GPU Nuclear

GPU Nuclear Corporation
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4410-85-L-0210
Document ID 341A

October 28, 1985

TMI Program Office
Attn: Dr. W. D. Travers
Acting Program Director
US Nuclear Regulatory Commission
c/o Three Mile Island Nuclear Station
Middletown, PA 17057

Dear Dr. Travers:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Resolution of Quality Assurance Issues
Relating to the Defueling Canisters

Your letter dated October 17, 1985, provided comments on GPU Nuclear letter 4410-85-L-0202 dated October 10, 1985, which described the actions taken to verify that the first four filter canisters, fabricated by NES, were built in compliance with the design specifications. Attachment 1 provides our response to your comments with the exception of Comment 8 which addresses the cement filler material in the fuel canisters. The response to this comment, which is not a prerequisite to acceptance of the first four filter canisters, will be submitted upon completion of GPU Nuclear's evaluation of this issue. Attachments 2 through 11 contain the applicable canister-related documents that you requested.

Additionally, your letter requested that GPU Nuclear explain our program for ensuring that the design specifications are met for the additional canisters to be fabricated by NES Manufacturing as well as those canisters fabricated by other vendors, i.e., the Joseph Oat Corporation and Babcock and Wilcox (B&W).

D009 Add: QAB
1/1

Specifically, you requested that GPU Nuclear explain how this program differs in scope from the program for the first four filter canisters. GPU Nuclear letter 4410-85-L-0206 dated October 23, 1985, described the above program with specific emphasis on the actions implemented at the other canister vendors as a result of the deficiencies identified during NES fabrication of the first four filter canisters.

In addition, please be advised that based on new information just received by us, we are currently evaluating certain UT measurements conducted by NES Manufacturing of these four canisters. We will advise you of the results of this evaluation as more information becomes available.

Sincerely,

F. R. Standerfer
Vice President/Director, TMI-2

FRS/RDW/eml

Attachments

LIST OF ATTACHMENTS

NRC COMMENT 1

Describe the program controls implemented to assure proper catalyst loading during canister fabrication at NES Manufacturing. Include the following aspects:

a. What assurance was obtained that the catalyst received from AECL and Englehard met the design specifications. If CofC's or CMTR's were included, submit those for our review.

b. What receipt inspection was performed by Bechtel and/or NES, and how was the material stored, handled, and controlled in bulk form.

c. How was the catalyst transferred from bulk form to the individual quantities for loading into the lower head cartridges and the upper cartridges for all types of canisters. How were the individual packages labeled and controlled, including maintaining traceability to individual lot numbers.

d. During weighing operations what inspection/verification of weights was performed by NES, what Quality Control witnessing was performed by NES, and how was it documented. What weight verification was required to be performed by the Bechtel Supplier Quality Representative (SQR) and what verification was actually performed by the SQR.

e. What verification of catalyst loading was performed prior to installing the retaining screen.

f. What was your basis for selecting the frequency of verification by the SQR and what was your justification for not requiring 100 percent Quality Control verification by the fabricator.

GPU NUCLEAR RESPONSE

The recombiner catalysts were purchased by product trademark from Atomic Energy of Canada Limited (AECL) and Englehard Industries Divisions. Both AECL and Englehard are required by the Bechtel Purchase Order to provide a verification that the catalyst materials are provided in accordance with the specified technical requirements and that they are identical to the materials tested at Rockwell Hanford Operations. From a quality and safety concern, material traceability in subsequent fabrication processes is not required since the chemical nature of the catalyst is certified.

The AECL and Englehard catalysts were received at NES with the required Certificates of Conformance (C of C's), which are provided in Attachment 2, and the test reports. The material was receipt inspected by NES for the general condition of the shipping container and catalyst and included a review of the above documentation. This receipt inspection was witnessed by the Bechtel SQR. The material was stored in the original shipping containers (cardboard lined with plastic sheet) in a clean, dry storage area.

The weighing of the catalyst was performed by NES Manufacturing personnel in the storage area. Wearing plastic gloves, personnel weighed out 5 grams of AECL catalyst into a plastic bag and 20 grams of Englehard catalyst into another plastic bag. These two bags were then bound together with a twist tie to form a catalyst assembly. The weighing operation was controlled by the manufacturing sign-off on the traveler. NES Quality Assurance verified this operation and signed the travelers for approximately 25% of the weighing operations. There is no inspection plan requirement for the Bechtel SQR to verify the weighing operations. However, during random in-process inspections, the Bechtel SQR witnessed approximately 20% of the weighing operations and signed the travelers. The catalyst assemblies were then returned to the original shipping container to await loading.

NES Quality Assurance authorized the withdrawal of the catalyst assemblies necessary for loading. The lower heads for each canister type are identical and have four catalyst bed housings. One catalyst assembly was poured into each of the four catalyst bed housings. The upper heads of the fuel canister have one catalyst bed housing. Four catalyst assemblies were poured into the fuel canister upper head catalyst bed housing. The upper heads of the knockout and filter canisters each have two catalyst bed housings. Two catalyst assemblies were poured into each of the catalyst bed housings in the upper heads of the knockout and filter cansiters. The loading operation was controlled by the manufacturing and Quality Assurance sign-off of the traveler.

NES Quality Assurance verified 100% of the loading operations. The Bechtel SQR visually verified the presence of both types catalyst in 100% of bottom heads and upper heads prior to screen installation. A 20% minimum verification by the Bechtel SQR is required by the inspection plan.

The fabrication of all canisters is to be performed under the Quality Assurance program requirements stated in ANSI N45.2 which supports 10 CFR 50 Appendix B. The specification, which governs the fabrication process, identifies clearly those program elements necessary for the Quality Assurance fabrication activities which are described in Appendix A of Specification 15737-2-M-101A (Q) (Attachment 3). Seventeen (17) of the standard eighteen (18) elements are indicated by GPU Nuclear as being applicable to canisters. Design control was not required since this is a "fabrication only" contract.

An audit of the NES Quality Assurance Program conducted prior to the start of fabrication has shown that Quality Control coverage prevails throughout the entire fabrication effort for each step, i.e., 100%. An independent inspector stamps and signs each shop traveler as it is completed. This system fully meets the requirements of ANSI N45.2.

Concerning the SQR surveillance, the level of coverage is selected to ensure sufficient information is available to the buyer to judge that the fabricator complies with procedures. SQR coverage is not meant to

replace the supplier's responsibility. It is noteworthy that GPU Nuclear reviewed the traveler for catalyst installation and verified that the SQR performed a 100% witnessing of catalyst installation.

NRC COMMENT 2

In light of recent discussions on the apparent discoloration of the catalyst screens and pellets seen on one (1) in-process lower head, what actions have been or will be taken to determine if there is any potential for catalyst degradation from heat of welding.

GPU NUCLEAR RESPONSE

The attachment of stainless steel screens to the stainless steel catalyst bed housings is usually accomplished by heli-arc welding. If local catalyst damage does occur as a result of heating, the color of the Englehard catalyst would change from dark grey to very light grey. The color of the silicone-coated AECL catalyst would change from dark grey to black. Vapor from the damaged catalyst would not damage the adjacent catalyst.

To allow for catalyst damage, freezing conditions, and unforeseen conditions, the catalyst beds have a number of significant, built-in margins of safety which are documented in GEND-051, "Evaluation of Special Safety Issues Associated With Handling the Three Mile Island Unit 2 Core Debris", and are briefly discussed below.

Testing of the catalyst was conducted using gas generation rates of 0.2 liter/hr of hydrogen and 0.1 liter/hr of oxygen. As stated in the Defueling Canister Technical Evaluation Report (TER) submitted by GPU Nuclear letter 4410-85-L-0183 dated September 10, 1985, the calculated probable maximum hydrogen plus oxygen generation rate is 0.11 liters/hr. This results in a margin of safety of 2.7. During the above described testing, the mixed bed catalyst maintained the oxygen concentration to below 0.6% and the hydrogen concentration to below 1.2%. As the lower flammability limits are 5% for oxygen and 4% for hydrogen, this results in margins of safety of 8.3 for oxygen and 3.3 for hydrogen. Thus, the resulting net margin of safety is greater than a factor of 9 (i.e., there is 9 times more catalyst than requried).

GPU Nuclear has concluded that though limited catalyst damage was observed, the built-in margin of safety is sufficient to ensure recombination of the hydrogen and oxygen generated in the defueling canisters. Therefore, based on the above, GPU Nuclear believes that no further actions are required to determine the potential for catalyst degradation from heat of welding.

NRC COMMENT 3

Submit copies of the reports of all Quality Assurance surveillance and audits performed at NES. Additionally, provide all existing and future reports, as available, of audits and surveillance performed at all other canister fabricators.

GPU NUCLEAR RESPONSE

Attachment 4 provides the surveillance reports of the eleven (11) surveillances performed at NES. Attachment 5 provides a copy of the joint GPU Nuclear/Bechtel Quality Assurance Audit of NES conducted on April 23-24, 1985.

A copy of the initial surveillance/audit of the Joseph Oat Corporation, Camden, NJ, conducted on July 10-11, 1985, is provided in Attachment 6. A copy of the initial surveillance/audit of B&W, Lynchburg, VA, conducted on August 5-7, 1985, is provided in Attachment 7.

Audits of canister fabrication are scheduled as follows:

a. Joseph Oat Corporation, Camden, NJ - October 23-25, 1985

b. B&W Lynchburg, VA - November 5-7, 1985

GPU Nuclear maintains records of audits and surveillances performed at vendor facilities. As these records are available for NRC inspection, GPU Nuclear believes that an open-ended commitment to submit all future reports is not necessary; in order for the NRC to ensure that canisters manufactured by these vendors are acceptable; however, we will continue to respond to requests for specific documents.

NRC COMMENT 4

What testing has been performed to demonstrate the capability of the recombiner catalyst with all expected chemical contaminants, including the hydraulic fluids used with the defueling tools and the core boring equipment.

GPU NUCLEAR RESPONSE

GEND-051 describes the testing which has been performed to demonstrate the compatibility of the recombiner catalyst with all expected chemical contaminants exclusive of hydraulic fluids. Supplemental testing is being performed to demonstrate the compatibility of the recombiner catalyst with the hydraulic fluids which may be used in the defueling tools. These hydraulic fluids are either a 25/75% volume mixture of Borate Ester/UCON WS-34 hydraulic fluid or borated UCON WS-34 hydraulic fluid. The hydraulic fluid to be used in the core bore assembly is Houghto-Safe 620. Attachment 8 describes the testing to be performed.

Currently, only one test has been completed. This test and its results are described below. The results of further testing will be forwarded for your information upon their availability.

The testing consisted of briefly rinsing 101 grams of mixed bed catalyst and submerging it in water with a 2% solution of a 25/75% by volume of Borate Ester/UCON WS-34 hydraulic fluid. The water included appropriate quantities of boric acid and sodium hydroxide to simulate the water in the reactor coolant system. The catalyst was then placed in the test chamber under dripping wet conditions and covered with two (2) atmospheres of Argon gas. Next, 0.3 liters/hr of stoichometric hydrogen and oxygen gases were added to the test chamber; the concentration of oxygen in the cover gas built up to a 0.6% peak in five (5) hours and decreased thereafter. This catalyst performance is essentially identical to that which was reported in GEND-051. It therefore appears that this particular mix of hydraulic fluid has the same effect as water on catalyst performance.

Although not directly related to the above NRC comment, additional evaluations have been made to verify the compatibility of the fluids that may be used during defueling and core bore. The fluids that may be used, namely borated Ester, UCON WS-34, and Houghto-Safe 620, have been tested for compatibility to the RCS, SDS, and EPICOR II by GPU Nuclear and have been deemed acceptable. The miscibility of these fluids with RCS water has also been confirmed. GPU Nuclear has also verified the homogeneity of the borated Ester and UNCON WS-34 mixture and the borated UCON WS-34 mixture as well as the absence of boron precipitation from these mixtures.

NRC COMMENT 5

Describe the program controls implemented to assure proper B_4C loading during canister fabrication at NES Manufacturing. Including the following aspects:

a. What assurance was obtained that the poison material received from the supplier met the design specifications. If CofC's or CMTR's were included, submit these for our review.

b. Bechtel Specification 15737-2-M-101A, Section 5.3.1, requires the canister vendor to perform a prototype test of the manufacturing process which demonstrates that the minimum B_{10} content requirements are met. Explain how this specification was satisfied and submit the related documentation.

c. What receipt inspection was performed by Bechtel and/or NES of the B_4C material, and how was the material stored, handled, and controlled.

d. Describe the program for transferring the poison material from bulk supply to the individual poison tubes. In particular, how was the quantity of the material installed in the tube controlled and verified, what independent verification was performed, and how was traceability to individual lots maintained.

GPU NUCLEAR RESPONSE

Due to the importance of neutron poison in the canister safety analyses, it has been a requirement that the fabricator test the manufacturing process for B_4C materials. This was accomplished for pellet fabrication through testing of the first production scale lot of poison pellets. Isotopic and chemical tests were performed. The results of these tests demonstrate that the minimum B-10 isotopic concentrations exceed the requirements of the specification referenced in the above NRC comment.

Additionally, periodic samples are analyzed throughout the fabrication process to demonstrate consistency to a 95/95% statistical confidence level for each every pellet lot. This analysis is documented in vendor documents 15737-2-M-101A-25-01 and 23-03 (Attachments 9 and 10, respectively).

The poison material was received at NES with the required C of C's (Attachment 11) and the vendor inspection and test reports. The material was receipt inspected for general condition of shipping containers, dimensional inspection of a sample of poison material, and review of documentation. The receipt inspection was witnessed by the Bechtel SQR. The material was stored in the original shipping containers (cardboard lined with plastic sheet) in a dry, inside storage area.

The poison pellet was segregated in the packages to correspond to a single tube. The pellet manufacturer does this by placing pellets in a tray which is benchmarked to the minimum poison tube inside volume allowed per canister design. The pellet manufacturer then certifies, using the required Quality Assurance procedures, that each individual tray meets or exceeds the minimum quality of B-10. Each tray is then packaged for shipment to the canister fabricator and marked traceable to pellet lot and powder lot. This is done to ensure minimum B-10 content is achieved.

Since minimum B-10 content is ensured to a 95/95% statistical confidence level for every tray, traceability to a particular canister is not needed. Tray numbers are marked (etched) on the outside of each poison tube by NES; this process exceeds the requirements of the specification.

The loading of the poison material into the tubes was performed by NES Manufacturing personnel in the storage area. The poison, in the form of 2" slugs was received from the vendor in trays. Each tray contained the required poison for one tube. NES Quality Assurance would authorize the withdrawal of a poison tray and the material was spot checked by NES for

general condition and dimensions. After the tube was cleaned and inspected, the slugs were loaded into the tube and the tube capped. The above process is documented in vendor document 15737-2-M-101A-31-02 (Attachment 12). The loading operation and inspections were verified 100% by NES Quality Assurance and travelers were signed off. The SQR witnessed a minimum of 20% of the operations and signed off the travelers as appropriate.

NRC COMMENT 6

You have stated that there is considerably more conservatism in the catalyst bed design than that stated in the Technical Evaluation Report. Provide a description of the design conservatism and the calculations and experimental data to support these statements.

GPU NUCLEAR RESPONSE

See the response to NRC Comment 2.

NRC COMMENT 7

Iron oxide was observed on the canister lower heads, presumably from forming these heads on a carbon steel die. Provide a justification for your conclusion that carbon steel impregnation of the stainless steel heads will not affect the acceptability of the shell to head welds and the long term structural and corrosion properties of the canisters. Will any action be taken to remove this iron oxide.

GPU NUCLEAR RESPONSE

Iron oxide was observed on the canister lower heads. This has been shown to be a surface phenomenon, probably associated with the forming process. The demonstration that this is a surface phenomenon was conducted at the Bechtel Materials Testing Laboratory in San Francisco, CA. A reject head, with iron oxide on both the inner and outer surfaces in quantities significantly greater than those on the canisters, was sent to this laboratory from the canister vendor's fabrication shop.

The Materials Testing Laboratory provided the following information:

"We have examined the canister head shipped to us by NES. Both sides of the head were streaked with red rust. The convex (inner) side had heavier concentrations.

The rust could be removed by light mechanical polishing. We used emery paper, but brushing with stainless steel wire brushes could accomplish the same purpose. After the rust stains were removed, the stainless steel surfaces were tested with a copper sulfate solution that will reveal iron contamination (see ASTM A380). No iron contamination was observed on the cleaned surfaces.

On the basis of our examination we believe that the rust stains are the result of mild iron contamination of the stainless steel surfaces. This contamination would come from steel dyes used for forming the head or from the airborne metal dust that would be expected in a fabrication shop. The rusting patterns are the type that one would expect from such casual contamination.

The rusting is not an indication of any corrosion deficiency of the stainless steel. The iron contamination of the stainless steel surfaces will not affect its ability to resist corrosion in the water environments in a fuel pool. Furthermore, it will not diminish its ability to withstand any reactor coolant water remaining in the fuel".

GPU Nuclear concludes, therefore, that the presence of the small quantities of surface contamination observed will have no deleterious effect on canister performance. However, as an added measure, the fabrication procedures at all canister fabrication shops have been revised to require power brushing, using a stainless steel brush, to remove all visible rust.

NRC COMMENT 9

Attachment 6 to your letter 4410-85-L-0202 dated October 10, 1985, is the completed filter canister checklist package. It is marked as Revision 1. What revisions were made to the checklists after their completion? If additional revisions are to be made, submit the completed final revisions with an explanation of the revision for our review.

GPU NUCLEAR RESPONSE

Revision 2 was issued for configuration control purposes to include previously omitted verification items and to incorporate GPU Nuclear comments which were primarily directed at improving the clarity and understandability of the checklists. All pages of the checklist packages are identified as Revision 2.

Also revised were checklist pages M-6B page 1, M-7 page 1, M-16 pages 1 and 2, F-3 page 1, F-3 page 2, F-4 page 2, F-8 page 1, and F-8 page 2.

A revised checklist is provided in Attachment 13. Note that revisions are identified with a revision bar, and that this checklist covers all four (4) of the filter canisters under consideration.

Currently, GPU Nuclear does not anticipate any further changes to this checklist. However, in the event of future revisions, they shall be submitted for your information along with an explanation of the revisions.

NRC COMMENT 10

Attachment 1 to the completed checklist states in section 4 that imposition of ANSI N45.2 was not necessary since CMTR's/CofC's were requested. Did you verify that the suppliers held a current ASME Quality System Certificate? If not, justify how a CMTR/CofC can be considered valid if not supported by an approved Quality Assurance Program.

GPU NUCLEAR RESPONSE

Filter Canister Checklist Attachment 1, Section 4 provides a brief and general explanation of instances where NES did not impose the ANSI N45.2 Quality Assurance program requirements on material suppliers. The Bechtel Review Team independently evaluated the need for imposing such requirements on the supplier of the specific material mentioned in the checklist and concurred with NES's decision not to impose such requirements. Wherever Section 4 is referenced in the checklists, the review team evaluated, on an item by item basis, the acceptability of the supplied material solely on the basis of either CMTR's or C of C's required by NES.

In judging the need for imposition of Quality Assurance program requirements, the Review Team considered the complexity, uniqueness, degree of standardization, and applicability of any special technical or special process requirements. Note that the materials referenced in Attachment 1, Section 4 are not specifically manufactured for nuclear industry use only. They are standard commercially available products, generally manufactured in accordance with specific Standard requirements, e.g., ASTM. These products generally have been and continue to be procured by the nuclear industry solely on the basis of CMTRs/C of C's, without the imposition of unique nuclear industry Quality Assurance program requirements being imposed on suppliers of such products. As for current ASME Quality System Certification, note that the canisters are ASME Code Section VIII Vessels and ASME Code Section VIII does not specifically mention or require an ASME Quality System Certificate, as is required by ASME Code Section III.

ASME Code Section VIII only requires that "the manufacturers shall have a system of receiving control which will ensure that the material received is properly identified and has documentation including required Certificates of Conformance or material test reports to satisfy code requirements as ordered".

NRC COMMENT 11

Explain in further detail how the upper heads are traceable to their heat numbers. At what point in the process were the heat numbers removed? Justify how this meets the ASME Code requirements on material traceability.

GPU NUCLEAR RESPONSE

The material for the upper heads was received by NES as round plate slugs. Each slug was stamped with a heat number traceable to one of the three CMTRs also received. The material was inspected for dimensions and heat number and the CMTRs reviewed to the material requirements. The heat number was maintained by stamping, throughout the machining operation. When the heads were welded to the shell, the heat number, which was stamped on the underside of the head, was no longer accessible. Although unique traceability to a heat number was not maintained, all heads were verified to be of the same material specification, grade and type; therefore, code required traceability was maintained. This traceability was verified by NES Quality Assurance, the Bechtel SQR and the Code Inspector, as evidenced by his acceptance of the code data report for the canisters.

ENGELHARD

ATTACHMENT 2
(4410-85-L-0210)
3 Pages

ENGELHARD CORPORATION
SPECIALTY CHEMICALS DIVISION
429 DELANCY STREET
NEWARK, NEW JERSEY 07105
(201) 465-6052 TELEX 138029

5-10-85
W.O # 84091 (P.N. 1150940 A)

CERTIFICATE OF COMPLIANCE

Requested By:	Engelhard Corporation Systems Department Union, New Jersey 07083
Attention of:	G. Tonner
Reference:	Bechtel P.O. TC-018139 Item 1
Material Identification:	Deoxo Catalyst: Type A-16430
Amount:	97 lbs
Lot Number:	32723
Total Halides, ppm:	<50

We hereby certify that the above shipment complies with the requirements of said order.

BECHTEL
354

By: [signature]
Liz Lanza
Q.A. Coordinator

Date: March 29, 1985

ENGELHARD

ENGELHARD CORPORATION
SPECIALTY CHEMICALS DIVISION
429 DELANCY STREET
NEWARK, NEW JERSEY 07105
(201) 465-6052 TELEX 134879

CERTIFICATE OF COMPLIANCE

Requested By:	Engelhard Corporation Systems Department Union, New Jersey 07083
Attention of:	G. Tonner
Reference:	Bechtel P.O. TC-018139 Item 1
Material Identification:	Deoxo Catalyst: Type A-16430
Amount:	70.548 lbs
Lot Number:	32809
Total Halides, ppm:	<50

We hereby certify that the above shipment complies with the requirements of said order.

8-6-85
W.O. # 84091
P.N. 1150940A

BECHTEL 354

By: ____________________
Lia Langa
Q.A. Coordinator

Date: March 29, 1985

BECHTEL 354

Atomic Energy
of Canada Limited
Research Company
Chalk River
Nuclear Laboratories

L'Énergie Atomique
du Canada, Limitée
Société de Recherche
Laboratoires Nucléaires
de Chalk River

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COMMERCIAL OPERATIONS
Research Contracts

1984 December 21

RECEIVED
DEC 27 1984
NES MANUFACTURING

T. Harman Jr.
Project Manager
NES Manufacturing
101 Swing Rd.
GREENSBORO, North Carolina
27409

Dear Mr. Harmon:

Silicone Coated Recombiner Catalyst
for TMI-2 Defuelling Cannisters
Certificate of Compliance

We hereby certify that the above-noted catalyst for Bechtel job #15737 purchase order #TC016181 meets the specifications as follows:

The catalyst shall be spherical-shaped particles, 1/4 inch (± 1/8 inch) in diameter. The seller shall provide written certification for the following:

a) The catalyst consists of a base material of silica with a minimum of 0.14 weight percent of platinum.

b) The catalyst has less than 5 ppm content of chlorine/fluorine.

c) All physical and chemical properties shall be essentially identical to those of samples shipped to Rockwell Hanford Operations in October 1983 for testing.

d) The catalyst particles shall have sufficient structural strength to withstand normal handling and loading without crumbling.

The shipment dated 1984 December 12 contains 5.15 kg with the balance of 5.85 kg to follow early in 1985 January.

