

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

Report No. 99900308/80-02

Program No. 51300

Company: ACF Industries Inc.  
WKM Valve Division  
P. O. Box 2117  
Houston, Texas 77001

Inspection at: Missouri City, Texas

Inspection Conducted: August 25-28, 1980

Inspectors:

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Program Evaluation Section  
Vendor Inspection Branch

12-17-80  
Date

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Jan 7 1981  
Date

Approved by:

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1-16-81  
Date

Summary

Inspection on August 25-28, 1980 (99900308/80-02)

Areas Inspected: Implementation of 10 CFR 50, Appendix B and applicable codes and standards including design and document control - design input, and a 10 CFR Part 21 inspection. Also, performed a review of the vendor activities and conducted an exit meeting at the Missouri City, Texas plant on August 28, 1980. On September 4, 1980, a subsequent meeting was held in the NRC IE RIV office. The inspection involved fifty-two (52) inspector hours on site by two (2) NRC inspectors.

Results: In the two (2) areas inspected no deviations were identified in two (2) areas. However, the following violation and unresolved item were identified in one (1) area.

Violation

Failure to evaluate, or cause all purchasers of POW-R-SEAL valves to evaluate, the safety significance of overpressurization of the valve body that could result from a design defect which permitted process fluid to be trapped in the body of the valve in the valve-open position. (See Notice of Violation enclosure).

Unresolved Item

Documentation made available during the inspection did not appear to substantiate the WKM management position that the linear indications identified on the interior and exterior of stainless steel POW-R-SEAL valves was limited only to valves supplied to the Babcock and Wilcox Company. Resolution of this item is dependent on receipt of data from other NRC Regional Offices. (See Details Section I, paragraph B.3.e.(2)).

DETAILS SECTION I

(Prepared by D. F. Fox)

A. Persons Contacted

- \*J. R. Brinkley, Chief Engineer
- \*W. Cook, Supervisor, Quality Control
- \*R. V. Hopkins, Former Manager, Quality Assurance
- \*H. M. Jackson, Project Coordinator
- B. Larson, Engineering Manager, Large Valves
- O. McDaniel, Division Contract Administrator
- \*C. E. Morcate, Manager, Quality Assurance
- \*A. M. Williamson, Manager, Operations

\*Denotes those present at the exit meeting.

B. 10 CFR Part 21 Inspection1. Objectives

The objectives of this area of inspection were to examine the establishment and implementation of related procedures for 10 CFR Part 21 to verify that:

- a. 10 CFR Part 21 is posted in accordance with the requirements.
- b. Deviations and nonconformances are evaluated and adequate records are maintained and properly dispositioned by the responsible organizations or persons.
- c. Methods of analysis for a defect, deviation or failure to comply are clearly described and responsibilities assigned to organizations or persons in each related phase of analysis.
- d. A director or responsible officer has been appointed to notify the commission of evaluated defects, deviations or failures to comply for substantiated safety hazards.
- e. Procurement documents for safety-related items specify that 10 CFR Part 21 requirements apply.
- f. Evaluation of deviations was appropriate.
- g. Items determined to be substantial safety hazards were appropriately reported to the NRC.

## 2. Method of Accomplishment

The preceding objectives were accomplished by review of the following:

