U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

Report No: 99901323/97-01

Organization: Westlectric Castings, Incorporated
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Nuclear Industry Activity: Manufacturer of low carbon and stainless steel sand castings such as impellers, valve bodies and pump replacement parts.

Dates: November 17 - 19, 1997

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Office of Nuclear Reactor Regulation

Enclosure 3

1 INSPECTION SUMMARY

During this inspection, the NRC inspectors reviewed the implementation of selected portions of the Westlectric Castings, Incorporated, quality assurance (QA) program, and reviewed activities associated with its manufacture and supply of low carbon and stainless steel sand castings to the nuclear industry.

The inspection bases were:

- 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 (Appendix B)

- 10 CFR Part 21, "Reporting of Defects and Noncompliance"

During this inspection, a violation of NRC requirements was identified and is discussed in Section 3.1 of this report. Additionally, several instances where Westlectric Castings, Incorporated (Westlectric), failed to conform to NRC requirements contractually imposed upon them by sub-tier suppliers for NRC licensees were identified. These nonconformances are discussed in Sections 3.2, and 3.4 of this report.

2 STATUS OF PREVIOUS INSPECTION FINDINGS

This was the first NRC inspection of the Westlectric facility.

3 INSPECTION FINDINGS AND OTHER COMMENTS

3.1 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspectors reviewed Westlectric's procedure for reporting in accordance with 10 CFR Part 21: QA Procedure QA104, "Part 21 - Reporting of Defects and Noncompliance," Revision A, dated, January 26, 1996. The NRC Inspectors also observed and reviewed Westlectric's 10 CFR Part 21 posting.

b. Observations and Findings

The procedure did not address evaluation, notification or associated time constraint requirements of §21.21, "Notification of failure to comply or existence of a defect and its evaluation," of 10 CFR Part 21. instead, it focused on delineating specific requirements for Westlectric employees regarding internal processes to identify, document and transmit product deviations to a Westlectric Part 21 Committee member. For example, the "reporting" section of the procedure had three paragraphs indicating how an employee was required to fill out the Westlectric deviation documentation form.

The NRC Inspectors conducted discussions with the QA Manager to outline the salient points of the Part 21 regulation that are required to be addressed and included in a Part 21 procedure. Failure to have adequate procedures to require that evaluations or reporting of deviations is performed as required in 10 CFR 21.21(a), constitutes a violation of NRC requirements. The QA Manager committed to revising and issuing the

corrected Part 21 procedure within 120 days of the November 19, 1997, exit meeting. Violation 99901323/97-01-01 was identified in this area.

The NRC Inspectors determined that Westlectric's posting documents were in compliance with the Part 21 regulation and that it was conspicuously displayed in multiple locations at Westlectric's facility. However, it was noted that the inadequate Part 21 procedure was integral with the posting. Therefore, the QA Manager stated that he would also revise the posting document to include Westlectric's new Part 21 procedure when it was revised and issued.

Potential 10 CFR Part 21 Issue

As discussed in Section 3.4 below, a Westlectric practice was identified by the NRC Inspectors regarding the method employed for "correcting" the chemical composition analysis heat results obtained from Westlectric's spectrometer readings. As stated in §21.3 of Part 21, a deviation means a departure from the technical requirements included in a procurement document. Since this matter may represent a deviation of the procurement documents, as of November 19, 1997, Westlectric was reviewing the circumstances to determine if its customers needed to be informed in accordance with §21.21(b) of Part 21.

c. Conclusions

The NRC Inspectors concluded that Westlectric's procedure adopted to implement the provisions of 10 CFR Part 21 was not adequately established to ensure that evaluations were performed in accordance with §21.21, "Notification of failure to comply or existence of a defect and its evaluation."

