

October 28, 2011

Mr. David Gobbi  
Quality Assurance Manager  
Flowserve Pump Division  
2300 E. Vernon Ave.  
Vernon, CA

SUBJECT: NRC INSPECTION REPORT NO. 99901369/2011-202, NOTICE OF VIOLATION  
AND NOTICE OF NONCONFORMANCE

Dear Mr. Gobbi

From September 12 to September 16, 2011, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the Flowserve Pump Division (Flowserve) facility in Vernon, California. The enclosed report presents the results of this inspection.

This was a limited scope inspection, which focused on assessing your compliance with the provisions of Part 21 of Title 10 of the *Code of Federal Regulations* (10 CFR Part 21) "Reporting of Defects and Noncompliance," and selected portions of Appendix B to 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it is described in detail in the subject inspection report. The violation is being cited in the Notice because NRC inspectors identified that Flowserve failed to meet the requirements set forth in 10 CFR Part 21 for procedures to ensure effective evaluation of deviations associated with substantial safety hazards within 60 days of discovery.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

During this inspection, NRC inspectors also found that implementation of your QA program failed to meet certain NRC requirements contractually imposed on you by your customers. Specifically, the NRC inspectors determined that Flowserve failed to disposition nonconforming material in accordance with Flowserve's policy and procedures. This nonconformance is cited in the enclosed Notice of Nonconformance (NON), and the circumstances surrounding it is described in detail in the enclosed inspection report.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance.

D. Gobbi

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the Public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Sincerely,

*/RA/*

Frederick Brown  
Division Director  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation

Docket No.: 99901369

Enclosures: 1. Notice of Violation  
2. Notice of Nonconformance  
3. Inspection Report 99901369/2011-202

D. Gobbi

- 2 -

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the Public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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<b>OFFICE</b>	IQVB/DIRS/NRR	IQVB/DIRS/NRR	IQVB/DIRS/NRR	BC: IQVB/DIRS/NRR	D:DIRS/NRR
<b>NAME</b>	AArmstrong	JOrtega	PPrescott	CNguyen	FBrown
<b>DATE</b>	10/26/2011	10/ 27/2011	10/ 27/2011	10/27/2011	10/28/2011
<b>OFFICE</b>	NRO/DCIP/CQVA	NRO/DCIP/CQVB			
<b>NAME</b>	MVaaler*	EHuang*			
<b>DATE</b>	10/26/2011	10/26/2011			

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## NOTICE OF VIOLATION

Flowserve Pump Division  
2300 E. Vernon Ave.  
Vernon, CA

Docket Number 99901369  
Inspection Report No. 99901369/2011-202

Based on the results of a Nuclear Regulatory Commission (NRC) inspection conducted September 12 to September 16, 2011, of activities performed at Flowserve Pump Division (Flowserve), one Violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the Violation is listed below:

- A. 10 CFR 21.21(a)(1), requires, in part, "that each individual, corporation, partnership, dedicating entity, or other entity subject to the regulations in this part shall adopt appropriate procedures to evaluate deviations and failures to comply to identify defects and failures to comply associated with substantial safety hazards as soon as practicable, and, except as provided in paragraph (a)(2), in all cases within 60 days of discovery."

10 CFR 21.3, defines discovery as, "the completion of the documentation first identifying the existence of a deviation or failure to comply potentially associated with a substantial safety hazard within the evaluation procedures discussed in 21.21(a)."

Flowserve procedure NPO-NNP-02, "Reporting of Defects Which May Result in Substantial Safety Hazards," Revision 00, dated April 22, 2008, Paragraph 4.5.2 states that, "Results of the evaluation activity shall be documented and any objective evidence referenced or created through the evaluation process shall be maintained as Quality Records and able to be retrieved."

Contrary to the above, as of September 16, 2011:

Flowserve failed to identify Nonconformance report (NCRA) 08206, dated February 17, 2009, as the date of discovery, and did not correctly implement procedure NPO-NNP-02 to evaluate and document the results of the evaluation within 60 days of discovery. The completed evaluation was documented May 27, 2009.

