**WANO EVENT REPORT**

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| \*\* Note: | WER-MOW \*\*\*\*  |
| \*\* Station: | Bushehr Unit 1 |
| \*\* Event Date: | 05 February 2014 |
| \*\*Title: | Malfunction of steam valve FSIV(Fast Steam Isolation Valve) No. RA30S004 |
|  \*\*Reference Unit: | Bushehr 1 |
| \*\*Station Event: | Unit event |
| Summary: |  During overhaul it became known that due to the weak connection of nozzle to the body, the nozzle was separated from body.  Lack of nozzle in the shell led to the fact that it was not possible to decrease the pressure by exit of steam from the lower part of the valve chamber by the valve 13RA30S041, 042. Later this valve was not closed by directing through valves 12RA30S043, 044 either.  |
| Event units: | No others |
| References: |  |
| Report Description: |  **In 05. 02. 2014, 03:15 AM** During the Unit shutdown, as per the table 10.2.3, requirements of operating Regulation and in accordance with the program No.53.BU.1 ZB9.RA.AB.SPR.BNPP.1320, testing the steam valves (RA10-30S004) started with the aim of examining their performance. This test included examining the FSIV (Fast Steam Isolation Valve) valves closure through opening the conductive valves RA10-30S041, 042 or conductive valves RA10-30S043, 044.At 04:40  Testing the valves FSIV (RA10-30S004) was performed through the command sent from the MCR ( Main Control Room) with the following results: * Performance of RA10S004 and RA20S004: without defect

**Results of testing RA30S004:** After sending the command for closing through the valves 13RA30S041,042, the aforementioned steam valve did not close and it had the following defects:* 13RA30S041; getting longer the time of opening (LZAFV signal);
* 13RA30S042; defect in performance of end breaker (RMF1 signal);
* Through the valves 12RA30S043, 044 as well as the RA30S004 steam valve did not close. These valves worked without defect.

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| \*\*Consequences: | **Damage to the equipment:*** Not closing the Steam valve FSIV No.RA30S004 and with serial number 022029
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| Report Analysis and Comments: | **1)The following documents were examined with the aim of equipment work analysis:*** A copy of summary of explanations registered in the reports logbook and preparation of Reactor Management related equipment.
* Report of disturbance in NPP operation in terms of radiation and nuclear safety (developed by the nuclear safety and fuel management).
* A copy of summary of explanations registered in the reports logbook and preparation Production Division related equipment.
* Report of performance capability of steam valve FSIV with No.RA30S004 in BNPP-1
* A copy of summary of explanations registered in the log book of equipment defect of BNPP-1 related to I&C Management.
* Report related to the defects observed on the piece of equipment (steam valve FSIV with No.RA30S004) with No 68.BU.1ZB9.RA.REM.LST.PAS.
* Report of event description presented by the Reactor Management.
* Technical report of steam valve as per the analysis during its test.
* Letter from the manufacturer (Энергомаш- ЧЗЭМ), steam valve FSIV with No.51312 dated April 10, 2014.
* 2)**The following documents were examined in order to analyze the personnel performance at the time of disturbance:**
* A copy of journal of request for bringing equipment out for performing the repairs with the approval of NPP chief engineer;
* A copy of operator logbook of reactor management shift supervisor;
* Explanatory notes of operators (NPP shift supervisor, reactor management shift supervisor, reactor control engineer).

**3)After examining the aforementioned documents, the following became evident:** At the time of performing the overhaul repairs, it became cleared that due to the weakness, connection of nozzle to the body was broken and it displaced from its exact location (report of equipment failures No.68.BU.1ZB9.RA .REM.LST.PAS). Lack of nozzle in the body led to the possibility that reducing the pressure through steam escaping from the lower part of valve container was not allowed through conducting by the valve 13RA30S041, 042. In continue, this valve did not close through conducting by valves 12RA30S043, 044.Character of event :Equipment failureDirect causes: loosening, displacement. Root causes Original design inadequateCausal Factor: Equipment installed does not meet all codes / requirements   |
| Corrective Actions: |  1)Repairing the systems (equipment):* 1-1) Performing the overhaul repairs on steam valve FSIV
* No.RA30S004. determining and fixing the reasons of
* not closing the valve;
* 1-2) Removing the defects related to the conductive valves;
* Getting longer the time of valve opening (LZAFV) 12RA20S042;
* Failure in end breaker of valve 13 RA20S044 (RMF1);
* Failure in end breaker of valve 10 RA20S045 (RMF1);
* 1-3) Controlling the tightness of other valves related to the
* Valves RA10, 20, 40S004 to the vessel.
* 1-4) Removing the defects of the conductive valve
* 12RA20S042,12RA30S041,042(the prolongation of
* The "On" mode).

 2) Operating the systems (equipment): in accordance with the operation procedure No. 1058-600-СПМ-ТЗ-Р, article 3.3.1, table No. 7 is needed . negotiations should be done with the manufacturing company about the job ТО-3 titled " technical inspection " (internal, external, hydraulic test) which has bound that company annually because this article is different article 3.2.4 of this procedure and the Act ПНАЭ Г-7-008-89.* 3) the structure of the system (equipment):
* 3-1) change in the structure of the fastenings of the nozzle .
* 3-2) organizing the changes in the manufacturing
* Documents.
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| Note:  |  |
| INES Level: | 0 |
| Station Status: | 150- Hot shutdown - sub critical coolant temperature < normal operating temperature |
| Station Activity: | 25 - Routine testing (of existing equipment) with existing procedures/documents |
| Direct cause: | 0101- loosening, displacement |
| Category: | 3 – Major equipment damage  |
| Consequence(s)\*: | 03 - Equipment damage |
| System(s)\*: | 510 - Main stream and auxiliaries (including auxiliary steam) |
| Component(s)\*: | 230 – Valves (including safety)  |
| Group(s)\*: | 210 –Shift - Control room operators170-Work planning or scheduling  |
| Root cause(s)\*: |  2001- Original design inadequate |
| Causal factor(s)\*: | 2108-Equipment installed does not meet all codes / requirements  |
| List Attachments: |  |