3.2 Quality Assurance Program

a. Inspection Scope

The NRC Inspectors reviewed Westlectric's QA Manual (QAM), Revision K, dated October 14, 1996, and associated procedures and records to assess the Westlectric quality program to determine whether it adequately addressed applicable Appendix B requirements.

b. Observations and Findings

Quality Assurance Manual

The NRC Inspectors determined that Appendix B requirements were contractually imposed on Westlectric in approximately 1991 by Pacific Pump (currently Ingersoll-Dresser Pump, Inc. (IDP) and Bryon Jackson Pump Division (BW/IP). It was noted that Westlectric's QA manual (QAM) did not address whether it did or how it would meet the applicable Appendix B criteria necessary to provide adequate confidence that its components supplied for safety-related use would perform satisfactorily in service. That is, the QAM did not adequately address how the applicable requirements of the 18 criteria of Appendix B were to be satisfied by the Westlectric QA program. The introduction of the QAM stated that the manual is a description of the procedures followed to maintain

quality standards required to produce castings in accordance with Military Specification-Inspection (MIL-I)-45208, "Inspection System Requirements." It also stated that the manu[illegible]ets the calibration system requirements of Military Specification-Calibration (MIL-[illegible]62A, "Calibration System Requirements." The QAM also stated that all measurements related to product conformance are traceable to the National Bureau of Standards (NBS), and that the manual establishes the quality system and procedures required by the company.

The NRC Inspectors noted that the QAM contains general instructions and procedures such as casting traceability, pattern maintenance control, corrective action, control of non-conforming castings, calibration procedures, processing test bars and test reports, shipping procedures, sand control, heat treat process, and metal control.

Accuracy of QAM Procedures

The NRC Inspectors also selectively assessed the Criterion I aspect of requiring that the authority and duties of persons and organizations performing activities affecting the safety-related functions of nuclear power plant components be clearly established and delineated in writing. After reviewing specific requirements of selected procedures, the NRC Inspectors identified several areas where it determined that the procedural steps and requirements were not clearly or accurately established or delineated in writing. For example, the NRC Inspectors found that the QAM general policy section did not accurately reflect the QA personnel and QA department structure that was in existence for several years. The QAM's general policy section states that all of the Westlectric inspectors, including non-destructive examination (NDE) level II inspectors are under the direct supervision of the "QA Assistant." However, the NRC Inspectors determined that as of November 19, 1997:

- Although Westlectric's QAM states that all Westlectric visual and nondestructive examination (NDE) inspectors are under the direct supervision of the "QA Assistant," Westlectric has not had a QA Assistant since approximately 1991.

- Until recently the visual inspector worked for and reported to production department personnel. Currently, there are two visual inspectors.

- Until recently Westlectric's QA department consisted of only the QA Manager. Currently, the Westlectric QA department consists of the QA Manager and both visual inspectors.

- Westlectric has had only one NDE certified inspector since approximately 1991, and the NDE Inspector does not report to or take direction from the QA Department.

- Although the Level II Inspector also holds the position of "Chief Inspector," the authority and responsibility of the Chief Inspector were not delineated in QAM Section 1.0, "General Policy," 3.0, "Quality Control Department Operation and Duties," 8.0, "In-Process Inspection," or 10.0, "Final Inspection."

- Although both Westlectric visual inspectors report to the QA Manager, they also take inspection activity direction from the Chief Inspector/Level II NDE Inspector. Thus, their independence from production is not assured.

The NRC Inspectors identified that the Level II NDE Inspector is also designated as the Cleaning Room Foreman (discussed in weld rod control procedure), and the Cleaning Room Supervisor (discussed in heat treat process). The NRC Inspectors determined that the employee that holds each of these positions reports to, and is under the responsibility of the Operations Manager, and does not report to or take inspection direction from the QA Manager. Discussions with the Westlectric staff and management indicated that this relationship had not been reviewed or approved by the QA organization to determine whether sufficient independence from cost and schedule when opposed to safety considerations existed.

The NRC Inspectors identified that the QAM description of the reporting relationship of the visual and NDE inspectors is inconsistent with actual practices. Nonconformance 99901323/97-01-02 has been identified in this area.