This issue has been identified as Violation 99901369/2011-202-01.

This is a Severity Level IV Violation (Section 6.9.d).

Pursuant to the provisions of 10 CFR 2.201, "Notice of Violation," you are required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with a copy to the Director, Division of Inspection and Regional Support, Office of Nuclear Reactor Regulation, within 30 days of the date of the letter transmitting this Notice of Violation. This reply should be clearly marked as a "Reply to a Notice of Violation" and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. Where good cause is shown, consideration will be given to extending the response time.

**ENCLOSURE 1**

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agency-wide Documents Access and Management System (ADAMS), to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection, described in 10 CFR 73.21.

Dated this 28<sup>th</sup> of October 2011.

## NOTICE OF NONCONFORMANCE

Flowserve  
2300 E. Vernon Ave.  
Vernon, CA

Docket Number 99901369  
Inspection Report No. 99901369/2011-202

Based on the results of a Nuclear Regulatory Commission (NRC) inspection conducted September 12 to September 16, 2011, of activities performed at Flowserve Nuclear Pump Division (Flowserve), certain activities were not conducted in accordance with NRC requirements, which were contractually imposed upon Flowserve by NRC licensees.

- A. Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50, states in that, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Flowserve's Nuclear Product Operations (NPO), SN-19, "Non-conformance Control," Revision 00, dated April 29, 2009, states in part, "Measures are to be established to control material, part, and components, which do not conform to requirements and to prevent their inadvertent use or installation. These measures shall include provisions for identification, documentation, segregation, disposition, re-installation, and corrective action."

Flowserve's procedure QA-1717, "Quality Department Control of Nonconforming Items," Revision B, dated October 26, 2010, defines, "Use as is" nonconforming condition(s) that does not affect safety, performance, interchangeability, reliability, regulatory, or special customer requirements and is used as is unless contractually prohibited. Items with disposition of use as is may require Customer concurrence and will be handled on a case-by-case basis. The procedure also defines, "Rework" item(s) made to conform to requirements using method and/or operations that were originally planned and/or specified." Flowserve's procedure further defines, "Repair" item(s) that are made functionally acceptable using methods and operations that were not included in the original plans or specifications," and, "Scrap" item(s) unfit for use in accordance with specified design conditions and cannot feasibly be reworked or repaired."

Contrary to the above, as of September 16, 2011:

Flowserve failed to disposition nonconforming material in accordance with procedure QA-1717. Specifically, Flowserve had canceled Nonconformance reports (NCRAs) without a disposition. Flowserve procedure QA-1717 provides dispositions of uses as is, rework, repair and scrap, but provides no provisions for cancelation of NCRAs.

**ENCLOSURE 2**

This issue has been identified as Nonconformance 99901369/2011-202-02.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Director, Division of Inspection and Regional Support, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid non-compliances; and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated this 28<sup>th</sup> day of October 2011.

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
DIVISION OF ENGINEERING  
VENDOR INSPECTION REPORT

Docket No.: 99901369

Report No.: 99901369/2011-202

Vendor: Flowserve Pump Division  
2300 E. Vernon Ave.  
Vernon, California CA

Vendor Contact: David Gobbi,  
Quality Assurance Manager  
Phone: (980) 722-6770  
dgobbi@flowserve.com

Nuclear Industry: Flowserve's scope of supply for the commercial US nuclear industry includes manufacturing, repair, and replacement of safety-related pumps. This includes spare/replacement parts, components, associated engineering, and field services. Flowserve performs the design and manufacture of pumps and commercial-grade dedication of pump components.