- a. 10 CFR Part 21 notices that were posted in the Personnel Office and in the main factory which described the Regulations and WKM procedures, and identified the location where copies of the regulations and procedures are available and the name of the individual to whom reports may be made, to accomplish objective a above.
- b. WKM Quality Assurance Standard (Procedure) 78-0023, Rev. P095 dated May 19, 1980, "Program for Compliance to the Code of Federal Regulations, Title 10, Part 21"; WKM internal memoranda dated August 6, 1979, and May 15, 1980, relating to the WKM Material Review Board evaluation of the "10 CFR 21 Incident Marotta Relief Valve"; WKM Purchase Orders No. 95221, 95223, 95224 and 95279 to Marotta Scientific Controls Incorporated for pressure relief valves; change order No. 8 to Babcock and Wilcock Purchase Order 029752; and WKM Sales Orders 25058 and 25061 from Babcock and Wilcox; and 34661 and 38301 from Bechtel Power Corporation for WKM valves for nuclear service, to accomplish objectives b through g above.
- c. B&W Specification 08-10250000, "Remotely Operated Class 1 and Class 2 Valves for Auxiliary System Service," Revisions 0 thru 6; seven (7) WKM assembly drawings (RS238904, RS238913, RS238914, RS241259, RS244465, RS244466, RS259313); and three (3) WKM component manufacturing drawings (C241823, C272977 and C272978), to determine the functions, material and component specifications, operational requirements, design details and modifications thereto (including provisions for overpressure protection if any), of WKM valves supplied, or being supplied, for nuclear service.
- d. WKM Manufacturing Shop Travelers (260468-N622, 260473-N386, A260492-N387 and A260497-N387) to verify that: (1) valve body remaining wall thickness measurements were required to be taken at locations where linear indications were removed by a metal removal process; (2) relief holes for overpressure protection were required to be drilled per drawing; (3) stainless steel retaining clips were installed in Marotta internal pressure relief valves to replace existing non-stainless clips.

- e. Wall thickness measurement reports for valve bodies (WPPSS-1/CF-VIA/495389, WPPSS-1/CF-VIB/495390, WPPSS-4/4CF-VIB/495392, WPPSS-4/4DH-VIIA/495405, WPPSS-1/DH-VI2A/495407, WPPSS-1/DH-VI2B/495408 and WPPSS-4/4DH-VI2A/495409) to determine the amount (depth) of metal that had to be removed in order to eliminate the linear indications and to verify that the remaining wall thicknesses did not violate minimum wall thickness requirements.
- f. Nonconformance Report No. 1214, and others, to verify that the wall thickness remaining after linear indications were removed was considered acceptable by WKM even though the manufacturing drawing minimum wall thickness requirements were violated.
- g. Physical observations of the following valves, or valve bodies, to determine the nature, size and extent of the linear defect indications on the body or the depth of the excavations that resulted from removal of the indications:
- B&W/PASNY/DH-V3A/177655
  - B&W/PASNY/DH-V3B/177656
  - B&W/PGE/DH-VIA/495418
  - B&W/PGE/DH-VIB/495419
  - B&W/WPPSS-4/4CF-VIA/495391
  - B&W/WPPSS-4/4CF-VIB/495392
  - B&W/WPPSS-4/4DH-VIA/495401
  - B&R/STP/274781
  - B&R/STP/274782
- h. Physical observation of the internal gate/segment components of the following valves to verify that a small (1/16 to 1/4 inch diameter) radial hole was drilled through the side wall of the gate's "open port" to provide overpressure protection in the valve-open position:
- B&W/WPPSS-4/4CF-VIA/495391
  - B&W/WPPSS-4/4DH-VIA/495401
  - B&R/STP/273478

- i. Pre-excavation radiographs and post-excavation metallurgical examination reports (WKM/15-0061-14 dated July 21, 1980, and Anderson & Associates/6908 dated June 30, 1980) of one of the two "cracks" in the interior of B&W valve WPPSS-1/CF-VIA/495389, Heat No. 80321A, to determine the nature, size, depth and length of the "cracks."
- j. Numerous internal memos and external letters, contract variation approval requests, inspection reports, personal notes and personal interviews tracking the history and actions taken with respect to the overpressurization problem in WKM carbon and stainless steel POW-R-SEAL valves, and significant defects (cracks and other linear indications) in WKM stainless steel POW-R-SEAL valves.

### 3. Findings

#### a. Violation

One violation was identified in this area of the inspection. See Notice of Violation, enclosure.

#### b. Deviation

None were identified during this inspection.

#### c. Unresolved Item:

Documentation made available during the inspection did not appear to substantiate the WKM management position that the linear indications identified on the interior and exterior of stainless steel POW-R-SEAL valves was isolated to valves supplied to the Babcock & Wilcox Company. Resolution of this item is dependent on receipt of data from other NRC Regional Offices.

#### d. Follow Up Items

To be evaluated during future inspections.