Yours sincerely,

R.J. Quaiattini
Project Manager

W.J. Langford
QA Manager

W.A. Seddon
Business Development Officer

WAS:E

P.N. 115097ZA

8-6-85
W.O. # 84091
TC016181

BECHTEL 354

PAGE 20 OF

ATTACHMENT 3
(4410-85-L-0210)
1 Page

SUPPLIER QUALITY ASSURANCE PROGRAM REQUIREMENTS
DATA SHEET

ANSI N45.2 REQUIREMENTS

The following marked QA Program Elements of ANSI N45.2 apply and are subject to Bechtel evaluation and verification

PROGRAM ELEMENTS	SUPPLIER DOCUMENT AND PARAGRAPH REFERENCES TO BE COMPLETED BY THE SUPPLIER
x QUALITY ASSURANCE PROGRAM	
x ORGANIZATION	
☐ DESIGN CONTROL	
x PROCUREMENT DOCUMENT CONTROL	
x INSTRUCTION, PROCEDURES, & DRAWINGS	
x DOCUMENT CONTROL	
x CONTROL OF PURCHASED MATL., EQUIP., & SERVICES	
x IDENT. & CONTROL OF MATLS., PARTS, & COMPONENTS	
x CONTROL OF SPECIAL PROCESSES	
x INSPECTION	
x TEST CONTROL	
x CONTROL OF MEASURING & TEST EQUIP.	
x HANDLING, STORAGE, & SHIPPING	
x INSPECTION, TEST, & OPERATING STATUS	
x NONCONFORMING ITEMS	
x CORRECTIVE ACTION	
x QUALITY ASSURANCE RECORDS	
x AUDITS	

OTHER ANSI QA REQUIREMENTS

☐ ____

x ANSI N45.2.2

x ANSI N45.2.13

*Supplement 17S-1 and Appendix 17A-1 of ANSI/ASME NQA-1-1979 (including ANSI/ASME NQA-1a-1981 Addenda to Supplement 17S-1 and Appendix 17A-1)

ASME CODE QA PROGRAM REQUIREMENTS

☐ ASME SECTION III (NCA 4000) ____

☐ ASME SECTION III (NCA 3800) ____

x ASME Section VIII

SIGNATURE OF SUPPLIER REPRESENTATIVE..............................

NO	DATE	REVISIONS	BY	CHECKED	QA	APPROVED
2	6/19/85	Revised and Reissued for Purchase	[illegible]	SES	[illegible]	[illegible]
1	11/20/84	Issued for Purchase	[illegible]	SES	[illegible]	[illegible]
0	9/12/84	Issued for Bids	[illegible]	SES	[illegible]	[illegible]

BECHTEL	TECHNICAL SPECIFICATION FOR FABRICATION OF FUEL CANISTERS	JOB NO. 15737
		DOCUMENT NO. 2-M-101A — REV. 2

GPO 3379 3-82

GPU NUCLEAR
SURVEILLANCE REPORT
PAGE 1 OF 5

To: T.V. Sarma
Project QA Engineer

Report No. TMI-2/7/8510074 Rev. -
Date: October 15, 1985

Supplier: Nuclear Energy Services
Address: 101 Swing Road
Greensboro, NC 27409

Site: TMI-2
P.O. No. 016172 C/O No. 001
Spec No. - Rev. No. -

Fabricated at: Nuclear Egy. Svc.
Address: 101 Swing Road
Greensboro, NC 27409

PQA No. - B/A No. 220060

Date of Visit: 9/18-20, 24-27, 30-10/3
10/7-9/85

Vendor No. 26106-001

Activity Items:
Defueling canisters

Personnel Contacted:
A.E. Smith - Bechtel Sr. Qual. Rep.
L. Ludwig - NES QA Mgr.

Purpose of Visit:
Perform final documentation review with Bechtel QAR for four (4) filter canisters previously shipped to TMI-2.

Summary of Visit:
Final documentation review for four (4) filter canisters previously shipped to TMI-2 was performed with the Bechtel QAR and considered acceptable with comment. These documentation packages were delivered to TMI by the writer on October 10, 1985. U.T. examinations of (2) fuel canister upper hd. to shel circ. seam weldments were witnessed with the Bechtel QAR and considered acceptable. Presence of poison was verified in a sample of twenty (20) small diameter K/O canister poison tubes. See body of report for details.

Results of surveillance were X Satisfactory __ Unsatisfactory

Action Required:
By Bechtel - Provide NES with formal instructions to reflect R.T. film control/storage requirements imposed by GPUN/QA Ref. Ballard/Linton memo 6110-85-062 (attached). Revise Specification 15737-2-M-101A(Q) to reflect current poison traceability requirements.

No. of Nonconformance Reports Issued None

Final Report Prepared by: D. M. Kierpa 10/21/85
QA Surveillance Rep. Date
D. M. Kierpa

Reviewed by: D. D. Bansch 10/21/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: C. J. Paczolt 10/21/85
Manufacturing Assurance Manager Date
C. J. Paczolt

Distribution: See attached.

For GPUN use only
Rev. 0
Date
Location All Plants

Rec. No.
RecType 002.03
Form No. 7207.01 3-1
Retention- Lifetime

DISTRIBUTION - TMI-2

B. W. Alatary - QA Engineering Manager, Corp.
J. E. Kunkel - Director, Procurement Section
L. H. Lilien - Manager, TMI Contracts
J. F. Marsden - QA Engineering Manager
C. T. Schrock - Manager, HQ Procurement Office
J. C. Solakiewicz - QA Engineering & Systems Mgr., OC
J. E. Tietjen - QA Program Receiving Supervisor
Vendor File - For Data Entry/CARIRS-HQ
R. P. Warren - Plant Engineering Director, Acting
D. M. Kierpa - QAE
R. Wells - TMI-2, Licensing Engineer

Summary of Visit

The writer visited NES Manufacturing, Greensboro, North Carolina on September, 18-20, 24-27, 30 - October 3, and October 7-9, 1985. The purpose of these visits was to perform final documentation review with the Bechtel QAR for the four (4) filter canisters previously shipped to TMI-2. Bechtel has the prime responsibility for surveillance for this procurement in accordance with Bechtel QA Plan H-15737-101A(Q), Revision 1.

At the present time, seventy-seven (77) canisters remain at this facility. The following is a brief status of canister fabrication at NES.

CANISTER STATUS

	Fuel	Filter	Knockout
Total Quantity	35	18	28*
In Fab.	33	12	27
Fab./Testing Complete	2**	2**	0
Shipped to TMI-2	0	4	0

*One set of K/O internals has been sent to Oakridge National Lab for testing.

**Final dimensional inspection and documentation review still outstanding.

Final documentation review for the four (4) canisters previously shipped to TMI-2 was performed with Bechtel QAR, Mr. A. Smith and was considered acceptable with comments noted below. These documentation packages were delivered to TMI by the writer on October 10, 1985.

Documentation Review for Filter Canisters, S/N^{s} F-401, 402, 403 and 404. (One documentation package per canister, each consisting of the documents listed below.)

- G321V Quality Verification Document Requirements
- U.T. Report, Weld #2
- R.T. Report, Weld #3
- R.T. Report, Long Seam (ARMCO)
- R.T./U.T. Weld MAP
- P.T. Reports - 9 Welds
- P.T. Weld Maps
- U1-A Manufacturer's Data Report
- Hydro Test Report - Pipe (ARMCO)
- Pressure Test Certification - Completed Canister
- Filter Bundle Certifications (Pall Trinity)

  Filter Media Verification Certificate
  Certificate of Conformance
  Bubble Test Report
  P.T. Certification

- Post-Installation Integrity Test Report
- Inspection and Verification Report for Fit-Up and Installation of Poison Tubes
- Certificate of Conformance - Poison Tube Assembly
- Certificate of Conformance - Lift Point Test
- Certificate of Conformance - Filter Canister Assembly Cleanliness

The following documentation books contain CMTRs, C of Cs, SDDRs, and other documentation per Specification 15737-2-M-101A Rev. 3, which are common to all canisters as described below.

Common Book #s 1, 2, and 3 contain CMTRs for the following components.

FUEL CANISTERS

Component	Drawing, Piece No.
Closure Head	1150989F, Pc. 1
Bulkhead	1154014F, Pc. 1
Shell	1150983C, Pc. 1
Lower Head	1150917D, Pc. 1
Skirt	1150988C, Pc. 1
Bolts	1154021C, Pc. 1
Locating Pins	1154033C, Pc. 1
Shock Absorber Support	1150993C, Pc. 1
Impact Plate "C"	1150994C, Pc. 1
Impact Plate "D"	1150995C, Pc. 1
Ribs	1154104C, Pc. 1
Bottom Plate	1150992E, Pc. 1

FUEL CANISTERS (cont)

Component	Drawing, Piece No.
Impact Plate "A"	1154006D, Pc. 1
Impact Plate "B"	1154007D, Pc. 1
Standoffs	1154103a, Pc. 1
Ribs	1154105a, Pc. 1
Drain Tube	1155381C, Pc. 1

FILTER CANISTERS

Component	Drawing, Piece No.
Closure Head	1150958D, Pc. 1
Shell	1150945C, Pc. 1
Lower Head	1150917D, Pc. 1
Skirt	1150944C, Pc. 1
Plug (used in closure head)	1150957B, Pc. 1
Poison Tube	1150949D, Pc. 2
Bottom End Plug	1150949D, Pc. 3
Top End Plug	1150949D, Pc. 4

KNOCKOUT CANISTERS

Component	Drawing, Piece No.
Closure Head	1150943E, Pc. 1
Shell	1150945C, Pc. 1
Lower Head	1150917D, Pc. 1
Skirt	1150944C, Pc. 1
Inlet Tube	1155247E, Pc. 1
Intermediate Support Plate "A"	1150939D, Pc. 1
Support Ring	1150937D, Pc. 1
Center Tube	1154090C, Pc. 1
Center Tube End Cap	1150961C, Pc. 1
Center Tube Drain Line	1154030C, Pc. 3
Poison Tube "A" - Tubing	1155233D, Pc. 2
Bottom End Plug	1155233D, Pc. 3
Top End Plug	1155233D, Pc. 4
Poison Tube "B" - Pipe	1150946C, Pc. 4
Top End Cap	1150946C, Pc. 2
Bottom Support Plate	1150950E, Pc. 1

Also, Common Book #3 contains C of C^{s} for all other canister components (including catalyst and non-pressure parts) as required by Specification 15737-2-M-101A.

Common Book #4 contains the following poison certifications applicable to filter and knockout canisters.

- A.R.T. Certificate of Conformance
- Pellet Dimensional Inspection Reports
- B^{10}/Inch Inspection Report
- Inspection Report for pellet length, weight, weight % boron (B^{10} content of B_4 pellets
- Visual Inspection and Loading Reports for B_4C pellets.

Common Book #5 contains closed supplier deviation disposition requests (SDDRs) applicable to the first four (4) shipped filter canisters. NES will forward SDDRs to TMI as they are closed for future canisters for insertion into this common book. Mr. A. Smith, Bechtel QAR, was reminded that all SDDRs applicable to a specific canister must be closed prior to shipment of that canister to TMI.

MISCELLANEOUS DOCUMENTATION PACKAGE NOTES

1. NES was unable to locate the required CMTR for Knockout Canister Bottom End Cap, P/N 1150996C, PC 3. NES will locate this CMTR prior to the shipment of the first Knockout Canister and forward a copy to TMI for insertion in the appropriate common book.

2. Poison Shroud Assembly CMTRs for Fuel Canisters will be forwarded to TMI pending resolution of the applicable documentation-related Bechtel Action Items noted below.

BECHTEL ACTION ITEMS

1. Revise Specification 15737-2-M-101A(Q) to reflect current poison traceability requirements and provide NES with specific instructions regarding required documentation as soon as possible.

2. Provide NES with instructions to reflect R.T. film control/storage requirements imposed by GPUN/QA. Reference Ballard/Linton memo, 6110-85-062 (attached).

During the surveillance visits noted by this report, the following activities were witnessed with Bechtel QAR, Mr. A. Smith, and considered acceptable.

- U.T. Examination; Upper Hd. to Shell Circ. Seam Weldment per approved P.T.L. Procedure PTL-QC-UT. 1. Fuel Canister Weld I.D. #s 17P1 and 19P2. Note: Personnel Certification and Eye Examination Report for PTL U.T. Level III Inspector R. Doviscak, have been previously reviewed and accepted by Mr. A. Smith.

- Presence of poison was verified in a random sample of twenty (20) small diameter knockout canister poison tubes which were awaiting end cap fit-up and welding.

GPU Nuclear

Memorandum

Subject: Control/Storage of NES Radiographs

Date: August 6, 1985

From: Manager, TMI QA Modifications/Operations - B. E. Ballard, Sr.

Location: TMI Trailer 24 6110-85-062

To: Manager, Recovery Programs - W. H. Linton

It has come to my attention during our recent involvement with the purchase order with NES (Greensboro, NC) that there is currently no requirement for NES to send radiographs of components/equipment with their shipment to TMI. As a result of this information, I am uncertain what plans have been made or requirements imposed upon NES regarding storage and maintenance of the records.

Based on this uncertainty, I feel a contract change is necessary to assure us that NES either: (1) notifies us prior to destruction of the radiographs with an option that we take the records into our records storage facility, or (2) send us the radiographs with shipment for our storage with the understanding that NES has full access rights to those records.

Your help in this matter will be greatly appreciated.

B. E. Ballard, Sr.
B. E. Ballard, Sr.
Manager, TMI QA
Modifications/Operations

BEB:DLS:cam

cc: Director, Quality Assurance - N. C. Kazanas
Director, TMI-2 Division, F. R. Standerfer
Task Leader, Defueling Operations - P. Bradbury
CARIRS

ORIGINAL CC

GPU Nuclear

GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054-1149
(201) 263-6500
TELEX 136-482
Writer's Direct Dial Number:
201-299-2026

September 18, 1985
6170-85-629

Bechtel North American Power Corp.
15740 Shady Grove Road
Gaithersburg, MD 20877-154

Attention: Mr. T. V. Sarma, Project QA Engineer
Location - 2D4

Gentlemen:

SUBJECT: GPUN/QA SURVEILLANCE REPORT #TMI-2/6/8510074
NUCLEAR ENERGY SERVICES, GREENSBORO, NC
September 3-6 and 9-12, 1985

Enclosed please find a copy of the subject surveillance report for your use and record.

As stated in the report, action is required by Bechtel to evaluate the extensive weld repairs of the same areas of the lower head to shell circumferential weld seam on the canisters.

Please supply the writer with results of Bechtel's evaluation.

If you have any questions, please feel free to call the undersigned at your convenience.

Very truly yours,

John D. Bansch

J. D. Bansch
Supervisor, Surveillance & Controls

CJP

JDB:CJP:hm

Attachments

To: T. V. Sarma
Project QA Engineer

Report No. TMI-2/6/8510074 Rev. 0
Date: September 17, 1985 6170-85-652

Supplier: Nuclear Energy Services Site: TMI-2
Address: 101 Swing Road
Greensboro, NC 27409 P.O. No. 016172 C/O No. 1
Spec No. - Rev. No. -

Fabricated at: Same as Above.
Address: PQA No. - B/A No. 220060

Date of Visit: Sept. 3-6 & 9-12,1985 Vendor No. 26106-001

Activity Items:
Defueling Canisters

Personnel Contacted:
A. E. Smith - Bechtel Sr. Quality Rep.
L. Ludwig - NES QA Manager

Purpose of Visit:
Perform Final Inspection and Documentation Review for completed Canisters.

Summary of Visit:
Partial Visual and Dimensional Inspection was performed with Bechtel PQAR for one (1) Filter and one (1) Fuel Canister and was considered conditionally acceptable. Although documentation packages for four (4) completed Filter Canisters are incomplete, TMI-2 management has authorized shipment of these four canisters to TMI-2 for use in training and testing only. Completed documentation packages, still to be reviewed by Bechtel and GPUN/QA, will follow within two weeks. See body of report for details.

Results of surveillance were X Satisfactory ___ Unsatisfactory

Action Required:
By Bechtel - Review and evaluate the potential metallurgical consequences of the extensive re-weld repairs of the same areas of the lower head to shell circumferential seam weldments.

No. of Nonconformance Reports Issued None

Final Report Prepared by: D. M. Kiepa 9/17/85
QA Surveillance Rep. Date
D. M. Kierpa

Reviewed by: John D. Bansch 9/18/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: C J Paczolt 9/26/85
Manufacturing Assurance Manager Date
C. J. Paczolt

Distribution: See attached.

For GPUN use only
Rev. 0
Date
Location All Plants

Rec. No.
RecType 002.03
Form No. 7207.01 3-1
Retention- Lifetime

0652N/36

DISTRIBUTION - TMI-2

B. W. Alatary - QA Engineering Manager, Corp.
J. E. Kunkel - Director, Procurement Section
L. H. Lilien - Manager, TMI Contracts
J. F. Marsden - QA Engineering Manager
C. T. Schrock - Manager, HQ Procurement Office
J. C. Solakiewicz - QA Engineering & Systems Mgr., OC
J. E. Tietjen - QA Program Receiving Supervisor
Vendor File - For Data Entry/CARIRS-HQ
R. P. Warren - Plant Engineering Director, Acting
D. M. Kierpa - QAE

The writer visited NES Manufacturing, Greensboro, North Carolina on September 3-6 and 9-12, 1985. The purpose of these visits was to perform final inspection and documentation review for completed canisters with the Bechtel PQAR. Bechtel has the prime responsibility for surveillance for this procurement in accordance with the Bechtel QS Plan H-15737-101A (Q), Revision 1.

At the present time, eighty one (81) canisters remain at this facility. All other canister fabrication has been transferred by Bechtel to other suppliers. The following is a brief status of the remaining canisters at NES.

CANISTER STATUS

	FUEL	FILTER	KNOCKOUT
Total Qty. Remaining at NES	35	18	28
In Fab.	33	14	28
Fab./Insp. Complete	*2	*4	0

*Completed canister serial numbers are as follows:

	FUEL		FILTER			
S/N	D-102	D-103	F-401	F-402	F-403	F-404
NB #	Not Yet Assigned		616	617	619	618
Weld Seam ID #	26P2	82P1	45P2	43P1	11P2	140P2

Lower head to shell circumferential seam welding continues to be a significant problem at NES. Approximately 50% of the canisters have had weld repairs made on this seam. Also, extensive re-weld repairs of the same areas of the seam have occurred, and in some cases, the fourth repair on the same area is in progress. This situation was briefly discussed with Mr. B. Bain, Bechtel M&QS representative at NES. Bechtel M&QS should review and evaluate the potential metallurgical consequences of this situation as soon as possible.

The NES R. T. procedure supplement described in the writer's report #TMI-2/5/8510074 has been verbally approved with comment by Bechtel. The following actions are still outstanding regarding this procedure supplement.

1. Cross-reference procedure supplement to PTL R. T. procedure previously approved by Bechtel.

2. Since the indications described in this supplement are <u>generic</u> to all radiographed circumferential seams, each reader sheet must be revised to reference this document.

The following verbal agreements have been reached with Bechtel engineering and M&QS regarding the lower head rust condition described in the writer's report #TMI-2/3/8510074.

1. For the six (6) canisters noted above which are complete, the rust will be mechanically cleaned and removed by NES. Should this rust re-appear at TMI, it will be addressed at that time.

2. The remaining heads at NES will be mechanically cleaned with all accessible rust removed. An iron contamination test will then be performed on each head. Following this, a nitric acid bath will be used to passivate the O.D. surface of each head.

3. For all heads shipped from NES to B&W and J. Oat, a similar process to #2 above will be required. Bechtel will formally advise these two vendors of their responsibility in this matter.

The following is a summary of the partial visual and dimensional inspection performed on one (1) fuel and one (1) filter canister in conjunction with Mr. A. Smith, Bechtel, PQAR.

Filter Canisters S/ N F403
Drawing 1154018

ATTRIBUTE	RESULTS
- Overall Length 149-3/4 + - 1/4	Accept.
- Max. Connector Weight 3.200" maximum. No tolerance!	Inlet - 3.207- per verbal agreement reached with Bechtel engineering, this "as built" dimension is acceptable. Outlet - Accept.
- SHL Wall Thickness .219 Min.	Accept.
- Straightness 14-5/16" Perfect Cylinders, Total Length, Dwg.Note #13.	Scheduled to be verified on September 13, 1985 prior to shipment.
- Dwg. Note Requires Circ. Seam to be Ground Flush w/125 RMS Finish.	Lower Hd. to SHL. circ. seam is in "as-welded" condition - per verbal agreement reached with Bechtel engineering, if the aforementioned perfect cylinder inspection is successful, this "as built" condition will be acceptable.

0652N/38

Drawing 1150959

- Grapple Port	
2.125" Dia.	Accept.
3-1/8" Dia.	Accept.
2-3/8" Depth	Accept.
8° Angle	Accept.
* 13/16" Dim.	*These dimensions were verified as acceptable per review of NES inspection records and traveller signoffs.
* 1/8" x 45° Champher.	
* 3/8" + 1/16" Radius	
* All port locations & size	

ATTRIBUTES	RESULTS
- Overall Length 150" Max.	Scheduled to be verified on September 13, 1985 prior to shipment.
- SHL Wall Thickness .219 Min.	Accept.
- Straightness 14-5/16" Perfect Cylinder, Total Length, Note #13.	Scheduled to be verified on September 13, 1985 prior to shipment.
- Drawing Note Requires Circ. Seam to be Ground Flush w/125 RMS Finish.	Lower Hd. to SHL. Circ. Seam is in "as-welded" condition per verbal agreement reached with Bechtel engineering, if the aforementioned perfect cylinder inspection is successful, this "as-built" condition will be acceptable.

Drawing 11500989, Revision 3 NOTE: Bechtel/NES are in the process of verifying that the latest drawing revision was used to fabricate these bulkheads.

Connector Port	
2" Dim.	Accept.
1-1/8" Depth	Accept.
2" Dia. Counterbore	Accept.
2-1/8" Depth	Accept.
Grapple Port	
2.125" Dia.	Accept.
3-1/8" Dia.	Accept.
2-3/8" Depth	Accept.
8° Angle	Accept.
* 13/16" Dim.	* These dimensions were verified as acceptable per review of NES inspection records and traveller signoffs.
* 1/8" x 45° Champher	
* 3/8" x 1/16" Radius	
* All port locations & size	

Mr. T. Demmitt, TMI-2 Deputy Director has authorized shipment of the four (4) filter canisters noted above to TMI for purposes of training and testing with the following activities incomplete.

1. Bechtel Material Verification Audit at NES for the canisters is still open, with resolution of software - related QA problems still outstanding.

2. NES documentation packages are incomplete, and will not be included with the shipment. Bechtel and GPUN/QA will review these documentation packages at NES before they are forwarded to TMI.

During this surveillance visit, Mr. A. E. Bradford, EG&G/Idaho, QA Representative, was in attendance at NES. Mr. Bradford reviewed the progress of the Bechtel Material Verification Audit on the four (4) filter canisters and two (2) fuel canisters noted above. Also, he interfaced with the writer regarding the status and results of the inspection/testing and NDE on these completed canisters.

Mr. Bradford will provide Bechtel representatives at NES with the results of his visit during an exit meeting scheduled for September 13, 1985.

0652N/40

GPU Nuclear

GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054-1149
(201) 263-6500
TELEX 136-482
Writer's Direct Dial Number:

201-299-2026

August 28, 1985
6170-85-501

Bechtel North American Power Corporation
15740 Shady Grove Road
Gaithersubrg, Maryland 20877-154

Attention: Mr. T. V. Sarma, Project QA Engineer, Location 2D4

Gentlemen:

SUBJECT: GPUN QA SURVEILLANCE REPORT #TMI-2/5/8510074
NES MANUFACTURING, GREENSBORO, NORTH CAROLINA
SURVEILLANCE VISIT OF AUGUST 14-16, 1985

Enclosed please find a copy of the subject surveillance report for your use and record.

As stated in the report results of the surveillance were satisfactory. However, action by Bechtel is required related to evaluating the NES/PTL R. T. procedure supplement as described in the body of the report.

If you have any questions related to the report or if we can be of any assistance, please feel free to call at your convenience.

