



NUCLEAR PRODUCTS OPERATIONS
Vernon Nuclear Pump Operations, Vernon, CA 90058

12 November 2012

INTERIM REPORT – FORMAL EVALUATION OF DEVIATIONS REPORTED

To: Document Control Desk, Nuclear Regulatory Commission
From: David P. Gobbi, Nuclear Quality Program Manager, Flowserve Nuclear Products Operations
Reference: Docket Number – 99901369; Flowserve Pump Division, Vernon, CA, 90058

Subject: Request for 30 day extension to complete Formal Evaluation processes in accordance with 10CFR21.21

Date of Discovery by Customer: 19 September 2012
Date of Notification to Flowserve: 24 September 2012
Initial Evaluation by Flowserve Material Review Board: 26 September 2012
Results of Initial Evaluation: Inconclusive with further investigation and information required;
Internal Reference: Flowserve Internal Corrective Action: 143313

- A pressure reducing balancing sleeve, performing as a basic component installed on a rotating element designed and intended for use as in charging service has been reported by the Exelon, Braidwood Station, as having visual linear indications. (The owner had further verified the indications through magnetic-particle testing)
- The owner had drawn another rotating element from his on-site warehouse to continue with the prescribed maintenance and replacement activities associated with his outage. This balancing sleeve was found to also have linear indications
- The owner was requested to return one rotating element to Flowserve, Vernon, California for disassembly and further evaluation which includes magnetic particle testing, disassembly and further Non-Destructive Examinations.
- A meeting was held by the Flowserve Material Review Board to conduct an initial evaluation of the reported indications and to develop an activities listing focused on identifying the inputs required to conduct a formal evaluation for the condition's impact to safety
- The rotating element, with the basic component installed had been received three weeks after the preliminary evaluation.
- The activities, detailed within an Action Item List are currently in-process of completion with the following action items being completed: Review of documents; Receipt of material; Procurement of new material; Review of processes used in original manufacture; NDE of the pressure reducing sleeve in the installed condition and the witness of the removal of the installed pressure reducing sleeve. Items remaining and scheduled for completion include the magnetic particle testing of the removed balance sleeve; saw cutting the balance sleeve to expose the base material; magnetic particle testing of the exposed base material and to analyze and record the results as objective inputs for submittal in the Formal Evaluation. Material will be sent to a metallurgical testing laboratory for analysis.

Attached for your review is the Action Item List with the scheduled dates of completion.

This request is for approval to increase the allotted evaluation period from 60 days to 90 days to permit further investigation to obtain critical information to be used in the subsequent Formal Evaluation. .

I may be reached at 980-722-6770 or by email, at dgobbi@flowserve.com.

Cc: Dan Baehner, Facility Quality Manager, Vernon NPO
Erik Meisner, Nuclear Business Lead, Vernon NPO Operations
Matt Sweeney, Director, Global Nuclear Business

Sincerely,

David P. Gobbi,
Nuclear Quality Program Manager
Nuclear Products Operations
Flowserve Corporation

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Nuclear Quality Program Manager
Nuclear Products Operations
Flowserve Corporation

