ORGANIZATION: SANDVIK SPECIAL METALS CORPORATION
KENNEWICK, WASHINGTON

REPORT NO.: 99900764/82-01	INSPECTION DATE(S) 4/6-8/82	INSPECTION ON-SITE HOURS: 72

CORRESPONDENCE ADDRESS: Sandvik Special Metals Corporation
ATTN: Mr. J. A. Lindberg
President and General Manager
P. O. Box 6027
Kennewick, Washington 99336

ORGANIZATIONAL CONTACT: K. Bowles
TELEPHONE NUMBER: (509) 586-4131

PRINCIPAL PRODUCT: Nuclear Fuel Tubing

NUCLEAR INDUSTRY ACTIVITY: Nuclear fuel tubing supplier for CE and B&W designed cores and reloads supplied by Exxon.

ASSIGNED INSPECTOR: J. T. Conway /for — 6-22-82
W. M. McNeill, Reactive & Components Program Section (R&CPS) — Date

OTHER INSPECTOR(S): L. E. Ellershaw, R&CPS
J. T. Conway, R&CPS

APPROVED BY: J. T. Conway /for — 6-22-82
I. Barnes, Chief, R&CPS — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 50, Appendix B and 10 CFR Part 21.

B. SCOPE: This inspection was performed as a result of the receipt by the Nuclear Regulatory Commission of allegations pertaining to quality program implementation and effectiveness. Areas selected for inspection included material identification, manufacturing process control, calibration, NDE control, training, document control and audits.

PLANT SITE APPLICABILITY:

Not Identified.

DESIGNATED ORIGINAL
Certified By Rheanne Jones

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A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 6.0 in Section 1-6 of the QA Manual:

   a. The following examples were identified where the control of documents was not in accordance with the requirements of Document Control Procedure QA-GA-7, Revision 1:

      (1) The document index pages in Quality Assurance Procedure Manual No. 3 were not the current issue required by paragrph 2.4.

      (2) Superseded procedure revisions were not removed from work locations in accordance with paragraph 6.3; e.g., Quality Assurance Procedure Manual No. 21 contained a superseded revision of Procedure QA-GA-9, a superseded revision of Procedure QA-GA-16 was at the rework station, and a superseded revision of Procedure NDT-UT-10 was at the UT line 4 station.

      (3) Specification Z-075 was not at the rework station, as required by paragraph 5.2.

      (4) Unassigned procedures were found at three work stations (Vacuum Blast-one, Final Inspection-one, Special Products-two), which is contrary to paragraph 5.1.

   b. Procedure QA-GA-23, pertaining to establishment of visual standards, was not listed in the Quality Control Matrix as required by paragraph 0.0 in Section 1, Revision 3, of the QA Manual.

2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 10.0 in Section 10 of the QA Manual, certain inspections were not being performed in accordance with written instructions, as evidenced by the following examples:

   a. Identity of surface measurement equipment in use was not being documented, although required to be by QA-SP-45, Revision 2, paragraph 4.12.

b. Verification of the digital thermometer used for elevated temperature tensile testing was performed three times in the last 12 days of testing, and not daily as required by Laboratory Procedure 1300-19, Revision 5, paragraph 8.2.

c. Contractile Strain Ratio testing was being performed without the applicable written procedure required by the QA Manual, section 5, paragraph 5.0.j.

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.1.1 of procedure QA-GA-5, ingots were used but were not identified on the QC 110 form as being acceptable to the customer.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 1-12 and QA procedure QA-GA-15, the following conditions pertaining to calibration were observed:

a. The ultraviolet light, an instrument critical to quality measurement during fluorescent penetrant examination, was neither listed in Appendix I nor were there records to show that its light intensity has been verified.

b. The Weston light meter, which could be used to verify the intensity of the ultraviolet light, was neither listed in Appendix I nor were there records to show if it had been calibrated.

c. Ultrasonic Test (UT) 3D standard no. 2018, being used as a reference for inside and outside tube diameter measurements, did not have a calibration record card available.

d. UT standard F-2002-3, used for flaw detection, could not be located, and the calibration record card did not identify the standard as being out of service.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Quality Assurance Procedure No. NDT-PT-1, ZR-10 emulsifier was being used during fluorescent penetrant examination rather than the required ZR-1 emulsifier.