Inspection Stamps

The NRC Inspectors noted during review of PO packages that Westlectric's original certified material test reports (CMTRs) were not hand signed. It was noted that the approving official's signature was stamped instead of being signed by the approving official, the QA Manager. The QA Manager stated that he had a signature stamp for his use (mostly on CMTRs). During a discussion between the NRC Inspectors and QA Manager, the shipping supervisor brought in a stack of CMTRs to sign (stamp), and the QA manager stamped the records and returned them. The NRC Inspectors noted that the QA manager kept his signature stamp in his desk drawer. When asked whether anyone else was issued signature or inspection stamps, the NRC Inspectors were informed that the Level II NDE Inspector/Chief Inspector had also been issued a signature stamp for stamping NDE quality records. Subsequently, the NRC Inspectors requested the Chief Inspector to retrieve his signature stamp and it was noted that the Chief inspector's signature stamp was stored in a locked cabinet in the Cleaning room office. The Chief Inspector stated that the main reason that he had a signature stamp was because many of the Westlectric documents were triplicates. The NRC Inspectors obtained a blank Westlectric CMTR form and noted that the form was made of carbon-copy type paper, which would allow a signed signature to be reproduced on the second and third pages of the triplicate form.

The NRC Inspectors noted that paragraph 1.4 of Section 3.0, "Quality Control Department Operation and Duties Procedure," of Westlectric's QAM requires the QA Manager to maintain a file in his office of all inspection stamps issued to workers, and Criterion V, "Instructions, Procedures, and Drawings," of Appendix B requires activities affecting quality to be accomplished in accordance with documented procedures. The NRC Inspectors review of this area revealed that the two signature stamps for the QA Manager and Chief Inspector were not indicated as being issued even though they are used for quality record approval. Nonconformance 99901323/97-01-03 was identified in this area.

c. Conclusions

The Inspectors found that Westlectric's QAM did not accurately describe its QA department personnel and associated duties. Further, the NRC Inspectors concluded that the QA Manager's and Level II NDE Inspector's signature stamps were not identified as being issued in the QA Manager's inspection stamp file.

3.3 Welding Control

a. Inspection Scope

The NRC Inspectors conducted discussions with Westlectric staff regarding its welding program including welding processes, observed weld rod control and issuance, and reviewed certification and qualification of personnel. The NRC Inspectors noted that Westlectric's welding program control is outlined in a "Welding Control Procedure," that is part of Section 22.0, "Control of Special Processes," of Westlectric's QAM. There were no orders for nuclear applications being processed at the time of the inspections involving weld maps or other special controls. Therefore, the NRC Inspectors were not able to observe or witness implementation of the welding control process.

b. Observations and Findings

Paragraph 1.1.1 of Section 22.0 of Westlectric's QAM states in part, that the welding program will meet Section IX, "Welding and Brazing Qualifications," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The NRC Inspectors reviewed welding procedure specifications (WPS), procedures qualification reports (PQR), and welder qualifications. Westlectric has 20 different WPSs, each with a unique PQR, and currently has 11 welders that are qualified to at least one weld procedure. The NRC Inspectors determined that the welding records are well maintained and records are kept for each welder to indicate when last a specific procedure was used during each 3 month interval. This satisfies the requirements of American Society for Testing and Materials Standard (ASTM) A 488, "Standard Practice for Steel Castings, Welding, Qualification of Procedures and Personnel," which in turn, satisfies the 6 month interval required by subparagraph QW-322.1, "Expiration of Qualifications," of Section IX, ASME Code.

Paragraph 5.1.5 in the weld control procedure stated that major weld repair shall be documented by generating a weld map if required by specification or customer purchase order (PO) requirements. The NRC Inspectors observed examples of weld maps in shop traveler record package 128674, dated February 11, 1997, for Ingersoll Dresser Pumps (IDP), PO 91797, for an intermediate cover, grade CA6NM, (Heat 976A).

c. Conclusions

The NRC inspectors concluded that Westlectric maintained good records of its welder qualification and certification program and also generated and maintained satisfactory records to allow traceability of individual welders to the applicable welding specifications and procedures to maintain certification.