- (1) The existing procedure for evaluating and reporting safety concerns does not appear to contain sufficient guidance to a WKM employee with a safety concern for him to ultimately express the concern to the responsible reporting official for evaluation, documentation and reporting under the provisions of 10 CFR Part 21.
- (2) Some WKM POW-R-SEAL gate valves delivered and installed in the Louisiana Power and Light and Nebraska Public Power Company (non N-Stamped valves, service unknown) nuclear power station may not have valve body overpressure protection in the valve-closed position.

e. Comments

- (1) With respect to the failure of WKM to evaluate or cause all purchasers of POW-R-SEAL valves to evaluate, the safety significance of potential overpressurization of WKM POW-R-SEAL valve bodies due to expansion of entrapped process fluid:

- (a) Statement of the Problem

Certain types of gate valves, such as the WKM POW-R-SEAL gate valve, can entrap process fluid in the valve body in the open position as well as in the closed position. Entrapment of fluid results from the design of the dual sealing gates which isolate the valve body from the process stream in both the valve fully opened and fully closed positions. Unless overpressure protection is provided for these type valves in both the open and closed position, the potential for overpressurization and subsequent valve malfunction or failure exists whenever a significant increase in system temperature occurs such as during system heat up or during and after LOCA.

Some, but not necessarily all, WKM POW-R-SEAL valves have been provided with overpressure protection in both the open and closed positions. Some sizes or models of WKM POW-R-SEAL valves have an internally mounted pressure relief valve situated so as to relieve excess body pressure directly into the process stream and thus over pressure protection is provided in both the open and closed positions of these valves. Other POW-R-SEAL valves have a pressure relief valve mounted in one of the gates (the "segment" gate) so as to relieve excess body pressure into the process stream in the valve closed position only. In some, but not all of these valves, over pressure protection in the open position, has been provided by drilling a small radial hole through the side wall of the valve gate "open port" to provide for communication between the valve body and the process stream. Some valves delivered and installed in the Louisiana Power and Light and Nebraska Public Power (non N-Stamped valves, service unknown) nuclear power stations may not have valve body overpressure protection in the valve-open position. Furthermore, some valves delivered and installed in the Louisiana Power and Light and Nebraska Public Power (non N-Stamped valves, service unknown) nuclear power stations do not appear to have valve body overpressure protection in either the valve-open or valve-closed positions.

(b) Awareness of the Problem

The Babcock and Wilcox Company advised WKM in early October 1978, that the potential for overpressurization of the bodies of certain WKM POW-R-SEAL valves was a potentially significant safety hazard requiring immediate resolution. The stated design deficiency was that the design of the dual sealing gates isolates the valve body from the process stream in the fully open position (as well as the fully closed position) and thus can entrap process fluid in the body. Any subsequent increase in system temperature, such as during system heat up or during and after a LOCA, will result in a pressure increase of the entrapped fluid which could deform or rupture the valve body so as to make the valve inoperable, ineffective, or unable to retain process fluids critical to perform essential plant safety functions. These consequences had been enumerated in I&E Circular 77-05, Liquid Entrapment in Valve Bonnets.

(c) WKM Management Position

WKM staff management stated in writing (Questions and Answers provided to NRC on September 4, 1980) that "WKM is not aware of substantial design or manufacturing defects relative to the WKM valves. 10 CFR 21 and/or 50.55(e) reports were filed by WKM customers relative to the overpressurization in the valve-open position, cracks and linear indications in bodies, and carbon steel vs. SS Marotta retaining clips." However, the same document goes on to say that WKM recognized and notified B&W by J. Page's letter of April 11, 1977, of a potential body cavity pressure build up in the POW-R-SEAL valves due to thermal gradients. This overpressurization could possibly lead to the valve pressure locking with ultimate possibility of valve body and bonnet separation and loss of pressure integrity. At this point in time, WKM considered only the closed position and projected



and began designing concepts for use of an internal relief valve installed in the valve segment. In the October 2, 1978 meeting with B&W personnel, B&W made known the fact that overpressurization in the open position must be considered due to expected operation and needed a guarantee that overpressurization would not be possible in the open position. To relieve this condition all valves were modified by one of the following methods to eliminate overpressurization possibility in both open and closed positions: (i) use of a relief valve in segment and drilled hole in gate, or (ii) use of a relief valve in body conduit.