6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 1.2 in Section 1-1 of the QA Manual, there was no evidence or documentation of some QA training. For example, six out of seven QA files for inspectors did not contain the Job Training Progress Record required by paragraph 3.4 of QCI-4, Revision 0, on inspection activities, and there was no

evidence that the seven inspectors had received indoctrination and training in QA activities in general. In addition, the QA files for six exempt employees in the QA organization contained no documented evidence of QA indoctrination and training.

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.0 in Section 1-17 of the QA Manual, certain records were not being retained for 10 years, in that superseded revisions for two laboratory procedures, 1300.19 and 1300.20, and process specification Z431 were missing from the historical files.

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 0.1 in Section 1-0 of the QA Manual and ANSI N45.2, the audit system was not comprehensive in that internal audits were not scheduled to be performed in all applicable areas. Examples of areas not addressed are procurement, control of materials, QA records, nonconforming materials, and indoctrination and training.

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 2.1, 2.4, 2.6 and 5.4.1 in Quality Assurance Procedure QA-GA-22, a review of nine internal audit reports for 1981 indicated that:

   a. Of the 16 scheduled audit areas, 5 were not audited and another 5 were audited only once.

   b. There were no followup audits in three of six areas in which deficiencies were found.

   c. For six findings, the reply from management in the affected areas exceeded 2 months in one case, and in two cases management had still not replied 8 months after the issue of the deficiency reports.

   d. The Production Manager was not on the distribution for five of nine audit reports.

C. UNRESOLVED ITEMS

None

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D. OTHER FINDINGS OR COMMENTS:

1. Material Identification - The segregation and identification of ingots and final anneal lots were verified to follow established procedures. Material was processed on Manufacturing Work Orders which were placed on the tubes, hollows, and trexs. In addition, a color code system is used to further identify material to a job. The three dimensional ultrasonic charts and ultrasonic flaw charts were inspected for two lots of clad. There appeared sufficient charts to demonstrate that all material had been inspected. Material accountability was demonstrated on two lots in final inspection and two lots in process. The entire manufacturing sequence was reviewed in light of material identification. In this area of the inspection, nonconformances B.1.a.(1) and B.1.b were identified.

2. Manufacturing Process Controls - The implementation of Criteria V, X, XIV was inspected. The final inspection of tubing was witnessed; in particular, final dimensional inspection, surface finish measurement, and tube cutting. Laboratory records, procedures and equipment were inspected on tensile testing, hydride orientation, and corrosion testing. The review of testing and inspection records by QA was overchecked for a recent shipment to a customer. The Quality Control Customer Requirements were reviewed for three different customers and the documentation of customer requirements was verified. The prefinal sample inspection was verified as well as the computerized sampling procedure. In this area of the inspection, nonconformances B.2 and B.3 were identified. It was further noted that pretest strain requirement of the customer was not accurately documented to the laboratory.

3. Calibration - This area of the inspection was conducted by observation of six ultrasonic test (UT) standards being used, and review of their applicable calibration records. In addition, calibration records of micrometers, dial indicators, other UT standards, the Tabo furnace (used for final annealing) and its thermocouples, recorders, and potentiometers. As a result of this review, nonconformance B.4 was identified.

4. NDE Controls

   a. Fluorescent Penetrant Examination - This area of the inspection was conducted by observing inprocess fluorescent penetrant examination being performed on thimble tubes being provided to Exxon Nuclear Company, Inc. A review of the penetrant materials being used and their respective material test reports was made. As a result of this review, nonconformance B.5 was identified.

Comment - The ultraviolet light is required to have a light intensity of 90 foot-candles minimum. The NRC inspector measured the light intensity with an uncalibrated Weston light meter which resulted in a reading of approximately 90 foot-candles. However, the ability to accurately identify and assess indications in the material being inspected was severely hampered in that the bottom and sides of the penetrant tank were coated with dried penetrant and developer which produced reflected light to the extent that it interferred with the ultraviolet light. Sandvik Special Metals management personnel agreed to evaluate and take the necessary actions to preclude a recurrence of this condition.

b. Ultrasonic Examination (UT) - This area of the inspection was reviewed by observing inprocess UT being conducted to examine wall thickness, inside and outside diameters, and flaw detection. The tube travel speed and revolutions per minute were compared and verified against the applicable procedure requirements. A review of the setup and test logs at five UT stations was made. There were no unresolved items or nonconformances identified.