3.4 Spectrometer - Chemical Analysis

a. Inspection Scope

The NRC Inspectors reviewed the current and historical chemical analysis records generated from Westlectric's Thermo Jarrell Ash spectrometer. The purpose was to assess chemical analysis accuracy (by verifying calibration), ensure that the results were

accurately documented on the applicable certified material test reports (CMTRs), and verify compliance to Westlectric and customer requirements.

b. Observations and Findings

Spectrometer Calibration - First Step

Westlectric performs chemical analysis with a Thermo Jarrell Ash (TJA) 181/81 optical emission spectrometer, Model 12621600, Serial Number 41883. The TJA recommended calibration consisted of two steps. The first step required creating a curve-set[1] by developing curves for each element that the machine is capable of assessing. Each curve is a plot of light intensities emitted from electrical arcing against metal standards of different chemical concentrations and the certified chemical concentrations for these standards. Each curve-set is a family of curves for the chemical elements to be analyzed. For example, carbon steel is one unique curve-set, while stainless steel is a different set of curves. The standards are normally purchased from recognized sources including the National Institute of Standards and Technology (NIST).

The NRC Inspectors requested to see the calibration records and traceability back to NIST for Westlectric curve-sets identified as: LOWB (ASTM-A-216), SER3M (ASTM-A-743, CF3M), and SERIES4M (ASTM-A-743, CA-CNM). The Westlectric staff was unable to provide curve-set calibration records for the spectrometer, and did not have curve-set traceability to NIST. The NRC Inspectors and QA Manager phoned the spectrometer service representative and were informed that the curve-sets were retrievable from the computer files along with the identity of the standards.

Spectrometer Standardization - Second Step

The second recommended Spectrometer manufacturer's step in calibration is the standardization of the curve-set. The repositioning of the curves in a particular curve-set is called standardization. Standardization of the curve-set is necessary because the spectrometer is sensitive to atmospheric effects, equipment wear, and equipment cleanliness. In order to maintain a high level of accuracy, repeatability, and reproducibility, the curve-set must be standardized each day before use, and more frequently if necessary. The NRC Inspectors determined that Westlectric used a one-point technique for standardization. The one-point technique locks a particular alloy's curve-set's chemical composition parameters to the associated NIST standard. This technique is a fast and effective technique for analyzing specimens with a chemical composition that is similar to that particular standard.

A common weakness in the one-point technique is that the further the test specimen's analysis is from the locked chemical composition value, the larger the potential error in analyses. For the curve-sets LOWB, SER3M, and SERIE4M, Westlectric used NIST Standards 1261A, 1155, and C-1289 respectively. The NRC Inspectors identified that Westlectric did not establish specific documented acceptance or rejection limits on the analysis range for each element affected by the one-point standardization for each curve-set.

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[1] One curve-set consists of multiple individual or unique curves.

Since Westlectric did not have comprehensive spectrometer operational procedures, as discussed further in this Section, the spectrometer technicians developed the concept of looking at the standard deviation for each element to determine the acceptability of the calibration. One of the technicians (who is the production melter) informed the NRC inspectors that low standard deviations were acceptable and high standard deviations were rejectable. The operator could not place a number on what would be considered the maximum acceptable standard deviation values. The NRC inspectors consider the lack of written procedures for the acceptance of the standardization calibration and the absence of limits to the chemical range for each element as a deficiency in Westlectric's spectrometer control.

Since the NRC Inspector was not able to obtain evidence of the accuracy of the curve-sets, and since Westlectric was not able to demonstrate traceability of the curve-sets back to NIST standards, the NRC Inspectors were not able to verify that all measurements related to product conformance are traceable to NIST as required. Additionally, the NRC Inspectors were not able to verify that Westlectric's spectrometer meets the calibration system requirements that Westlectric had stated, that is MIL-C-STD-45662A requirements. The NRC Inspectors determined that Westlectric did not establish adequate measures to control its spectrometer operation and maintenance. Nonconformance 99901323/97-01-04 was identified in this area.

As a result of this identified deficiency, a departure from the technical requirements, as defined in §21.3 of 10 CFR Part 21, included in a procurement document may have occurred as discussed within Sections 3.1 and 3.4 of this report.

Spectrometer Procedures

The NRC Inspectors found that production personnel that used the spectrometer for its heat verifications used a written procedure for a standardization calibration but it was not controlled within Westlectric's QA program. The procedure was found to be untitled, was not dated, and was not approved or signed by the person(s) who developed the procedure. Additionally, the procedure for a standardization calibration did not set limits on the analysis range for each element affected by the one-point standardization. Therefore, the NRC inspectors determined that Westlectric did not assure that the spectrometer was properly controlled, calibrated, and adjusted to maintain its accuracy. This is another example of Nonconformance 99901323/97-01-04.

