPV and inside the PCV, and ultimately also check the concentration of dust in PCV gas management systems. We have seen no significant increase in these parameters at Units 1 or 3, so we have determined that fuel debris inside the PCV is being kept stable and cool.
- However, in order to ascertain the impact that this drop in PCV water level will have on future decommissioning work, and to confirm that water levels are stable and sufficient for implementing the internal investigation of the Unit 1 PCV planned for FY2021 (to be conducted using a robot that floats on the surface of the water in the PCV), we will temporarily increase the amount of cooling water being injected into Unit 1 for approximately one week to 10 days and monitor changes in PCV water level. (approximately 3.0m³/hour ⇒ approximately 4.0m³/hour)
- The increase in the amount of cooling water injected into the Unit 1 will be conducted at the end of March, and after changes (increasing trend) in PCV water level have been monitored during this period where cooling water injection has been increased, we will return cooling water injection volume to its original rate (approximately 3.3m³/hour). This operation shall be performed carefully while monitoring plant parameters.

Confirming PCV water level by injecting additional cooling water into Unit 1 (planned)



Unit 1 primary containment vessel temperature gauge/water level gauge installation heights

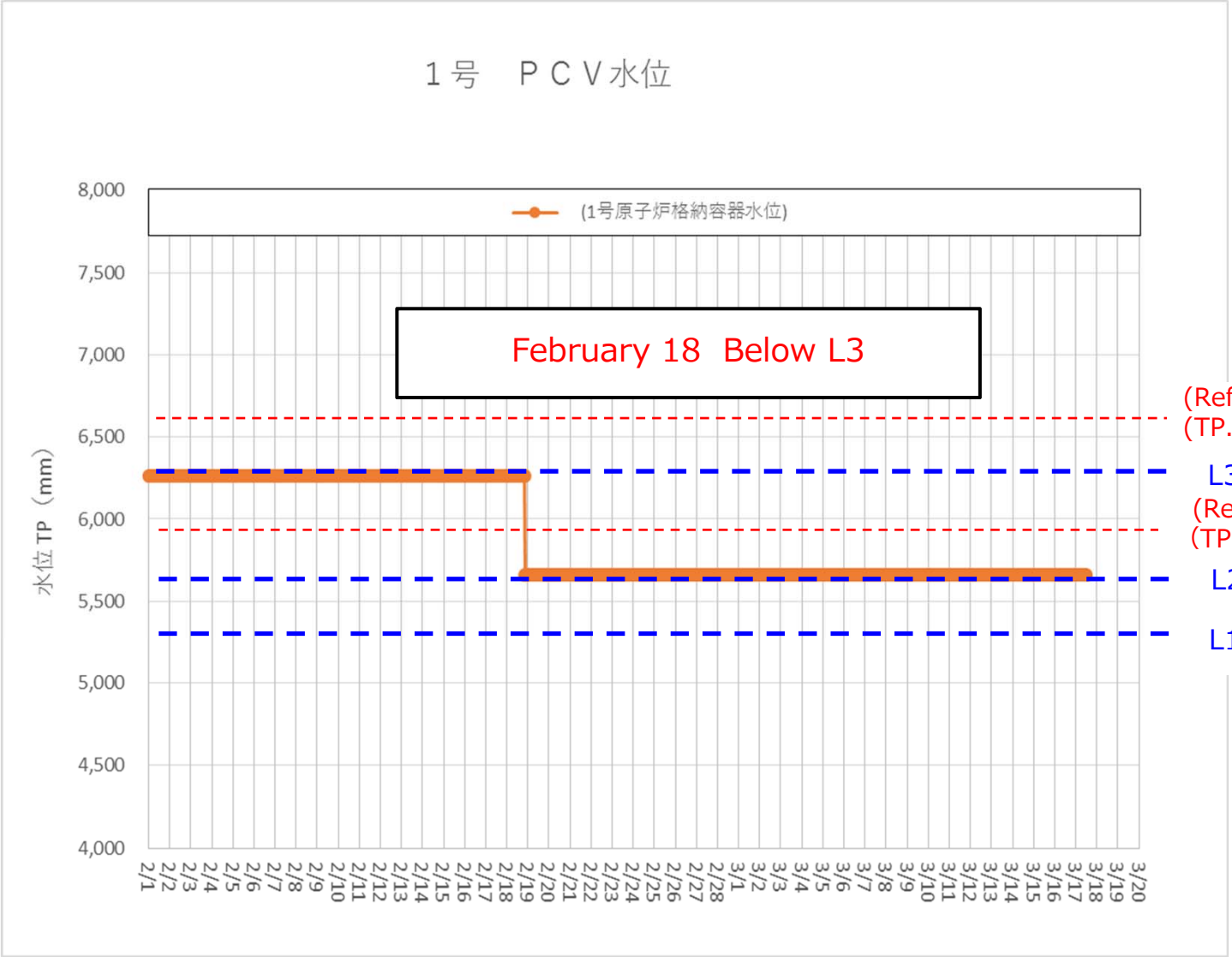


Water level on February 13 prior to the earthquake

Current water level (March 18) (estimated)

Installation height is indicated using elevation （T.P.）

Unit 1 primary containment vessel water level



(Reference)T3 height (TP.6564)

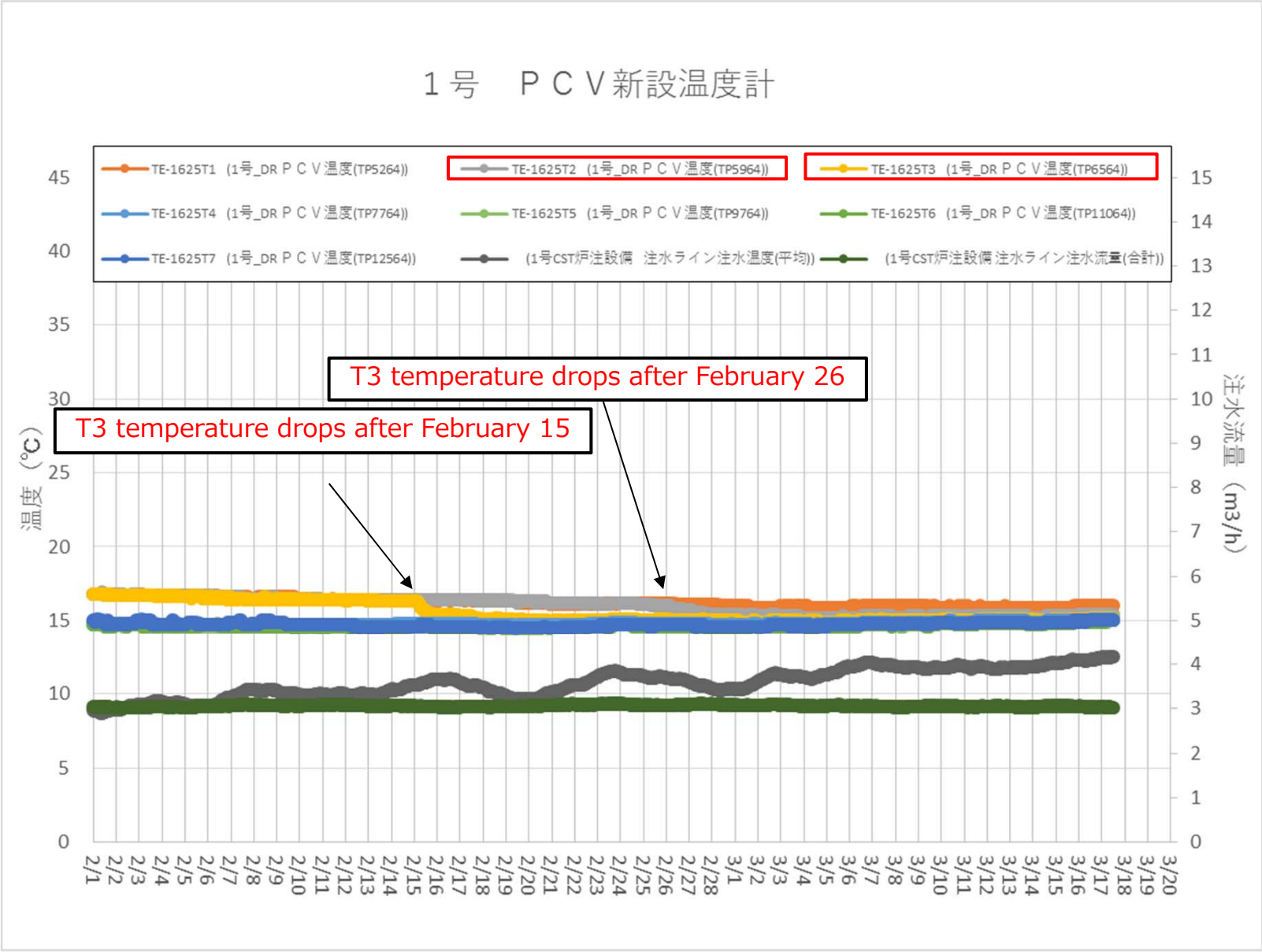
L3 height(TP.6264)

