

<Reference>

The Suspension of the Common On-Site Power Supply (3B) Facilities at Fukushima Daiichi NPS

October 7, 2013

Tokyo Electric Power Company



東京電力

1. Overview

- At around 9:47 AM on October 7, we found that “the bus voltage low alarm” was activated, and that the common on-site power supply facility (M/C: Metal clad 3B) was suspended.
- Although the reactor water injection pump (B) of the condensate storage tank (CST) for Unit 1 was suspended, the pump (A) was automatically activated on the spot.
 - Change in the amount of the reactor water injection for Unit 1 (total amount):
 - It is stable as follows:
4.6m³/h→0.6m³/h→4.6m³/h
(The necessary amount of reactor water injection for Unit 1: 2.3m³/h)
- We found neither significant change in the monitoring post indicated value nor casualties.
- TEPCO employees go on a patrol on the site on a regular basis. (The whole area is covered in two patrols per week.) They make it a rule to check each parameter (electrical current and voltage) at the power supply facility.
- Two TEPCO employees (one as an operator, and the other as a confirmer) went on patrol this time. The employees completed the data check of the concerned power panel (M/C: Metal clad 3B). When leaving the control panel room, the operator noticed that the flat panel display was not switched off yet, and touched the control panel display.
- Then, the operator pressed a button activating the breaker activation by mistake, and the M/C initial power receiving breaker went “released”. It caused the suspension of the bus line.

2. Chronological order

On October 7

At 9:47 The bus voltage low alarm for the common on-site M/C (3B) was activated.

At 10:10 The reactor water injection pump (B) of CST for Unit 1 stopped, and the pump (A) was automatically activated. No abnormality was found at the site.

At 10:25 We determined deviation/recovery from the operational requirement (LCO) as per Article 18 (concerning the reactor water injection pump) of the implementation plan (concerning safety) system at the same time.

At 11:58 Initial power receiving at the common on-site M/C (3B)

At 12:07 Initial power receiving at the common on-site P/C (3D)

At 12:23 Initial power receiving at the common on-site P/C (3B):

At 12:30 Power supply for measuring devices was recovered.

From 13:34 to 13:38

At the primary containment vessel gas control system for Unit 2, the exhaust fan was switched from (A) to (B).

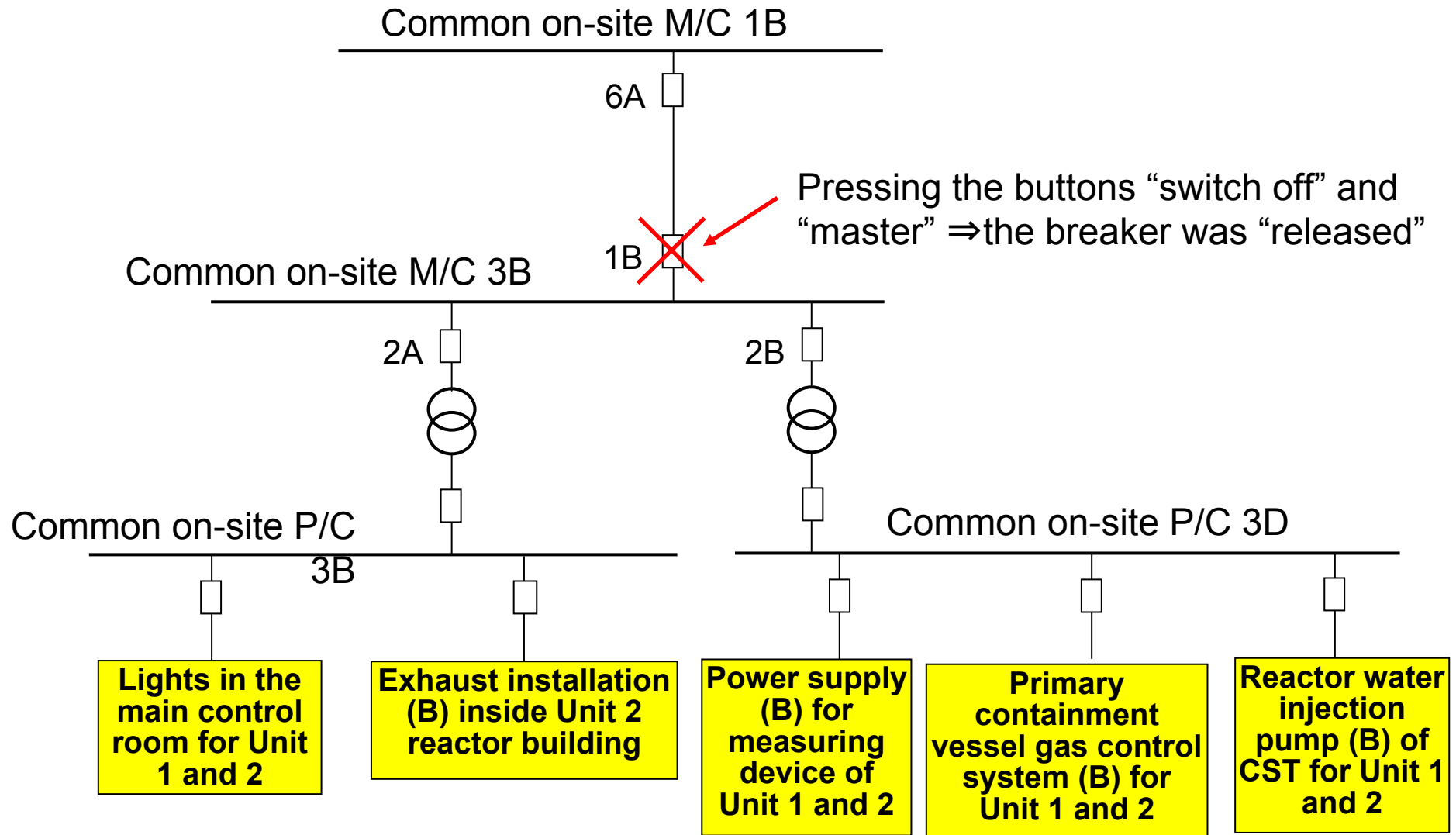
At 13:57 At the primary containment vessel gas control system for Unit 1, the exhaust fan was switched from (A) to (B).