Phase #1 Activities - Causal Analysis

Exelon Pressure Reducing Sleeves / Balancing Drums

Drawing # D-71698 / Part # 09187642

Reference CAR- 143313 / Discovery Date: September 19, 2012

| Action Items | Owner | Co-Owner | Target / Complete |
|--|------------|----------|---|
| <i>HARDWARE RELATED - Basic Preparation</i> | | | |
| Return of Rejected Items w/Rotors | DGobbi | PProm | • 10/26 |
| <ul style="list-style-type: none"> • Establish Lines of Communication – Identify Fls Status – Action Items • Provide assistance to have Items returned • Prepare and issue customer site-specific RMA and Trouble report • Details concerning original equipment delivery dates and Job No's from Vernon to each customer location • Communication with PProm / recommended customer conferences | | | <ul style="list-style-type: none"> • 10/5 • 10/10 • 10/5 • 10/5 • 10/5 • 10/10 |
| <i>SELECT A PROJECT MANAGER / POINT CONTACT</i> | | | |
| Point Contact | EMeisner | Ronak | • 10/5 |
| <ul style="list-style-type: none"> • Receive Documentation to prepare RLCJ job • Provide activities required for job entry • Conduct ongoing vigilance & tasks to maintain knowledge of status of returned items • Report on barriers / participate in progress reviews | | | <ul style="list-style-type: none"> • 10/19 • 10/10 • On-going • On-going |
| <i>BAAN and AGILE PREPARATION / NCR INSTRUCTIONS</i> | | | |
| Returned Items | MEftychiou | DShaw | • 11/7 |
| <ul style="list-style-type: none"> • Enter work scope into AGILE as related to (possible) disassembly of returned rotors* • Enter specific instructions to achieve special tests and inspections...visual and NDE; compare to pre-shipment documents • QA to witness (and not provide guidance) removal of sleeves from customer shafting. The process employed shall be "typical" as common practice - report process controls...(e.g. FOMS System) • Saw-Cut removed sleeve in radial and axial planes as preparation to perform visual, Mag Particle and Hardness Testing at various locations of the exposed wall thickness. Metallurgy evaluation and direction to be supplied by DShaw; Record results as traceable to segments • Identify sleeve segments for traceability to hardness and metallurgy test documents • Provide results to Dbahner, NPO-QA • <i>Prepare for formal evaluation</i> | | Ronak | <ul style="list-style-type: none"> • 10/26 • 11/5 • 11/12 • 11/16 • 11/16 • 11/19 |
| | | DGobbi | |

| | | | |
|--|------------|---------------|--|
| <i>(Phase 2 - Metallurgy evaluation and direction to be supplied by DShaw; Record results as traceable to segments)</i> | | | |
| RECONVENE EVALUATION - COMPLETE FORMAL EVALUATION — MRB INPUT / REPORT <i>Phase 1 completed</i> | MEftychiou | DShaw, DGobbi | <ul style="list-style-type: none"> • 12 / 12 Evaluation • 12 / 17 Report |
| New Items to be manufactured as “Moch-up pieces”- | | | <ul style="list-style-type: none"> • Long Term Actions / CAR 143313 |
| <ul style="list-style-type: none"> • Enter item-specific product definition into AGILE • Product definition to carry item specific requirements that will support investigation • Processes that are to be used are the same as the typical processes employed on the returned/rejected part number • Flame spray supplier function requires Comm Grade Survey... • In-Process and Final inspection steps are to be assigned to conduct special tests, MT and hardness to monitor and record changes in properties...Foot print / maps for NDE are required • Completed “Moch Pieces” are to be installed and removed from dummy shaft of same dimensional values as those required for a typical assembly • The assembly of the “Moch” pieces are to be witnessed by same persons as above...same process parameters are to be verified and recorded | | | |
| QUALITY ASSURANCE | DBaehner | | <ul style="list-style-type: none"> • 10/10 |
| Job History Review- Identify Variables | | | |
| <ul style="list-style-type: none"> • Retrieve all Production Orders related to the Job numbers identified by PProm • Review Production Orders for consistency between part numbers and processes • Tabulate Non-Conformances concerning the Pressure Breakdown Sleeve and the Rotors including respective Performance Testing • Identify anomalies, similarities and variables in processes such as operators, shifts, rework activities or performance testing cycle events that would take place after the item final acceptance by Quality Control • Perform a Commercial Grade Survey on supplier of Flame Spray Service | | | |

| | | | |
|--|--------|--|--------|
| | | | |
| <i>MANUFACTURING ENGRG</i> | Sarvi | | • 11/7 |
| Production Order Creation - Returned and New Items | | | |
| <ul style="list-style-type: none"> • Production Orders to be created to convey all the requirements of AGILE and Quality • Production Order required for Returned Equipment – disassemble, inspect, identify, Warranty Job – RLCJ • Production Order required for receiving, cutting-off and machining bar stock to same dimensional values as the returned or originally shipped shaft to make two sample shafts • Production Order required for the manufacture of three “moch” sleeves of 420SS to be used for investigative purposes / cause analysis-assembly and removal function • QA and Metallurgy to witness activities required for those processes that involve assembly and removal of pressure reducing sleeve to the sample shaft - machined bar stock | | | |
| <i>PROCUREMENT ACTIVITY</i> | GCasas | | • 11/2 |
| Purchase Orders - Materials “Moch” Testing | | | |
| <ul style="list-style-type: none"> • Purchase Orders required for the procurement of 420SS Bar Stock....8 ft piece (three new “moch” sleeves) • Purchase Order required for bar Stock to make two sample shafts used for “moch” assembly and removal • Purchase Order required for Flame Spray – same supplier as used in jobs supplied to Exelon • Place Purchase Orders, advise delivery dates | | | |