Very truly yours,

John D Bansch

J. D. Bansch
Supervisor, Surveillance & Controls

JDB:GTB:hm

Attachment

0674N/1

To: T. V. Sarma
Project QA Engineer

Report No. TMI-2/5/8510074 Rev. 0
Date: August 28, 1985 6170-85-585

Supplier: Nuclear Energy Services Site: TMI-2
Address: 101 Swing Road
Greensboro, NC 27409

P.O. No. 016172 C/O No. 1
Spec No. - Rev. No. -

Fabricated at: Same as above.
Address:

PQA No. - B/A No. 220060

Date of Visit: August 14-16, 1985 Vendor No. 26106-001

Activity Items:
Defueling Canisters

Personnel Contacted:
A. E. Smith - Bechtel Sr. Quality Rep.
L. Ludwig - NES QA Manager

Purpose of Visit:
Observe Canister Hydro-Testing and review Circumferential Seam Radiographs with Bechtel PQAR.

Summary of Visit:
Witness of one (1) Fuel Canister Hydro-Test with Bechtel PQAR was found acceptable. Also, a sample of Circumferential Seam Radiographs were reviewed with the Bechtel PQAR, with questionable linear indications observed. See body of report for details.

Results of surveillance were X Satisfactory __ Unsatisfactory

Action Required:
By Bechtel...Evaluate NES/PTL R. T. Procedure supplement as described in the body of this report.

No. of Nonconformance Reports Issued None

Final Report Prepared by: D. M. Kierpa 8·28·85
QA Surveillance Rep. Date
D. M. Kierpa

Reviewed by: J. D. Bansch 8/28/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: [signature] 8/28/85
Manufacturing Assurance Manager Date
for C. J. Paczolt

Distribution: See attached.

For GPUN use only
Rev. 0
Date
Location All Plants

Rec. No.
RecType 002.03
Form No. 7207.01 3-1
Retention- Lifetime

0652N/8

The writer visited NES Manufacturing, Greensboro, North Carolina on August 14-16, 1985. The purpose of this visit was to observe canister hydrotesting and review circumferential seam radiographs with the Bechtel PQAR. Bechtel has the prime responsibility for surveillance for this procurement in accordance with the Bechtel QS Plan H-15737-101A (Q) Revision 1.

The following canister testing operation was witnessed by the writer in conjunction with Bechtel PQAR A. Smith in accordance with approved procedure noted below and was considered acceptable.

Canister Type & SN	Test	Procedure	Results
Fuel 25P2	Hydro-Test	NES 84091-HTP-0, Rev.2	Acceptable

All testing was performed using calibrated measuring and test equipment.

Additionally, it was verified, by review of traveller signoffs, that the Bechtel radiography review for lower head to shell circumferential seam welds has been completed for canister 25P2.

A review was made of sample of canister lower head to shell circumferential seam radiographs with Mr. A. Frevold, Bechtel PQAR, R. T. Level II. Radiographs of weld #3, for canisters 19P1, 38P2 and 49P1 were reviewed in accordance with PTL procedure QC-RT-1, revision 13, approved by Bechtel, with the following questionable linear indications observed.

The radiographs of these three welds exhibited, in certain views, suspect linear indications normally of the type associated with discontinuities in the root pass of the weld. Unfortunately, due to the geometric configuration of these canisters, visual examination of the I. D. surface of these welds is impossible. At this time, Mr. L. Ludwig, NES QA Manager and Mr. R. Dovicsak, PTL R. T. Level III produced a sectioned specimen of a weldment which is essentially identical to the lower head to shell circumferential weld in question. Visual examination of the specimen weld I.D. performed by the writer and Mr. Frevold revealed internal convexity and bead rollover which appeared in the sample radiograph of this specimen as linear indications of a similar type as those observed in the actual circumferential seam radiographs in question. Based on this review, the following suggestions were made by the writer to the Bechtel, NES, and PTL representatives.

1. Archive this sample specimen and its radiograph.

2. Prepare technique sheet and reader sheet for this sample radiograph.

3. NES/PTL must prepare a generic R. T. procedure supplement, for Bechtel review and approval, describing the aforementioned specimen, its radiograph, visual examination of the specimen weld I.D., and subsequent film interpretation as well as the specimen radiographs' relationship to the actual canister circumferential seam weldments.

4. Review actual canister circumferential seam weldment R. T. reader sheets to note internal convexity and bead rollover, as applicable.

It should be noted that resolution of this problem is a prerequisite for shipment of these canisters.

The following additional information was obtained and/or discussed during this surveillance visit.

1. Mr. A. Smith's surveillance activities are now being supported by Bechtel PQAR Mr. J. Garner on a temporary basis, as required by the workload at NES.

2. The writer was advised that the recent ASME survey conducted at NES resulted in no findings being issued, and all ASME stamps in NES' possession being renewed.

3. The transfer of materials for the thirty (30) fuel canisters from NES to J. Oat is in progress. (See the writers surveillance report #TMI-2/1/8510102 for the details of the ASME code problem for the lower head sub-assemblies for these canisters.)

4. The following is a brief status of the ongoing Bechtel Material Verification Audits at NES.

- Rack #2 - essentially complete and acceptable. Rack shipment is scheduled for August 19, 1985.
- Shields/Collars/Trolley - 90% complete. A list of open items has been presented to NES for response.

- o Canister material still to be transferred to J. Oat (for thirty fuel canisters only) - essentially complete.

- o First of each type of canisters fabricated at NES - not yet started.

5. J. Oat and B&W Lynchburg have been verbally awarded contracts for additional canisters to be transferred from NES. Firm quantities are not available at this time.

6. Mr. A. Smith, Bechtel PQAR, was advised that based on previous successful hydro-test/integrity testiing of fuel and/or filter canisters, testing of the few canisters tentatively scheduled for the week of August 19, 1985, may be witnessed by Bechtel without GPUN/QA participation. However, Bechtel is still obligated to notify GPUN/QA for witness of final inspection of any canisters and any testing <u>after</u> week of August 19, 1985.

0652N/11

Nuclear

GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054-114
(201) 263-6500
TELEX 136-482
Writer's Direct Dial Number:
201-299-2026

August 7, 1985
6170-85-507

Bechtel North American Power Corporation
15740 Shady Grove Road
Gaithersburg, MD 20877-154

Attention: Mr. Larry McAnallen
Location 2A4

SUBJECT: GPUN-QA SURVEILLANCE PARTICIPATION
TMI-2 DEFUELING

Gentlemen:

This is to advise that GPUN/QA wishes to be notified of the scheduled start of the following operations at the applicable supplier.

Notification should be as far in advance as possible so GPUN /QA can make arrangements to be present with the Bechtel representative during witnessing of the specified hold point activity.

Supplier	Commodity	Hold Point Operations
Joseph Oat Corporation Camden, NJ	Defueling Canisters	H-2 Pressure Test H-3 Canister Check-out Test H-5 Final Inspection

Note: The GPUN/QA representative will review completed UT reports and accepted radiographic film on the first canister during visit to witness the pressure test. Subsequent review will be at GPUN/QA option.

GPUN/QA reserves the right to add or delete operations to be witnessed. Witnessing of repeat operations after the first operation will be based on first operation results, TMI receipt inspection results or specific requests from GPUN TMI personnel.

Very truly yours,

J. D. Bansch
Supervisor, Surveillance & Controls

JDB:CJP:hm

cc: Attached

GPU NUCLEAR
SURVEILLANCE REPORT

To: T. V. Sarma
Project QA Engineer

Report No. TMI-2/4/8510074 Rev. 0
Date: August 6, 1985 6170-85-506

Supplier: Nuclear Energy Services Site: TMI-2
Address: 101 Swing Road
Greensboro, NC 27409

P.O. No. 016172 C/O No. 0
Spec No. - Rev. No. -

Fabricated at: Same as above.
Address:

PQA No. - B/A No. 220060

Date of Visit: July 29 - August 1,1985 Vendor No. 26106-001

Activity Items:
Defueling Canisters

Personnel Contacted:
A. E. Smith - Bechtel Sr. Quality Rep.
L. Ludwig - NES QA Manager

Purpose of Visit:
Observe Canister Hydro-Testing and review Circumferential Seam Radiographs with Bechtel PQAR.

Summary of Visit:
Witness of one (1) Fuel Canister Hydro-Test and one (1) Filter Canister Hydro-Test and Integrity Test with the Bechtel PQAR were found acceptable. Also, a sample of circumferential seam radiographs previously evaluated by the Bechtel PQAR were reviewed, with the writer concurring with the Bechtel's film interpretation. See body of report for details.

Results of surveillance were X Satisfactory ___ Unsatisfactory

Action Required:
None
No. of Nonconformance Reports Issued None

Final Report Prepared by: D. M. Kierpa 8·7·86
QA Surveillance Rep. Date
D. M. Kierpa

Reviewed by: J. D. Bansch 8/7/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: C J Paczolt 8/7/85
Manufacturing Assurance Manager Date
C. J. Paczolt

Distribution: See attached.

For GPUN use only
Rev. 0
Date
Location All Plants

Rec. No.
RecType 002.03
Form No. 7207.01 3-1
Retention- Lifetime

0247N - 66

DISTRIBUTION - TMI-2

B. W. Alatary - QA Engineering Manager, Corp.
J. E. Kunkel - Director, Procurement Section
L. H. Lilien - Manager, TMI Contracts
J. F. Marsden - QA Engineering Manager
C. T. Schrock - Manager, HQ Procurement Office
J. C. Solakiewicz - QA Engineering & Systems Mgr., OC
J. E. Tietjen - QA Program Receiving Supervisor
Vendor File - For Data Entry/CARIRS-HQ
R. P. Warren - Plant Engineering Director, Acting
B. E. Ballard -Manager, TMI QA Mod./Ops.
D. L. Hosking - Unit 2 QA Project Engineer
N. C. Kazanas - Director, Quality Assurance
D. M. Kierpa - QAE
R. D. Wells - Licensing Engineer, TMI
R. L. Wayne - Manager, QA Design & Procurement

The writer visited NES Manufacturing, Greensboro, North Carolina on July 29 through August 1, 1985. The purpose of this visit was to observe canister hydrotesting and review circumferential seam radiographs with the Bechtel PQAR. Bechtel has the prime responsibility for surveillance for this procurement in accordance with Bechtel QS Plan H-15737-101A (Q) Revision 1.

A review was made of a sample of canister lower head to shell circumferential seam radiographs previously evaluated by Mr. A. Frevold, Bechtel QAR, R.T. Level II. The following radiographs, in accordance with PTL procedure QC-RT-1, Revision 13, approved by Bechtel, were reviewed, with the writer's film interpretation in agreement with that of Bechtel's PQAR, Mr. Frevold.

Canister Type & SN	Weld I.D.	Exposure #	Density	Remarks
Filter-45P2	45P2-RTW-3	0-1	Acceptable	
		1-2	Unacceptable	PTL (NES Subcontractor will reshoot.
		2-3	Unacceptable	" " "
		3-0	Acceptable	
Filter- 140P2	140P2-RTW-3	0-1	Acceptable	
		1-2	Acceptable	
		2-3	Acceptable	
		3-0	Unacceptable	PTL (NES Subcontractor) will reshoot.
Filter-47P1	47P1-RTW-3	0-1 (R-1)	Acceptable	
		1-2 (R-1)	Acceptable	
		2-3	Acceptable	
		3-0	Unacceptable	Linear indication, incomplete penetration. Film rejected. Weld repair and reshoot required.

Additionally, it was verified, by review of traveller signoffs, that the Bechtel radiography review for lower head to shell circumferential seam welds has been completed for the following canisters; 26P2 and 43P1.

The following canister testing operations were witnessed by the writer in conjunction with Bechtel PQAR's R. Ferguson and A. Smith in accordance with the approved procedures noted below and were considered acceptable.

Canister Type & SN	Test	Procedure	Results
Filter-43P1	Hydro-test	NES 84091-HTP-F,Rev.1	Acceptable
Filter-43P1	Integrity Test	Pall Trinity T-652,Rev.D	Acceptable
Fuel-26P2	Hydro-test	NES 84091-HTP-0,Rev.2	Acceptable

All testing was performed using calibrated measuring and test equipment.

Note: Regarding use of "Leak Tec" soap bubble solution asspecified in the aforementioned hydro-testing procedures, the following agreement was reached with NES QC personnel, Bechtel PQAR's, and the writer. Application of the soap bubble solution (for detection of possible leakage if air was entrapped in the canister) on all canister weldments and mechanical connections would occur after the forty-five (45) minute hydro-test "hold" time had elapsed, but while still maintaining a test pressure of 225 PSIG. This sequence of events would eliminate the potential of masking any leakage which might occur during hydrotesting. The writer recommended to Mr. P. Dedlani, Bechtel material verification audit team leader, that Bechtel re-review these procedures for the possible formal incorporation of the aforementioned clarification.

The following additional information was obtained and/or discussed during this surveillance visit.

1. Mr. A. Smith advised the writer that the GPUN/QA technical and editorial comments on the PTL Ultrasonic Test Reports for the canister shell to bulkhead circumferential seam weldments have been incorporated into revised reports. These will be available for review during the next GPUN/QA surveillance visit to NES Manufacturing.

2. The Bechtel material verification audit for Rack #2 (on which fabrication is complete) is currently in progress. Also, the material verification audit for the first of each type defueling canister is scheduled to commence week of August 5, 1985. Mr. P. Dedlani was advised that GPUN/QA wishes to be apprised of the results of these audits prior to the shipment of these items from NES Manufacturing. Additionally, the writer recommended that Mr. Dedlam suspend the Bechtel audit activities at NES during the ASME survey, presently scheduled for August 5-7, 1985. This would allow NES QA/QC personnel to concentrate their efforts on the accomodation of the ASME survey team without any other distractions.

3. Material at NES, designated for transfer to Joseph Oat for thirty (30) fuel canisters, is currently being readied for shipment.

4. NES commitment to increase their QA/QC staff at this facility has been met by the assignment of two QA Engineers and four additional QC Inspectors from their Danbury office.

5. The writer was advised by PQAR Mr. A. Smith that effective Friday, August 2, 1986, his full-time surveillance support at NES from PQAR Mr. R. Ferguson will be terminated. The writer expressed concern at this reduction of Bechtel surveillance personnel at NES in light of the fact that the actual in process fabrication and inspection/testing activities during this surveillance visit were extensive and potential PQAR support of the Material Verification Audit Team could impact on time available to perform actual surveillance activities. Mr. L. McAnallen, Bechtel Project Surveillance Coordinator advised the writer via telecon on August 1, 1985, that although Mr. Ferguson would no longer be in residence at NES, Mr. Smith would continue to be supported on an "as needed" basis by Mr. A. Frevold for R.T. film review.

6. Based on a request from Mr. L. McAnallen, the following is a restatement of GPUN/QA holdpoints for the defueling canisters at NES Manufacturing.

Reference: Quality Surveillance Plan #15737-027 (101AQ)

Surveillance Activity

H-3 Pressure Test - each canister type - 1st operation plus 20% of remaining units.

H-4 Canister Checkout Test - filter canister. 1st operation plus 20% of remaining units.

H-7 Final Inspection - each canister.

Notification should be as far in advance as possible so GPUN/QA can make arrangements to be present with the Bechtel representative during witnessing of the specified hold point activity.

GPUN/QA reserves the right to add or delete operations to be witnessed. Witnessing of repeat operations after first operation will be based on first operation results, TMI Receipt Inspection results or specific requests from GPUN TMI personnel.

GPU Nuclear

GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054-1149
(201) 263-6500
TELEX 136-482
Writer's Direct Dial Number:

201-299-2025

July 16, 1985
6170-85-456

Bechtel North American Power Corporation
15740 Shady Grove Road
Gaithersburg, MD 20877-154

Attention: Mr. T. V. Sarma, Project QA Engineer
Location 2D4

Gentlemen:

SUBJECT: GPUN/QA SURVEILLANCE REPORT TMI-2/3/8510074
NUCLEAR ENERGY SERVICES, GREENSBORO, NORTH CAROLINA

Enclosed please find a copy of the subject surveillance report for your action and record.

As stated in the report GPUN/QA would like a copy (for information) of the Bechtel surveillance of July 5, 1985, describing Mr. Frevold's radiographic film review of canister circumferential seam welds at NES.

If you have any questions on the above or the report, please feel free to contact the undersigned at your convenience.

Very truly yours,

John D Bansch

John D. Bansch
Supervisor, Surveillance & Controls

CJP

JDB:DMK:CJP:hm

Attachments

0540N/1

GPU NUCLEAR
SURVEILLANCE REPORT

To: T. V. Sarma
Project QA Engineer

Report No. TMI-2/3/8510074 Rev. 0
Date: July 12, 1985 6170-85-454

Supplier: Nuclear Energy Services Site: TMI-2
Address: 101 Swing Road
Greensboro, NC 27409

P.O. No. 016172 C/O No. 0
Spec No. - Rev. No. -

Fabricated at: Same as above.
Address:

PQA No. - B/A No. 220060

Date of Visit: July 8-10, 1985 Vendor No. 26106-001

Activity Items:
Defueling Canisters

Personnel Contacted:
A. E. Smith - Bechtel Sr. Quality Rep.
L. Ludwig - NES QA Manager

Purpose of Visit:
Observe Canister Hydro-testing with Bechtel PQAR. Review Bechtel/NES responses to QA related concerns noted in the writers previous surveillance report of June 19, 1985.

Summary of Visit:
Canister hydro-testing was postponed due to problems with the canister circumferential seam radiographs. Bechtel/NES responses to previously reported QA related concerns were reviewed and discussed. A brief status of canister storage racks, transfer shield, and collars was also obtained. See body of report for details.

Results of surveillance were __ Satisfactory X Unsatisfactory

Action Required:
By Bechtel - Provide, for GPUN/QA information, a copy of the Bechtel surveillance report of July 5, 1985, describing Mr. Frevold's radiographic film review of canister circumferential seam welds at NES.

No. of Nonconformance Reports Issued None

Final Report Prepared by: D. M. Kierpa 7.12.85
QA Surveillance Rep. Date
D. M. Kierpa

Reviewed by: C J Paczolt for 7/12/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: C J Paczolt 7/12/85
Manufacturing Assurance Manager Date
C. J. Paczolt

Distribution: See attached.

For GPUN use only
Rev. 0
Date
Location All Plants

Rec. No.
RecType 002.03
Form No. 7207.01 3-1
Retention- Lifetime

0247N/49

The writer visited Nuclear Energy Services (NES), Greensboro, North Carolina on July 8-10, 1985. The purpose of this visit was to observe canister hydro-testing and review Bechtel/NES responses to QA-related concerns noted in the writer's previous surveillance report of June 19, 1985. Bechtel has the prime responsibility for surveillance for this procurement in accordance with Bechtel QS Plan H-15737-101 A (Q) Revision 1.

Hydro-testing of the canisters scheduled for this surveillance visit was postponed due to the following reasons. As noted in the writer's surveillance report of June 19, 1985, numerous problems appeared to exist regarding the canister circumferential seam radiographs. These problems were investigated by Bechtel during their formal R. T. film review, conducted by Mr. A. Frevold, Bechtel, R.T. Level II, on July 5, 1985. The following is a summary of problems detected by Mr. Frevold and those previously noted by the writer.

1. Radiographs are not sorted or filed by weld.

2. Radiographic reports are not issued by weld.

3. Repairs are not traceable to original reports and/or radiographs.

4. Conam (NES' NDE subcontractor) R. T. procedure is not approved by Bechtel, with the following Conam R. T. report problems noted.

- Lack of signature and identification of radiographer.

- Shooting sketch not included with report.

- Exposure data and material identification missing.

- Reference to acceptance/rejection criteria is confusing

- Penetrameter placement is questionable.

5. PTL (NES' other NDE subcontractor) R. T. procedure has been approved by Bechtel. However, the same problems as noted in item 1 through 4 above exit on the PTL circumferential seam radiographs.

6. R. T. location marker are "ink marked" on the canisters. Permanent R. T. location markers (either etched or stamped) are required.

7. NES has not addressed the subject of code nameplate stamping for NDE requirements; i.e., "R. T." would not represent the actual NDE performed on the canister.

8. No one individual at NES is in control of the subcontracted radiographic operations, with no evidence available indicating that NES has reviewed the film and reports to verify uniformity and procedural compliance, prior to presentation to Bechtel for review.

A meeting was held regarding circumferential seam NDE problems (both U.T. and R.T.) on Tuesday, July 9, 1985, with the following personnel in attendance.

D. M. Kierpa	GPUN/QA
A. E. Smith	Bechtel Sr. QAR
L. Ludwig	NES QA Manager
F. Sugar	NES G. M. (part-time attendance)
R. Doviscak	P.T.L. R.T. and U.T. Level III.

1. NES/PTL agreed to revise U.T. report for canister circumferential seam welds (shell to bulk head weld) in accordance with GPUN/Bechtel comments.

2. NES will delegate responsibility for all radiography to P.T. L. P.T.L. will reshoot, after receiving formal authorization from NES, all circumferential seam radiographs previously shot by Conam. This would be accomplished using the P.T.L. procedure and certified personnel previously reviewed and approved by Bechtel. P.T. L. will also file, colate, and organize all reports and film, filing radiographs for one weld per envelope, one weld per report, and assuring traceability to the specific weld seam through the use of permanent R.T. location markers.

3. NES will seek clarification from Bechtel as to correct code nameplate stamping relative to NDE requirements.

4. At this time, the writer advised Bechtel and NES personnel that GPUN/QA would review a sample of these radiographs after Bechtel acceptance at NES prior to shipment of these canisters.

NOTE: The writer was advised via telecon from Mr. P. Bradbury, Bechtel Task Manager, on July 9, 1985, that per his conversations with our Mr. B. Ballard, inclusion of a set of radiographs in the documentation package to be sent with canister shipment would not be required, making double loading of film cassettes unnecessary. Alternate means for GPUN to obtain these radiographs at a later date are now being investigated.

The following additional QA-related information was obtained regarding the canisters at NES.

1. Continuation of USNRC inspection at NES, originally scheduled for week of July 8, 1985, has been postponed, with no new date presently established.

2. NES' "U" stamp certificate of authorization expires on August 9, 1985. The required ASME re-survey is presently scheduled for week of August 4, 1985.

3. The writer accompanied Mr. A. Smith, Bechtel PQAR to observe his inprocess visual examination of several canisters in various stages of fabrication in the NES outside yard. The following surface condition was observed.

On seven (7) of the fifteen (15) canisters examined, extensive areas of rust exist on the circumference of the straight flange section of the lower head, type 304L, stainless steel material adjacent to the circumferential seam weld. Mr. Smith will document this condition in his next surveillance report, and verbally advise Bechtel MQS personnel at the Gaithersburg office as soon as possible.

During this surveillance visit, the writer obtained the following brief status of the balance of GPUN/Bechtel orders at NES. TP-007954 C/N 008. Bechtel Quality Surveillance Plan #5737-2C-406 (Q), Fuel Canister Storage Racks. Rack # 84-075-01 is essentially complete. However, a Bechtel QSDR (Quality Surveillance Deficiency Report) issued relative to sub-standard weld quality and workmanship is still open. Resolution and close-out of the QSDR is a pre-requisite to shipment of this rack.

Also, the Bechtel material verification audit in progress for the racks, with problem areas was detected relative to completion of required liquid penetrant examinations. Completion of this audit and close-out of the previous Bechtel audit finding is still outstanding.

TC-016180 C/N 001. Bechtel Quality Surveillance Plan # 15737-2M-067 (N). Canister transfer shields and collars. Load testing of the handling trolley is presently scheduled for July 11, 1985. This test will be witnessed by the Bechtel PQAR, and will be performed in accordance with NES Procedure 83A1595, Revision 0, entitled "TMI-2 Canister Handling Trolley Load Test Procedure." This procedure has been approved by Bechtel. Also, the writer observed, in conjunction with the Bechtel PQAR, the following liquid penetrant examination.

TRANSFER SHIELD OUTER WALL ASSEMBLY, FLANGE TO SHELL WELD
NES TRAVELLER #004157, P/N 83E1604-2-901
NES PROCEDURE QIP-PT-V, REVISION 0, WITH SUPPLEMENT 85008 P.T., REVISION A - approved by Bechtel.

The results of this examination were acceptable, with P.T. material and personnel certifications previously reviewed and found acceptable by Bechtel.