At 14:13 The exhaust fan (B) of the Unit 2 reactor building was reactivated.

3. Situation of each Plant

	Unit 1	Unit 2	Unit 3	Unit 4
Reactor water injection facility	Automatic switch from (A) to (B) at the reactor water injection pumps of CST. (A) In operation (B) In standby [12:55]	The reactor water injection pump (A) of CST is in operation	The reactor water injection pump (B) of CST is in operation	—
Spent fuel pool cooling facility	The system A is in operation at the system 1 and 2.	The system B is in operation at the system 1 and 2.	The system A is in operation at the system 1 and 2.	The system A is in operation at the system 1 and 2.
Primary containment vessel gas control system	Exhaust fan (B) Trip (A) Automatic activation (B) Operation / (A) Suspension [13:57] • No abnormality on the monitoring display (A and B) • The monitoring (B) will be suspended. (Recovered on Oct.8)	Exhaust fan (B) Trip (A) Automatic activation (B) Operation / (A) Suspension [13:38] • No abnormality in the monitoring display (A) • No measurement for the system (B) • The monitoring (B) will be suspended. (Recovered on Oct.7)	• No abnormality is found on the monitor display (A and B)	—
Power supply for measuring device	At 12:30, power supply was recovered.			
Nitrogen gas separation apparatus	Nitrogen gas separation apparatus (A) and (C) are in operation.			

4. One-line diagram



5. Cause

[Cause]

- A TEPCO employee **pressed the button activating a breaker by mistake**, when checking the data of the M/C.
- An operator is originally supposed to press only the button “measuring”, when checking the data. However, he pressed by mistake both the buttons “switch off (select)” and “master (implement)”, when trying to switch off the display panel after checking the data. (*A breaker is activated when both “switch off” and “master” is pressed.)

[Environmental cause]

- The buttons for a breaker have no sign to address they are only for the breaker operation, therefore it caused confusion between the buttons for breaker and the one for measuring display panel.
- There is no detailed instruction book on the regular patrol at the common on-site M/C, therefore points to be noted remains vague.

6. Countermeasure

[Countermeasure]

<Hardware side>

- We will put “Only for breaker activation” labels on the buttons. (As soon as possible)
- In addition, we will put a hard cover over the buttons, so that no one can reach the buttons by mistake. (In several days)
 - We will put hard covers to similar apparatuses.

<Software side>

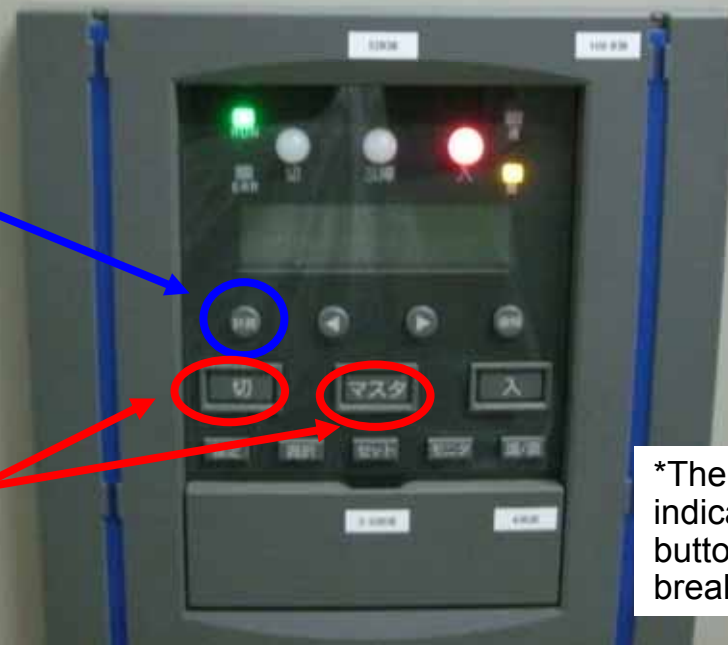
- We will clarify the operation procedures on the patrol.
- We will provide those who have little experience with more opportunities/trainings for administrating apparatuses (general product) concerning nuclear power.

The control panel of the initial power receiving breaker



<Correct operation>
Measuring electrical current and voltage by pressing the button "Measure".
→Display panel will be automatically switched off afterward.

<Operation with mistake>
The operator was trying to switch off the display panel.
①: Pressing the button "switch off"
↓ (due to the remaining display panel)
②: Pressing the button "master" (double action)
↓
M/C breaker: "Released"



*There is no sign indicating that the buttons are "for a breaker".