With respect to the potential for overpressurization of valve bodies, WKM staff management verbally stated that:

- (i) WKM does not consider the potential for overpressurization of the body in the valve open position to be a design deficiency nor to be a significant safety hazard in WKM POW-R-SEAL valves.
- (ii) WKM considers the potential for overpressurization to be an applications problem, not a WKM valve problem and thus in general, they would be unable to evaluate the safety significance of the problem.
- (iii) The WKM Material Review Board (the group charged with the responsibility to "evaluate the defect to determine if a substantial safety hazard exists" per section 71-1100 of the WKM Quality Assurance Manual) never convened to discuss, nor to evaluate, the B&W concern of possible overpressurization of the valve cavity for its safety significance. Thus the reportability or nonreportability of the item was not considered by the Material Review Board therefore the minutes of the WKM Material Review Board are void of any references to the item.

WKM's Material Review Board convened subsequent to the inspection and meeting of September 4, 1980, to evaluate the safety significance of valves identified in their letter to NRC dated September 16, 1980, as being delivered without the requisite overpressure protection. WKM subsequently reported in their letter to NRC dated October 15, 1980, that ". . . we had placed an asterisk (\*) by some items to indicate that WKM's Material Review Board (MRB) was evaluating.

The results are attached for your information. In summation, the board found that each item did have overpressurization protection with the single exception of the valves for Ebasco/Louisiana Power and Light. WKM will notify Ebasco and ask them to evaluate relative to the Waterford -3 System."

(d) Recognition of the Significant Deficiency

WKM concurred with B&W's technical position (which was subsequently defined by B&W Engineering as a "major design problem," during the joint B&W/WKM meeting held at WKM on November 1-3, 1978) that "there is a possibility of harm to the valve under these conditions." On October 20, 1978, WKM notified the Bechtel Power Corporation of this concern.

B&W's Report of Safety Concern PSC 16-78 dated December 5, 1978, documents that the lack of . . . "provision for overpressure protection of the valve body cavity when the valve is in the open position . . . constitutes a significant deficiency . . . (and that) they (WKM) therefore concluded that the potential to overpressurize did exist with the valve open. B&W and WKM have agreed that corrective action is necessary and that the valves shall be modified as necessary."

(e) Lack of Notification to NRC or Purchasers

The inspector could not verify that WKM fully exercised their responsibility to evaluate or report to NRC, or cause to be evaluated by the purchasers the substantial safety hazard that could result from the lack of provision for overpressure protection of POW-R-SEAL valve bodies.

Specifically, the inspector could not positively verify, from the information available during and after

the inspection, that: (1) All WKM POW-R-SEAL valves supplied for, or to be supplied for, use in safety-related systems of nuclear power plants have been provided with the requisite overpressure protection in both the open and closed positions. (2) All past and present purchasers of WKM POW-R-SEAL valves were advised of the need to evaluate the safety significance of the design deficiency with respect to their specific applications of the valves in their nuclear power plant safety related systems.

- (2) With respect to the unresolved item concerning to possibility of the fabrication defects ("cracks" and other linear indications) in delivered WKM POW-R-SEAL valves:

(a) Statement of the Problem

The Babcock and Wilcox Company purchased forty-eight (48) ASME Class 1 and Class 2 two and one half inch through fourteen inch WKM POW-R-SEAL valves for use in safety-related systems of nuclear power stations being constructed for the Power Authority of the State of New York, Portland General Electric Company, Tennessee Valley Authority, and the Washington Public Power Supply System. WKM had completed and shipped approximately one half of the valves to Portland General Electric, Tennessee Valley Authority and Washington Public Power Supply System when the fabrication defects were detected in delivered valves.

Linear indications in Class 1 decay heat removal system dropline isolation valves and "cracks" in a Class 2 core flooding system isolation valve were visually detected in WKM POW-R-SEAL valves delivered to WPPSS. The linear indications in the Class 1 decay heat removal system isolation valves were detected during the mandatory Section XI baseline visual inspection performed by the Washington Public Power Supply System at WNP 1/4 and were subsequently verified by WKM when the subject valves were returned to WKM's Missouri City Plant for replacement of the defective retaining clips for the internal Marotta pressure relief valves with clips of the proper material. The "cracks" in the Class 2 core flooding system isolation valve was discovered visually by the manufacturer during replacement of its internal pressure relief valve retaining clip. The unacceptable indications in the decay heat removal isolation valves are located in the inlet and outlet conduit regions on the inside and outside of the valves. The "cracks" in the core flooding system isolation valve are located in the body crotch region above the seat pockets on the inside of the valve.

