

Decrease in the Reactor Injection Water Amounts at Unit 1-3 of Fukushima Daiichi Nuclear Power Station

< Reference >

September 3, 2012

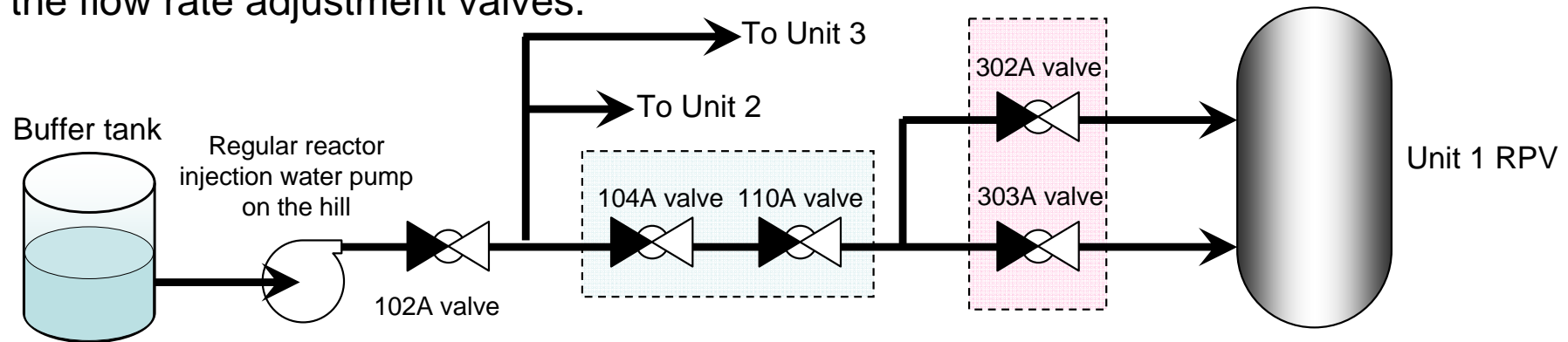
Tokyo Electric Power Company

1. Outline

- At 3:00 PM on August 30, 2012, the amounts of reactor injection water into the reactors at Unit 1-3 of Fukushima Daiichi Nuclear Power Station were found to be lower than the required amounts (necessary to cool the reactors) at the regular data check. The condition was judged to be an unfulfillment of the operational requirement stipulated in the Technical Specification (at 3:07 PM for Unit 1, 3:00 PM for Unit 2 and 3:05 PM for Unit 3).
- The flow rate of each unit was recovered by continuously adjusting the flow rate adjustment valves. The minimum required water injection amounts are sustained by adjusting the flow rate every time it decreases.
- No significant change is found with RPV temperatures and the parameters of the noble gas monitor at the exit of PCV gas control system of each unit as a result of continuous monitoring.
- As a part of cause investigation on the flow rate decrease of the reactor injection system, the following measures have been implemented.
 1. Flushing through the flow rate adjustment valves (August 31, 2012)
 2. Mini flow lines in service (September 2, 2012)The outlines of these measures are provided in the following pages.

2. Flushing through the Flow Rate Adjustment Valves (August 31, 2012)

As flow rate decrease may be due to the flow rate adjustment valves not fully opened and the flow channel obstructed by substance stuck in the valves, flushing was done while opening and closing the flow rate adjustment valves.



Flushing through the flow rate adjustment valves at the exit of the regular reactor injection water pump on the hill (110A-C): While maintaining the total flow rate consistent, flushing was done by changing the opening amount of 110 valve (closing 104 valve and opening 110 valve).