5. Training - Applicable procedures and instructions in the QA Manual and QA Procedures Manual addressing training and qualifications of quality assurance personnel were evaluated. The QA files for seven inspectors and six exempt personnel in the QA organization were reviewed to determine what documentation if any, existed to attest to the fact that all employees were indoctrinated and trained in quality assurance. In this area of the inspection, nonconformance B.6 was identified.

Eight individuals from the QA organization were also questioned regarding the awareness of the reporting requirements of 10 CFR Part 21. Only one individual was aware that the requirements were posted in the work area, but he could not remember the specifics of the regulation.

In addition, the QA files for four inspectors did not contain a certification (i.e., NDT Level Qualification) signed and dated by a management official.

6. Document Control - The Master File, Historical File, and the Index Book (maintained by Documentation Specialist) for Process Specifications and Procedures (maintained by Operations Department), Quality Assurance Procedures and Laboratory Procedures (both maintained by the Quality Assurance Department) as well as documents contained at seven work stations, were evaluated to assure that documents, including changes, are reviewed for adequacy, approved for release by authorized personnel, and distributed and used at the location where the prescribed activity is performed.

In this area of the inspection, nonconformances B.1.a.(2), B.1.a.(3), B.1.a.(4), and B.7 were identified.

Although the Documentation Specialist contacts any individual who is not using the signed receipt system for revised documents (ref. paragraph 6.31 of QA-GA-7), additional measures are required in the QA program to assure that the current revision of all documents are being used at the location where a prescribed activity is being performed.

7. Audits - Applicable procedures in the QA Manual and the QA Procedures Manual addressing audits were evaluated. Nine internal audit reports which contained 12 deficiency reports (6 findings and 6 observations) for the year 1981 were reviewed. In this area of the inspection, nonconformances B.8 and B.9 were identified.

   In the area of internal audits, it was noted that audit reports were issued 2 to 3 months after the audit was conducted, and standard checklists did not exist for each of the areas being audited.

   Additional measures are required in the QA program to assure that audits are conducted and reported in a timely fashion; and quality related practices, procedures, instructions, activities, items, and records should be identified on a checklist to ensure that the QA program is effective and properly implemented.

8. Allegations - The inspection findings with respect to the allegations received by the NRC were as follows:

   a. QA/QC is not independent of production - QA/QC was described as very weak and insignificant in the manufacturing process. Review of QA/QC staffing indicated management support of the activity. QA/QC inspection points, hold points, and release points in the manufacturing process were found to be maintained, and no evidence was found to suggest that production pressures unduly influenced QA/QC.

   b. Orders have gone out mixed without the customer's knowledge - All customers require tubes to be segregated by anneal lots. The inspection indicated that the material control system was being implemented, with a review of the identification and color coding system showing tubes to be properly segregated. The allegation also stated that material types, niobium and titanium, may have been mixed. However, titanium is not used in a nuclear application and niobium is only used for a unique nondomestic design.

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c. There is not a continuous audit of inspection records - The allegation dealt with inprocess checking of tube ultrasonic testing charts and does not pertain to a specific 10 CFR Part 50, Appendix B requirement. The charts in question were reviewed for several lots at final inspection. Acceptable charts were found for each tube.

d. No Scrap Control - The allegation was that rejected material which had been dispositioned as scrap may be shipped as an acceptable product. Nonconforming material was found to be identified, and that which had been dispositioned as scrap was also found to be segregated as required by procedures.

e. There is no UT of tubes that are reprocessed after removing flat spots - The cold working of clad is limited to a unique nondomestic clad design and is not applicable to domestic products.

f. Laboratory analysis of tubes is not adequate - The allegation implied that anneal lots could be distinguished by laboratory analysis. Available information indicates, however, that reliable discrimination of anneal lots cannot currently be achieved.

It was noted that procedures were not written when they should have been, requirements were not properly documented, and procedures were not fully implemented. Although, the allegation was not specifically supported, nonconformances were identified in this area.

g. QA Manual states every new employee will be given a 1-hour lecture on QA - It was found that there was no documentation of the training of employees. The training procedures and files were reviewed. This allegation was supported by inspection findings and a nonconformance identified.

h. Maintenance of measuring instruments is not being done properly - The allegation was that calibration controls were not properly implemented. A review of calibration controls, tools, and instruments found procedures to be not fully implemented, and a nonconformance was identified. The inspection findings were, therefore, supportive of the basis for the allegation.