Inspection Dates: September 12 – September 16, 2011

Inspection Team Leader: Aaron Armstrong, NRR/DIRS/IQVB

Inspectors: Jonathan Ortega, NRR/DIRS/IQVB  
Paul Prescott, NRR/DIRS/IQVB  
Marlayna Vaaler, NRO/DCIP/CQVA (Training)  
Eugene Huang, NRO/DCIP/CQVB (Training)

Approved by: Caroline Nguyen, Acting Chief  
Inspection & Quality Vendor Branch  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation

**ENCLOSURE 3**

## **EXECUTIVE SUMMARY**

Flowserve Pump Division  
99901369/2011-202

The purpose of this inspection was to review selected portions of Flowserve's quality assurance (QA) program requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Part 50 of Title 10 of the *Code of Federal Regulations*. The inspectors also verified that Flowserve implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," (Part 21) that meets the regulatory requirements. The inspectors focused on Flowserve's activities in the area of dedication of pumps and pump parts supplied to NRC-licensed facilities. The inspection was conducted at Flowserve's manufacturing facility in Vernon, California.

The NRC inspection bases were:

- Appendix B to 10 CFR Part 50
- 10 CFR Part 21

There were no open items from the previous inspection report 99901369/2007-201 for the NRC inspections of Flowserve's facility in Verona, California. The results of this inspection are summarized below.

### **10 CFR Part 21 Program**

The inspectors identified one violation of Part 21. Violation 99901369/2011-202-01 was cited for failure to prescribe an adequate process to perform a Part 21 evaluation. Specifically, the 60-day evaluation period did not commence from the time a deviation was initially identified (discovery) in Flowserve's process. With the exception of the violation noted above, the inspectors concluded that Flowserve's Part 21 program was consistent with regulatory requirements.

### **Nonconformance**

The inspectors identified one Nonconformance to 10 CFR Part 50, Appendix B. Nonconformance 99901369/2011-202-02 was cited for failure to disposition nonconforming material in accordance with Flowserve's process. With the exception of the nonconformance noted above, the inspectors concluded that Flowserve's corrective action and nonconformance processes and implementing procedures met the requirements of Criterion XV of Appendix B to 10 CFR Part 50.

### **Commercial-Grade Dedication**

Based on the review of Flowserve's commercial-grade dedication process, implementing procedures, and a sample of completed job orders, the inspectors determined that Flowserve's process met regulatory requirements of Criteria III and VII of Appendix B to 10 CFR Part 50. No findings of significance were identified.

### Audits

Based on the review of Flowserve's internal and external audit and survey process, associated implementing procedures, and a sample of CARs, the inspectors concluded that Flowserve's audit program requirements and implementation were consistent with regulatory requirements of Criteria VII and XVIII of Appendix B to 10 CFR Part 50. No findings of significance were identified.

### Indoctrinations and Training

Based on the review of Flowserve's indoctrination, training, and documentation requirements the inspectors concluded that indoctrinations and training program was consistent with regulatory requirements of Criteria II of Appendix B to 10 CFR Part 50. No findings of significance were identified.

## **REPORT DETAILS**

### 1. 10 CFR Part 21 Program

#### a. Inspection Scope

The inspectors reviewed Flowserve's Quality Assurance (QA) Program, and implementing procedures developed to implement the requirements of Part 21. Specifically, the inspectors focused on Flowserve's implementing procedure, NPO-NNP-02, "Reporting of Defects Which May Result in Substantial Safety Hazards (10CFR21)," Revision 00, dated April 22, 2008.

In addition, the inspectors evaluated Flowserve's Part 21 evaluations from the past two years to verify compliance with Part 21 requirements. The following evaluations were reviewed:

- Nonconformance reports (NCRA) 08206,"Failed Flow Test, Tested by Wyle Laboratories, dated February 17, 2009.
- NCRA 08209, "Per RWNA06096 Part was Cut to 4 Section to Determine the Cause of Flow Test Failure, dated February 19, 2009.
- Part 21 Evaluation Report, "10 CFR 21 Evaluation of Orifice," dated May 27, 2009.
- Corrective Action Report (CAR)-34252, "Report on Formal Investigation of Deviation Concerning Bolting Material as Reported Through Flowserve Internal CAR #34252," dated February 23, 2010.