(Reference)T2 height (TP.5964)

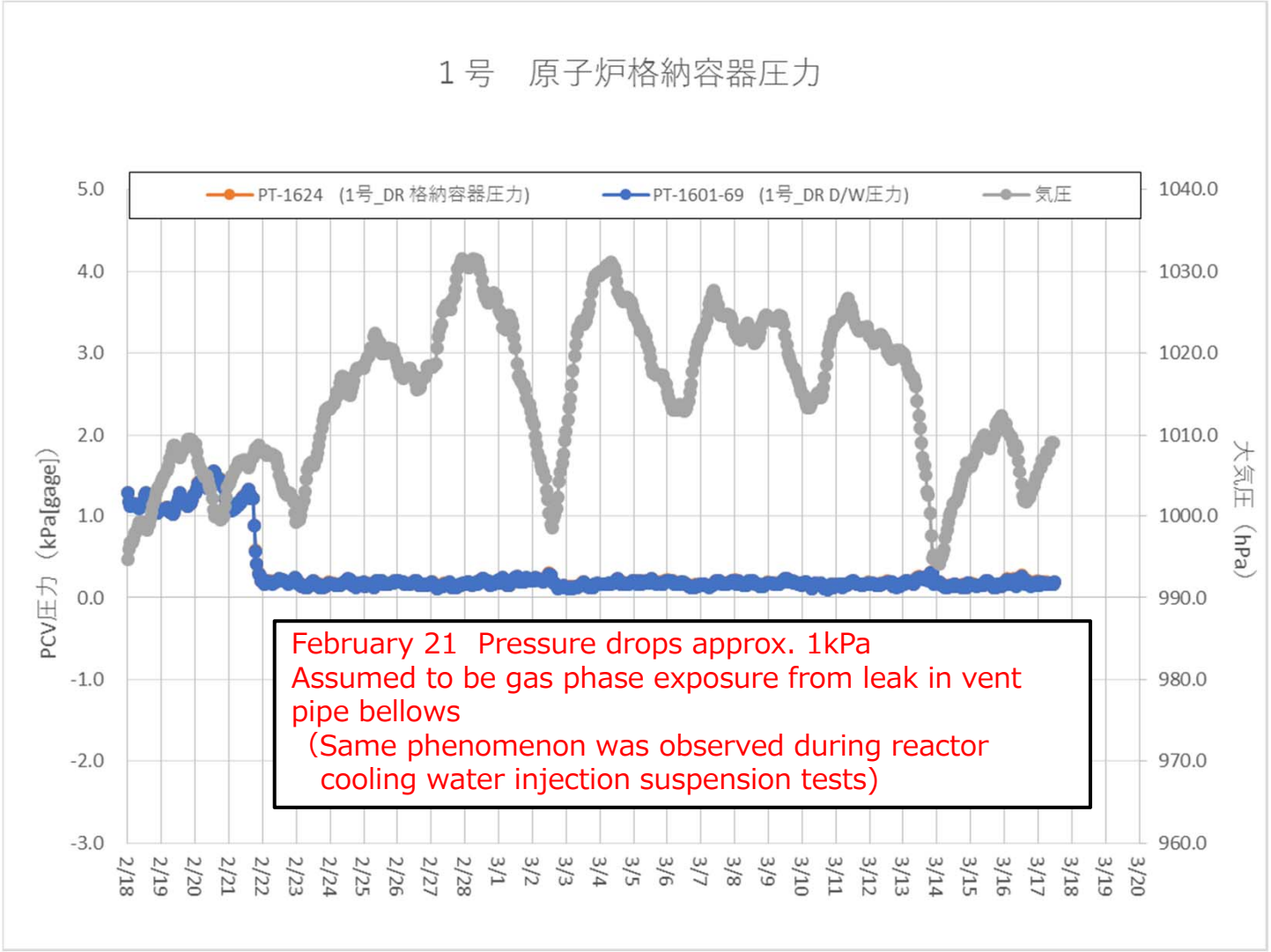
L2 height（TP.5664）

L1 height（TP.5364）

Unit 1 primary containment vessel temperatures