It should be noted that the surveillance effort of Mr. A. Smith, resident PQAR at NES, is now being supported by additional Bechtel PQAR personnel. Mr. R. Ferguson has now been assigned to temporary residency at NES. Also, Mr. A. Frevold, an R. T. Level II PQAR based in the Charlotte area, will provide further assistance in the area of R. T. film review when required.

Nuclear

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100 Interpace Parkway
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(201) 263-6500
TELEX 136-482
Writer's Direct Dial Number:

201-299-2026

June 20, 1985
6170-85-404

Bechtel North American Power Corporation
15740 Shady Grove Road
Gaithersberg, MD 20877-154

Attention: Mr.T. V. Sarma, Project QA Engineer
Location - 2D4

Subject: GPUN QA Surveillance Report #TMI-2/2/8510074
Nuclear Energy Services, Greensboro, NC 6-10, 6-14-85

Gentlemen:

Enclosed please find a copy of the subject surveillance report for action and record.

As stated in the report results of the surveillance were unsatisfactory.

GPUN - QA requires your written response describing disposition and corrective action taken or planned.

Upper QA Management of GPUN has discussed these problems with Bechtel Project Management and has requested submittal of a corrective action plan.

Very truly yours,

John D. Bansch

John D. Bansch
Supervisor - Surveillance and Controls

CJP

JDB:CJP:DMK:rws

0503N/1

DISTRIBUTION - TMI-2

B. W. Alatary - QA Engineering Manager, Corp.
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J. E. Tietjen - QA Program Receiving Supervisor
Vendor File - For Data Entry/CARIRS-HQ
R. P. Warren - Plant Engineering Director, Acting
D. M. Kierpa - QAE
J. D. Bansch - Supervisor, Surveillance & Controls

To: T. V. Sarma
Project QA Engineer

Report No. TMI-2/2/8510074 Rev. 0
Date: June 19, 1985

Supplier: Nuclear Energy Services
Address: 101 Swing Road
Greensboro, NC 27409

Site: TMI -2

P.O. No. 016?72 C/O No. 0
Spec No. Rev. No.

Fabricated at: Same as above
Address:

PQA No. B/A No. 220060

Date of Visit: June 10-14, 1985 Vendor No. 26106-001

Activity Items:
Defueling Canisters

Personnel Contacted:
See Attachment

Purpose of Visit:
Observe canister hydro-testing and integrity testing with Bechtel PQAR. Review NDE results of canister circumferential welds.

Summary of Visit:
This surveillance visit revealed numerous QA related problems in the areas of NDE and hydro-testing. Also a USNRC inspection conducted concurrently with the writers surveillance visit revealed numerous NES and Bechtel QA deficiencies as described in an inspection status meeting of June 14, 1985.

Results of surveillance were ___ Satisfactory x Unsatisfactory

Action Required:
Bechtel action items are delineated in the body of this report.

No. of Nonconformance Reports Issued None

Final Report Prepared by: John D. Bansch for D.M.K. 6/20/85
QA Surveillance Rep. Date
D.M. Kierpa

Reviewed by: John D. Bansch 6/20/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: C. J. Paczolt 6/21/85
Manufacturing Assurance Manager Date
C. J. Paczolt

Distribution: See attached.

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Rec. No.
RecType 002.03
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Retention- Lifetime

0503N/3

DISTRIBUTION - TMI-2

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L. H. Lilien - Manager, TMI Contracts
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C. T. Schrock - Manager, HQ Procurement Office
J. C. Solakiewicz - QA Engineering & Systems Mgr., OC
J. E. Tietjen - QA Program Receiving Supervisor
Vendor File - For Data Entry/CARIRS-HQ
R. P. Warren - Plant Engineering Director, Acting
D. Hosking - Unit 2 Project QA Engineer
N. C. Kazanas - Director, Quality Assurance
B. E. Ballard - Manager, QA Mod./Ops., TMI

0503N/4

The writer visited Nuclear Energy Services (NES), Greensboro, NC on June 10-14, 1985. The purpose of this visit was to observe canister hydro-testing and integrity testing and review NDE results of canister circumferential welds in conjunction with Bechtel's QA representative, Mr. A Smith. Bechtel has the prime responsibility for surveillance for this procurement in accordance with Bechtel QS Plan #15737-101A(Q) rev. 1.

The following QA related problems in the area of NDE and hydro-testing were identified during this visit. These problems were reviewed at length during meetings conducted with the following Bechtel personnel;

A.E. Smith	SR. QAR (resident at NES)
A.N. Frevold	QAR (substituted for Mr. Smith during his one (1) day vacation.)
L.J. McAnallen	PSQS
T.I. Gillespie	QA Mgr., Projects

I. The writer's review of Pittsburgh Testing Laboratory's U.T. report for examination of the fuel canister circumferential closing seam revealed the following areas of concern. (Note: PTL is NES's NDE sub-contractor.)

- The sketch provided does not adequately represent the complexity of this weld joint or define examination starting point
- The "special note" describing joint geometry and configuration requires clarification and more precise terminology.
- Equipment identification, including transducer size and angle are misleading and in some cases, in error.
- Test parameters for straight beam examination are vague.
- Calibration block description is inadequate.

In general the inadequacies of this report in its present form would make repeatability of this examination impossible and raised doubts as to the validity and Code compliance of the examination. It should be noted that the NRC NDE consultant, Mr. J. Holm, concurred with these concerns.

BECHTEL RESPONSE: The Bechtel representatives concurred, in general with the writers concerns, and scheduled a meeting with the PTL/U.T Level III, Mr. R. Dovicsak to provide clarification. During this meeting, Mr. Dovicsak agreed to revise and reformat this U.T. report to address all of the aforementioned concerns, if he receives NES authorization to do so. It should be noted that based on conversations with Mr. Dovicsak and proposed report revisions, I feel more confident that this U.T. examination meets code and contract requirements. Also, Bechtel will continue to witness these U.T. examinations. Bechtel was further advised that the revised U.T. reports would be reviewed by GPUN during our next visit to NES.

II. The writers review of the status of R.T. of canister circumferential seams revealed the following problems:

- Visual examination of the canisters revealed a lack of circumferential seam identification marking of any kind. This marking is essential to maintaining R.T. film to weld seam traceability.

- R.T. location markers were "ink marked" on the canisters. Code requires permanent location markings, either etched or stamped.

- Apparently, some of this sub-contracted R.T. has been performed by PTL with the balance performed by Conam. (Approximately ten canisters' circumferential seams have been radiographed.) At the present time, only PTL's R.T. procedure has been approved by Bechtel with NDE personnel certifications also reviewed. Conam's R. T. procedure is unavailable and not submitted to Bechtel for approval. Also, NDE personnel certifications for Conam personnel have not been reviewed by Bechtel. Based on "ink marked" location markers being located on the head side of the circumferential seam for Conam radiographs and on the shell side of the circumferential seam for PTL radiographs, it appears as if a different R. T. technique may have been used.

- To date, no circumferential seam radiographs have been reviewed by Bechtel. It is the writer's opinion that since the Bechtel representative has been in residency at NES for many months, R.T. film should be reviewed as soon as possible after the completion of the radiography. Should Bechtel's review of this film now require weld repair or reshoot for incorrect techniques, this would be difficult, if not impossible.

- At the present time, NES has not addressed the subject of Code nameplate stamping for NDE requirements, (i.e., "R.T." would not represent the actual NDE performed on each canister).

BECHTEL RESPONSE: Bechtel acknowledges that R.T. film review prior to hydro-test and installation of internals would be preferred. However, due to late receipt of a densitometer by NES, lack of permanent marking of location markings on shells, film has not yet been reviewed.

III. The writer witnessed "attempted" hydro-testing of filter canister s/n 140.P2. The following problems were encountered;

- Range of pressure gauge was not in accordance with NES approved hydro-test procedure. This procedure requires a 0-500 PSIG gauge, while in actuality, a 0-600 PSIG gauge was used.

- Hydro-test water analysis per Bechtel specification requirements has not yet been received by NES. However, this filter hydro-test was allowed to proceed.

- NES hydro-test procedure, approved by Bechtel, requires the canister to be pressurized to 225 PSIG and held for 30 minutes. After several attempts, this pressure was unable to be maintained for thirty minutes. Approximately 4-5 PSIG pressure drop was noted. This was probably caused by air being trapped in the canister.

BECHTEL RESPONSE: - NES hydro-test procedure will be revised to reflect the actual gauge used during the test. This procedure will be resubmitted to Bechtel for approval.

Bechtel recognizes that water sample analysis should gave been completed prior to hydro-test. However, since the one canister was already filled with water before it was realized that water analysis was incomplete, the test was allowed to proceed.

IV. Upon reviewing the Bechtel specification which delineates documentation to be included with shipment, it was noted that only radiographic reader sheets are required, and not the actual film. Bechtel was advised to clarify this requirement with GPUN, to determine whether or not the R.T. film is actually required to be included with the shipment.

V. Approximately sixty(60) Supplier Deviation Disposition Requests (SDDR's) have been issued to date on this contract. Bechtel has previously been advised of GPUN's concerns over excessive SDDR's issued to NES.

Concurrent with this surveillance visit, a USNRC inspection of NES was being conducted. The writer attended a meeting on June 14, 1985 at which time the NRC presented the status of their inspection activities completed to date, and provided a tentative schedule for the completion of their inspection (a roster of meeting attendance is attached to this report).

The following is a brief summary of NRC concerns presented at this status meeting:

- NES housekeeping, materials cleaning, storage and handling are inadequate. Specific examples are, end caps missing from pipe, materials stored unprotected outside, damaged poison tubes, etc.

- Lack of material traceability for non pressure parts such as baffels and skirts.

- Lack of segregation and/or tagging of non-conforming materials.

- R.T. review of longitudinal seams of Bechtel supplied pipe manufactured by Armco revealed possible traceability problems between the radiographs and the actual pipe welds. Also, it appears that repairs have been made to the longitudinal seam welds and are not noted on the film or the reader sheets. The writer and the Bechtel QAR were asked to review the film in question and concurred that a problem does appear to exist which requires more investigation. NRC will complete their review of this film on June 15-16, 1985.

- An uncontrolled procedure supplement for poison tube loading/marking is in use in the plant. Additionally, this document, marked "sample" has the Bechtel QAR's signature written on the forms by an NES employee.

- NES evaluation of suppliers has been inadequate, or in some cases not performed.

- NES has not been performing detailed receipt inspection of Bechtel supplied material.

- Bechtel evaluation of suppliers, such as Armco, appears to be inadequate.

- Welding is not being performed inaccordance with approved welding procedures, Specifically, voltages observed were outside of the parameters specified in the welding procedure specification.

The NRC indicated that this inspection would continue at NES in approximately two weeks, with an inspection team spending another week at the facility.

GPU Nuclear

GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054-1149
(201) 263-6500
TELEX 136-482
Writer's Direct Dial Number:

201-299-2026

May 1, 1985
6170-85-287

Bechtel North American Power Corporation
15740 Shady Grove Road
Gaithersburg, Maryland 20877-154

Attention: T. V. Sarma, Project QA Engineer
Location 204

Gentlemen:

SUBJECT: GPUN/QA SURVEILLANCE REPORT #TMI-2/1/8510074
NUCLEAR ENERGY SERVICES, GREENSBORO, N.C. APRIL 18, 1985

Enclosed please find a copy of subject surveillance report for your information and record.

The pressure test operation originally scheduled by NES was not performed due to fabrication and welding problems related to the circumferential shell to bulkhead welds.

GPUN/QA representative will review items listed in the report during next visit to witness the pressure test operation.

Very truly yours,

John P Bansch

J. D. Bansch
Supervisor, Surveillance & Controls

CJP

JDB:CJP:hm

Attachments

0405N/1N

GPU NUCLEAR
SURVEILLANCE REPORT

To: T. V. Sarma
Project QA Engineer

Report No. TMI-2/1/8510074 Rev. -
Date: April 25, 1985

Supplier: Nuclear Energy Services Site: TMI-2
Address: 101 Swing Road
Greensboro, NC 27409 P.O. No. TC-016072 C/O No. 0
Spec No. - Rev. No.

Fabricated at: Same as Above.
Address: PQA No. - B/A No. 220060

Date of Visit: April 18-19, 1985 Vendor No. 26106-001

Activity Items:
Defueling Canisters

Personnel Contacted:
A. E. Smith - Bechtel Sr. Quality Rep.
R. C. Himmelspach - Bechtel Area Supv.
T. Harmon - NES Project Engineer

Purpose of Visit:
Perform interim surveillance activities on Defueling Canisters with Bechtel QA Representative.

Summary of Visit:
This surveillance visit revealed numerous QA related problems in fabrication, NDE, welding, and procedures. See body of report for details.

Results of surveillance were ___ Satisfactory X Unsatisfactory

Action Required:
By NES... - Develop a plan for the successful NDE of the Fuel Canister Shell to bulkhead circumferential seam which will meet contract and code requirements.
By Bechtel... - Formally evaluate the need for a procedure for installation and inspection of the fuel canister cement type lining. Provide an explanation for the inordinately high number of SDDR's thirty-two (32) issued to date.

No. of Nonconformance Reports Issued None

Final Report Prepared by: D. M. Kiepa 4.25.85
QA Surveillance Rep. Date
D. M. Kiepa

Reviewed by: John D. Bansch 4/25/85
GPUN - Supv. Surveillance & Controls Date
J. D. Bansch

Concurrence: R. J. Bl... 4/26/85
Manufacturing Assurance Manager Date
for C. J. Paczolt

Distribution: See attached.

For GPUN use only
Rev. 0
Date
Location All Plants
0247N/71

Rec. No.
RecType 002.03
Form No. 7207.01 3-1
Retention- Lifetime

DISTRIBUTION - TMI-2

B. W. Alatary - QA Engineering Manager, Corp.
J. E. Kunkel - Director; Procurement Section
L. H. Lilien - Manager, TMI Contracts
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C. T. Schrock - Manager, HQ Procurement Office
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J. E. Tietjen - QA Program Receiving Supervisor
Vendor File - For Data Entry/CARIRS-HQ
R. P. Warren - Plant Engineering Director, Acting
D. Hosking - TMI-2 QA Engineer
D. M. Kierpa - QAE
J. D. Bansch - Supervisor, Surveillance & Controls

The writer visited Nuclear Energy Services (NES), Greensboro, North Carolina on April 18-19, 1985. The purpose of this visit was to observe various interim surveillance activities on the defueling canisters for Three Mile Island, Unit Two in conjunction with Bechtel's QA representative, Mr. A. Smith. Bechtel has the prime responsibility for surveillance for this procurement.

Upon arrival at NES, the writer met with Mr.A. Smith, Bechtel QAR. Mr. Smith has been in residency at NES throughout fabrication and testing completed thusfar, for a time period of approximately four months. The major items on this order are, seventy-seven (77) fuel canisters, thirty-nine (39) filter canisters, and one hundred and thirty-four (134) knock down canisters. Mr. Smith maintains complete surveillance files for this order, containing all available documents, reports, welding procedures, NDE procedures and certifications, and drawing and procedure approvals. The required surveillance activities applicable to this order are outlined in Bechtel Q.S. Plan #15737-2M -101A(Q).

Based on discussions with Mr. Smith and the writer's own observations and reviews, the following QA related problems were identified.

1. For the first five (5) fuel canisters, preliminary "information only" radiographs of the shell to bulkhead circumferential seam welds revealed incomplete penetration and lack of fusion, with these welds to be completely ground out and rewelded in their entirety. Also, on one of these canisters, radiography of the shell to/lower head circumferential seam weld revealed a temporary fixture plate had been inadvertantly left in the vessel by NES. This circumferential seam weld will be ground out, with the plate removed, and the seam rewelded.

2. At the present time, there is no firm plan in effect by NES for the successful NDE of the fuel canister shell to bulkhead circumferential seam. It appears that complete coverage of this seam using radiographic examination is impossible due to internal configuration and cement lining. Also, ultrasonic examination of this seam will be extremely difficult due to the same reasons.

3. There is no NES procedure in effect for the installation and inspection of the cement type lining for the fuel canisters. For the first five (5) canisters, it appears that no environmental parameters were checked or recorded during cement pouring, Also, there are no provisions for inspection of the lining for voids or cracks.

4. To date, Mr. Smith has issued thirty-two (32) Supplier Deviation Disposition Requests (SDDR's) on this contract. Considering that fabrication on this contract is less than 30% complete, this seems to be an inordinately high number.

At the conclusion of this surveillance visit, a brief meeting was held with Mr. Smith and Mr. R. Himmelspach, Bechtel's Area Supervisor, to discuss these aforementioned concerns. Based on this discussion, the following actions are required.

By NES... - Develop a plan for the successful NDE of the fuel canister shell to bulkhead circumferential seam which will meet contract and code requirements.

By Bechtel... - Formally evaluate the need for a procedure for installation and inspection of the fuel canister cement type lining. Provide an explanation for the inordinately high number of SDDR's, thirty-two (32) issued to date.

0247N/73

ATTACHMENT 5
(4410-85-L-0210)
18 Pages

Bechtel North American Power Corporation

Engineers — Constructors

15740 Shady Grove Road
Gaithersburg, Maryland 20877-1454
301--258-3000

May 6, 1985

Mr. F. Sugar
General Manager
NES Manufacturing
100 Swing Road
Greensboro, NC 27409

Dear Mr. Sugar:

TMI-2 Project, Job No. 15737
BNAPC/GPUN QA Audit No. NES-85-02
File: 15737-85-031

Enclosed for your information and action is the report for the subject audit conducted at NES Manufacturing, Greensboro, NC, facility during April 23-24, 1985.

Three Quality Assurance Findings (QAFs) were written to document deficient conditions noted during the audit in the areas of material control, inspection personnel qualification, and calibration and control of inspection equipment. These deficiencies indicated a breakdown of NES Manufacturing QA Program implementation. As a result of this conclusion, shipments of Defueling Canisters or Canister Storage Racks were put on hold until such time as all corrective actions in the deficient areas were completed by NES Manufacturing. This action was discussed with you during the post audit conference held on April 24, 1985.

You are requested to provide your corrective action responses by completing the "Action Taken" section of each QAF on or before June 1, 1985.

Please be advised that the "Hold" on shipment will be released after satisfactory verification of the completed corrective actions.

Please extend our appreciation to all cognizant individuals for the courtesies and cooperation extended to the audit team during the course of the audit.

If you have any questions, please contact us.

Very truly yours,

T. I. Gillespie

T. I. Gillespie
QA Manager, Projects

RECEIVED
MAY 08 1985
TMI-2
Bechtel Job 15737

TIG:TVS:kc

Enclosure: As Stated

cc: Mr. L. Ludwig w/1

Bechtel North American Power Corporation

bcc:	S. A. Bernsen	w/1
	R. L. Rider	w/1
	W. H. Linton	w/1
	H. J. Porter	w/1
	P. Bradbury	w/1
	L. J. McAnallen	w/1
	W. W. Perry	w/1
	J. W. Brothers	w/1
	T. V. Sarma	w/1
	W. G. Heysek	w/1
	A. Stowe	w/1
	A. Smith, PSQD	w/1
	S. Heisler/M. Melandin	w/1

THREE MILE ISLAND NUCLEAR STATION
UNIT 2
QUALITY ASSURANCE DEPARTMENT
PROCEDURES MANUAL

QUALITY ASSURANCE PROGRAM
PROJECT AUDIT REPORT

PROJECT NAME & NO. TMI-2 AUDIT NO. NES-85-02 AUDIT DATE 4/23-24/85

AUDITOR T. V. Sarma (ATL)
W. C. Gund
W. D. County (GPUN

TYPE OF AUDIT

☐ ENGINEERING ☐ CONSTRUCTION ☒ OTHER (NES Manufacturing)

INDIVIDUALS CONTACTED
(NAME & TITLE)

See Audit Administrative Data

DESCRIPTION & SCOPE OF AUDIT

See Page 1

SUMMARY OF DEFICIENCIES NOTED

Three Quality Assurance Findings were written to document deficiencies in the following areas:

1. Two inspectors performing NDE have not been certified by NES Manufacturing.
2. Nonconforming items were not identified with status indicating tags. Also, they are not documented on nonconformance reports.
3. Calibration control of tools and gages was found deficient in that removal of inspection equipment was not being logged.

DISTRIBUTION	INFO	ACTION	ATTACHED QAF NOS.
L. Ludwig S. A. Bernsen W. H. Linton R. L. Rider H. J. Porter W. Heysek Audit Team Members		X	QAF Nos. 1, 2, & 3

AUDITOR	DATE	PQAM/PQAE	DATE
TVSarma	5/6/85	T. J. Gillespie	5/6/85

1.0 DESCRIPTION AND SCOPE OF AUDIT

BNAPC and GPUN QA performed a joint audit of NES Manufacturing, Greensboro, NC facility during April 23-24, 1985. The audit scope included verification of the implementation of the NES/Selamco Nuclear Quality Assurance Program and associated procedures in the manufacture of Defueling Canisters, Fuel Storage Canister Racks and Canister Handling Trolleys.

At the start of the audit, a tour of the manufacturing facility was undertaken by the audit team to become familiar with the fabrication process and obtain the status of operations associated with the tasks within the scope of this audit.

2.0 DETAILS OF THE AUDIT

During the pre-audit meeting and subsequent discussions the audit team learned that in the recent past there have been some organizational and personnel changes. The current QA Manager, Mr. Lon Ludwig was relocated from NES, Danbury, CT, a few days prior to this audit.

2.1 Procurement Control:

NES Policy/Procedure MC-03, dated 10/83, governs the preparation, processing, placement of purchase orders issued by NES Manufacturing, Greensboro, NC. To verify compliance to the subject procedure six purchase orders applicable to TMI-2 project were reviewed.

The purchase orders were:

1. NES Job No. 85008 - Canister Handling Trolleys

P.O.	Item	Supplier
4564	Shield Castings	O.G. Kelley Inc.
4588	SS Pipe	Keystone

2. NES Job No. 84075 - Canister Storage Racks

P.O.	Item	Supplier
4333	SS Bar Stock	Carolina Steel
4045	Aluminum Alloy Pipe	Ryerson Steel

3. NES Job No. 84091 - Defueling Canisters

P.O.	Item	Supplier
4302	SS Tubing	Keystone
4322	O-Ring Seals	Carolina Gasket

All of the purchase orders were identified as being required to be placed with approved suppliers with the exception of P.O. 4322 which was for the purchase of buna O-ring seals, a commercial grade item. The latest computerized "Qualified Source List" dated 2/16/85 was reviewed to see if the suppliers for the other purchase orders were

on the list. They were all on the "Qualified Source List" with the exception of O. G. Kelley, supplier of lead shield castings. Discussions, however, revealed that O. G. Kelley was audited by NES personnel on 2/11/85 and found acceptable and recommended for placement on the "Qualified Source List". Audit of O. G. Kelley was verified by the auditors.

In addition to the above, the purchase orders were reviewed for:

- o Identification of Inspection Requirements
- o Identification of Documentation Requirements
- o Imposing Part 21 if Applicable
- o Completeness of Entries
- o Proper Usage of Purchase Order Change Notices

A purchase order log, required to be maintained by the subject procedure was also reviewed.

No deficiencies were identified in the area of procurement document control.

2.2 Material Control

2.2.1 Shop Travelers

2.2.1.1 The basic document used by NES in accomplishing manufacturing and quality activities is identified as Manufacturing Plan and Quality Record (MPQR). The MPQRs are preprinted forms to reflect different types of shop travelers. There are essentially two types of travelers: Detail Traveler and Assembly Traveler. Detail Travelers are used for parts and Assembly Travelers are used for subassemblies and final assemblies. The preparation, processing and control of travelers is covered by NES/Salamco Procedure No. ME-04. To verify the requirements of the procedure and adequacy of the system the following Travelers were reviewed:

Canister Assembly Traveler No. 003815
Canister Assembly Traveler W.O. No: 8409123-01
Canister Assembly Traveler W.O. No: 8409123-05
Canister Assembly Traveler W.O. No: 8409123-06
Canister Assembly Traveler W.O. No: 8409123-08
Fuel Rack - Type 1 Assembly Traveler: 003747

The above referenced travelers were in various completion stages. Also, each Assembly Traveler was made up of several Detailed Travelers representing various parts, the required operations along with QC inspection points, and client hold points. Each of them was verified to have been reviewed/ approved by

Quality Assurance prior to issuance of the traveler. In the case of travelers associated with Canisters the Authorized Inspector's signatures were obtained. Also, upon completion of the item Quality Engineering reviews the traveler for completeness. All but two of the Detail Travelers were verified to have been reviewed by Quality Engineering. These were considered to be isolated cases.