Section III of the ASME Code states that all Class 1 cast pressure retaining materials shall be examined on all external surfaces and all accessible internal surfaces by the liquid penetrant or magnetic particle method. With respect to when the inspections are to occur, the code requires only that the examination take place (during manufacture) after the final heat treatment as required by the Material Specification.

The code further states that all weld repair areas and all machined surfaces, except threads, of a cast product are also to be examined by either method after post weld heat treatment and final machining.

WKM manufacturing records indicate that all code required surface (liquid penetrant) examinations (including machined surfaces) were performed and tested indication free.

While WKM manufacturing records do not indicate that any metal working (other than the final acceptance hydrostatic test) or metal removal operations (other than finishing of machined surfaces) were performed on the valves during their manufacture, review of the manufacturing operations, discussions with WKM manufacturing and management personnel, and direct examination of in-process valves indicate that some manufacturing operations were performed subsequent to the required surface (liquid penetrant) examination. Specifically,

"PROPRIETARY INFORMATION DELETED"

; bodies were surface ground to remove imperfections or blemishes; closures, attachments and lugs were welded to the bodies and additional material was welded on the upper and lower portions of the body. Such metal working and metal removal operations could have uncovered or otherwise opened "hot tears" and/or "inclusions" which had previously not been exposed, and thus not detected during the code required liquid penetrant examinations performed on the valve body casting.

With respect to the two "cracks" discovered in the Class 2 core flooding valve, the defective valve body casting was the only one produced for B&W from heat number 80321A, however at least one valve body casting was produced for the Bechtel Power Corporation from the same heat. The defective B&W casting was the only one upgraded (reworked as necessary to be acceptable for nuclear service) by WKM for B&W.

The remainder of the valves in the B&W order were upgraded by Pennsylvania Radiographic Laboratory. B&W contends (B&W/WPPSS

Valve Repair Plan dated December 4, 1979) that reconstruction of the radiographs revealed that the defective casting did not have complete RT (Radiographic Examination) coverage in the crotch region and that the defects were located in the portion not covered by RT. This apparent lack of RT coverage could have occurred even though the RT could have been performed in accordance with ASME code requirements. This conclusion was reportedly drawn by the P&W QCS inspectors during a review of the radiographic film coverage undertaken as part of the B&W/WPPSS Repair Plan.

(b) Awareness of the Problem

WKM notified B&W verbally on November 13, 1979, and confirmed by telegram on November 14, 1979, that a "crack" was found in the body of the Class 2 Core Flood Valve and requested the return of the radiographs of the valve for evaluation. On November 14, 1979, WKM Materials Development reviewed the melt log, the heat report and a radiographic film taken after the defect ("crack") was visually observed. The melt log and heat report were reportedly "both found acceptable and indicated no gross abnormalities." A subsequent radiograph taken of the defect reportedly showed the defect to be "a very tight defect with little depth." WKM Materials Development concluded that "the defect was very likely the remnants of a hot tear which was not detectable during the initial inspection phase but later propagated during hydro testing."

During a joint WKM/B&W meeting held at WKM's Missouri City manufacturing facilities to review the issues associated with the decay heat removal and core flooding system valves, WKM was advised that "we (B&W) and the customer (WPPSS in this particular case) both considered this a grave situation (the existence of "cracks" and other linear indications) and that both WPPSS and B&W were both filing reports with the NRC and that B&W was filing under 10 CFR 21." B&W stated that due to all the organizations involved it would be necessary to identify fundamental problems resulting in valves once cleared, now being found to have defects, places all valves under suspicion."

On December 17, 1979, B&W filed a written 10 CFR Part 21 report which stated that "two linear defects (were) discovered inside the body of a core flooding system isolation valve, 4CF-VIA supplied to Washington Public Power Supply System. . . and unacceptable indications in six (6) decay heat removal system isolation valves found by WPPSS by the ASME Section XI preservice baseline inspection." The subject 10 CFR 21 report did not identify that WKM also supplied POW-R-SEAL valves of similar size and design to other customers.