Chemistry Verification

Metal Control Procedure, Section 11.0, states that heats shall be comprised of select scrap, iron ore, processed alloys, and remelt-material. It also requires that a minimum of three chemical analysis checks be made on the spectrometer for arc furnace heats prior to pouring castings. The three checks for the arc furnace heats are performed at the beginning, middle and end of the process, specifically: (a) melt-down, (b) preliminary, and (c) final. The preliminary analysis checks all chemical elements to allow calculation of the necessary alloy additions to the heat as well as assuring that a vigorous carbon boil is occurring. The final analysis verifies that all alloy additions were properly added and that the analysis meets industry and customer specifications.

The Westlectric person that assures that each heat is comprised of the correct amounts of material is the melter. The melter is also responsible for the outcome of each of the three checks by verifying on the spectrometer that each heat, which he is making and monitoring, meets the specifications.

Criterion I, "Organization," of Appendix B, state that the QA functions are those of assuring that an appropriate program is established and effectively executed, and verifying, such as by checking, auditing, and inspection, that activities affecting safety-related items have been correctly performed.

The NRC Inspectors noted that Westlectric's QAM did not specifically allow or disallow its melter from verifying his own work. It merely stated that the chemical analysis testing shall be performed by a trained laboratory technician. The Inspectors also noted that Westlectric's in process procedure (Section 8.0), and final inspection procedure (Section 11.0) did not address "inspection" of heat chemistry, even though the chemical composition is very important to the safety-related component.

Evaluating Correction of Chemical Composition Analyses Effects

Immediately after standardizing the curve-sets, Westlectric runs the same NIST standard as if it was an ordinary heat specimen. The values from this run are compared to the NIST standard's CMTR values, and the differences for each major element are noted on a daily adjustment work sheet. The operator told the NRC Inspectors that the daily adjustment work sheet is used to change the final chemical analysis of a heat that might otherwise be out of specification. The rationale is that the standardization process is not accurate because the spectrometer does not provide identical results with the values shown on the NIST standard's CMTR (neglecting any tolerances).

Therefore, Westlectric would either add or subtract the daily adjustments to the actual values from the spectrometer printer. The NRC Inspectors observed that the operator adjusted the chemical results while making out the "Daily Chemical Analysis Report."[2] After the operator performed the corrections to the daily chemical analysis report, it was given to the QA Manager. The QA Manager then takes the daily chemical analysis report that has been corrected and manually inputs the data into Westlectric's computer network for the documentation and issuance of applicable CMTRs for each heat. The NRC Inspectors observed an example where the shipping department supervisor called up a specific heat on the network and printed the CMTR in the shipping department. The NRC Inspectors were informed by the QA Manager that he is not typically involved in generating the chemical analysis and has limited knowledge regarding the operation of the spectrometer.

During a subsequent telephone conversation with the TJA spectrometer representative, the representative stated to the NRC Inspectors and Westlectric's QA Manager that there is no need to perform any correction or adjustment of the spectrometer values because all necessary adjustments are automatically performed during the standardization process. This was not known by the Westlectric personnel.

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[2] The daily chemical analysis report was merely a pre-printed form where the corrected values would be documented and handed to the QA Manager.

As a result of Westlectric's adjustments of its spectrometer results, Westlectric was documenting incorrect spectrometer values and consequently, was issuing CMTR's that were not representative of the actual chemical composition of the casting.

Section 11.0, "Metal Control," states that the chemical analysis verifies that all alloy additions were properly added and that the analysis meets customer specifications. To determine the effects from Westlectric using this manual adjustment technique, the NRC inspectors reviewed five heats that were applied on purchase orders identified for nuclear safety-related applications. The five heats were 109B, 125B, U195, U354, and 976A. Table 1 tabulates the chemistry before and after adjustment of the actual spectrometer's chemical analysis and the CMTR chemistry.