PERSONS CONTACTED

Company Sandvick Special Met

Dates April 6-8, 1982

Docket/Report No. 99900764

Inspector McNeill

NAME(Please Print)	TITLE(Please Print)	ORGANIZATION(Please Print)
*J.A. LINDBERG	PRESIDENT	SSM
*K.C. BOWLES	QA MGR.	"
*P.G. DUNSTAN	QC ENG.	"
*J. PATTERSON	INSPECTION SUPER.	"
*T NAYLOR	V.P. OPERATIONS	"
* JW NICKOLAUS	DEPUTY GEN. MGR & V.P.	"
* J. LUERSKE	SUPER. QC/INST. & MEASURE	"
CLAUDE STACEY	LAB SUPER.	"
JON DARSOW	MATERIALS MGR.	"
JASON LO	QC/MFT SUPER.	"
* CARL VOLMER	QA MGR.	EXXON
* ATTENDED EXIT MEETING		

82-01

Inspector McNeill

Docket No. 99900764/
Report No. 82-01

Scope/Module

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
QAM-1	4	QUALITY ASSURANCE MANUAL	4/1/81	3
QCI-10	3	QUALITY CONTROL INSTRUCTION (QCI) ACCEPT OF LOTS INTO FINAL	JULY 17 '81	0
QCI-12	3	COMPUTER SAMPLING PROCEDURE	FEB. 2, '82	0
QA-6A-3	3	QUALITY ASSURANCE PROCEDURE (QA) OVERCHECK OF THE CERT. OF QUALITY	FEB 9, '82	1
" 8	3	MATERIAL CONTROL	NOV, 12 '81	9
" 16	3	REWORK PROCEDURE FOR FINISHED TUBING	JUNE 6 '81	6
" 21	3	ADDITIONAL LOT IDENTIFICATION BY COLOR CODING OF TUBES	JULY 17, '81	2
QA-SP-40	3	FINAL TUBING CUT TO LENGTH PROCEDURE	JUNE 10, 80	3
QA-SP-41	3	HAND STRAIGHTENING, STRAIGHTNESS, AND LENGTH INSPECTION	3/4/81	4
QA SP-45	3	SURFACE FINISH MEASUREMENT	8/21/75	1
1300.19	3	TENSILE TESTING	JAN. 28, 82	5
1300.20	3	CORROSION TEST FOR ZIRCONIUM ALLOYS	JUNE 12, 79	5
SSM 1021	2	TUBE HOLLOWS - ZIRCONIUM ALLOYS	JAN. 4, 80	2B
SSM 1030	2	TUBE REDUCED EXTRUSION (TREX) ZIRCONIUM ALLOY,	MAY 14, 81	6A
1300.09	3	HYDRIDE ORIENTATION	OCT 24 80	0

Document Types:
1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-If necessary)

Columns:
1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

PERSONS CONTACTED

Company Sandvik Special Metals Corp. Dates 4/5-7/82

Docket/Report No. 99900764/82-01 Inspector L.E. Ellershaw

NAME(Please Print)	TITLE(Please Print)	ORGANIZATION(Please Print)
J A Lindberg	President	Sandvik Special Metals
k C Bowles	Manager, Quality Assurance	" " "
P G Dunstan	Chief Quality Control Engineer	" " "
J Luebke	Supervisor, Instrumentation & Measurement	" " "
K. Lynch	Calibration Technician	" " "
E S. Martin	Level II Fluorescent Penetrant Examiner	" " "
J C P Lo	Supervisor, QC/Manufacturing	" " "
C Stacey	Lab Supervisor	" " "

Inspector L E Ellershaw

Scope/Module Calibration/ultrasonic examination/fluorescent penetrant examination

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
1	4	QA Manual	3-2-81	-
2	3	QAP No. QA-GA-15 "Calibration Procedure"	12-28-81	10
3	3	QAP No. NDT-UT-10 "Ultrasonic Flaw Inspection of Metal Tubing"	6-13-80	5
4	3	QAP No. NDT-3D-31 "Operation and setup of the SEM Tubing Dimensional Gage"	3-11-81	3
5	3	QAP No. NDT-PT-1 "Fluorescent Post-Emulsified Liquid Penetrant Inspection of Thimble Tubes"	10-25-78	3
6	3	PO 19 "Tabo Furnace Operating Procedure"	12-15-77	4
7	8	Calibration records of 6 UT standards	-	-
8	8	Calibration records of 30 micrometers and dial indicators	-	-
9	8	Calibration records of Tabo furnace, thermocouples, recorders, and potentiometer	-	-