(c) WKM Management Position

WKM staff management stated in writing that "WKM is not aware of substantial design or manufacturing defects relative to the WKM valves. 10 CFR 21 and/or 50.55(e) reports were filed by WKM customers relative to the over-pressurization in the valve open position, cracks and linear indications in bodies, and carbon steel vs SS Marotta retaining clips."

The same WKM document goes on to state that "there are no known reported cracks, linear PT or visual indications outside of the inspection criteria on the exterior or interior of the WKM valves other than those currently being worked on for B&W."

WKM stated that the metallographic reports (which were subsequently reviewed by the inspector) of the examination of one of a sample containing one of the alleged "cracks" indicate that the voided region of the defect ("crack") was deficient in the materials normally present in the casting alloy and appeared to contain materials foreign to the alloy, such as sand. WKM further stated that the defect likely was an isolated inclusion of foreign material that occurred during the casting process and that became exposed, or otherwise detectable, subsequent to the acceptance of the casting for use in a nuclear quality valve.

WKM, in their letter to B&W dated December 14, 1979, states in part that, "WKM disagrees with B&W that the 12" x 8" Decay Heat Valves can technically be justified as requiring a filing under 10 CFR 21. WKM does not believe a substantial safety hazard exists in any conditions found. We do concur however, that the one 14" x 12", Core Flood Valve falls under the jurisdiction of 10 CFR 21. However, it is not WKM's place to make the report as the property was in the possession of others."

(d) Observations by the Inspector

With respect to the "cracks" in the Class 2 core flooding system isolation valve: (i) The smaller of the two reported defects was visually observed to be on the inside of

the valve in the body crotch region immediately adjacent to the gate seating surface of the valve. The defect was oriented 90 degrees to the larger defect (which has been excavated) and appeared to be a hot tear or shrink over two inches long and one-thirty second inch wide at its surface. The inspector could not determine if the defect was the exposed edge of an inclusion or if any foreign materials, other than shop dirt, and residual surface examination materials, were present in the defect. (ii) The radiograph of the larger of the two reported defects (that was taken before the sample containing the defect was excavated) contained a faint but distinct image of what appeared to be an irregular width essentially linear hot tear or shrink. The image of the defect was approximately one thirty second to one sixteenth inch wide and five inches long.

With respect to the linear indications on the Class 1 (and Class 2) valves: (i) review of inspection records indicate that an average of twenty five linear indications had been (or were in the process of being) removed from the interior and exterior of each valve that had been reinspected and reworked to be free of linear surface defects greater than three-sixteenths inch long. Most of the indications were in the crotch regions of the inlet and outlet conduits. Depressions resulting from removal of the defects were less than one quarter inch deep, however, about five excavations per valve were approximately or and one-half inch long by one inch wide by one-half inch deep. Furthermore, at least four excavations on two valves violated the fabrication drawing minimum wall thickness requirement but were subsequently accepted by WKM via the dispositioning of Nonconformance Reports. (ii) One valve was observed to contain an excavation from the outside surface significantly greater than one half inch deep that does not meet the five eighth inch radius blend out requirements and is currently awaiting B&W/WKM disposition. (iii) Numerous linear indications and porosity were observed on the surface of valves not yet reworked. The indications appeared to be randomly oriented essentially linear hot tears up to about one half inch long and approximately one thirty second inch maximum width. One valve contained over seven such linear indications in a region approximately two inches long by one half inch wide located in an outside crotch region of the valve.

(e) Lack of Notification to NRC or Purchasers

The inspector could not positively verify from the information made available during the inspection and the subsequent meeting in Region IV offices, that: (i) all WKM POW-R-SEAL valves supplied for, or to be supplied for, use in safety related systems of nuclear power plants are free of "crack like" defects and other linear indications. (ii) All past and present purchasers of stainless steel WKM POW-R-SEAL valves were advised of the need to evaluate the safety significance of the manufacturing defects with respect to their specific application of the valves in their nuclear power plant safety-related systems.