Finally, the inspectors reviewed NPO-CNP-02, "Implementation of the Nuclear Products Operations Corrective Action Program," Revision 00, dated February 4, 2010, Flowserve's procedure, QA-1717, "Quality Department Control of Nonconforming Items," Revision B, dated May 26, 2010, and Flowserve's procedure, QA-1785, "Quality Department Corrective Action Request Procedure," Revision A, dated October 10, 2007.

#### b. Observations and Findings

##### b.1 Implementation

The inspectors reviewed Flowserve's policy and procedure governing the Part 21 program to assure an adequate description of the process and implementation of the requirements of Part 21. Procedure NPO-NNP-02, defines the methods to identify, report, and disposition defects or noncompliances which may result in a substantial safety hazard. NPO-NPP-02, paragraph 4.5.2 states in part, "Results of the evaluation activity shall be documented and any objective evidence referenced or created through the evaluation process shall be maintained as Quality Records and able to be retrieved."

Procedure NPO-NNP-02 assigns a group of Flowserve personnel to the Material Review Board (MRB) for review and disposition of deviations in basic components. Members of the MRB are selected based upon their individual expertise in product knowledge and related programmatic requirements. The MRB shall always include a member of the Quality Organization and dispositions deviations for repair, rework, use-as-is or scrap as applicable.

The MRB provides technical justifications for the acceptance of product with deviations, or use-as-is and conducts the evaluations of deviations for their impact on the safety function of the basic component. The inspectors identified that Flowserve created NCRA 08206, dated February 17, 2009, held an MRB sometime after, but did not document the Part 21 evaluation as required per Flowserve's procedure. The Part 21 evaluation was later documented within a Flowserve customer closeout letter dated May 27, 2009. This issue was identified as Violation 99901369/2011-202-01.

b.2 Posting

The inspectors reviewed Flowserve's posting of Part 21 to determine whether Flowserve had complied with the posting requirements. The inspectors found that Flowserve had posted notices that included a copy of Section 206 of the Energy Reorganization Act of 1974, a current copy of Part 21, and the applicable NPO-NNP-02 procedure. No findings of significance were identified related to Part 21 posting.

c. Conclusions

The inspectors identified Violation 99901369/2011-202-01 for failure to identify NCRA 08206 as the date of discovery and did not correctly implement procedure NPO-NNP-02 to evaluate and document the results of the evaluation within 60 days of discovery. With the exception of the violation, the inspectors concluded that Flowserve's Part 21 program was consistent with regulatory requirements.

2. Nonconformance

a. Inspection Scope

The inspectors reviewed Flowserve's procedure SN-20, "Corrective Action," Revision 00, dated April 29, 2009, and Flowserve's corrective action procedure QA-1785, governing the implementation of Flowserve's corrective action program to ensure the procedures provided adequate guidance consistent with the requirements of Appendix B to 10 CFR Part 50. The inspectors also reviewed a sample of CARs to assess Flowserve's implementation of the corrective action program.

The inspectors reviewed Flowserve's Nuclear Products Operations SN-19, "Non-conformance Control," Revision 00, dated April 29, 2009, and Flowserve's nonconformance procedure QA-1717, governing the implementation of Flowserve's nonconformance program to ensure the procedures provided adequate guidance consistent with the requirements. The inspectors assessed Flowserve's implementation through a review of a sample of NCRAs from Flowserve's Baan database.

The following NRCAs and CARs were reviewed:

- NCRA 11557, "Documentation Wrong Information Improper," dated December 29, 2010.
- NCRA 11757, "Documentation Certs do not meet PO/Procedure," dated February 3, 2011.