2.2.1.2 While reviewing Canister Assembly Traveler 003815 it was noted that operation 200 was described as follows

"Draw concrete, IT.9, from stores and mix per inst. Fill voids between shroud and shell vibrating to assure no voids. Allow to cure for 24 hours."

There was no QC inspection/verification of the concrete mix and fill after the 200 operation. Further investigation regarding the requirements of concrete mix and fill revealed that the instructions concerning the mixing procedure were provided by Babcock & Wilcox. Mr. Ludwig, NES QA Manager readily acknowledged the requirement to have QC verification of concrete mix and fill. This operation will be incorporated into the traveler. An examination of the partially completed fuel cansters in the shop indicated that the filled concrete in the void appeared to have developed minor cracks. When this was referred to Bechtel Project Engineering personnel it was indicated that such cracks or minor voids are not of any concern since the purpose of the concrete in the void is not for radiological shielding.

Another minor discrepancy was observed in the traveler. Operation 330 reads "verify information in operation #300". The operation should be 320 in lieu of 300. This was brought to the attention of Mr. Ludwig. In the same traveler the welding procedure was referenced as WPS 001 Rev. 0. (GTAW manual/ machine). This should be changed to Rev. A which is the latest approved procedure. Although several discrepancies were noted during this portion of the audit no quality assurance finding was written since they were all treated as minor in nature. However, the items were discussed with the cognizant QA personnel for corrective action(s).

2.2.2 Material Control and Nonconforming Items

2.2.2.1 During this portion of the audit the areas of the NES/Selamco QA Program covered were as follows:

N-8, "Identification and Control Of Material, Parts, and Components"
N-14, "Inspection, Test and Operating Status"
N-15 "Nonconforming Items and Services"

To examine the controls exercised on the shop floor receiving, staging and processing areas were toured by the audit team. In the receiving area it was observed that several items for Canisters, Racks and Trolleys were lying on the floor and to some of them status tags were attached. It was noted that a single Accepted or Partially Accepted Tag was used for a group of like items. This method was found acceptable, however, a Partial Acceptance Tag applied to shield castings for trolleys indicated as applicable to two items. The second item to which the status tag was applicable could not be identified readily. After a careful examination the second item could be verified. At this point NES Inspector applied an independent tag to the second item. The items involved were: Type E 85008, Traveler S-04564, Heat No. HT CHEM-831.

2.2.2.2 In the receiving area a group of 24 canister shells were lying on the floor with no tags attached. On a close examination it was found that there were paint markings on the surface of shells indicating rejection because of rejectable radiographs, length too short, PT not performed etc. It was also found that no nonconformance reports were written to document the deficiency for each pipe shell. When this deficient condition was brought to the notice of the QA Manager, corrective action was instituted and status tags (Withold) were noted to be in the process of being applied. Also, nonconforming reports were being written. This deficiency is addressed in Quality Assurance Finding No. 1. To review the complete nonconforming system, a review of NCR log book was performed. It was noted that some of the log entries were missing. Index was incomplete. Some of the NCRs logged on the index were not available in the book. It was indicated that most of the missing NCRs were in the review and disposition process. It is recommended to review the log periodically and update the information in the log.

2.2.2.3 While examining the items in the staging and process areas it was noted that shells belonging to fuel, knockout, and filter canisters separated by each group were lying on the floor adjacent to each other. No tags were, however, affixed. There are very minor differences between each type of shell.

Although unlikely, potential exists for mistaking one for the other without some clear visible indicators. In the same area three partial fabricated canisters were noted. Only on one there was an Acceptance Tag. The other two canisters did not have any kind of tags. Also noted that there were a group of 7 canisters which were all rejected because of bad welds. Circular seam welds between bulkheads and shells were rejected because of lack of fusion and penetration and the joints were cut out. Of the seven, only two canisters were found to have withold tags and others did not have any. A close examination of tags revealed that tag bearing work order No. 84091 and RN118 was not filled out completely. Purchase order No., Traveler No., and date were not filled out. These deficiencies were identified on Quality Assurance Finding No. 1

2.2.3 Special Processes and Inspection

2.2.3.1 Weld Control

There are essentially two welding processes that are being used for the three TMI-2 orders. The two welding processes being WPS-001 (Gas Tungsten Arc) and WPS-004 (Gas Metal Arc, spray mode). The latest revision being used was verified as approved by Bechtel. The welders stamps appearing on the travelers reviewed for canisters and racks were correlated with their names from a log maintained by the QA department. The five welder's qualification records were reviewed for different welding procedures and found that all of them were appropriately qualified for the procedures appearing on Travelers. No deficiencies were noted in this area.

2.2.3.2 Non Destructive Testing and Inspection

There are essentially four nondestructive examination (NDE) procedures being used for the TMI orders. The four procedures being - Liquid Penetrant (PT), Visual Examination (VT), Radiographic Examination (RT) and Ultrasonic Examination (UT). Of these RT and UT were subcontracted to Pittsburgh Testing Lab (PTL) and the other two are being performed by NES themselves. All four procedures were verified to have been approved by Bechtel Project Engineering. A review of the NES employed NDE personnel qualification and certification records revealed the following:

D. C. Peddycord:	Certified as Level II for PT, MT & VT by L. C. Ludwig and R. M. Wise, Level III examinar (NES). The backup test data was available in the package.
Stamford E. Burdette:	No NES certification were noted. Review of the package indicated that he was certified by Johnson Controls as mechanical inspector Level II. Also, verification from another employee in VT and mechanical inspections.
Rick Anthony Sellers:	No NES certifications were noted. Package includes certification in PT as Level II from Brown & Root. Also verified by Brown & Root as Level II in Q.C. and attended VT training courses.
Don Saintsing:	Certified as Level II in MT and PT by NES. The backup test data was available in the package.

Of the four NDE Inspection personnel, two were found to have been not certified by NES to perform NDE Operations as required by SNT-TC-1A and NES procedures. This deficiency was identified on Quality Assurance Finding No. 2.

NES QA Program and Quality Procedure Q-4, "Qualification of Inspection, Examination, and Testing Personnel" requires the inspectors to have been formally indoctrinated and trained. Documentation indicating that QC, welding, engineering personnel have received training was verfied during the audit.

2.3 Control of Measuring and Test Equipment Used For Inspection and Test

A computer printout of measuring and test equipment was obtained for usage in this portion of the audit. The printout was dated 4/20/85 and was found to list all applicable inspection equipment subject to calibration. One page of the printout listed equipment due for recall during the forthcoming month.

The following inspection equipment was examined in the shop crib/ inspection area:

1. Permeability Tester	SEL-049
2. Gage Blocks	SEL-002
3. Bore Gage	SEL-029
4. Go-No-Go Gage	SEL-001
5. Depth Micrometer	SEL-059
6. Dial Caliper Gage	SEL-028
7. Dial Thickness Gage	SEL-078
8. Durometer	SEL-077

All items were checked for listing on the equipment printout. All were properly listed except for the Go-No-Go gage SEL-001 which along with thread gages are calibrated/checked on an "as use" basis. The items checked all had appropriate and current calibration labels. Gage maintenance records were all found to be in order.

Tools, gages and test equipment that are not listed in Q-01 as to how to calibrate are sent to an approved outside source for calibration, traceable to the National Bureau of Standards. This was the case for the permeability tester SEL-049 and the gage blocks SEL-002. Certifications for these calibrations R-47303 and 16311 from Gage Lab Corp. were reviewed and found acceptable.

It should be noted that for all of these items, the gage maintenance records reflected no out of tolerance conditions were found upon calibration.

A new Dillon Dynamometer was observed in the shop storage area. The dynamometer had been purchased for the defueling canister Job No. 84091. The auditor requested to see the certifications supplied with the dynamometer, but they could not be located during the time of the audit. This fact was passed on to the Resident Bechtel Supplier Quality Representative for followup prior to its usage.

Procedure Q-01 has a requirement that states "Inspection equipment issued from the crib cage shall be controlled by a tool check log". Also, that each inspection performed and tools used for inspection shall be logged on the "Daily Inspection Gage Record."

It was observed that a tool checkout log for inspection equipment was not in use. Also, the latest "Daily Inspection Gage Record" produced was dated 3/26/85. Daily records were also missing for the following periods:

02/15/85 to 03/21/85
01/23/85 to 02/12/85
12/07/84 to 01/07/85
11/05/84 to 12/07/84

The deficiencies on the tool checkout log and the daily records are documented on Quality Audit Finding Number 3 for corrective actions.

2.4 Handling, Storage, Shipping and Preservation

NES QA procedure N-13 provides guidance for the subject activities. No detailed procedures are presently in usage but are being prepared.

At present, any special handling/storage requirements are identified by Engineering and incorporated into applicable travelers.

Only Level "C" storage requirements have been imposed for TMI-2 products at NES.

2.5 Audits:

Per N-18 of the NES QA Manual, 18 internal audits are planned and performed annually. Each audit corresponds to one of the 10CFR50 App. B criteria. Deficiencies are documented on CAR forms and tracked until resolved. Detailed review of the audit reports indicated that they merely check "yes" or "no" against the checklist item and in very few cases remarks were entered. Also, checklist items in the reports indicated the emphasis was mostly on the procedural rather than on hardware. The audit program, as currently being implemented, was found to be weak. It is recommended that the NES audit program be redirected to put emphasis on hardware and hardware related problem identification.

Audits are conducted by designated Lead Auditors. Qualifications for 3 lead auditors were examined, and found to meet ANSI N45.2.23 guidelines.

2.6 QA Records

Documents pertaining to the TMI-2 canister rack, trolley and canister projects are still "working documents" and are not yet dispositioned as records. The program for controlling records was reviewed and found satisfactory based on dual storage at NES (Danbury) and/or customer locations.

Records for Non-GPUN projects were briefly reviewed for compliance to NES procedure Q-09 "Requirements for Storage and Maintenance of Quality Assurance Records". In some instances the master record index was not complete. This deficiency had been previously identified by an NES internal audit (#CLN-17) and a corrective action request (CAR) was initiated. The CAR is still open.

3.0 CONCLUSION

As a result of the document reviews, discussions, and examination of material control system performed by the audit team, it was determined that the NES Manufacturing QA program implementation in the areas of material control and qualification of inspection personnel is deficient requiring immediate corrective action. Activities associated with the calibration and control of inspection equipment need strengthening. Also, audit program needs strengthening to identify problems. Other audited areas appeared to satisfy the requirements of the QA Program.

DATE		QAF NO.
4/25/85	THREE MILE ISLAND NUCLEAR STATION UNIT 2 QUALITY ASSURANCE DEPARTMENT PROCEDURES MANUAL **QUALITY ASSURANCE FINDING** JOB NO. 15737	1 PAGE 1 OF 2

Description of Audit/Surveillance		Auditor
NES Material Control/Nonconforming Items		T. V. Sarma
Where Found NES Manufacturing Shop	**Discussed With** L. Ludwig, QA Manager	SURVEILLANCE/AUDIT NO. NES-85-02
Reference Document NES/Selampco Procedure and Policy Manual; MC-04; Q-12		TYPE OF AUDIT ☒ FIELD ☐ OFFICE

REQUIREMENT

1. MC-04, "Identification and Control of Material, Parts, and Components" Date 6/6/84, Para. 4.6, requires that the Receipt Inspected items are affixed with accepted tags. Para. 4.7 requires that the accepted items are accompanied by Travellers and be moved to storage or staging areas for further processing. Also, the Quality Control Inspectors who complete final inspection operations on a traveller, complete a green acceptance tag or label. (Continued)

FINDING

Contrary to the requirements of the procedure, the following discrepancies were noted:

1. 24 canister pipes that were receipt inspected and/or further processed by NES were noted to be rejected because of PT not performed, rejectable radiographs, length too short, etc. However, there were no Withhold Tags or Labels (Continued)

RECOMMENDED ACTION (OPTIONAL)

1. Verify and apply the necessary status indicating tags as required by the procedures.
2. Initiate Nonconforming Reports for all Nonconforming items.
3. Retrain all inspection personnel concerning the requirements of NES Manufacturing QA Program and Procedures in the areas of Status Tags and Nonconforming Reports.

RESPONSIBILITY FOR ACTION	SCHEDULED COMPLETION DATE
L. Ludwig	6-1-85

ACTION TAKEN

RESPONSE SUBMITTED BY (TITLE)	SIGNATURE	DATE

VERIFICATION ACTIONS BY QA

QA VERIFICATION BY (TITLE)	SIGNATURE	DATE

QUALITY ASSURANCE FINDING
(Continuation Sheet)

JOB NO. 15737

QAF NO 1 DATE 4/25/85
AUDIT NO NES-85-02

REQUIREMENT/FINDING/RECOMMENDED ACTION/ACTION TAKEN

REQUIREMENT (Continued)

2. Q-12, "Inspection and Acceptance Tags & Stamps" dated 6/6/84, Paras. 3.2.9 and 3.3.1 requires the application of Withhold Tags or Labels and prepare Nonconformance Report on any nonconforming items or services.

3. Q-12, Para. 4.1.1(b) states that "The Yellow Partial Accepted Tag or Label is used to designate uncompleted items and to provide the description or remaining operations, features to be completed, as well as to provide identity and traceability information."

FINDING (Continued)

applied to the nonconforming pipes. Also, no nonconforming reports available.

During the course of the audit, however, application of Tags and issuance of Nonconforming Reports were initiated.

2. About 7 Fuel Canister assemblies were noted to be rejected and the Head to Shell Welds were cut out in some cases because of weld defects. Of the 7 canisters, however, only 2 had Withhold Tags and Nonconformance Reports. Also, the two Withhold Tags were not completely filled out.

3. Shells belonging to all three types of canisters along with three partially completed canisters in laydown area were observed to be without any status indicating tags with the exception of one partially completed canister to which an Accepted Tag was affixed.

DATE	THREE MILE ISLAND NUCLEAR STATION UNIT 2 QUALITY ASSURANCE DEPARTMENT PROCEDURES MANUAL	QAF NO.
4/25/85	**QUALITY ASSURANCE FINDING** JOB NO. 15737	2 PAGE 1 OF 2

Description of Audit/Surveillance	Auditor
NES Qualification of Inspection, Examination and Testing Personnel	T. V. Sarma

Where Found	Discussed With	SURVEILLANCE AUDIT NO. NES-85-02
NES Manufacturing Shop	L. Ludwig, QA Manager	TYPE OF AUDIT ☒ FIELD ☐ OFFICE
Reference Document: NES/Selampco Nuclear QA Program & Policy Procedures Manual		

REQUIREMENT

1. Quality Assurance Procedure N-9, "Control of Special Processes & Test," Paras. 4.1 and 4.2 requires that the qualification of personnel performing NDE shall be in accordance with applicable codes and standards.

(Continued)

FINDING

1. Review and examination of records revealed that R. A. Sellers and S. E. Burdette, NDE inspectors for PT and MT, have not been qualified and certified by NES.

RECOMMENDED ACTION (OPTIONAL)

1. All NDE personnel shall be qualified and certified by NES per the requirements of the referenced procedures.
2. Institute an indoctrination and training program for inspection personnel and document the training sessions.
3. Reinspect the welds that were PTed by Sellers or Burdette using a qualified and certified NDE inspector.

RESPONSIBILITY FOR ACTION	SCHEDULED COMPLETION DATE
L. Ludwig	6-1-85

ACTION TAKEN

RESPONSE SUBMITTED BY (TITLE)	SIGNATURE	DATE

VERIFICATION ACTIONS BY QA

QA VERIFICATION BY (TITLE)	SIGNATURE	DATE

THREE MILE ISLAND NUCLEAR STATION
UNIT 2
QUALITY ASSURANCE DEPARTMENT
PROCEDURES MANUAL

QUALITY ASSURANCE FINDING
(Continuation Sheet)

JOB NO. 15737

QAF NO 2 DATE 4/25/85
AUDIT NO NES-85-02

REQUIREMENT/FINDING/RECOMMENDED ACTION/ACTION TAKEN

REQUIREMENT (Continued)

2. Procedure Q-11, "Control of Special Processes" dated 6/6/84, Para. 3.2.5.3 requires that personnel performing the Nondestructive Examination shall be qualified and certified by the program title "Qualification and Certification of NDE Personnel," which includes the necessary training and testing in advance of certification. All testing of NES/Selampco N.D.E. personnel will be approved by the Level III.

3. N-2, "Quality Assurance Program" requires that all NES/Selampco personnel are required to receive indoctrination and training.

4. Q-4, "Qualification of Inspection, Examination, and Testing Personnel" dated 10/81, Paras. 4.1, 4.2, and 4.5 requires that all inspection personnel shall receive indoctrination and training and the qualification of personnel shall be certified in writing.

DATE		QAF NO.
4/25/85	THREE MILE ISLAND NUCLEAR STATION UNIT 2 QUALITY ASSURANCE DEPARTMENT PROCEDURES MANUAL **QUALITY ASSURANCE FINDING** JOB NO. 15737	3 PAGE 1 OF 2

Description of Audit/Surveillance	Auditor
NES/Control of Measuring and Test Equipment	W. C. Gund

Where Found	Discussed With	SURVEILLANCE AUDIT NO.
Gage Crib/Inspection Area	L. Ludwig, QA Manager	NES-85-02

Reference Document	TYPE OF AUDIT
Q-01, Rev. 3, Calibration of Tools Gages & Test Equipment	☒ FIELD ☐ OFFICE

REQUIREMENT

1. Para. 4.5, Inspection equipment issued from the gage crib shall be controlled by a Tool Check Log.
2. Para. 9.1, Each inspector shall document each inspection on a daily gage record, Exhibit Q-01-6.
   Para. 10.0(c), Tools used for inspection shall be logged on the "Daily Inspection Gage Record.

FINDING

1. A Tool Check Log is not being used for removal of inspection equipment from the gage crib/inspection area. Equipment sent out for calibration is not logged out and no notations are made on maintenance record card as to its location.

(Continued)

RECOMMENDED ACTION (OPTIONAL)

1. Reinstitute the usage of a Tool Check Log and Daily Inspection Gage Record per the requirements of NES Procedure Q-01, Rev. 3.
2. Retrain all appropriate NES personnel concerning the requirement of NES manufacturing QA program and procedures in the area of Tool Check Logs and Daily Inspection Gage Records.

RESPONSIBILITY FOR ACTION	SCHEDULED COMPLETION DATE
L. Ludwig	6-1-85

ACTION TAKEN

RESPONSE SUBMITTED BY (TITLE)	SIGNATURE	DATE

VERIFICATION ACTIONS BY QA

QA VERIFICATION BY (TITLE)	SIGNATURE	DATE

THREE MILE ISLAND NUCLEAR STATION
UNIT 2
QUALITY ASSURANCE DEPARTMENT
PROCEDURES MANUAL

QUALITY ASSURANCE FINDING
(Continuation Sheet)

JOB NO. 15737

QAF NO 3 DATE 4/25/85
AUDIT NO NES-85-02

REQUIREMENT/FINDING/RECOMMENDED ACTION/ACTION TAKEN

FINDING (Continued)

2. The latest "Daily Inspection Gage Record" produced was dated 3/26/85. Records were missing for the following periods:

   2/15/85 to 3/21/85
   1/23/85 to 2/12/85
   12/07/84 to 1/07/85
   11/05/84 to 12/7/85

THREE MILE ISLAND NUCLEAR STATION
UNIT 2
QUALITY ASSURANCE DEPARTMENT
PROCEDURES MANUAL

AUDIT NO: NES Manf/85/2
AUDIT DATE: 4-23-85/4-24-85

AUDIT ADMINISTRATIVE DATA

A. AUDIT TEAM MEMBER
B. PREAUDIT CONFERENCE 4-23-85
C. POSTAUDIT CONFERENCE 4-24-85
D. CONTACTED DURING THE AUDIT

NAME	TITLE	A	B	C	D
T. V. Sarma	Audit Team Leader Project QA Engr.	x	x	x	
L. Ludwig	QA Manager - NES Mfg.		x	x	x
W. D. County	GPUN Auditor	x	x	x	
W. C. Gund	QAE	x	x	x	
D. L. Saintsing	QAE		x	x	x
F. A. Sugar	General Manager			x	
A. L. Smith	Bechtel, SQR			x	x

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REPORT OF AUDIT
SUPPLIER QUALITY PROGRAM
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A. GENERAL

1. This Report of Audit on the supplier listed below consists of two parts:

PART I : AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY
PART II: AUDIT CHECKLIST (CONTROLLED DISTRIBUTION)

SUPPLIER
JOSEPH OATS CORP

ADDRESS	CITY	STATE	ZIP CODE	TELEPHONE NO.
2500 BROADWAY, DRAWER 10	CAMDEN	NJ	08104	609) 541-2900

2. The audit was performed for the purpose of examining the supplier's implementation of his quality program and his adherence to technical requirements of the purchase order(s).

B. PART I—AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY

1. Type audit and date performed:

X	TYPE AUDIT	DATE PERFORMED
X	Full Scope	7/10, 11/85
	Limited Scope	
	Progressive (P-1 or P-2)	

2. Supplier Quality Program Evaluated:

	TITLE	REVISION	DATE
Quality Manual(s): (Include Addendums, Supplements, etc.)	QUALITY ASSURANCE MANUAL	8	6-26-85
Other Q.C. Documents: (Exclusive of quality manual)			

3. Purchase Orders Covered by this audit

PURCHASE ORDER NO(S).	REVISION	DATE	*P.O. STATUS	DESCRIPTION OF COMMODITY/MATERIAL
PRE AWARD QUALIFICATION AUDIT				

*STATUS CODE: A=IN FABRICATION B=DESIGN/ENGINEERING C=INACTIVE

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REPORT OF AUDIT
SUPPLIER QUALITY PROGRAM
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Supplier J. CATS

PART I – AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY (Continued)

4. Audit Meeting Data:

	NAME	MEMBER STATUS (Auditor, Observer, or Technical Specialist)	PROJECT/AREA OR DIVISION OFFICE	*ATTENDANCE A	B	C
BECHTEL	T. I. GILLESPIE	AUDIT TEAM LEADER	EASTERN POWER DIV QA	✓	✓	✓
	P. KUNGEER	TECH. SPECIALIST	EPD DESIGN ENGR.	✓	✓	✓
	T. McKEARNEY	" "	EPD M&QS MGR	✓	✓	✓
	L. J. McANALLEN	AUDITOR	EPD PSQS	✓	✓	✓
	R. MARSHALL	AUDITOR	SF HO ATL		✓	✓
OTHERS						

	NAME	POSITION		B	C
SUPPLIER	M. KAPLAN	PRESIDENT		✓	✓
	R. KAPLAN	GENERAL MG'R		✓	
	J. BENCKERT	Q.C. MG'R		✓	✓

5. Audit Scope and Summary: (**)

SCOPE YES	SCOPE NO	QUALITY ELEMENT	FINDING	SCOPE YES	SCOPE NO	QUALITY ELEMENT	FINDING
X		1. Organization	S	X		11. Test Control	[illegible]
X		2. Quality Assurance Program	S	X		12. Control of Measuring and Test Equipment	S
X		3. Design Control	S	X		13. Handling, Storage and Shipping	S
X		4. Procurement Document Control	S	X		14. Inspection, Testing and Operating Status	S
X		5. Instructions, Procedures and Drawings	S	X		15. Nonconforming Items	S
X		6. Document Control	S	X		16. Corrective Action	[illegible]
X		7. Control of Purchased Material, Equipment and Services	S	X		17. Quality Assurance Records	S
X		8. Identification and Control of Material, Parts, and Components	S	X		18. Audits	S
X		9. Control of Special Processes	APR-1 X			19. Special Audit Requirements	
X		10. Inspection	S				

*ATTENDANCE:
A – At Pre-Audit Meeting
B – At Entrance Meeting
C – At Exit Briefing

**AUDIT FINDING CODE: S – Satisfactory
X – Program Deficiency
N/A – Not Applicable

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REPORT OF AUDIT
SUPPLIER QUALITY PROGRAM
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Supplier J. OATS

B. PART I—AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY (Continued)

5. Audit Scope and Summary (Continued):

a. Comment on areas of the quality program observed to be functioning exceptionally well: NONE

b. The Quality Assurance Program elements examined by this audit were found to be effectively implemented with the following exceptions:

AUDIT TEAM PERFORMED A FULL SCOPE AUDIT AT J. OATS CORP, CAMDEN NJ.