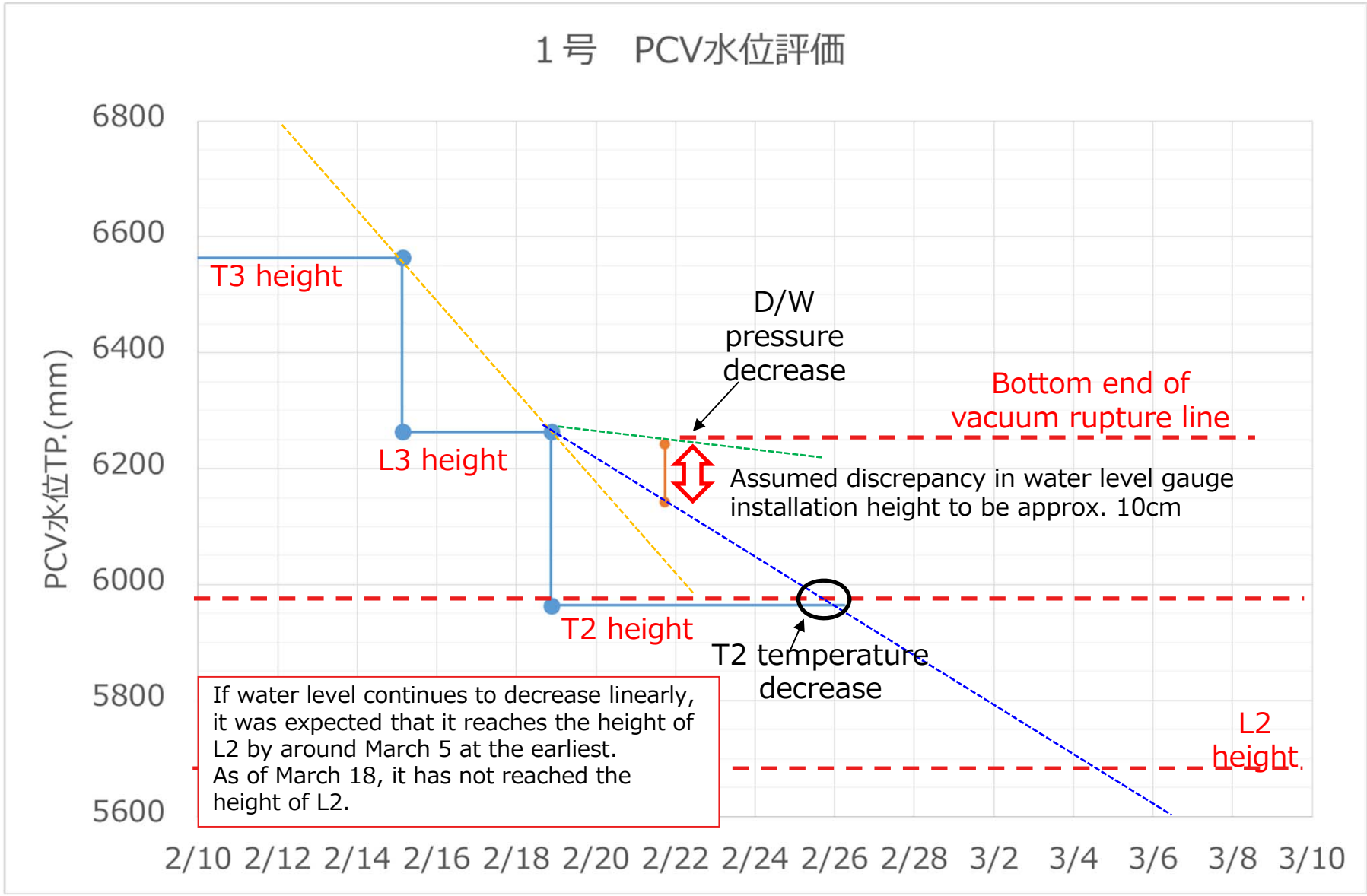


Unit 1 primary containment vessel pressure



※　Unit 3 has remained about the same (approx. 0.4kPa) during the PCV water level decrease.