- NCRA 09425, "Documentation Certs do not meet PO/Procedure," dated March 5, 2010.
- NCRA 11757, "Documentation Certs do not meet PO/Procedure," dated January 23, 2011.
- NCRA 11729, "Test Failure Dynamic Vibration Over Maximum A," dated January 27, 2011.
- NCRA 11642, "Machining Dimensional Threads/Gears/Keyway," dated January 18, 2011.
- NCRA 11757, "Machining Dimensional Nicks/Tool Crash/Face," dated January 18, 2011.
- NCRA 11642, "Machining Operational Position Incorrect," dated January 18, 2011.
- CAR-53994, "Purchase Orders- Rev Material Specs and Applicable Code Year," dated November 13, 2010.
- CAR-82712, "Trouble Report," dated June 3, 2011.
- CAR-81573, "NEK KRSKO (incorrect parts)," dated March 26, 2011.
- CAR-76313, "Corrective Action Completion," dated April 20, 2011.

b. Observations and Findings

The inspectors reviewed Flowserve's procedure SN-19, which establishes the process for controlling materials, parts and components that do not conform to requirements and prevent their inadvertent use or installation. The inspectors noted that procedure SN-19 also had provisions for identification, documentation, segregation, disposition, and re-inspection of nonconforming materials.

The inspectors reviewed Flowserve's procedure QA-1717, which establishes the minimum requirements at Flowserve (Vernon) for the operational methods and actions taken when products, information, or materials are found in a nonconforming condition. Procedure QA-1717 defines, "Use as is," as a nonconforming condition that does not affect safety, performance, interchangeability, reliability, regulatory, or special customer requirements and will be used as is unless contractually prohibited. Item(s) with disposition of use as is may require customer concurrence handled on a case-by-case basis. "Rework," is defined as item(s) made to conform to requirements using method or operations that were originally planned or specified. "Repair," is defined as item(s) that are made functionally acceptable using methods and/or operations that were not included in the original plans or specifications, and "Scrap," as item(s) unfit for use in accordance with specified design conditions and cannot feasibly be reworked or repaired.

The inspectors reviewed Flowserve's Baan database, which is used for tracking and disposition of NCRAs. The inspectors noted that eight NCRAs in the Baan database were "Cancelled." Flowserve management informed the inspectors that some canceled NCRAs were transferred and tracked on other NCRAs. However, the inspectors identified four NCRAs that were not transferred to other NCRAs for disposition. Specifically, the inspectors noted that NCRA 11757 provided, "Cancelled per Flowserve Vernon Management" as the justification for NCRA's cancelation. The inspectors questioned Flowserve's justification for NCRA 11757 disposition. Flowserve management informed the inspectors that the correct certificate of conformance was

received from the supplier. Flowserve stated that all NCRAs undergo a final review before the final product shipment and that this includes canceled NCRAs. The inspectors identified that Flowserve procedure QA-1717 provides disposition of “uses as is,” “rework,” “repair,” and “scrap;” but, provides no provisions for cancellation. This issue was identified as Nonconformance 99901369/2011-202-02.

The inspectors reviewed Flowserve’s procedure SN-20, which establishes the measures to assure that conditions adverse to quality are promptly identified and reported to the appropriate levels of management. These measures focus on determining the cause of condition and plan of action to preclude recurrence. Procedure SN-20 also defines the relationship and responsibilities for implementing the corrective action program requirements for supplier corrective actions. The inspectors determined the corrective action adequately implemented. No findings of significance were identified.

The inspectors reviewed Flowserve procedure QA-1785 which defines the methods for administering the corrective action program utilized by Flowserve’s CAR process. Procedure QA-1785 defined the process for the generation, response, and closure of CARs. The inspectors noted from review of the CAR process that Flowserve had identified corrective action timeliness issues and addressed these issues on CAR-76313. The inspectors also determined the proposed corrective action was acceptable. No findings of significance were identified.

c. Conclusion

The inspectors identified one Nonconformance to Criterion XV, “Nonconforming Materials, Parts, or Components,” to 10 CFR Part 50, Appendix B. Nonconformance 99901369/2011-202-02 was cited for failure to disposition nonconforming material in accordance with Flowserve’s procedure QA-1717. With the exception of the Nonconformance, the inspectors concluded that Flowserve’s corrective action and nonconformance processes and implementation were consistent with regulatory requirements.