DETAILS SECTION II

(Prepared by William D. Kelly)

A. Persons ContactedACF Industries - WKM Valve Division (WKM)

J. R. Brinkley, Chief Engineer  
 W. C. Cook, Supervisor  
 R. V. Hopkins, Special Assistant to Chief Engineer  
 E. M. Hughes, QA Supervisor  
 H. M. Jackson, Project Coordinator Special Products  
 O. McDaniels, Supervisor Contracts Administration  
 C. Morcate, Manager, Quality Assurance  
 A. M. Williamson, Director of Operations

B. General Review of Vendor's Activities

1. There has been no change in the status of the ASME Certificates of Authorization, the authorized inspection agency, or the authorized nuclear inspector as reported in the NRC IE RIV Report No. 99900308/80-01.
2. WKM has not changed their decision of not soliciting new contracts for valves intended for nuclear service.

C. Design and Document Control -  
Design Input Verification and Documentation1. Objectives

The objectives of this area of the inspection were to verify that:

- a. Procedures had been prepared and approved by the vendor to prescribe a system for the control of design input verification and documentation which are consistent with NRC rules and regulations and his commitments in the ASME accepted Quality Assurance Manual.
- b. The design input verification and documentation procedures are properly and effectively implemented.

2. Method of Accomplishment

The objective of this area of the inspection was accomplished by:

- a. Review of the ASME accepted Quality Assurance Manual, Revision J.
  - (1) Section 420, Product Engineering Order Processing;
  - (2) Section 610, Qualification and Testing of Personnel; and
  - (3) Section 1100, Control of Nonconformances and Corrective Action Requests,

- to verify the vendor had established procedures to prescribe a system for control of design input.
- b. Review the procedures referenced in paragraph a. to verify that they had been prepared by the designated authority, approved by management, and reviewed by QA.
  - c. Review the customer's Equipment Specification 08-1025000002-06 for "Remotely Operated Valves for Auxiliary System Service" which establishes the general requirements for the valve (and their operators) design, performance, materials, manufacturing, quality assurance, and testing, to verify it had been properly and effectively implemented, the design input is correct, and had been verified and documented.
  - d. Reviewed the documents referenced in paragraph a. to verify that they contained measures to verify the adequacy of design, require documented results of the design verification, required the design verification to consider the importance to safety, identify the method of performing the design verification, identify items to be addressed during the design review, and prescribes the requirements for performing verification by alternate calculations, or by qualification test.
  - e. Reviewed WKM design verifications:
    - (1) Calculation Summary Sheet 32-3908-01, "EMO Sizing Calculations," dated November 19, 1976, for 12 X 8 1500 # gate valve, Tag No. DH-V1A&B; and
    - (2) Report No. 258136, "Sesmic Effect Calculations for . . . Valve Tag No. RC-V11," also Report Nos. 258137, 258138, 258189, and 258140, to verify that the design verification procedures are being implemented.
  - f. Review of Section 420 of the ASME accepted Quality Assurance Manual to verify that it provided for identification of personnel responsible for preparing, reviewing, approving, and issuing design documents; and that the review and approval of significant changes were performed by the same personnel. Also to ascertain whether minor changes to design documents, that do not require review and approval, are identified.
  - g. Interviews with personnel to verify that they are knowledgeable in the procedures applicable to design input.

### 3. Findings

a. The inspector verified that:

- (1) Procedures had been prepared and approved by the vendor to prescribe a system for the control of the design input verification and documentation which is consistent with NRC rules and regulations and his commitments in the ASME accepted Quality Assurance Manual.
- (2) The design input procedures are properly and effectively implemented.

b. Within this area of the inspection, no deviations from commitment or unresolved items were identified.

### D. Exit Interview

At the conclusion of the inspection on August 28, 1980, the inspector met with the company's management, identified in Section I Paragraph A, for the purpose of informing them of the results of the inspection. During this meeting each identified violation was discussed and the evidence which supported the findings were identified.

The company's management acknowledged the findings and supporting evidence.

Subsequent to the exit interview a representative of WKM attended a meeting at the NRC IE RIV office on September 4, 1980, and provided answers to a list of questions presented during the inspection.