Table 1

Heat Chemical Analysis Before & After Manual Correction/Adjustment
(Values are in Weight Percent)

Heat No	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Adjusted?
976A	0.06	0.71	0.52	0.029	0.011	12.27	4.25	0.62	--	No
976A	0.03	0.67	0.52	0.028	0.011	12.08	4.23	0.53	--	Yes
125A	0.052	1.23	0.81	0.037	0.021	18.71	10.50	2.92	0.26	No
125A	0.03	1.30	0.84	0.038	0.020	18.81	10.25	2.92	--	Yes
109B	0.076	0.67	0.67	0.027	0.022	12.27	3.70	0.56	--	No
109B	0.03	0.67	0.67	0.027	0.022	12.27	3.70	0.56	--	Yes
U195	0.216	0.65	0.50	0.021	0.038	0.34	0.21	0.06	0.05	No
U195	0.21	0.68	0.50	0.020	0.031	0.34	0.21	0.06	0.05	Yes
U354	0.28	0.92	0.56	0.019	0.022	0.18	0.18	0.04	0.04	No
U354	0.28	0.90	0.57	0.023	0.023	0.18	0.18	0.04	0.04	Yes

Table 2 tabulates the heat numbers with customer purchase order information. From Table 1, the carbon in heat 109B is 0.076 before adjustment and 0.03 on the CMTR after adjustment. The 0.076 exceeded the Ingersoll-Dresser Pump Company purchase order number 074528 specification ASTM-A743 CA6NM which has a 0.06 maximum carbon. The NRC Inspectors asked Westlectric to standardize the spectrometer and run a recheck of the initial test specimen which came back as 0.05 carbon. Based on the effects that the manual adjustment can have on the final chemical analysis, the NRC Inspectors informed Westlectric that they were required to review this matter in accordance with §21.21 of 10 CFR Part 21.

Table 2

Heat Number and Customer Purchase Order Information

Heat No.	Traveler	Customer	PO	PO Date	Material Spec.	Part No.
976A	128674	IDP	91797	1/31/97	ASTM A 743 CA6NM	M6535
125A	130255 130256 130257	BW/IP	21V550517	8/29/97	ASTM A 351 CF3M	24296 21997 23968
109B	130120	IDP	95695	7/28/97	ASTM A 743 CA6NM	M6535
U195	128220				ASTM	
U195	126220	BW/IP	VV433833	11/13/96	A 216	72579

Westlectric started to review the circumstances surrounding the matter to determine if it was a deviation, and whether it needed to either evaluate the issue or inform the customer. Subsequent to the inspection, Westlectric informed the NRC staff that it had informed an applicable customer pursuant to §21.21(b) of 10 CFR Part 21, so that it could cause an evaluation to be performed, and it was still reviewing the remaining issues to determine if additional deviations existed.

The NRC Inspectors determined that the adjustment of the spectrometer's chemical analysis results without an established program to control the special process and without a program to assure that appropriately trained personnel operated the spectrometer were indicative of an inadequately controlled special process. Nonconformance 99901323/97-01-05 was identified in this area.

Westlectric QA 11.1.5.1 states that chemical analysis testing shall be performed by a trained lab technician. Westlectric said that their melt shop superintendent has been trained by TJA on the operation of the spectrometer. However, the melt shop superintendent was unavailable during the inspection. The NRC Inspectors were told that the melt shop superintendent gave on-the-job training to the individuals operating the spectrometer. The NRC Inspectors observed a melter and a recently assigned lab tech operating the spectrometer. The melter told the NRC Inspector that when problems occur he would check the argon pressure, push the spectrometer reset button, adjust the lens (mirror), clean the arc chamber, and/or restandardize the spectrometer. If none of these actions clear up the problem, he calls the melt shop superintendent. The lab tech said he calls the melter if he has problems. The NRC Inspectors noted that some specimens had multiple cracks across the testing surface and some of the burns overlapped each other. The NRC Inspectors noted that although either of these conditions can cause incorrect or erroneous readings the Westlectric personnel were not aware of the impact of these conditions. Additionally, the NRC Inspectors determined that neither the melter nor laboratory technician knew how to control movement in the mercury meter during the mirror adjustment prior to standardization. It appeared to the NRC Inspectors that the individuals operating the spectrometer received limited guidance on operating the

spectrometer and specimen preparation. Except for the standardization procedure, the spectrometer is operated with no other written guidance. Nonconformance 99901323/97-01-05 was identified in this area.