Document Types:
1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchase Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Columns:
1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

PERSONS CONTACTED

Company SANDVIK

Dates 4/6-8/02

Docket/Report No. 99900764/02-01

Inspector J. CONWAY

NAME(Please Print)	TITLE(Please Print)	ORGANIZATION(Please Print)
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JOHN LUEBKE	SUP. - QC/INSTRUM. & MEASUREMENT	"
JIM PATTERSON	SUPERINTENDENT - INSPECTION	"
DARLENE KNUTZEN	DOCUMENTATION SPECIALIST	"
DENNIS HOXIE	QC AUDITOR	"
WARREN KLINE	ENGINEER - QC	"
CLAUDE STACEY	LABORATORY SUPERVISOR	"
GLEN BELL	INSPECTOR	"
SALLY MARTIN	INSPECTOR	"

Inspector J. CONWAY

Scop/Module _____

DOCUMENTS EXAMINED

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1	2	TITLE/SUBJECT	3	4
1	4	QUALITY ASSURANCE MANUAL	9/81	5
2	8	QA PROCEDURES MANUAL		
3	8	MASTER FILE, HISTORICAL FILE, & INDEX BOOK (DOCUMENT CONTROL) FOR PROCESS SPECIFICATIONS and PROCEDURES, QA PROCEDURES, & LABORATORY PROCEDURES		
4	8	QA FILES for 9 INSPECTORS		
5	8	QA FILES for 6 EMPLOYEES IN QA ORGANIZATION		
6	8	NINE "AUDIT RESULTS" for INTERNAL AUDITS CONDUCTED DURING '81		
7	3	QA-GA-1 "DOCUMENT CONTROL PROCEDURE"	11/1/79	1
8	3	QA-GA-22 "INTERNAL AUDIT PROCEDURE"	9/1/81	2
9	3	QCI No. 4 "TRAINING of INSPECTORS"	4/1/78	0
10	3	QCI No. 8 "AUDITOR QUALIFICATION"	2/1/81	0
11	3	QA-GA-1 "PERSONNEL QUALIFICATION & CERTIFICATION"	5/1/78	2
12	3	NDT-UT-10 "ULTRASONIC FLAW INSPECTION of METAL TUBING"	6/1/80	5
13	3	NDT-V-51 "FINAL VISUAL & PACKAGING"	9/1/81	7

Document Types:
1. Drawing
2. Specification
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5. Purchase Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Column Nos.
1. Sequential Item No.
2. Type of Document
3. Date of Document
4. Revision No., if applicable

APPENDIX D

Sandvik Special Metals Corporation
Docket No. 99900764/82-01

RESULTS OF INQUIRY

On October 26, 27, and 28, 1981, three individuals, employed by Sandvik Special Metals, Kennewick, Washington, were interviewed concerning allegations presented to the NRC, Region V office. Based on the information provided to NRC, Region V, these individuals were interviewed concerning the following alleged concerns:

1. QA/QC is not independent of production;

2. Mixed specifications of tubing shipped without customers knowledge;

3. There is not a continuous audit of inspection records;

4. There is no ultrasonic testing of tubes that are reprocessed after removing flat spots;

6. Laboratory analysis of tubes is not adequate;

7. The QA Manual states every new employee will receive one hour QA instruction. This is not done; and

8. Maintenance of measuring instruments is not being done properly.

Interviews of Individuals's A, B, and C disclosed that their allegations related to their philosophical differences with company policies rather than specific wrongdoing in the various areas identified supra. Discussions with these individuals also disclosed their dissatisfaction with their supervisors. Apparently, each of these persons have been outspoken concerning their opinions regarding company policies, which has led to their having problems with supervisory personnel. Another area, which seems to have impacted on these individuals dissatisfaction with the firm, is the fact that some individuals are denied membership in an employee labor union.

A joint evaluation of the allegations by the NRC inspector and reporting investigator concluded that the concerns of the individuals did not represent intentional wrongdoing or efforts to knowingly circumvent NRC regulations or requirements. Based on this determination, it was agreeded that the matters presented should be the subject of an inspection effort. The results of this effort is reported in Appendix A of this report.

Investigator: _____ 8/19/82
D. D. Driskill, Investigator — Date

Reviewed: _____ 8/19/82
E. H. Johnson, Director of Enforcement — Date

Approved: _____ 8/19/82
I. Barnes, Chief, Reactive & Component Program Section (R&CPS) — Date