Unit 1 Predicted primary containment vessel water level fluctuations



Method/procedure for increasing the amount of cooling water injected into the reactor at Unit 1

■ Criteria and action

- The amount of cooling water being injected will be increased by +1m³/hour if the water level in the PCV falls to the height of the L2 water level gauge.

■ Objective

- In order to enable water level to be continually monitored with water level gauges, the amount of cooling water being injected shall be increased as a precaution if water level falls below L2 in order to prevent the water level in the PCV from falling to the height of L1, which is the lowermost contact point

■ Procedure

- The amount of cooling water being injected shall be immediately increased as soon as the PCV water level falls below the height of L2
- "Confirming PCV water level by injecting additional cooling water into Unit 1" scheduled in March will be conducted in the same procedure.

＜Unit 1＞

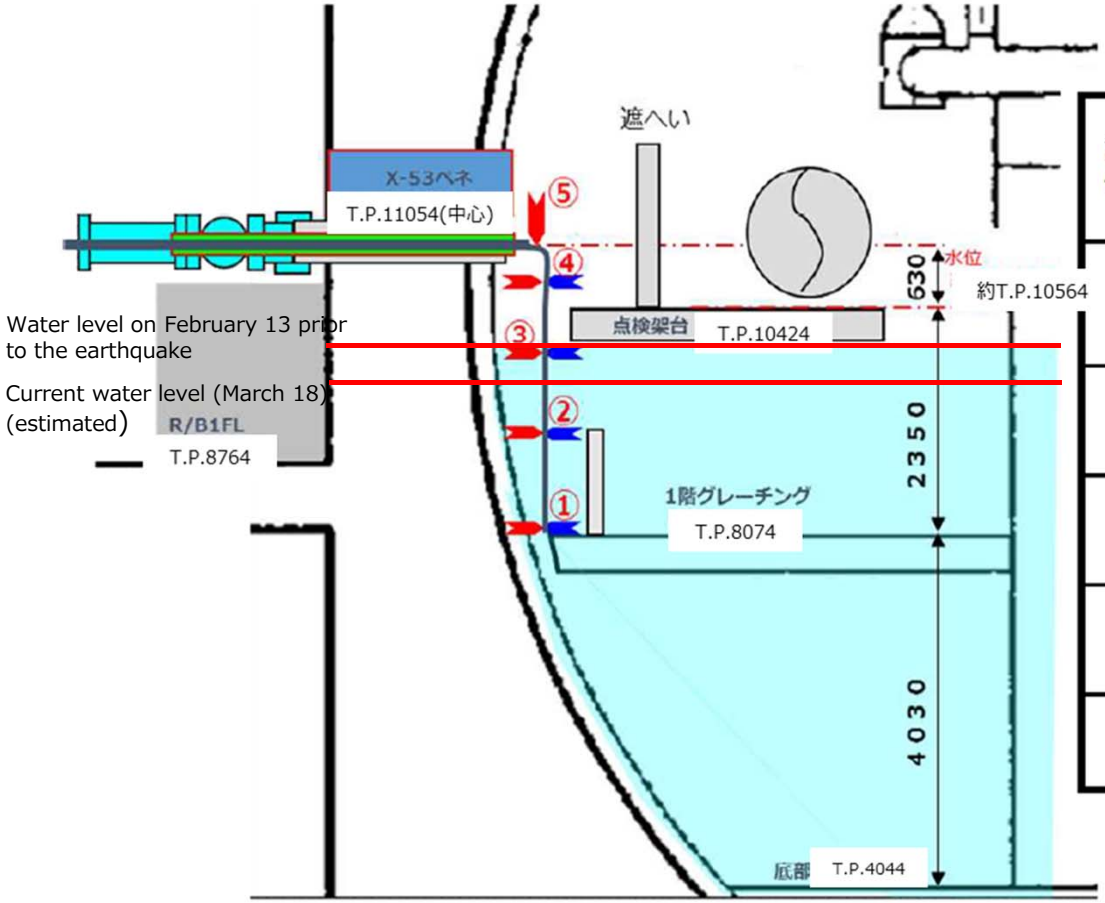
Feed water system	1.5m³/h	⇒ 2.5m³/h	(+1m³/h)
Core spray system	1.5m³/h	⇒ 1.5m³/h	(No change)

