

## Check Plan for Equipment Past Its Check Period at Hamaoka Nuclear Power Station Reactors No. 3, 4 and 5 and Investigation of Check Record (Overview)

Following cases of inadequate maintenance management at other companies, the Hamaoka Nuclear Power Station Reactor No. 3 underwent a periodic safety management review by the Japan Nuclear Energy Safety Organization at the end of August. The review revealed that of the valves that had undergone periodic licensee's inspection (overhauling) during the 16th maintenance cycle, one valve had been checked later than the check period prescribed in the check plan.

Having learned this fact, Chubu Electric Power conducted an investigation on equipment subject to periodic licensee's inspection at Hamaoka Reactors No. 3, 4 and 5.

### Investigation results

Number of pieces of equipment subject to investigation: about 45,000 at No. 3, about 45,000 at No. 4, about 37,000 at No. 5

#### (1) Equipment past its check period because of check date input error

We found that 27 pieces of equipment are past their check period at this time because of input errors on the check plan control table. No evaluation of check date extension had been performed for these pieces of equipment.

|  | No. 3              | No. 4              | No. 5 |
|--|--------------------|--------------------|-------|
| Pieces of equipment past their check period at this time because of errors when inputting check date on check plan control table | 14<br>(all valves) | 11<br>(all valves) | 0     |
| Pieces of equipment past their check period at this time because they were not registered to check plan control table            | 2<br>(both valves) | 0                  | 0     |

\*These pieces of equipment that are past their check periods are valves, etc., that drain water during checks and do not need to be operated during accidents.

\*In addition to the above equipment, we found that in the past there had been a total of 19 pieces of equipment that had been past their check periods (19 at No. 3, none at No. 4 or 5). These pieces of equipment had already undergone overhauling at their periodic checks and were found to be sound.

#### (2) Results of investigation on performance of check date extension evaluation

We found that 43 pieces of equipment are past their check period at this time where an evaluation of check date extension had been performed and thereafter the check date was changed. However, evaluation records had not been kept for 39 of these pieces of equipment.

|   | No. 3             | No. 4             | No. 5 |
|---|-------------------|-------------------|-------|
| Pieces of equipment with check period extended after conducting an evaluation of such extension | 8<br>(all valves) | 35<br>(33 valves) | 0     |

\*These pieces of equipment that are past their check periods are valves, etc., that drain water during checks and do not need to be operated during accidents.

\*In addition to the above equipment, we found that in the past there had been a total of 133 pieces of equipment that had been past their check periods (105 at No. 3, 28 at No. 4 and none at No. 5). These pieces of equipment had already undergone overhauling at their periodic checks and were found to be sound.

### Problems

#### (1) Input errors relating to check plan control table

For more efficiency, we are changing our check plan control table from ordinary software to a computer-based "Plant Management System," and have completed the transition with almost all equipment, but most valves had not yet been switched and were being managed by ordinary software.

Plant Management System-based management means that check functions will be operated by the system, whereas ordinary software-based management depends on human checkers. In the latter case, no countermeasures were taken against input errors, which made it impossible to eliminate input errors when managing a check plan control table listing equipment like valves that are many in number.

Moreover, when reflecting check date changes in the check plan control table, the operating procedures are prescribed by internal rules with a Plant Management System, whereas there were no internally unified rules with ordinary software, so we were depending on each department conducting the checks to take care of it.

#### (2) Results of investigation on performance of check date extension evaluation

The check period for valves was used as a rough guide, taking into account the fact that the timing might change because of plant conditions at the time of the periodic check, and as a result, the check period was vague as a requirement.

The rules on check date extensions and evaluations were imprecise internally.

### Evaluation of equipment soundness at this time

In all cases, including equipment that was past its check period at this time because of input error and also equipment for which evaluation records had been kept, **we conducted evaluations of equipment soundness at this time and concluded that equipment soundness has been maintained and that it is possible to continue using the equipment without performing an overhaul until the periodic check that is coming up in the near future**, as shown in the table below.

| Content of soundness evaluation  |  | Evaluation results   |
|--|--|--|
| Evaluation based on deterioration phenomena, actual usage status and similar equipment check results | Evaluation based on recent equipment inspection results and usage conditions | <ul style="list-style-type: none"> <li>➢ We confirmed that there was no finding of anticipated deterioration phenomena in past check records.</li> <li>➢ Actual usage conditions incorporate a sufficient safety margin compared to design conditions, and we concluded that there is sufficient tolerance in terms of deterioration phenomena at this time.</li> </ul>  |
|  | Evaluation based on check results of similar equipment                       | <ul style="list-style-type: none"> <li>➢ We selected similar equipment with similar specifications and usage conditions and confirmed that there was no finding of anticipated deterioration phenomena in recent check records and that there is sufficient tolerance in terms of deterioration phenomena at this time.</li> </ul>   |
| Evaluation based on status monitoring  |  | <ul style="list-style-type: none"> <li>➢ We found no irregularities in system leak inspections during past periodic checks, or in periodic tests, patrols or visual checks of equipment on which these had been done again.</li> <li>➢ We found there were no irregularities that would require countermeasures against nonconformities, either at Chubu Electric Power or elsewhere.</li> </ul>                             |
| Evaluation based on safety function requirements   |  | <ul style="list-style-type: none"> <li>➢ We found that these were all pieces of equipment that would not need to be operated during accidents.</li> <li>➢ We found that in all cases onsite checks can be performed while the plant is in operation, that there were no seat leaks, etc., during equipment status monitoring, and that the required safety functions have been maintained without irregularities.</li> </ul> |

### Response to phenomena

#### (1) Create a system to eliminate human input errors

Nonconformity control has been put into effect for those cases where the next check date was not properly set because of input errors. The check date on the check plan control table was set to be a periodic check in the near future.

We are rapidly changing to a check plan control table under the Plant Management System, as well as creating a system to eliminate human input errors as a recurrence prevention measure. We are examining effective operations control methods to ensure that the input error check function works effectively, and working on such improvements as enhancing the function to eliminate input errors in the system.

#### (2) Concerning imprecision of rules on check date extensions and evaluations

We admit the fact that requirements were vague because the check period was a rough guide, and are turning this into a clear requirement.

We will work for continuous improvement of our business processes so that in cases where a check is to be performed past the check period, nonconformities will be managed and the check date extension will be evaluated appropriately.

#### (3) Overhaul of equipment that is past its check period at this time

We will overhaul all equipment that is past its check period at this time during a periodic check in the near future. Until then, we will conduct continuous monitoring by patrol, etc.

#### (4) Other

We will conduct similar investigations on equipment other than that subject to periodic licensee's inspection at Hamaoka Nuclear Power Station.