Spectrometer Technicians

The NRC Inspectors conducted discussions with and observed two production personnel that normally test heat[3] samples taken from the Westlectric arc and induction furnaces during the melting/combining process. Both employees typically operate the spectrometer; therefore, the NRC Inspector's discussion encompassed the operation, calibration and principles of the spectrometer's chemical analyses. The QA Manager was involved in all of the discussions. The NRC Inspector determined that the two production personnel were regularly assigned to operate the spectrometer and verify the chemical analyses of the heats. One of the employee's title was "melter," and the other was the production department's "laboratory technician." Both employees work and report to production department management. The melter is a production department employee that is responsible for measuring and putting the correct amount of raw material (alloy additives) into the furnaces to bring the heat within the chemical analysis before the pouring of the specific castings.

The NRC Inspectors were informed by the Westlectric QA Manager that the two Westlectric personnel had received indoctrination on the operation of the spectrometer, but their responses indicated that the training was limited and was not overly comprehensive. The NRC Inspectors noted that the Westlectric personnel were not very familiar with the calibration and operating principles of the spectrometer. Although the NRC Inspectors were informed that both employees had received training for the operation of the spectrometer, records to indicate the training was satisfactorily completed were not provided during the inspection. The NRC Inspectors could not verify that both production department employees were appropriately trained for the job activity. Westlectric provided certification records for the employees subsequent to the inspection; however, those records were not specific enough to determine the appropriateness of training.

Although Appendix B requires that special processes are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements, Westlectric did not establish adequate procedures or appropriately trained personnel to control its spectrometer chemical analyses' operation. This is another example of Nonconformance 99901323/97-01-05.

c. Conclusions

The NRC Inspector was not able to verify that "all measurements related to product conformance regarding its spectrometer are traceable to NIST, and that Westlectric's spectrometer meets the calibration system requirements specified in MIL-C-STD-45662A." Westlectric was not able to produce records to indicate that it had been adequately controlling, calibrating and adjusting its spectrometer within documented

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[3] The contents of one furnace batch that is blended to a predetermined chemical composition is commonly referred to as a "heat." Therefore, each particular furnace batch will be identified with a different heat number.

parameters, and that its operators were appropriately trained. Given the extent of the concerns identified by the NRC Inspectors the adequacy of the quality oversight functions for the spectrometer operation is questionable.

3.5 Traceability of Castings

a. Inspection Scope

The NRC Inspector reviewed procedure 19.0, "Casting Traceability," to identify the Westlectric requirements that have been established and to determine whether manufacturing has been in compliance with the requirements.

b. Observations and Findings

Paragraph 1.2 of Procedure 19.0 states that heat/code numbers shall be affixed to patterns with raised aluminum letters or pressed into molding sand with letters attached to a handle. The NRC Inspectors observed three 8" x 8" valve body castings from heat U818 which showed that the production department was not in strict compliance with its procedure. The NRC Inspectors observed that the first three digits of the heat number cast into the body appeared satisfactory, but the fourth digit was ground off and replaced with a stamped letter. Westlectric stated that the heat number sequence is determined by the molding foreman because he has to insert the heat number into the mold several days before pouring.

Occasionally, process control modifications such as, smaller quantities for a specific heat, or a chemical composition analysis that was incorrect will cause a change in the anticipated production and heat numbers. Instead of making up new molds with the correct heat number, Westlectric casts the existing molds, grinds off the wrong portion of the cast heat number, and stamps the correct heat number in its place.