(Reference)

＜Unit 3＞

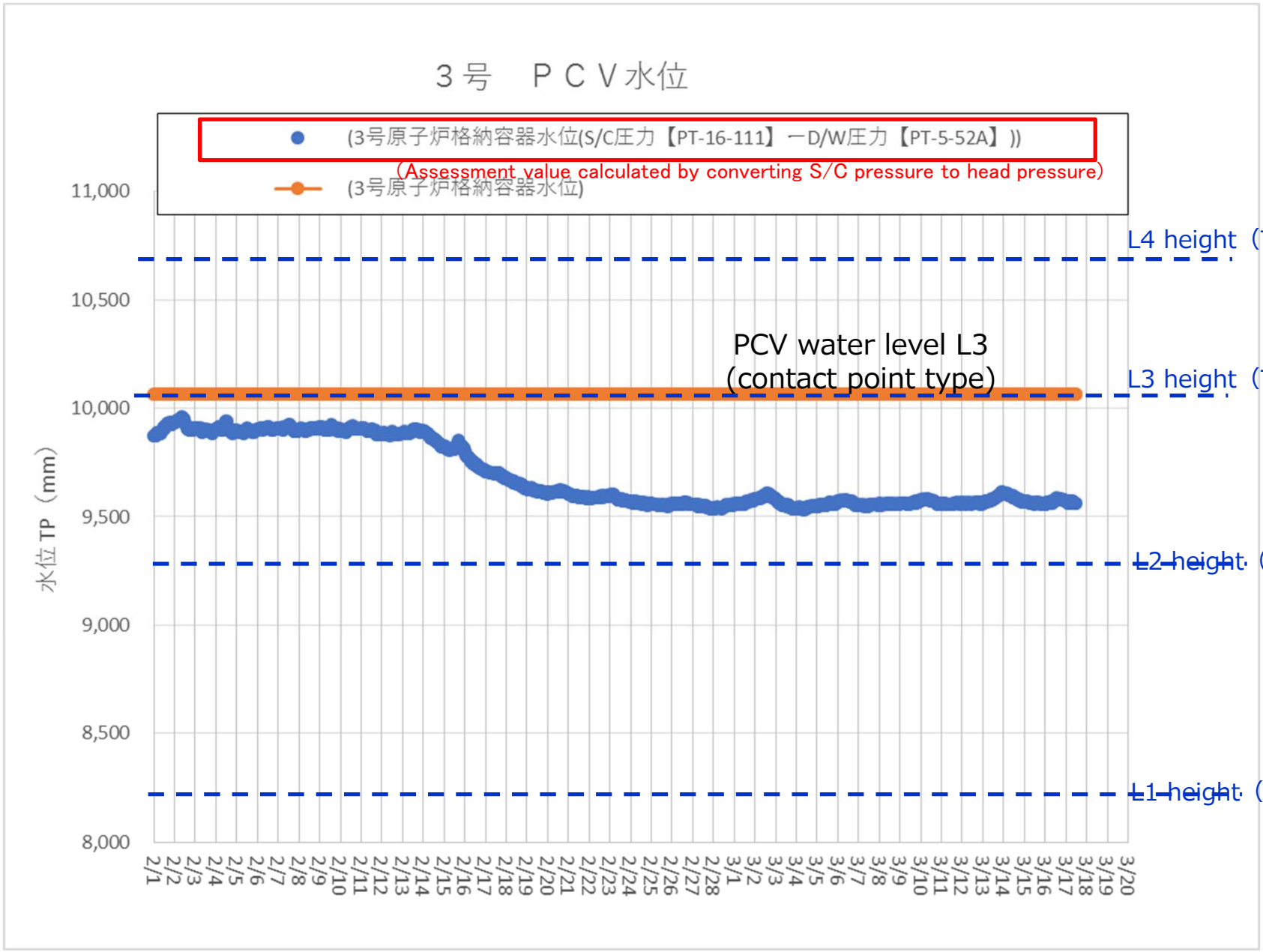
Feed water system	1.5m³/h	⇒ 1.5m³/h	(No change)
Core spray system	1.5m³/h	⇒ 2.5m³/h	(+1m³/h)