THE AUDIT INVESTIGATION REVEALED ONE DEFICIENCY AS IDENTIFIED IN AUDIT FINDING AFR #1 AND SUMMARIZED BELOW.

ELEMENT II-1 AFR #1

WELD PROCEDURES TO BE USED FOR A PARTICULAR JOIN WERE LISTED ON THE DRAWING. A PROCEDURE NOT LISTED WAS USED.

DURING THE EXIT MEETING THE SUPPLIER SHOWED EVIDENCE THAT THE DRAWING IN QUESTION HAD BEEN REVISE THAT MORNING. AS THE PROCEDURE USED WAS ON THE CONTRACT APPROVED LIST AND CONFORMED TO THE GOVERNING WELD PARAMETERS THIS AFR WAS CLOSED.

c. Restrictions imposed/recommended NONE

1) Hold on release of material/equipment for shipment: NONE

2) Control measures on further processing of selected activities: NONE

	NAME	PROJECT	DATE
PROJECT CONCURRENCE OF RESTRICTION ABOVE:	N/A		

	SIGNATURE OF AUDIT TEAM LEADER	DATE
[illegible] FINDING REPORTS	T. J. Gillespie	7/17/85

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AUDIT FINDING REPORT
PSQ-395

AUDIT FINDING REPORT NO.	DATE	NAME OF EVALUATOR(S)
1	7-11-85	T. R. McKearney

1. SUPPLIER: Joseph Ort Corp Camden N.J.

2. CHECKLIST AUDIT ITEM NO: IX-1

3. CONTROLLING DOCUMENT(S): (Quality manual, Procedure, Spec. references) QA Manual

4. REQUIREMENT: (Quote or paraphrase the controlling document, i.e. Section, paragraph) QA Manual Para 4.2.2 – The Weld and Heat Sketch Record Sheet attached to the Shop Traveller is used to record the identification of [illegible] welding & [illegible] material, the welding procedures used for each joint, the consumables used and the welder identification for each joint. The Traveller refers to a drawing which specifies which welding procedure is applicable for each specific joint

5. FINDING: (Describe the deficiency in detail, i.e. What? How many? Numbers? When?) Shop Order 2470 – Dwg D7601 and Companion Dwg D7603 provide a selection of 4 welding procedures for attaching the Nozzles to the Head – WP's 4303, 5302, 7303 & 5301. These are listed on the dwgs. A review of the Weld and Heat Sketch Record Sheet attached to the traveller indicates the weld joint was made using WP's 4303 and 8303. WP 8303 is a "JOA" approved procedure but not specifically listed on the drawing as being applicable to this joint. Weld Nos 344 and 345 are designated as attaching the nozzles to the Head.

6. IMPACT ON QUALITY: (List direct and potential impact on quality of material)

There is no specific quality impact on this job since the procedure used is "JOA" approved and qualified to conform to the governing parameters of the joint i.e. P Number, gauge, filler metal, position etc. A potential problem exists if a non JOA approved procedure or one not qualified for the application was used.

7. RECOMMENDED CORRECTIVE ACTION: (Actions recommended are suggested methods only and not contractually binding. Specific action to be taken to resolve the finding is left to the discretion of the supplier.) When procedures other than those listed are required, revise the drawing to provide for their use.

J. Ort has initiated a dwg Rev. to list WP 8303 – 7-11-85 Finding Closed.

8. AUDIT FINDING DISCUSSED WITH:

a. Supplier Management Representative: Name: J Rinehart Position: Q C Mgr

b. Assigned Bechtel Quality Representative: Name: Date:

9. SUPPLIER AGREES TO COMPLETE CORRECTIVE ACTION BY (Date): Corrective Action Completed 7-11-85 COMPLETION ☑ RESPONSE ☐

10. RESTRICTION IMPOSED AS A RESULT OF THIS FINDING a) Type Restriction: N/A b) Project(s) Affected: N/A

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SUPPLIER QUALITY PROGRAM
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(1) AUDIT ITEM NO.	(2) QUALITY ELEMENT & REFERENCES	(3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	(4) RESULTS S / U / N/A	(5) SUMMARY OF INVESTIGATION
	1. ORGANIZATION			
1-1	Responsibility and Authority for Attaining and Verifying Quality Ref QAM Sect 1.0	a. Verify that the organization chart (schematic) depicts the current operating structure of the company. Focus attention on functional responsibilities, levels of authority and lines of communication for the management, direction and execution of the quality program. Verified the operating structure of the company by reviewing the current organization chart in the QAM Rev 7. Discussed with QC Mgr.	S	a) Reviewed Organization Chart and determined that there was independence and Organizational freedom of the Quality group with all entities within the company. A review of correspondence and audits indicates direct access to the proper levels of management.
1-2	Responsibility for Quality Assurance Program Management and Direction Ref QAM Sect 1.0	a. Verify the position and relationship of the following persons: John Benckert (Name of person who heads quality program) QC Manager (Title) Con Kaplan (Name of person quality head reports to) General Mgr (Title) b. Request for and review written evaluation reports on the effectiveness of the overall quality program submitted by the person in charge of the quality program or as appropriate, internal audit reports. Check reports for distribution to senior management of the company. Verified written evaluation reports of the effectiveness of the quality program via internal audit reports and distribution to senior management.		b) Reviewed internal audits for assessment of Quality Program as follows: QAM-Sect II 3/30/83 QAM-Sect III 4/23/85; QAM Section IX 5/2/85; QAM Section II 5/3/82. All of the above audits were transmitted to the General Manager & Cognizant Mg
1-3	Independence of Personnel Performing Verification Action Ref QAM Sect 1.0	a. Verify that quality personnel performing verification actions (Tests, inspections etc.) have authority and organizational freedom to identify quality problems, initiate recommend or provide solutions to problems, verify implementation of solutions and control further processing of nonconformances until proper dispositioning has occurred. Audit technique: Questioning of quality personnel and review of related documents is recommended. Verified via discussion with the QC manager and Deviation notices (DN's) review		a) Reviewed DN# 2479-6/25/85; DN# 2724-12/21/84, DN# 2887-6/27/85. The above were properly analyzed, dispositioned and where applicable corrective action taken.

Signature R J Gillespie Date 7/15/85

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1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S X N/A	5) SUMMARY OF INVESTIGATION
	II. QUALITY ASSURANCE PROGRAM			
B-1	Management Review of Quality Program Status and Adequacy Ref QAM Sect 1.0	a. Verify functional managers review actions of the quality program for which they have prime responsibility for execution b. Review documentation submitted by responsible managers on quality activities or internal audit reports, for evidence of implementation VERIFIED Functional MGR'S Review of the Quality Program by Review of Audits for Evidence of Implementation	S	Reviewed the following Internal Audit Reports & Evidence of Closure Report # QAM Sect II 3-30-83 QAM Sect II 5-3-82 QAM Sect II 10-27-83 [illegible] Sect V 5-15-8[illegible]
	[illegible]	Verify implementation of the indoctrination and training program. Examine training records for evidence of personnel proficiency levels, type of training and methods of instruction VERIFIED by Review of I&T Procedure for Auditors. ALSO Reviewed Training Records		a) Reviewed [illegible]dure SP-15 For Trai[illegible] and Qualificat[illegible] of Audit[illegible] Revision 1 3-11[illegible] Reviewed records of Qualificat[illegible] John Benckert - Certified as Audit Team Leader - 7/15/81 Joy Rena[illegible] - Certified as Audit Team Leader 6/1/81.
B-2	Revised [illegible] Through [illegible] System Ref QAM [illegible] 1.0 Sect 2	a. Verify implementation of the system in use for the control and distribution of the quality program manual and procedures, to include changes b. Review changes (revisions) and check for review and approval actions. Check on requirement for customer acceptance prior to implementation c. Verify the quality program manual currently in use in the facility is the same revision and date as the copy accepted by Bechtel VERIFIED QA Manual Control and distribution, Revision Control and Manual Accepted by Bechtel is Current		Reviewed Master Distribution List with Manuals & QC Managers Card Index File. QAM B-1 - M. Kaplan B-2 - R. Kaplan B-3 - J. Benckert Reviewed External Distribution B-34. This system is under Control

Signature F. J. Gilligan Date 7/15/85

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SUPPL[illegible] [illegible]UALITY PROGRAM
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Supplier Joseph Oats

1) Audit Item No	2) Quality Element & References	3) Standard Quality Requirements and Audit Guidelines	4) Results (S X N/A)	5) Summary of Investigation
	III DESIGN CONTROL			
III-1	Translation of Design Requirements Into Design Documents. Ref QAM 2.2.10, 2.2.13, 2.2.14, 2.2.15	a. Examine engineering specifications, drawings, instructions and procedures for inclusion of applicable technical requirements. NOTE: Requirements are based on contract requirements and applicable codes and standards referenced therein. b. Concurrent with the above, check for inclusion of applicable quality requirements. Examined Bid document review drawings, Mfg. specs. and Bills of Material to verify inclusion of technical and quality requirements.	S	Examined following documents relation to Job No. 2470, Heat Exchanger - - Bid document review of P.O., specs, Dwgs stamped for signatures. - Dwg. D7601, Rev. 3, 5 ECO's against it, Dwg. Revised to Rev. 4 - Checked BOM 7604 original
III-2	Control of Deviations from Design Requirement and Quality Standards. Ref QAM 2.2.11, 2.2.17	a. Verify implementation of the system governing control of deviations from design requirements and quality standards. Check that deviations are properly identified, documented and subjected to review and approval actions. Verified by review of Engineering Change Order, Hold and release notices.	S	Checked revision 8; added revision to item No. 85 Items revised on BOM - Checked Engineering hold notice
III-3	Identification and Control of Design Interfaces. Ref: —	a. Verify implementation of the system governing control of design interfaces. Check documentation for evidence of coordination and the review, approval, release and distribution by organizations or departments involved. No design interface involved for this procurement.	NA	(H-0143) against dwg. D7603 rev. 3 Distributed by Lee Ng 3/25/85 Release Notice (R-0143) 4/2/85 - Checked Dwg. No. D7601
III-4	Independent Verification of Design Adequacy. Ref QAM 2.2.10	a. Verify implementation of the system in use to verify or check the adequacy of design. Review records for evidence that the verification or checking process is performed by individuals or groups other than those who performed the original design. Verified by examination of Fabrication drawings, Meeting Notes and appropriate revisions, sign offs.	S	Preliminary Fab dwg. Meeting notes for fabrication dwg. Checked for incorporation of meeting notes into dwg. Dwg finalized.
III-5	Control of Design Changes. Ref QAM 2.2.11, 2.2.17	a. Cross reference Audit Item No. III-2. Examine documentation to verify that design changes, including field changes, were made by design control measures commensurate with those applied to the original design. Check changes to assure that they were reviewed and approved by the same organization that performed the original review and approval, or as applicable, other designated responsible design organization. Reviewed Engineering change orders and drawings to verify that revisions are subjected to the same review / approval cycles as originals.	S	- Checked the Attachments for individual BOM item - Checked Engineering letter #29 outlining function of Project Engineer outlining procedures within the realm of PE's responsibility.

Signature [signature] Date 7/10/85

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	IV PROCUREMENT DOCUMENT CONTROL			
IV-1	Inclusion of All Applicable Requirements in Procurement Documents Ref 2.2.14 3.1.1 3.1.6	a Examine supplier procurement documents (P.O. M/R, specifications, etc.) for inclusion of specific technical and quality requirements, to include those quality requirements and controls that must be further extended to subcontractors and suppliers. NOTE Requirements are based on contract requirements and applicable codes, standards and specifications referenced therein. (For standard catalog items, supplier may be using internal "code" system to identify requirements.) REVIEW BILL OF MATERIAL AND P.O. TO VERIFY INCLUSION OF TECHNICAL AND QUALITY REQUIREMENTS.	S	REVIEWED THE FOLLOWING ~~B/M~~ P.O.s P.O. — SUPPLIER 17265 — TRENT TUBE 15772 — LUKENS GEN. INDS. 15767 — " " 15764 — JESSOP STEELS 15762 — GUYON ALLOY INC. 17501 — J.E. DOOLEY 17504 — CAPPELO 17666 — RAMBALL TEST LAB 17616 — PENNA. WELD SUPPLY
IV-2	Release and Control of Procurement Documents Ref 3.1.1	a Verify implementation of the system used to control and release procurement documents. Examine documents for review and approvals required prior to release. VERIFIED REVIEW AND SIGN-OFF OF B/M AND P.O.s BY REQUIRED PERSONS.	S	THE ABOVE LISTED P.O.s ARE CONTAINED ON B/M 7604, C.O. #8.
IV-3	Changes Controlled as Original Procurement Documents Ref 3.1.8	a Examine changes (revisions) to procurement documents to verify that controls exercised were the same as that applied to the original procurement documents. VERIFIED BY REVIEW OF B/M AND P.O. THAT REVISIONS TO PROCUREMENT DOCUMENTS WERE CONTROLLED AS ORIGINAL.	S	NOTE: THE SUPPLIER STATED THAT WHEN PURCHASING NON CODE SAFETY RELATED MATERIALS ARE ORDERED TO A PROGRAM APPROVED BY J. OATS.

Signature [signature] Date 7/12/85

BECHTEL

SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
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Supplier Joseph Oats Corp. Camden, N.J.

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S, X, N/A	5) SUMMARY OF INVESTIGATION
	V INSTRUCTIONS, PROCEDURES AND DRAWINGS			
V-1	Documented Description of Activities Affecting Quality	a Auditing of this criterion requires the efforts of the entire audit team – with each auditor focusing his attention on those activities within his assigned area of audit responsibility	S	Reviewed the following drawings and verified availability in Engineering, Fabrication, and Q.C. office. (Job # 2470)
V-2	Compliance with Documented Description	b Each auditor should 1) Verify that written procedures and/or plans referenced in the quality program are in fact established, documented and in use in the facility		D-7601, Rev. II - Assembly D-7602, Rev. 4 - Tube Pattern + Baffle Details
V-3	Inclusion of Acceptance Criteria in Prescribed Documents NOTE: Lead Auditor will instruct all auditors on this criterion, and require each to provide input on those deficiencies that relate directly to the sub-elements indicated above Lead Auditor will consolidate input and formulate the necessary reports Ref QA Manual Sections 2, 3, 4, 5, 6, 10, and 11	2) Verify that instructions, procedures and/or drawings used for both work performance and verification action include qualitative (characteristics for determining satisfactory performance) and quantitative (dimensions, tolerances and operating limits) criteria. Focus attention on those documents used for quality verification actions (Inspections, test control) c Lack of compliance to procedures, instructions and/or drawings within a certain activity of the facility is a program deficiency to that specific quality element and not this quality element d Program deficiencies in this quality element will normally form the basis for an Audit finding This element was verified by review of Drawings, Procedures, and Travelers at various work stations in the office and factory. Review verified that documents contained quantitative and qualitative acceptance criteria or referenced documents containing those criteria.		D-7603, Rev. 5 - Details, Nozzles + Partial Section. D-7612, Rev. 3 - U-Tube Support C-7600, Rev. 4 - Outline Reviewed the following procedures and verified availability in Engineering, Fabrication, and Q.C. office. Q.C. 2470-10, Rev. 0 - L.P. Examination Q.C. 2470-20, Rev. 0 - RT Examination Q.C. 2470-30, Rev. 2 - Bubble Test, Tube-Tubesheet Q.C. 2470-40, Rev. 2 - Hydrostatic Test Q.C. 2470-60, Rev. 0 - Visual Exam. of Welds Q.C. 2470-90, Rev. 0 - As Built Dim. Inspect Q.C. 2471-60, Rev. 0 - Visual Exam of Welds JP 2470 + JP 2471-21, Rev 1, Packaging + Shipping JP 2470-7, Rev. 1 - Cleaning JP 2470-61, Rev. 2 - Weld Repair JP 2471-1, Rev. 2 - Cleaning Additional items verified available at work stations are Weld Proc.s + Travelers listed in Quality Elements VI + X.

Signature: Robert M. Marshall Date: 7/11/85

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SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
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Supplier Joseph Oat. Corp. Camden, N.J.

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	VI. DOCUMENT CONTROL			Reviewed the following drawings:
VI-1	Release and Control of Documents Ref: Q.A. Manual Sections 2 and 4	IF THE SUPPLIER OPERATES THIS FUNCTION ON A CENTRALIZED BASIS, AUDIT AS FOLLOWS: a. Verify that document control procedures are available and in use b. Examine distribution system used and verify that records indicate what documents have been issued and to whom, and that obsolete documents are controlled and dispositioned Verified by review of Document Distribution Lists.	S	C-7600, Rev. 4 - Outline D-7601, Rev. 5 - Assembly D-7602, Rev. 4 - Tube Pattern + Baffle Details D-7603, Rev. 5 - Details, Nozzles, and Partial Sections. D-7612, Rev. 3 - U-Tube Support
VI-2	Review and Approval of Documents by Authorized Personnel Ref: Q.A. Manual Sections 2 and 4	a. Examine selected quality documents and verify that reviews for adequacy and approval by authorized personnel have been accomplished Verified by review of drawings, procedures, Bill of Materials, and Engineering Change Orders (ECO's) for review signatures.		Reviewed the following procedures: QC-2470-30, Rev. 2 - Bubble Test QC-2470-40, Rev. 2 - Hydrostatic Test QC-2470-60, Rev. 0 - Visual Exam of Welds QC-2470-90, Rev. 0 - As Built Dim. Inspection JP-2470-1, Rev. 1 - Cleaning Proc.
VI-3	Changes Controlled as Original Documents Ref: Q.A. Manual Sections 2 and 4 NOTE: Lead Auditor will instruct all auditors on this criterion and require each to provide input on those deficiencies that relate directly to the sub-elements shown above. Responsible auditor for this criterion will consolidate data and formulate necessary reports.	a. Examine recent changes (revisions) to documents and verify that issuance was within the scope and authority of the contract, and that those requiring customer approval prior to implementation have been accepted b. Verify that the effectivity point, review action and approval for release are documented c. Verify that the control measures applied to the changes (reviews, and approvals) were the same as that used for the original documents d. Examine the control register/log used for recording changes and verify that a record reflecting history of change incorporation is being maintained Verified by review of drawings, procedures, Bill of Materials, ECO's, and Document Distribution Lists. NOTE: If this function is not under centralized control, check as a minimum, the inspection and test documents for latest revisions		WPS-4303, Rev. 2 and WPS-8303, Rev. 3 SP-1103, Rev. 00 - Expanding s/s Tubes into a Tubesheet. JP-2470-61, Rev. 2 - Weld Repair Proc. Bill of Materials M-7604, Rev. 8. Reviewed: List of Approved Procs for Job #2470 Document Distribution Lists for all above listed Drawings + procedures. Reviewed the following ECO's: 7601-3-5; 7602-3-1; 7603-4-3; 7612-2-1. Note: All above samples are for Job #2470 which is ASME III Cl. 1+2. Signature [signature] Date 7/11/85

BECHTEL

SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
PSQ-396 A

Supplier: J. OATS

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S, X, N/A	5) SUMMARY OF INVESTIGATION
	VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES			
VII-1	**Conformance of Purchased Items and Services to Procurement Documents** Ref: 3.2 3.1.2	a. Verify that written procedures for this activity are available and in use VERIFIED BY REVIEW OF QAM	S	REVIEWED SECTIONS OF THE QUALITY ASSURANCE MANUAL AS FOLLOWS: SECT. 3 PROCUREMENT AND RECEIPT OF MATERIAL, SECT. 10 AUDITS
VII-2	**Evaluation and Selection of Subcontractors, Suppliers, or Manufacturers** Ref: 10.2	a. Verify implementation of the system used for the selection and evaluation of subcontractors suppliers or manufacturers. NOTE: System may include the use of historical quality performance data, source surveys or audits, or source qualification program. Program for external audits should meet the requirements of Quality element XVIII b. Examine related documentation to verify that evaluations were performed prior to award of contracts and at the specified frequency. Check the qualifications of personnel performing the evaluations (surveys and audits) VERIFIED BY REVIEW OF QUALIFIED SUPPLIER LIST AND SURVEY REPORTS.	S	REVIEWED QSL DATED 6/1/. VERIFIED QUALIFICATION RECORDS FOR THE FOLLOWING SUB-VENDORS PENNA. WELDING — AUDIT 2/15/85 RAMBALL TEST LAB — 5/15/85 RYERSON INC. — 2/15/85 LUKENS GEN. END. — QSC-218 GUYON ALLOY — QSC-205
VII-3	**Source Inspection or Audit** Ref: 10.2	a. Verify implementation of the system for source inspection or audit, as necessary to assure quality of an item (may not be necessary when quality of item (s) can be verified by review of test reports, receipt inspection, or other means b. Program for lower tier audits should meet basic requirements of quality element XVIII VERIFIED BY REVIEW OF QSL AND SURVEY REPORTS.	S	JESSOP STEEL CO — QSC-301 GULFCO — AUDIT 4/2/84 TRENT TUBE — QSC-284 GULF ALLOY — QSC-22: TIOGA PIPE — QSC-467 CAPITOL PIPE — QSC-206 TELEDYNE-McKAY — QSC-242
VII-4	**Inspection of Purchased Items on Receipt** Ref: 3.2	a. Verify implementation of the system used for receiving inspection by reviewing related documents, or as appropriate, observing the operation — points of audit 1) Receiving checks incoming shipments to requirements of the purchase order, referenced specification, or applicable drawings 2) Material accepted on test reports or statements of conformance are subject to verification tests 3) Receiving inspection records indicate acceptance of material, or rejection of material with reasons therefor 4) Rejected material is identified and controlled 5) Inspected items controlled and identified from material awaiting inspection 6) Inspection personnel are qualified REVIEWED RECEIPT INSPECTION REPORTS TO P.O. VERIFIED IDENTIFICATION AND CONTROLL OF REJECTED MATERIAL.	S	VERIFIED MATERIAL AND RIRs FOR THE FOLLOWING. SHOP ORDER NO — ITEM — PO J-2472 — 22 — 17971

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	VII CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES (Cont'd)			
VII-5	Documented Evidence of Conformance Ref: 3.2.5	a. As required by customer contract or referenced codes, standards and specifications therein, verify that supplier or subcontractor generated documents (drawings, quality manuals, certifications, test results and inspection data for completeness, acceptability and conformance to contract requirements) were submitted and approved prior to acceptance of material. VERIFIED BY REVIEW OF P.O.S AND MTRs AND CoC FOR REVIEW AND SIGN OFF.	S	SHOP ORDER NO. / ITEM / P.O J-2472 / 51 / 17971 " / 52 / " 8104 / 62 / 18299 " / 6 / 18537 8102 / 79B / 18260 REVIEWED THE FOLLOWING RIRs AND MTRs. SHOP ORDER NO / ITEM / RIR 2470 / 1A / 1879 / 5 / 1526 / 6 / 1529 / 7B / 1881 / 11 / 1537 / 25 / 1296 / 35 / 5483 / 47E / 124 / 82 / 0790
VII-6	Assessment of Supplier Quality Related Activities Ref: 10.2.11	a. Request for and review documentation to verify that the functions for the control of quality of purchased material, equipment or services by lower tier suppliers/manufacturers is assessed at intervals consistent with importance, complexity, quality of the item, or customer requirements. b. Reference Audit Item No. VII-2, VII-3 and VII-4 as applicable REFER TO ELEMENT CHECKLIST ITEMS VII-2, VII-3, VII-4.	S	