3. Commercial-Grade Dedication Process

a. Inspection Scope

The inspectors reviewed Flowserve Pump Division Nuclear Products Operations SN-01, “Nuclear Quality Assurance Manual,” Revision 0, dated April 29, 2009, and implementing procedures that govern the processes for commercial-grade dedication activities. Specifically, the inspectors reviewed the procurement and commercial-grade dedication (CGD) activities associated with purchase orders (POs) from Public Service Electric and Gas, Exelon, the Tennessee Valley Authority’s, and the San Onofre Nuclear Generating Station, all of which were related to pump assemblies.

b. Observations and Findings

The inspectors reviewed Flowserve’s procurement and manufacturing process and determined that the safety-related pump assemblies typically consist of safety-related

and a limited number of commercially dedicated parts and components. The inspectors confirmed that the parts, components, and services purchased as safety-related, which were reviewed as part of this inspection, were purchased from approved suppliers that are periodically audited by Flowserve to verify compliance with Appendix B to 10 CFR Part 50. The inspectors determined that the remainder of the safety-related parts and components are purchased as commercial-grade items and dedicated for use in safety-related applications by Flowserve or a third-party dedicater.

The inspectors reviewed Flowserve procedure NPO-E-105, "Utilizing Commercial Items as Safety Related Components," Revision B, dated May 18, 2010, which outlines the requirements and responsibilities for dedicating commercial-grade items procured for use in safety-related applications. Procedure NPO-E-105 specifies the process to ensure that technical evaluations are conducted and documented to identify the technical and quality requirements necessary to have reasonable assurance that the item will meet the intended design conditions.

The inspectors observed that the Flowserve CGD process involved creating an engineering evaluation (EE) document for each type of commercial item or component that Flowserve procured with the intent of dedicating into a safety-related application. The EE contained the scope, design function, failure modes and effects, critical characteristics for design, and acceptance methods related to each commercial item or component. Whenever a product is furnished to Flowserve by suppliers who do not possess a quality program compliant with the requirements of Appendix B to 10 CFR Part 50, the item or component is subject to a full receiving inspection and parts dedication in accordance with the associated EE document and the approved procedures.

The inspectors noted that Flowserve's manufacturing process is primarily controlled through the Agile and Baan database computer systems. The Agile database contains all the design specifications, technical and quality requirements, engineering drawings, inspection procedures, and other related information for each product fabricated by Flowserve. The Agile system is controlled and maintained by the engineering organization, with input and oversight from the QA organization as appropriate. This information is replicated into the Baan database, which creates the detailed work instructions necessary to complete each manufacturing step and ensures that the appropriate documents, procedures, inspection requirements, etc. are associated with each activity and verified by the correct organization to ensure it contains all the correct and organized information. The output of the Baan database is also subject to oversight and approval by the QA, engineering, and manufacturing organizations. The inspectors determined that use of the Agile and Baan systems provides adequate control and oversight of the manufacturing process implemented at Flowserve, and specifically ensures that the critical characteristics of items important to safety are verified at the appropriate stage of the process.

The inspectors verified the CGD activities associated with a sample of POs reviewed. The inspectors noted that Flowserve performed verification activities for GCD in accordance with the engineering requirements and acceptance criteria established in the

EE documents, including recording actual values of critical dimensions on inspection reports when conducting inspection and test activities related to CGD.

The inspectors questioned Flowserve on their process used to replace lost work traveler documentation. Flowserve stated there is not a formal procedure for the regeneration of lost traveler documents. However, a copy of the current traveler documents are retrievable from the Agile database. Flowserve QA adds comments providing information if an inspection has been completed. The inspectors noted that Flowserve's process relies on the files and records being stored electronically in the Agile database during the ongoing work.

c. Conclusion

The inspectors concluded that Flowserve's material and services procurement, acceptance, and CGD programs conform to the regulatory requirements of Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. Based on the sample of activities reviewed, the inspectors concluded that Flowserve's implementation of these policies and procedures provided appropriate oversight of suppliers and control of purchased material, equipment, and services. No findings of significance were identified.