Unit 3 primary containment vessel temperature gauge/water level gauge installation heights

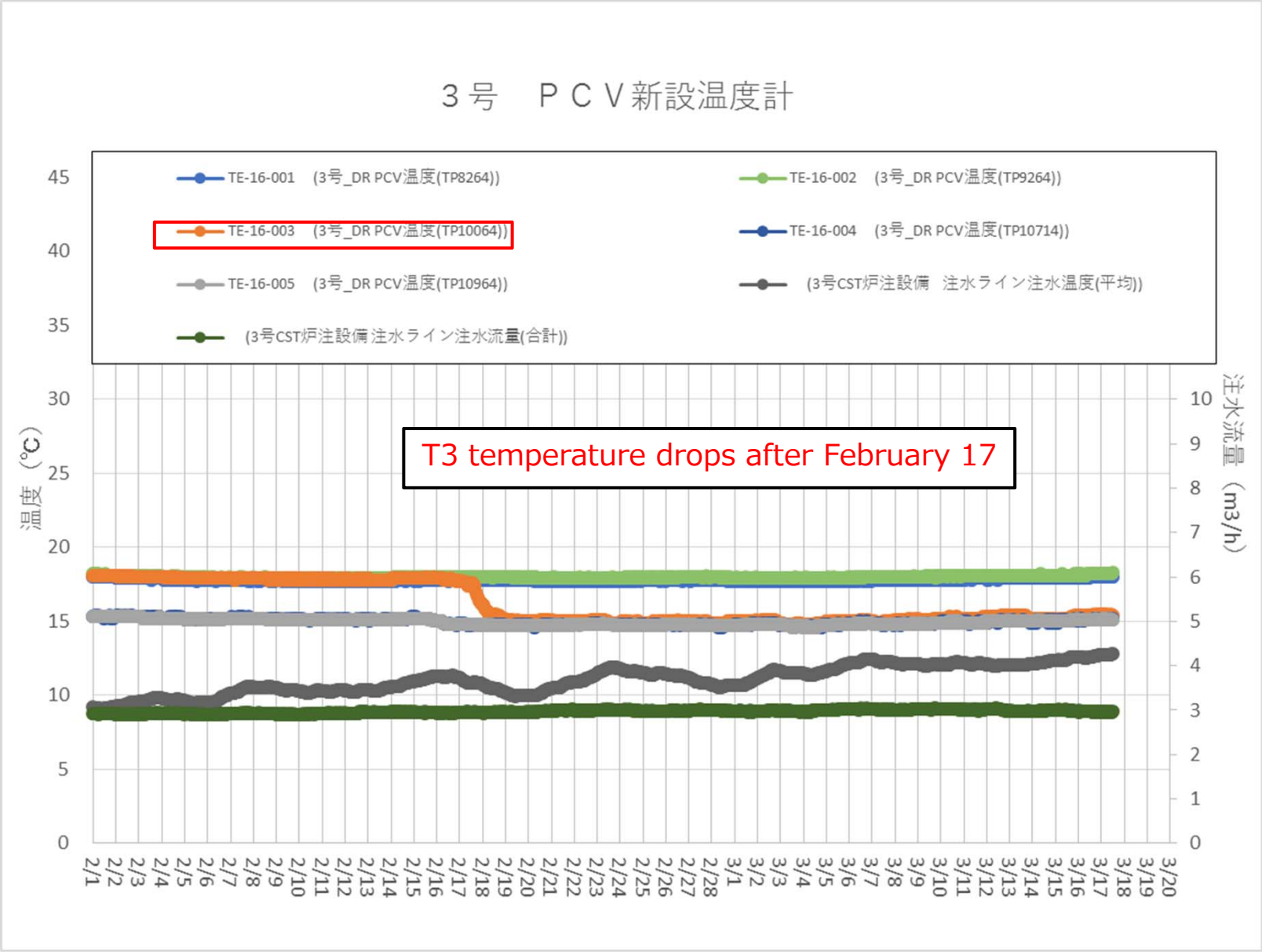


計器位置	設置計器		設置位置 (T.P)
	温度計	水位計	
⑤	TE-16-005	—	約10964
④	TE-16-004	LS-16-004	約10714
③	TE-16-003	LS-16-003	約10064
②	TE-16-002	LS-16-002	約9264
①	TE-16-001	LS-16-001	約8264