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	VIII IDENTIFICATION AND CONTROL OF MATERIAL, PARTS AND COMPONENTS			
VIII-1	Establishment and Maintenance of Item Identification and Control Ref: 4.3.3 4.3.2 3.2.6. 4.1.2	a. Examine items on the floor, or related documentation to verify implementation of the system used for identification of material, parts and/or components. NOTE: Identification system may include the use of HEAT NUMBER, SERIAL NUMBER OR OTHER MEANS 1) Check to ensure markings have not caused a detrimental affect on material 2) Check items subdivided for transfer of markings to each part Verified by review of material in assemblies in production	S	Checked components on Shop Order 2470 - for identification and marking. All component either metal stamped or marked. Marking material certified by the manufacturer to be acceptable (transmitted). Gusset plates subdivided from Heat # D8426-4A all legibly marked.
		b. Verify implementation of the system used to control material, parts and/or components. Points of audit: 1) Handling and storage methods used to prevent damage, contamination or loss 2) Control of items awaiting inspection and/or test results, and items that have been rejected 3) Identification and acceptance status of items of production (batch, lot, part, etc.) is maintained throughout all phases of manufacture Verified by review of items in production and shop traveller		Material examined S.O. 2470 showed no handling damage - Traveller indicated status of work and listed heat and other identification as applicable
VIII-2	Traceability of Items Ref: 4.3.2 4.3.2.	a. Examine items on the floor, or related documentation, to verify implementation of the system used for traceability of material, parts or components b. Verify that material is traceable to specific chemical/physical analysis, statements of conformance, test documents, purchase order, or other documents Verified by review of material in production and records of material certification		Checked material identification on the following components S.O. 2470 Item 5 - Vessel Head - Lukens Steel - HT# D7837-1HA " 6 - Shell Plates - " " - HT# D8426-4A - Gussets " " - " " " 10 - Nozzle - Alaskan Copper - 14664-W 8 - Flange - - ACF&G Mat'l checked to CMTR's - CMTR's verified by J. Oat all complied with Spec. Signature [signature] Date 7-11-85

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	IX. CONTROL OF SPECIAL PROCESSES			
IX-1	Establishment of Process Controls and Qualification of Personnel, Procedures and Equipment Ref: 5.1.2 5.1.3 5.1.5	a Determine applicable special processes and verify that implementation is being accomplished under controlled conditions in accordance with contract requirements or codes, standards and specifications referenced therein. Points of audit 1) Welding (verify the following) a) Procedure qualified and approved, as required b) Welders' qualifications current and on file c) Welding filler material controlled, properly disbursed and traceable d) Rework records maintained Verified by review of work in progress and records	X	Reviewed Weld Map SD2470-Nozzle to Head Welds #344 & 345 - Document lists Mat'l. Heat Nos, Welders, Weld Proc's. And Welding consumables. Welders #385 & 56 qualified for Mat'l & process, verified qualification and 3 month process verification. Checked 3 lots of filler metal used. Mat'l purchased from vendor on approved list, received, stored and issued in accordance with program requirements. Two (2) welding procedures used #4303 & 8303 were "SOB" approved. Proc. 4303 was shown on Dwg D7601 as applicable to the specific joint. Proc 8303 was not listed as applicable to the joint.
	Ref: 5.4 5.4.2	2) Heat Treat (Verify the following) a) Procedures qualified and approved, as required b) Control charts/records in use and maintained c) Verify calibration of 1. temperature measuring equipment 2. chart/recording equipment d) Verify calibration of furnaces when furnace temperature indicators are used to verify part temperature Not Applicable	HT N/A * X	*See Audit Finding Report No. 1
	Ref: 5.2.1 5.2.5 5.2.4 5.2.5	3) Nondestructive Examination (Verify the following) a) Procedures qualified and approved, as required b) Personnel qualification records in accordance with SNT-TC-1A or other standards c) Personnel qualifications current and on file d) Records of NDE performed available Reviewed Proc. & Personnel Qualifications	S	Reviewed NDE Proc's: QC2470-10 Rev 0 PT, QC2470-60 Rev 0 VT & QC2470-20 Rev 0 RT. All comply with ASME V. The PT proc was qual'd for temp range other than standard. Qual. was acceptable and reviewed by ANI. R.T. Film Package 2470-B-W121 Views 1-2 thru 12-1 were reviewed - Records showed 2 Repairs - Repair film correctly identified. Calibrated film strip available to set density meter. Personnel Qual. for J. Banckart, C. Lachard & W. Bedell reviewed - Records comply with program requirements
	Ref:	4) Other special processes (specify requirements and methods of verification) N/A		

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	X. INSPECTION			
X-1	**Establishment and Execution of Inspection Program** Ref: QA Manual Section 4	a. Verify implementation of the inspection program in use by the supplier to verify his company's performance to documented instructions, procedures and drawings. NOTE: The program should cover those work operations necessary to assure quality. Points of audit: 1) In-process inspections (Fabrication and Assembly) 2) Final Assembly and Inspection. Verified by review of Shop Travelers for inclusion or reference to inspection criteria.	S	Reviewed the following Shop Travelers: for Job #2470 (ASME III, Class 1+2) J-2470-Tubesheet, Rev. 1 J-2470-Nozzle A+B, Rev. 1 J-2470-Bonnet + Head Assy, Rev. 1 J-2470-Final Assembly, Rev. 1 For Job #2471 (Spent Fuel Racks, non-ASME, ANSI N45.2/10CFR50 App. B) J-2471-A3, Rev. 0 - Module Rack Assy J-2471-D1, Rev. 0 - " " " J-2471-A5, Rev. 0 - " " " ~~J-2471~~ [initials] 7/11/85
X-2	**Independence of Inspectors** Ref: Statement of Policy and Q.A. Manual Sect. 1	a. Question personnel and review related documentation to verify that personnel performing verification actions are other than those who perform the acitivty being inspected and that they do not report directly to the supervisors who are responsible for the work being inspected. Verified by Discussion with Q.A. Mgr and review of Statement of Policy and organization chart in Q.A. Manual.		Discussed QA/QC independence and authority with Q.A. Mgr.
X-3	**In-Process and Final Inspections** Ref: Q.A. Manual Section 4	a. Cross reference Audit Item No. X-1: Check work or inspection instruction (shop traveler, processing plans, etc.) in use for inclusion of the following minimum data, as applicable. 1) Function to be performed and sequence of operations. 2) Inspection Points and/or Hold Points. 3) Specifications to be used, to include drawing numbers and revisions applied. 4) Definition of acceptance criteria. 5) Material, tools, gages and inspection equipment used. 6) Workmanship criteria to include characteristics to be inspected (dimensions, tolerances, operating limits) b. Check inspection equipment used for current calibration status. c. Check qualifications of inspection personnel, per QA Program requirements. Verified by review of Shop Travelers, Inspection Procedures, Calibration stickers, and personnel qualifications.		Reviewed the following Inspection Procedures referenced in the above Shop Travelers: JP-2471-1, Rev. 2 - Cleaning Proc. for Boston Ed. Fuel Racks. QC-2471-60, Rev. 0 - Visual Exam of Welds JP-2471-21, Rev. 1 - Marking, Packaging and Shipping Proc. Procedures listed in Quality Element V. Continued next page -

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	X. INSPECTION (Continued)			
X-4	Recognition of Hold Points Ref: Q.A. Manual Section 4	a. Hold Points 1) Cross reference Audit Item No. X-3. Verify that mandatory Hold Points required by customer contract are specified on documents of the supplier, and that work has not proceeded beyond these points without the proper authority or action. Verified by review of Shop Travelers.	S	Examined tools and gages and verified current calibration status of items listed in Quality Element XII. Reviewed Inspector qualification records for personnel listed in Quality Element IX. Reviewed completed shop Travelers (those listed for Job # 2470 on the preceding page) for Q.A. Mgr review signature.
X-5	Documentation and Evaluation of Inspection Results Ref: Q.A. Manual Section 4	a. Examine records of inspection and verify inclusion of the following minimum data: 1) Date of inspection. 2) Identity of Inspector. 3) Type of observation. 4) The results. 5) The acceptability. 6) Action taken in connection with any deficiencies noted. 7) Sampling plans, as applicable. Verified by review of Shop Travelers. b. Verify that inspection results are reviewed by responsible authority. Verified by review of completed Shop Travelers for Q.A. Managers review signature.		

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	XI. TEST CONTROL			
XI-1	**Establishment and Execution of Test Program** Ref: QAM 5.3	a. Verify implementation of the test program in use by the supplier. NOTE: Tests may include prototype qualification tests, proof tests, pre-operational tests and operational tests. Specific requirements may be contained in customer contract, or referenced codes, standards and specifications therein. Verified by Review of Test Procedures	S	Reviewed Procedure QC-2470-40 for Hydrotest Procedure. Test for Shell side and Tube side pressurization. Reviewed Test Report. Equipment used were listed, specification reference listed, special criteria was also listed. Witness and inspector signed off.
XI-2	**Inclusion of Test Requirements, Acceptance Criteria and Test Conditions in Test Documents** Ref: QAM 5.3	a. Examine test documents in use for the following minimum data: 1) Acceptance criteria 2) Tools, gages and test equipment to be used 3) Specifications, drawing numbers and revisions to be applied 4) Details on the methods and tests to be performed 5) Characteristics to be tested and checked 6) Inspection and/or Hold Points b. Check test equipment used for current calibration status. c. Check qualifications of test personnel, per QA Program requirements. Verified by Review of Test Reports.	↓	Reviewed Procedure QC-2470-30 for Bubble Testing to Tubesheet joints & Corresponding Test Report. Equipment used were listed; Spec/Procedure reference listed; special criteria was also listed; Witness and inspector signed off.
XI-3	**Documentation and Evaluation of Test Results** Ref: QAM 5.3	a. Examine test records and verify inclusion of the following minimum data: 1) Identity of the test, type test conducted, and person performing the test 2) Procedure/instruction used for the test 3) Acceptance standards and test results 4) Final acceptance b. Verify that test results are reviewed by responsible authority. Verified by Review of Test Reports. Verified by appropriate information, data filled out, reviewed and accepted by responsible parties.	↓	

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	XII. CONTROL OF MEASURING AND TEST EQUIPMENT			
XII-1	Calibration and Control of Measuring and Test Equipment Ref: 6.1.1, 6.1.2, 6.1.4, 6.1.5	a. Verify implementation of the system in use for the calibration and control of measuring and test equipment. Points of audit: 1) Written procedures available and in use for calibration of items 2) Tools, gages and test equipment identified with date calibrated, date due for next calibration, and the serial number (or other code) 3) Employee owned tools and gages used for acceptance purposes subject to the same controls as company owned tools 4) Tools, gages and test equipment in the calibration system subject to mandatory recall 5) Checkout and accountability system for items in use Verified by check of equipment (Tools & gauges) and records	S	Procedures are written and available for each crew. The following measuring devices were checked: Micro. #J1-0-1", J14-0-1", J6-4-5" & Length Std. #4-7" Record show no deviation from allowable. Micron. checked on Standard Blocks #1HE8 - Documentation Traceable to NBS. Pressure Gauges #11-0-600# & #58-0-600# were in use on the floor - Records reviewed show no deviation from allowable - gauges checked before and after use. Gauges checked on Deadweight Tester #13884 which uses weights traceable to NBS.
	Ref: 6.1.1	b. Examine calibration records and verify inclusion of the following minimum data 1) Item identity number, name and location 2) Frequency of calibration and the applicable procedure used for the calibration 3) The date calibrated and date due the next calibration 4) The name of the person(s), or subcontractor, performing the calibration Verified by review of Records		Items checked indicate compliance with established schedule - where applicable stickers and tags are used to reflect date of calibration and date due and initials of person performing calibration.
XII-2	Maintenance and Control of Standards Ref: 6.1.3	a. Examine the standards used and verify traceability to the National Bureau of Standards, or other recognized standards b. As applicable, examine documentation to verify that subcontractor performing the calibration service is a recognized testing agency Verified by check of standards and records		The use of interim checks on measuring and testing devices minimizes the risk of work being accepted with uncalibrated equipment.
XII-3	Evaluation of Discrepant Material and Affected Items Ref: 6.1.3	a. Verify implementation of the system in use to evaluate the validity of previous inspection or test results, and the acceptability of items previously inspected or tested, when equipment is found to be out of calibration Verified by review of records		Personal Tools are not included in the calibration system. Proc's #1502 Rev. 3 and QC2470-40 Rev 2 indicate compliance with program requirements.

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	XIII. HANDLING, STORAGE AND SHIPPING			
XIII-1	Control of Handling, Storage and Shipping Ref: Q.A. Manual Section 11	a. Verify implementation of the system in use for the control of handling, storage and shipping. NOTE: Control measure should be directed toward preventing damage, deterioration and loss of material. Specific points of audit include assuring the measures taken are in accord with the customer contract requirements. 1) Handling: Verified by witnessing handling operations in use in shop. 2) Shipping: Verified by review of procedures and by examination of fuel rack prepared for shipment. 3) Storage a) Written procedures for the control and issuance of material available and in use. b) Status indicators on material in storage. c) Control of items (Q list, commercial, rejected, inspected) d) Storage areas (rooms) restricted to authorized personnel, as required. Verified by examination of material in storage.	S	Handling practices witnessed in the shop including use of slings, spreader bars, and welding jigs were adequate to prevent damage to in-process assemblies. Reviewed the following Cleaning, Packaging and Shipping procedures and verified compliance on Spent fuel Rack 2471-A3 being prepared for shipment during this audit. JP-2471-1, Rev. 2 - Cleaning Proc. JP-2471-21, Rev. 1 - Marking, Packaging, and Shipping Proc.
XIII-2	Control of Cleaning, Preservation and Packaging. Ref: Q.A. Manual Section 11.	a. Verify implementation of the system in use for marking and labeling items for packaging, shipment and storage. NOTE: Markings should provide identity, instructions for the maintenance and preservation of the shipment, and as applicable special control measures for handling critical items. b. Check procedures used to inspect and test special handling tools and equipment, as applicable. Verified by review of procedures and by examination of Fuel Rack prepared for shipment.		Material in storage was verified to be adequately identified and protected from loss or damage

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	XIV. INSPECTION, TEST & OPERATING STATUS			
XIV-1	Indication of Inspection and Test Status Ref: Q.A. Manual Section 4	a. Verify implementation of the system used to assure that the acceptability of items subjected to inspection and tests are known throughout manufacturing. Points of audit 1) Means to identify inspection and test status of items (Status Indicators) NOTE: Status indicators may include physical location and tags, markings, shop traveler, stamps or inspection records 2) Procedure for control of status indicators, including authority for application and removal Verified by Review of Shop Travelers.	S	Verified that the following Shop Travelers indicated both the acceptability and the current inspection/test status of the sub-assemblies to which they were attached. J-2471-A3, Rev.0 - Module Rack A. J-2471-A5, Rev.0 - " " " J-2471-D1, Rev.0 - " " " J-2470B, Rev.1, Nozzle A+B J-2470B, Rev.1, Bonnet + Head Assy J-2470B, Rev.1, Final Assembly
XIV-2	Indication of Operating Status Ref: Not Applicable	a. Verify implementation of the means in use for indicating the operating status of systems and components to prevent inadvertent operation. NOTE: This may also include the use of tags, or other marking means Not applicable to this commodity.	N/A	While indication of operating status does not apply to this commodity, it was noted that Dwg D-7601 for Job 2470 required labeling warning of precautions to take in handling and receiving heat exchanger purged with Nitrogen under pressure.

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	XV NONCONFORMING MATERIALS, PARTS OR COMPONENTS			
XV-1	Control of Nonconforming Items, Processes and Activities Ref QAM Sect 9.0-15	• Verify that documented procedures are available and in use to control items, services or activities which do not conform to requirements VERIFIED by REVIEW of Procedure SP-1551 & QAM	S	Reviewed Procedure's QAM Section 9.0 Non-Conformities & Corrective Action & SP-1551
XV-2	Identification, Documentation and Segregation of Nonconforming Items Ref QAM Sect 9.0	• Examine documentation to verify implementation of the system in use to identify document and segregate nonconforming items to prevent unauthorized use or shipment VERIFIED by REVIEW OF Hold TAG & DEVIATION NOTICES		a) REVIEWED Deviation Notices Job 2470A, DN 2735; Job No 2471 DN 2479; Job 2469-2A DN 2736
XV-3	Disposition of Nonconforming Items Ref QAM. Sect 9.0	• Verify implementation of the system in use for the review, acceptance, rejection, repair or rework of nonconforming items NOTE Material accepted by a material review activity should be identified as to its acceptance and the authorizing acceptance documentation Review actions for the following categories of accepted nonconforming items must be approved by appropriate authority "Use as is" "Repair" and "Rework" VERIFIED by REVIEW OF HOLD TAG, DEVIATION Log & CORRECTIVE Action		a) Reviewed Hold Tag on System Heat Exchanger Shell. Hold Tag #2469-3A. Reviewed Traveler, Deviation, Deviation Log. Reviewed Corrective Action & Sign off by Engineering on 7/10/85
XV-4	Inspection of Repaired or Reworked Items Ref QAM Sect 9.0	• Examine documentation and verify that repaired and reworked items are reinspected in accordance with applicable procedures VERIFIED by REVIEW OF DEVIATION NOTICES		a) REVIEWED the following Deviation Notices and Procedures: DN 2479 Job 2471 Field Rack DN 2735 Job 2470 Tubesheet
XV-5	Extension of Nonconformance Reporting Ref QAM Sect 9.0	• Cross reference audit item No XVI-4 Request for and review written reports on nonconformances to verify notification is provided to affected organizations and subcontractors suppliers and manufacturers VERIFIED The above in accordance with Procedure SP 1551		DN 2736 Job 2469-4 Shell Baffles All reinspected according to Procedure DN 2735 - Job 2470 A - Submitted supplier nonconformance to customer SNR #N1/8/85
XV-6	Maintenance of Nonconformance Records Ref QAM Sect 9.0	• Verify supplier's maintenance of nonconforming data Points of audit 1) Documentation verifying acceptability of nonconforming items with disposition or "repair" "Use As Is" maintained on file 2) Description of accepted change, repair method, waiver or deviation which denotes "as built" condition maintained on file 3) Review and analysis of repetitive deficiencies for determining "cause" and measures to preclude recurrence VERIFIED The above		Reviewed "Repair" Use as is documentation QAM 9.2.2 Requires Review of Corrective Actions Every 6 months & DN's Every 6 months Reviewed several examples

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	XVI CORRECTIVE ACTION			
XVI-1	**Identification and Correction of Conditions Adverse to Quality** Ref: QAM SECT 10	a. Review documentation to verify the system in use to identify, report and correct conditions adverse to quality, such as failures, deviations, defective material and equipment and other nonconformances. Points of audit include checking date of reports, time to complete actions, and "open" items. VERIFIED by REVIEW OF DOCUMENTATION	S	CORRECTIVE ACTION REVIEW OF the following Deviation Notices FOR Period 8/1/84 through 2/11/85 DN 2308, 2319, 2758, 3382, 3496, 2309 2330, 2760, 3475. AS A RESULT OF REVIEW All Conditions Adverse to quality were properly identified.
XVI-2	**Determination of Causes of Adverse Quality Conditions** Ref: QAM SECT 10	a. Request for and review documentation to verify implementation of the system in use to determine the causes of significant conditions adverse to quality and the corrective action taken to preclude repetition. VERIFIED by REVIEW OF DN'S AND CORRESPONDENCE		Reviewed AND verified that the QC MANAGER Reviews ON A REGULAR basis - Deviation Notices - 6 months, Internal audit Reports - 12 mths, Corrective Action Reports - 12 mths.
XVI-3	**Documentation and Reporting of Corrective Actions** Ref: QAM SECT 10	a. Examine documentation (corrective action reports) and check for the following minimum data: 1) Identification and description of the deficiency 2) Comments on the analysis to determine the cause of the deficiency 3) Corrective actions taken, to include a review and approval by responsible authority to indicate the adequacy of the action VERIFIED the ABOVE by REVIEW OF DN'S.		Reviewed DN 2876 - 6/21/85 & DN 2469 - 2A - 3/21/85. All 3 Requirements FOR identification, Comments to determine cause AND corrective Action taken were Satisfactory
XVI-4	**Extension of Corrective Action Controls to Subcontractors and Suppliers** Ref: QAM SECT 10	a. Cross reference audit item No.'s VII-2 and XV-5. Verify implementation of the system in use to extend corrective action requirements to subcontractors, suppliers or manufacturers and other affected organizations. Audit technique: Review of documentation. VERIFIED by REVIEW OF PROCEDURE SP-1551 & DN'S		a) VERIFIED COMPLIANCE TO SP-1551 Notification of Customer. DN 2735 submitted SUPPLIER NCR Report to Customer on 1/8/85 Notifying of Tube HOLE Ligaments. REVIEWED NCR Report To Customer # KAPL-169-219 REVM written on 4/25/85

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	XVII QUALITY ASSURANCE RECORDS			
XVII-1	**Preparation and Maintenance of Quality Assurance Records** Ref: QAM Sect. 7.0	a. Verify that written procedures are available and in use for the maintenance of quality assurance records. Verified Procedures for maintenance of records are available and in use for QA records.	S ↓	Examined checklist for Lifetime Record file for Job 2470. Examined records in Record storage Vault as follows: Specification & purchasing documents; Design calculations; Bill of Materials; NDE Procedures; Test Reports; Vendor Survey & audit reports
XVII-2	**Identification of Types of Records** Ref: QAM Sect. 7.0	a. Examine quality assurance file to verify record maintenance on the following (NOTE: Specific requirements may be outlined in customer contract) Inspection and test records; Reports of audit, Quality related procedures and instructions; Personnel qualifications and certifications; Material analysis reports; Statements of conformance; Operating Logs, etc. Verified by review of records in storage vault		
XVII-3	**Retrievability of Records:** Ref: QAM Sect. 7.0	a. Verify that quality assurance records are readily retrievable, identifiable and available for review by authorized personnel. Verified by selection of documentation		Examined storage area (vault) & File Cabinets. The records are readily retrievable identifiable and available. The storage area is adequate: Fire proof cabinets Environmentally qualified for storage
XVII-4	**Retention of Records** Ref: QAM Sect. 7.0	a. Concurrent with the above checks verify that records are maintained in facilities that provide protection against environmental effect, damage and loss, and that requirements for storage, transmittal and retention are established in accordance with customer contract requirements or codes and standards referenced therein. Verified by Examination of storage vault facilities and active files.		

Signature [signature] Date 7/11/85

BECHTEL

SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
PSQ-396 A

Supplier: Joseph Oat

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	XVIII. AUDITS Documented Planning of Quality Assurance Audits Ref: QAM Sect 10	a. Verify that written procedures are available and in use for audits of the quality program. VERIFIED by REVIEW OF Procedures FOR Audits	S	Reviewed Procedures in QAM Sect. 10 which WERE AVAILABLE And in USE.
XVIII-2	Audit Performance and Responsibility Ref: QAM Sect 10	a. Review documentation to verify that audits are performed in accordance with written procedures indicated above, and that personnel performing the audits are appropriately trained and have no direct responsibility in the area being audited. VERIFIED by REVIEW OF Audit Schedules, TRAINING RECORDS AND Procedure FOR COMPLIANCE		Audits are performed of All Portions of the Program ONCE each 12 months in accordance with Schedu[illegible]
XVIII-3	Documentation and Reporting of Audit Results Ref: QAM Sect 10	a. Review reports of audit. NOTE: Supplier may submit written summaries of audit findings with corrective actions to responsible management for review action in lieu of complete reports. VERIFIED by REVIEW OF Audits and CORRESPONDENCE.		a) Audit Reports are Trasmitted to The General MGR & Cognizant Supervision. Audits Reviewed Properly documented Findings with timely Corrective Actions taken. Reviewed Audits of sect 2 of the NQAM 3/30/83, Sect 3, 4/25/85, Section 4, 5/2/85, Section 5, 6/11/85, ~~Section 6, 7/25/85~~
XVIII-4	Follow-up Action Ref: QAM Sect 10	a. Review audit file and verify that follow-up action is being taken on deficiencies and that such action is continued to provide final resolution of the deficiency. VERIFIED by REVIEW OF Audit File that Follow-up action is taken and action to prevent recurrence		a) Follow up actions were take on deficiencies reported in sect 2 Audit 3/30/83 and Sect 2 Audit 5/3/82. Reviewed Audit Trending Reports 2/1/84 through 2/1/85 which reports No trending Conditions Related to Previous Audits.