4. Audits

a. Inspection Scope

The inspectors reviewed Nuclear Products Operations SN-10, "Control of Procurement Documents, Purchase Materials, Items and Services," Revision 00, dated April 29, 2009, for the conduct of external audits and Nuclear Products Operations SN-21, "Audit of Quality Assurance Program," Revision 00, dated April 29, 2009, for the conduct of internal audits in Flowserve's Nuclear Quality Assurance Manual, Edition 3, Revision 00, dated April 29, 2009, and the implementing procedures that governed the process for internal and external audits. The inspectors reviewed a sample of external audits and survey reports that Flowserve performed. The inspectors reviewed the most recent internal audits and verified adequate implementation of corrective actions for findings identified during the audits.

The following external audit/survey reports were reviewed:

- Valley Metal Treating, Inc. of Pomona, CA: Valley Metal Treating provides heat treatment services of items or material (steel). The audit was performed in July 2011, by Huber Consulting Services.
- Wilcox Machine Co. of Bell Gardens, CA: Wilcox Machine provides machining services of materials and items. The audit was performed in November 2010, by Huber Consulting Services.
- XRI Testing of Troy, MI: XRI Testing provides nondestructive examination testing (NDE) services. The audit was performed in June 2009, by Flowserve - Charlotte.

- Flowserve – Dayton Foundry of Dayton, OH: Flowserve – Dayton provides ferrous and nonferrous casting manufacturing services. The audit was performed in March 2011, by Flowserve – Raleigh.
- Johnson Brass and Machine Foundry, Inc of Saukville, WI: Johnson Brass and Machine Foundry provides ferrous and nonferrous casting manufacturing and machining services. The audit was performed in August 2011, by Flowserve – Charlotte.
- Delta Centrifugal Corp. of Temple, TX: Delta Centrifugal provides stainless, nonferrous, and high-alloy steel centrifugal casting manufacturing services. The audit was performed in June 2009, by a Nuclear Industry Assessment Committee (NIAC) member.
- SeaCast, Inc. of Marysville, WA: SeaCast provides ferrous and nonferrous casting manufacturing, machining, and NDE services. The audit was performed in November 2010, by Huber Consulting Services.
- Nova Machine Products, Inc. of Middleburg Heights, OH: Nova Machine Products provides ferrous and nonferrous materials (fasteners). The audit was performed in May 2009, by a NIAC member.
- Greene Tweed & Co. of Kulpsville, PA: Greene Tweed provides o-rings, seals and other similar soft parts. The survey was performed in May 2010 by Flowserve – Raleigh.

b. Observations and Findings

b.1 External Audits/Surveys

The inspectors noted that Flowserve - Vernon currently uses the Flowserve - Charlotte procedures NBU-ACP-03, "Supplier Audit Program Requirements," Revision 1, dated September 1, 2009, and NBU-ACP-04, "Implementing Procedure - Supplier Audits," Revision 0, dated June 1, 2003, for implementing the external audit process. Additionally, NPO-ACP-08, "Requirements for Qualifying Suppliers for the Placement of Purchase Orders through Method 2, Commercial Grade Survey," Revision 0, dated December 15, 2008, provides guidance to implement the survey process. The inspectors reviewed Flowserve's implementation of the audit and survey process through evaluation of the audits and surveys listed above.

The inspectors noted that the audit procedures were not standard corporate procedures. The Flowserve QA manager stated that the Flowserve - Charlotte procedures are in the process of being revised to be the corporate standard.

The inspectors reviewed several CARs Flowserve issued in response to findings from the audit or survey. The inspectors noted that the CARs had the associated corrective actions completed and appeared adequate to address the identified issue.