The NRC Inspectors were informed that another exception to the procedure is that on occasion, the cast heat number is illegible and Westlectric will grind off the illegible portion and stamp it. The NRC Inspectors confirmed that even though these practices are commonly performed, they are not delineated in the Westlectric casting traceability procedure. Although this process is not in conformance with an Appendix B QA program, the NRC Inspector notes that a nuclear safety related component would be handled somewhat different. That is, a Westlectric shop traveler would be used on nuclear orders and the shop traveler, which accompanies the component throughout the manufacturing process, requires that the heat be documented. As a result, if the heat was illegible, the traveler could provide some assurance of the correct heat.

c. Conclusions

The NRC Inspectors concluded that although these manufacturing practices may be necessary to prevent costly rework, they are not in compliance with the documented Westlectric and Appendix B requirements. This practice could be a factor for consideration if the component was destined to be "dedicated," in accordance with 10 CFR Part 21, because traceability to a heat may be indeterminate if numbers are modified from original cast numbers. This issue is an additional example of Nonconformance 99901323/97-01-03.

3.6 Nondestructive Examination

a. Inspection Scope

The NRC Inspectors reviewed Westlectric's Procedure's 1.0, "General Policy," and 22.0, "Control of Special Processes." Procedure 1.0 outlined Westlectric's QA department policies and responsibilities and Procedure 22.0 addressed the control of welding, heat treat and nondestructive examination (NDE) to assess the adequacy of Westlectric's NDE control.

b. Observations and Findings

Paragraph 1.1.1 of Procedure 22.0 stated that the QA manager is responsible for the welding program which will meet Section IX of the ASME Boiler and Pressure Vessel Code. Paragraph 2.6 of Procedure 1.0 stated that all inspectors, including magnetic particle testing (MT) and dye penetrant testing (PT) Level II who are under the direct supervision of the QA Assistant are responsible for the proper execution of required NDE. They must inspect all castings in accordance with customer requirements and standards used in the casting industry.

As discussed above, the NRC Inspectors determined that Westlectric has three inspectors total, two of whom are only visual inspectors certified to MSS-SP-55, and the third is characterized as a Level II NDE. The two visual inspectors are not trained to ASME Code. Instead, they use the visual acceptance and rejection criteria illustrated in MSS-SP-55. The NRC Inspector observed examples of rejected material that had been identified by the visual inspectors such as, coup-drag misalignment, interrupted/cold pour, porosity, and holes.

The NRC Inspectors requested Westlectric's NDE personnel certification and qualification records. The NRC Inspectors were only provided with the Chief Inspector's records, which indicated that he was certified as a Level II MT Inspector, certification dated February 21, 1997. The certification stated it was in accordance with SNT-TC-1A, "American Society for Nondestructive Testing Recommended Practice," but did not list the applicable edition. The Westlectric staff stated that it would review the matter.

The NRC Inspectors were also informed that a Level III NDE Inspector from Sun-Ray Testing International, Incorporated, Downey, California, developed Westlectric's NDE training program, performed training, maintained the personnel certifications and provided certifications to Westlectric personnel as necessary. The NRC Inspector requested to see the employer's written practices covering all phases of certification including training as required by SNT-TC-1A. At the time of the exit meeting, Westlectric had not made this information available for review. Unresolved Item 99901323/97-01-06 was identified in this area.

c. Conclusions

Westlectric was unable to provide the procedural controls and documentation associated with NDE personnel certification practices.

3.7 Entrance and Exit Meetings

In the entrance meeting on November 17, 1997, the NRC Inspectors discussed the scope of the inspection, outlined the areas to be inspected, and established interfaces with Westlectric management. In the exit meeting on November 19, 1997, the NRC Inspectors discussed their findings and concerns.

4. PERSONS CONTACTED

J.R. Heine	President
R.L. Ogden	Operations Manager
A. Arechiga	QA Manager
G. Kusumi	Sales
D. O'Sullivan	Sales Manager
M. Gutierrez	Clean Room Foreman/ Chief Inspector
S. Fericean	Shipping Supervisor
J. Lietzau	Inside Sales/Lab Technician
R. Young	Core/Molding Supervisor

5. ITEMS OPENED, CLOSED, AND DISCUSSED

99901323/97-01-01	VIO	Inadequate Part 21 Procedure
99901323/97-01-02	NON	QA Organization and Program
99901323/97-01-03	NON	Documented Instructions
99901323/97-01-04	NON	Control of M&TE and QA Records
99901323/97-01-05	NON	Control of Special Processes
99901323/97-01-06	URI	Unresolved Item - NDE Program