Unit 3 primary containment vessel water level



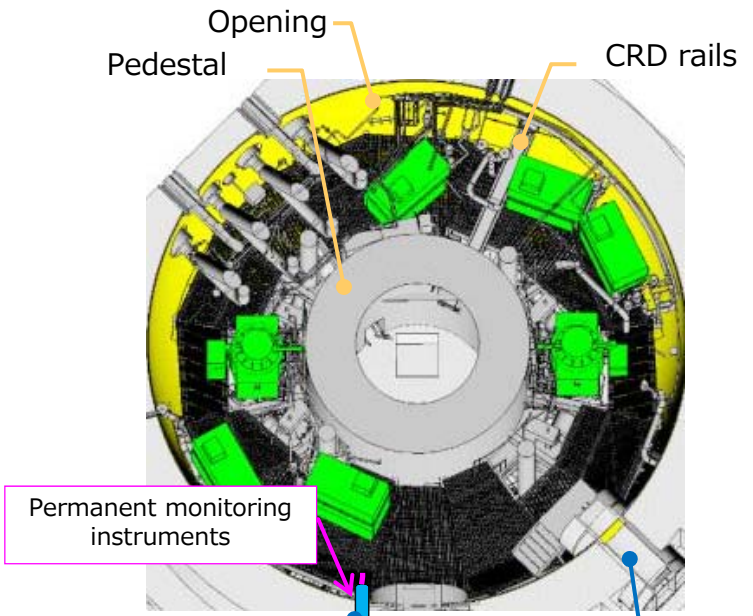
Unit 3 primary containment vessel temperatures, etc.



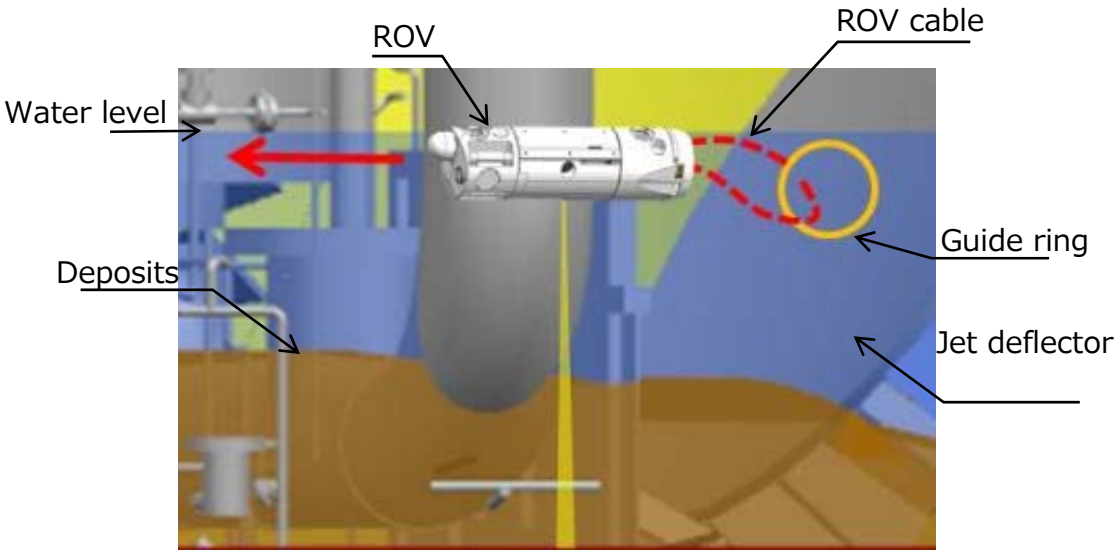
Impact on the internal investigation of the Unit 1 PCV

The drop in PCV water level may have the following impact on the PCV internal investigation (under examination)

- If the guide ring that keeps the ROV cable from getting hung up on obstructions cannot be attached to the jet deflector due to the decrease in water level, the risk that obstructions may interfere with the ROV cable will increase.
- If the PCV temperature gauges/water level gauges cannot be removed to avoid obstructions on the investigation route then the scope of the investigation will have to be narrowed.
- The risk of interference by PCV internal structures and deposits will increase if the vertical range of ROV movement is restricted.



Installation location of permanent monitoring instruments



Concept drawing of investigation to measure deposit thickness