No findings of significance were identified related to external audits and surveys.

b.2 Internal Audits

The inspectors reviewed NPO-ANP-01, "Internal Quality Audit Program," Revision 0, dated June 30, 2007. The procedure defined the requirements and methods used in the implementation of an internal QA program for the NPO facilities, such as Flowserve - Vernon. The inspectors reviewed the three internal audits that were completed for the current year: INT-11-002, for the control of nonconforming materials and items; INT-11-003, for the control of measuring and test equipment (M&TE); and INT-11-005, for the control of procurement documents. The inspectors ensured that Flowserve had prepared an annual internal audit schedule for the applicable QA program areas. Only one internal audit report identified any findings. The inspectors reviewed the corrective actions associated with the internal audit for the control of M&TE. The corrective actions had not been completed due to issues with the auditor's characterization of the findings. The inspectors' one internal audit finding of concern was found to be addressed; the need for an external audit of a calibration laboratory.

No findings of significance were noted related to internal audits.

c. Conclusion

Based on the review of Flowserve's internal and external audit and survey process, associated implementing procedures, and a sample of CARs, the inspectors determined that Flowserve's met the requirements of Criterion XVIII and Criterion VII of Appendix B to 10 CFR Part 50. No findings of significance were identified.

5. Indoctrinations and Training

a. Inspection Scope

The inspectors reviewed Flowserve's policies and procedures that govern the indoctrination and training of personnel performing activities affecting quality. The inspectors reviewed NPO-ENP-01, "Procedure for Indoctrination of Employees – Nuclear Operations," Revision 00, dated June 30, 2007, and QA-1102, "Quality Department Written Practice for Quality Assurance Audit Personnel and Certification," Revision D, dated July 20, 2005 and the personnel training and qualification records to verify personnel were adequately maintaining their qualification requirements as required.

b. Observations and Findings

The inspectors verified that Flowserve had adequate policies and procedures in place to assure that employees performing activities affecting quality were indoctrinated and qualified. In addition, the inspectors reviewed a sample of qualification records to verify that Flowserve had correctly implemented and maintained their program.

c. Conclusion

Based on the review of Flowserve's indoctrination and training requirements and associated implementing procedures, the inspectors determined that Flowserve's processes met the requirements of Criterion II of Appendix B to 10 CFR Part 50. No findings of significance were identified.

6. Exit Meeting

On September 16, 2008, the inspectors presented the inspection scope and findings during an exit meeting with Flowserve's Quality Assurance Manager, David Gobbi, and other Flowserve personnel.

**ATTACHMENT**

1. PERSONS CONTACTED

D. Baehner, Quality Engineer, Flowserve  
J. DeNovo, Manufacturing Manager, Flowserve  
J. Estenoz, QC Sup, Flowserve  
M. Eftchiou, Engineer Manager, Flowserve  
G. Galvan, Project Manager, Flowserve  
D. Gobbi, Manager, Quality Assurance, Flowserve  
D. Lewis, Business Unit Leader Nuclear Production, Flowserve  
M. Maurer, Facility QA Manager, Flowserve  
J. Meyer, General Manager, Flowserve  
M. Sweeney, Dir. Global Nuclear Business, Flowserve  
D. Zagres, Engineering Support, Flowserve

2. INSPECTION PROCEDURES USED

IP 36100, "Inspection of 10 CFR Parts 21 and 50.55(e) Programs for Reporting Defects and Noncompliance"  
IP 43002, "Routine Inspections of Nuclear Vendors"  
IP 43004, "Inspection of Commercial-Grade Dedication Programs"

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

There were no open items from the previous inspection report 99901369/2007-201 for the NRC inspections of Flowserve's facility in Verona, California.

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
99901369/2011-202-01	Opened	NOV	21.21 Evaluations
99901369/2011-202-02	Opened	NON	Criterion XV

4. LIST OF ACRONYMS USED

CAR	Corrective Action Request
CCV	Critical Characteristics Verification
CFR	Code of Federal Regulations
DE	Division of Engineering
ECO	Engineering Change Order
EDG	Emergency Diesel Generator
EQVB	Quality and Vendor Branch
Flowserve	Flowserve Pump Division
IP	Inspection Procedure
NLI	Nuclear Logistics Incorporated
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NON	Notice of Nonconformance
PO	Purchase Order
QA	Quality Assurance
QAM	Quality Assurance Manual
NCRA	Nonconformance Reports