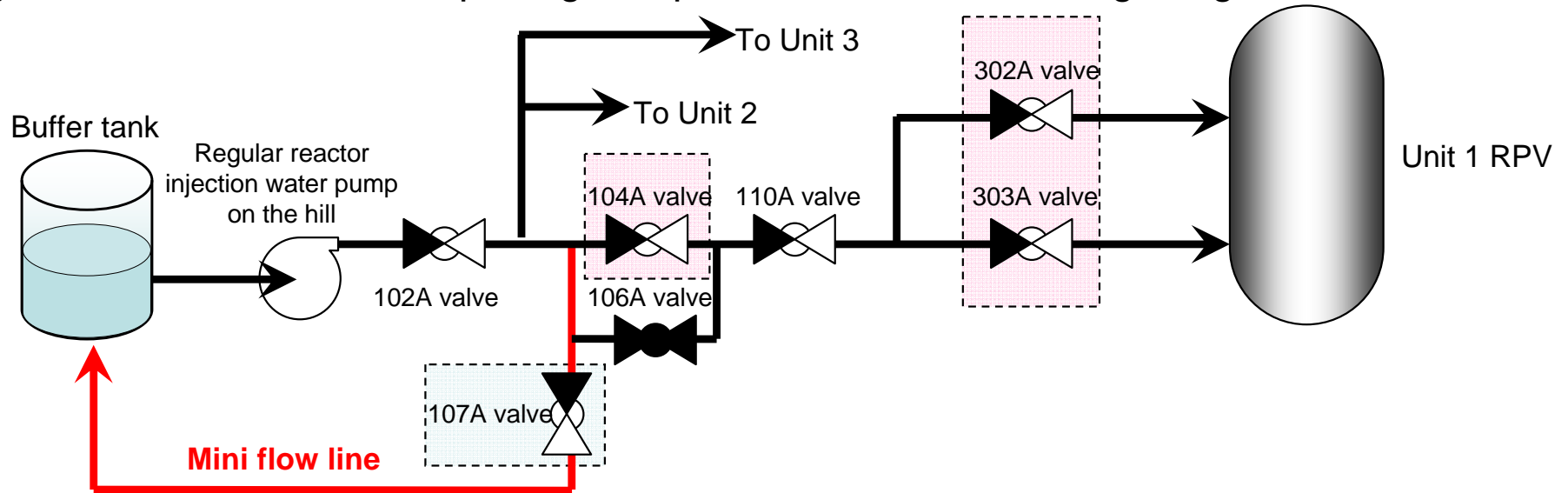
Flushing through the flow rate adjustment valves of the feed water system line and reactor core spray system line (302A-C, 303 A-C): While maintaining the total flow rate consistent, flushing was done by temporarily increasing the flow rate of either one of the two lines (opening 302 valve and closing 303 valve (or the other way around)).

Considering that the pressure on the upstream side of the flow rate adjustment valves (header pressure) decreased and the flow rate recovered right after the flushing, it was assumed that substance attached or stuck on the flow rate adjustment valves operating with low amount of opening may be causing the flow rate to decrease. However, the flow rate decreased as the header pressure increased a few hours later, and flow rate adjustment was done (After the flushing, adjustment was done twice on August 31, five times on September 1 and once on September 2).

(Note) Flow rate adjustment valves of the feed water system and reactor core spray system
[Feed water system] Unit 1: 302A, Unit 2: 303B, Unit 3: 303C
[Reactor core spray system] Unit 1: 303A, Unit 2: 302B, Unit 3: 302C

3. Mini Flow Line in Service (September 2, 2012)

As the flow rate decreased again after the flushing, the minimum flow rate circulation line (mini flow line) was put in service to increase the amount of opening of the flow rate adjustment valves operating with a small amount of opening and prevent substance from getting stuck in them.



Opening the mini flow line valve (107A) (Putting the mini flow line in service): By opening 107A valve, a part of the water to be injected into the reactor is returned from the regular reactor injection water pump exit to the buffer tank through the mini flow line. *107B and 107C valves are not adjusted.

Increase the amount of opening of the feed water system/reactor core spray system flow rate adjustment valves (302A-C, 303A-C): The reactor injection water amounts for each unit were adjusted by increasing the amount of 104 valve opening (by opening 301 and 303 valves).

The reactor injection water amounts will be constantly monitored and adjusted as necessary. The cause of the decrease in reactor injection water will continue to be investigated.