Signature: [signature] Date: 7/15/85

BECHTEL

SUPPLIER SURVEY
SUMMARY AND RECOMMENDATIONS
PSQ-391

SUPPLIER (NAME)	ADDRESS (CITY/STATE)
Joseph Oat Corporation	2500 Broadway, Drawer 10, Camden, NJ

X. SURVEY RESULTS/RECOMMENDATIONS

1) RESULTS

ITEM NO.	ACTIVITY	FINDINGS (✓) SATISFACTORY	UNSATISFACTORY
III	MANPOWER CAPABILITY	X	
IV	COMMODITY/MATERIAL	X	
V	CONTRACTS, OLD/NEW	X	
VI	FACILITY/WORK AREAS	X	
VII	SHIPPING	X	
VIII	MANUFACTURE CAPABILITY	X	
IX	QUALITY ASSURANCE	X	

2) RECOMMENDATIONS:

[X] APPROVAL as a Bechtel Source for:

[X] Principal item surveyed

[X] Material/Commodity shown below

Spent Fuel Racks

[ ] DISAPPROVAL as a Bechtel source for the item surveyed.

BASIS FOR RECOMMENDATION(S):

Based on observations of the supplier's shop equipment, inprocess activities, records, and an audit of the quality program implementation, this supplier is recommended.

SIGNATURE OF SURVEY TEAM LEADER: H McCrallen

DATE: 7/16/85

ATTACHMENTS
X PSQ-391G
X PSQ-391 M (Mechanical)
___ PSQ-391 E (Electrical)
___ PSQ-396R
X Other (Specify) 396A w/checklists

REVIEW/APPROVAL ACTION:

[X] Concur with above recommendations

* [ ] Do not concur with above recommendations

Supplier is [X] Approved with comments

[ ] Disapproved

* (Attach rationale for change in recommendations)

DISTRIBUTION: PSQ Central File, SFO

Originating Office ________ (Identify)

NAME (SIGNATURE): Eugene L Reechuan

TITLE: Technical Services Supv.

DATE: 7/23/85

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BECHTEL

SUPPLIER SURVEY
MANUF CTURING AND QUALITY C NTROL
PSQ-391 G

I. GENERAL

SUPPLIER			ADDRESS (CITY/STATE)		
Joseph Oat Corporation			2500 Broadway, Drawer 10, Camden, NJ		
ZIP CODE: 08104	AREA CODE: 609	TELEPHONE: 541-2900	NAME OF SURVEY TEAM MEMBER(S): T. Gillespie (QA) ATL; B. Marshall SQA; T. McKerney M&QS; P. Kunjeer PE; L. McAnallen PSQS		
JOB CHARGE(S): 15737	DATE OF SURVEY: 7/10, 11/85				
COMMODITY/MATERIAL SURVEYED (COMPLETE DESCRIPTION)			M/R OR SPECIFICATION NO.	Q-LISTED ITEM YES	NO
Defueling Canisters			15737-2M-101J	X	

TYPE SURVEY (CHECK ONE OR MORE)

- [x] FACILITY/MANUFACTURING CAPABILITY
- [x] QUALITY PROGRAM EVALUATION:
  - [ ] SUMMARY REVIEW ONLY (SECTION IX OF THIS FORM)
  - [x] IN DEPTH REVIEW TO SPECIFIED QUALITY REQUIREMENTS (SUPPLEMENTAL CHECKLIST)

II. KEY MANAGEMENT PERSONNEL IN ADMINISTRATION, ENGINEERING, PRODUCTION, QUALITY ASSURANCE AND QUALITY CONTROL

TITLE	NAME	CONTACTED DURING SURVEY YES	NO
President	Martin Kaplan	X	
V. P., Engineering	Kris Singh	X	
General Manager	Ron Kaplan	X	
Prod. Control Manager	Jay Murphy		X
Quality Control Manager	John Benckert	X	
Asst. Q.C. Manager	Chuck Leonard		X
Contract Administrator	Joy Reader		X

III. PRESENT MANPOWER CAPABILITY

DEPARTMENT/CLASSIFICATION	1ST SHIFT	2ND SHIFT	3RD SHIFT	UNION AFFILIATION
Shop Production	37	19		Local 19, AFL Sheet & Metal Workers
Engineers	7			None
Draftsmen	4			None
Quality Assurance	1 *			None
Quality Control **	3 *	0		None
Shop Inspectors	2			None

* Operate in same function

SURVEY TEAM COMMENTS: Supplier has sufficient manpower and has committed to a larger work force if required by workload. Quality verification activities are performed by Quality Control Personnel.

* Includes John Benckert

** Committed to an increase of 1 person

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BECHTEL

SUPPLIER SURVEY
MANUF CTURING AND QUALITY C NTROL
PSQ-391 G

IV. COMMODITY/MATERIAL

PRINCIPAL ITEMS MANUFACTURED/SUPPLIED

DESCRIPTION	SIZE MAXIMUM – MINIMUM	PRODUCTION CAPACITY
High Density Spent Fuel Racks	See Comments	See Comments
Heat Exchangers		
Pressure Vessels		
Welded Fabrications		

SURVEY TEAM COMMENTS: Size of units fabricated is controlled by customer requirements and production capacity is dependent upon type of work and complexity of item.

V. OLD/NEW CONTRACTS

1) PREVIOUS BECHTEL CONTRACTS

PURCHASE ORDER NO.	PROJECT NAME	MATERIAL/COMMODITY DESCRIPTION	YEAR COMPLETED
11917-3-M-070B	Korea	ASME VIII Turbine Bldg. HX	4/81
15737-TC-022106	TMI	Test Cannisters	6/85

2) MAJOR WORK CURRENTLY IN PROCESS OR COMMITTED

CUSTOMER	MATERIAL/COMMODITY DESCRIPTION	QUANTITY	SCHEDULED COMPLETION DATE
Commonwalth ED	High Density Spent Fuel Racks	39 Racks	7/83
Wash. Public Pwr.	High Density Spent Fuel Racks	32 Racks	4/83
MS Pwr. & Light	High Density Spent Fuel Racks	17 Racks	10/83
SMUD	High Density Spent Fuel Racks	11 Racks	11/83
Bechtel	Heat Exchangers (Savannah River)		

3) NUMBER OF YEARS EXPERIENCE IN THE MANUFACTURING AND/OR SUPPLYING OF NUCLEAR SAFETY RELATED ITEMS: 15 Yrs. NUCL

SURVEY TEAM COMMENTS: Discussions with supplier personnel found that supplier has had a varied background of different commodities which were constructed to standards consistent with ASME & 10CFR50, App. B.

BECHTEL

SUPPLIER SURVEY

MANUF. CTURING AND QUALITY C NTROL
PSQ-391 G

VI. FACILITY/WORK AREAS

1) TOTAL OPERATING SPACE	INDOORS (SQ. FT.)	OUTDOORS (SQ. FT.)
105,000	105,000	--

2) BUILDING BAYS 4

NUMBER	LENGTH (FEET)	WIDTH (FEET)	CRANE CAPACITY	UNDERHOOK HEIGHT (FEET)
A	360	100	2/15 ton	20
B	400	112	2/60 ton	50
A2	250	45	1/15 ton	50
B2	250	50	--	--

3) DESCRIBE CLEAN ROOM, OR OTHER RESTRICTED ACCESS FACILITIES

Bldg. B2 used as required for clean area

SURVEY TEAM COMMENTS: Shop area has sufficient size and adequate crane capacity.

VII. SHIPPING DATA

TYPE		SERVICED BY
RAIL	X	Conrail
TRUCK	X	
WATER	X	
AIR	X	

SURVEY TEAM COMMENTS: Supplier is located in a metropolitian area and has access to all modes of transportation. Shop is serviced by rail spur and pier to waterway (Delaware River) extends from shop.

VIII. MANUFACTURING DATA

REFER TO ATTACHED PSQ 391M (MECHANICAL) ~~OR PSQ-391E (ELECTRICAL) CHECKLIST~~

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BECHTEL

SUPPLIER SURVEY
MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

FOR USE WITH PSQ 391G, SUPPLIER SURVEY, MANUFACTURING AND QUALITY CONTROL

SUPPLIER (NAME)	ADDRESS (CITY/STATE)
Joseph Oat Corporation	2500 Broadway, Drawer 10, Camden, NJ

COMMODITY/MATERIAL SURVEYED	NAME OF SURVEY TEAM MEMBERS	DATE
Defueling Canisters	L. J. McAnallen, PSQS	7/10, 11/85

I. CODE CONSTRUCTION

1) ASME CODE CERTIFICATES OF AUTHORIZATION (ATTACH COPIES TO THIS REPORT):

SECTION	STAMP/CERTIFICATION	EXPIRATION DATE
N Class 1, 2, 3, MC	1488	8/23/88
NPT Class 1, 2, 3, MC	1489	8/23/88
NA Class 1, 2, 3	1577	8/23/88
Sec. VIII "U" Stamp	184	12/12/85

2) NATIONAL BOARD INSPECTION AGENCY:

Hartford Steam Boiler

3) OTHER:

API ______

AWS Yes

TEMA Yes

OTHER (SPECIFY) ANSI N45.2, 10-CFR-50 Appx B

SURVEY TEAM COMMENTS: After discussions with supplier and reviews of various documents, it was ascertained that supplier can procure items which comply with above codes and standards.

II. TOOLS AND EQUIPMENT

1) PRINCIPAL MACHINE TOOLS:

DESCRIPTION BY TYPE	QUANTITY	SIZE OF CAPACITY
See attached fact sheet		

BECHTEL

SUPPLIER SURVEY

MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

2) PRINCIPAL METAL FORMING AND CUTTING EQUIPMENT:

DESCRIPTION BY TYPE	QUANTITY	SIZE OR CAPACITY
See attached fact sheet		

3) TESTING EQUIPMENT:

TYPE	NO.	DESCRIPTION	CAPACITY	CALIBRATION
Hydrostatic	2	Pneumatic Pumps	6000 lbs.	yes
Pneumatic	1	Compressor	100 lbs.	yes
Helium Leak		Outside Vendor		
Halogen Leak		Outside Vendor		
Tensile		Outside Vendor		
Bend		Outside Vendor		
Impact		Outside Vendor		
Hardness	1	Ames Portable		yes
Other (specify)				

4) OTHER PRINCIPAL EQUIPMENT

See attached fact sheet.

SURVEY TEAM COMMENTS: Observations of facility and equipment reveals general housekeeping satisfactory and that equipment appears to be maintained and in working condition.

BECHTEL

SUPPLIER SURVEY
MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

III. SPECIAL PROCESSES

1) WELDING EQUIPMENT AND PERSONNEL:

	NO. OF MACHINES	NUMBER OF QUALIFIED WELDERS: ASME IX	AWS	OTHER (SPECIFY)
SHIELDED METAL ARC	See attached	25		
GAS TUNGSTEN ARC	fact sheet	10		
GAS METAL ARC		10		
FLUX CORED ARC		10		
SUBMERGED ARC		3		
ELECTROSLAG				
ELECTROGAS				
PLASMA ARC				
ELECTRON BEAM				

METALS AND ALLOYS NORMALLY WELDED: c/s, s/s, CuNi, AlBr, Titanium

SURVEY TEAM COMMENTS: Review of welder qualifications and procedure qualification confirm adequate personnel and control of processes.

2) MELTING AND HEAT TREATING FURNACES:

TYPE	MAX. TEMP.	CAPACITY	AUTOMATIC OR MANUAL: RECORDER	CONTROLLER
Outside Vendor				

SURVEY TEAM COMMENTS: All heat treating and brazing when required is subcontracted to qualified supplier on the approved vendor list.

BECHTEL

SUPPLIER SURVEY
MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

3) NON DESTRUCTIVE EXAMINATIONS (NDE):

a – NDE PERFORMED BY:

☐ SUPPLIER (ALL OR PARTIAL) PT, MT by Oat

☐ SUBCONTRACTOR (NAME/LOCATION) RT by Eastern Testing. Oat is currently in process of procurement of its own x-ray equipment

b – NDE PROCEDURES

METHOD	PROCEDURE DESIGNATION		*I.D.	REV.	DATE
MT – PROD	--				
MT – COIL	--				
MT – YOKE	QC-50	Written	PER	Contract	
PT – SOLVENT REMOVABLE	QC-10	Written	PER	Contract	
PT – POST EMULSIFYING	--				
UT – ANGLE BEAM	--				
UT – STRAIGHT BEAM	--				
RT – X-RAY	QC-20	Written	PER	Contract	
RT – GAMMA RAY	QC-20	Written	PER	Contract	
ET – EDDY CURRENT					

*ENTER "S" FOR SUPPLIER; "S/C" FOR SUBCONTRACTOR

c – NDE PERSONNEL QUALIFICATIONS/TESTING EQUIPMENT

METHOD	PERSONNEL QUALIFICATION SNT-TC-1A LEVEL 1	SNT-TC-1A LEVEL 2	SNT-TC-1A LEVEL 3	DESCRIPTION OF TEST EQUIPMENT
MT	-	1	1	Magnaflux Y5 & Y6 yoke
PT	0	2	1	Turco solvent removable
UT	-	-	-	
RT	-	1	1	Vendor's equipment
ET				

SURVEY TEAM COMMENTS: Verified that NDE procedures are available and in use. Check of equipment verified that equipment is currently calibrated as noted on calibration stickers.

Updated

JOSEPH OAT CORPORATION
CHEMICAL ENGINEERS & FABRICATORS
NUCLEAR POWER COMPONENTS

FACT SHEET

December 10, 1982

JOSEPH OAT CORPORATION
2500 Broadway, Drawer #10
Camden, New Jersey 08104
(609) 541-2900

Field Office:
JOSEPH OAT CORPORATION
New York Office
153 Bedell Avenue
Hempstead, New York 11550
(516) 483-0863

Trading continuously since 1788.

A privately owned corporation with no affiliation public or private.

GENERAL INFORMATION

JOSEPH OAT CORPORATION is a designing, fabricating, and engineering company primarily devoted to the Nuclear and Chemical Industries. Our product lines include heat exchangers, vessels, and complete liquid radwaste treatment systems, including evaporators, demineralizers, new and Spent Fuel Storage Racks.

JOSEPH OAT CORPORATION is qualified to furnish construction to the following ASME Codes:

	STAMP NO.	EFFECTIVE	EXPIRES
"U" Pressure Vessel	#184	11/29/82	12/12/85
"N" Stamp Classes 1,2,3, & MC Vessels	#1488	9/13/82	8/23/85
"NPT" Classes 1,2,3, MC Vessel Parts & Components & Supports	#1489	9/13/82	8/23/85
"NA" Shop Assembly of Class 1, 2 & 3 Components, Appurtenances - Piping Subassemblies & Component Supports	#1577	9/13/82	8/23/85

Credit information will be furnished upon request.

Our manufacturing location is: JOSEPH OAT CORPORATION
Drawer #10, 2500 Broadway
Building A & B
South Jersey Port Corporation
Camden, New Jersey 08104

Inquiries should be sent to the attention of Mr. Edward S. Marinock, Vice-President of Sales, at our Camden office, or John S. Shannon, Asst. Marketing Manager at our New York office.

COMPANY OFFICIALS

President	Martin Kaplan
Vice-President	Maurice Holtz
General Manager	Ronald Kaplan
Vice-President Engineering	Dr. K. Singh
Chief Engineer	Michael Holtz
Production Control Mgr.	Jay Murphy
Plant Superintendent	F.R. Gavin
Quality Control Manager	John Benckert
Vice President of Sales	Edward S. Marinock
Purchasing Agent	Al Gates

SCOPE OF WORK

Engineering, design, and fabrication of all types of distillation, evaporation, drying, heat transfer, pressure vessels, and equipment listed in our brochure, with all necessary guarantees.

All fabrication procedures conforming to ASME Specifications, covering Section III (Nuclear), Section VIII, and TEMA Standards. All welding performed by Code Qualified Welders.

UNION AFILIATION

Sheet Metal Workers Local 19

INSPECTION AGENCY FOR CODE CONSTRUCTION

The Hartford Steam Boiler Inspection & Insurance Company
Suite 444, Valley Forge Executive Mall Building
Post Office Box 504
Wayne, Pennsylvania 19087

METALS USED IN FABRICATION

All alloys covering every grade of stainless stell; carbon steel; all nonferrous materials, including nickel and monel; high alloy materials such as incoloy, carpenter 20, hastelloy; all clad materials; and titanium, titanium-clad, and zirconium.

SHOP FACILITY

"A" Building - 100 ft. x 360 ft.   "A2" Building - 45 ft. x 250 ft.

"B" Building - 112 ft. x 400 ft.   "B2" Building - 50 ft. x 250 ft.

Total square feet of working area -- 105,000

LIFTING CAPACITY

"A" Bay - 2/15 ton bridge-type crane, cab operated with 20 foot under hook, plus Jib cranes of 1 to 3 ton capacity.

"A2" Bay - 1/15 ton bridge-type crane, cab operated with 50 foot under hook

"B" Bay - 2/60 ton bridge-type cranes, cab operated with 15 ton auxiliary on same bridge, with 50 foot under hook

"B2" Bay - No crane

Floors - Reinforced concrete; 40% of floors are with leveling surface rails for precision fabrication.

MANUFACTURING EQUIPMENT

Shears: 3/8" capacity
Power Squaring Shear: 1" x 10'
Saw, Do-All: 20" throat (1)
2 - Linde Plasma Burner Type PT-5
Clad 1½" thk., 2" solid

8 Abrasive Cut-Off Saw, cut to 1" pipe
Auto. Flame Cutting: 4" carbon steel
22" Abrasive Cut-Off Saw Hydraulic operated, cut to 8" pipe - 4" round stock
Brake: ¼" capacity - 6'2" width, 6" stroke

Pyramid Rolls: 1 set 1½" max. plate - 18" min. ID x 120" width

Welders:
4 each Lincoln, Shield Arc, current range 1 to 600 amps
6 each Linde, 300 amp, AC-DC range, 1 to 300 amps
6 each Linde, 500 amp, DC range, 1 to 500 amps
1 each Linde, Submerged Arch Overlay Assembly with hot wire feed, automatic turntable
2 each Panjiris Submerged Arc - 14' x 14' boom, 60' track, electrically controlled, fully automatic
3 each Linde, 500 amp, DC range, 1 to 500 amps
1 each Linde, 650 amp, DC range, 1 to 650 amps
6 each Linde, 500 amp, DC range, 1 to 500 amps
1 each Linde, 300 twin amp, DC range, 1 to 300 amps
4 each Linde, 300 amp, DC range, 1 to 300 amps
3 each Linde, MIG units
5 each Westinghouse, 300 amp, DC, TIG
2 each Phoenix Dry-Rod Ovens, Type 300, adj. thermostat control 100° to 550°F - capacity 350 lbs. of 18" rod
1 each Linde VI - 800 amp - Submerged Arc
1 Miller syncorwave 300 AC-DC gas tungsten arc or shield metal arc welder
1 Miller coolmate 12 circulating system
1 Jetline side carriage with 20' track special sequence control and single heliarc torch
4 Miller Tig Rigs welding control for Miller 300 amp power supply
4 Miller gold star 300 ss power source 300 amp
2 Jetline seam welders with 16 ft. mandrells with double torch carriages, air and mechanical clamping, w/2 heliarc torches
4 Miller coolmate 12 circulating systems for cooling torch & mandrel

Rolls: 4 sets Power turning, 8 ton capacity
1 set Power turning, 60 ton capacity, Ransome Model CPR
1 set Power turning, 150 ton capacity, Ransome Model CPS
3 sets Power turning, 30 ton capacity, Ransome -
2 additional sets of idlers which can sustain up to 45
1 set Power turning, 17 ton capacity, Pandjiris
2 sets Power turning, 30 ton capacity, Pandjiris
2 sets Power turning, 45 ton capacity, Pandjiris
1 set Power turning, 20 ton capacity
1 set Power turning, 10 ton capacity
1 set Power turning, 5 ton capacity

Plus many sets of manual type rolls

4 each 24,000 lbs. Welding Positioners, power driven
2 each 16,000 lbs. Welding Positioners, power driven
2 each 1,000 lbs. Welding Positioners, power driven
1 each 48" diameter, Inert Gas Controlled Atmosphere, Welding Chamber
1 Pandris automatic head stock-tail stock positioners with 360" rotation 460 volt 3 phase

Machine Tools

1 each Baffle Deburrer - fully automatic

Radial Drill Presses - 1 each 3-1/2 ft. reach, 10" col., #5 Morse Taper
1 each 4 ft. reach, Ikeda, 12" col., #5 Morse
2 each 5 ft. x 15" col., Speedmaster, #5 Morse
1 each 7 ft. x 14" col., #5 Morse
1 each 7 ft. x 16" col., #5 Morse
2 each 8 ft. reach, Carlton, 19" Col., #6 Morse
1 each 5 ft. reach, Carlton, 15" Col., #5 Morse
1 turret lathe -#2A Warner Swasey serial #853, 921 22" swing 4" hole threading gear box automatic feeds
1 Cincinatti #3 vertical milling machine, 14" x 60" table, 5 h.p. motor, 3 way automatic feed
1 Roger's 210" table capacity knife, grinder, 5 h.p.

Vapkool Systems - 3 each 75 CFM at 100 psi with 12 gallon tank

Threaders - 3" max. pipe - 1" max. bolt size

Lathes - 1 each Lodge & Shipley, 20" over ways, 24" over rails, 5 ft. long
1 each American, 20" over ways, 24" over rails, 10 ft. long

Boring Mill - 1 each Colburn 54" table, 36" working height under heads - 2 cutting heads
1 each Horiz. 84" table, 60" working height under heads - 2 cutting heads
1 each Horiz. 100" table, 72" working height under heads - 2 cutting heads
2 each Bullard 42" Table, 36" working height under heads - 1

SCELLANEOUS

each Oliver-Adrian drill sharpener
each Oliver Adrian drill grinder

ONDESTRUCTIVE TESTING EQUIPMENT

1 - Andrex, portable, 180 KV, 1" penetration
1 - G.E. Type H-2 Halogen Leak Detector
1 - Model 100 Son Tector, portable for air test of vessels
1 - Bacharach, Purge Kit to check oxygen content when welding gas back-up
Turco Liquid Penetrant Inspection Kit, nonagueous type
Magnetic Particle Inspection, magnaflux yoke type, 110 volt
Test Plugs from 2" to 10" ips pipe

TESTING FACILITIES

1 - Demineralizer, Model MM4, Serial No. 51966. Exchange capacity 47,000 grains. Maximum blow rate 11.6 gallons per minute. To produce water of 2000,000 OHM quality:

Hydrostatic - 6,000 psig   Air - 3,500 psi

2 each - Hasket Liquid Pumps, 8,000 psi capacity, oil or water

Air Compressors - 1 each 75 HP, 300 CFM, Worthington Mono Rotor, 100 psi
1 each 60 HP, 240 CFM, Worthington Mono Rotor, 100 psi
1 each 125 HP, 640 CFM, Worthington Mono Rotor, 110 psi

TUBE EXPANDING EQUIPMENT

4 each Wilson Tube Expanding Machines air operated, torque controlled.

MATERIAL LIMITATIONS

	MAXIMUM THICKNESS
Carbon Steel	4"
Ferritic Stainless Steel (400 series)	2-1/2"
Austenitic Stainless Steel (300 series)	3-1/2"
Clad	3-1/2"
Nickel	2-1/2"
Nickel Alloy	2-1/2"
Copper	2-1/2"
Silicon Bronze	2-1/2"
Hastelloy B,C.	2-1/2"
Titanium, Zirconium, etc.	1-1/2"

We also work with silver.

Sand Blasting Facility: 1 - Portable Vacu-Blast Model OP
1 - Portable Empire Model 1105

TRANSPORTATION

Truck Lines - All major trucking companies that service the Philadelphia, Pennsylvania area.

Railroad - Spur line into both bays continuing onto pier. Serviced by Penn-Central and Jersey Central Railroads.

Waterway - Pier extends from shop with 350 ton lifting capacity. Waterway is the Delaware River.

ENGINEERING SERVICE

The Engineering Department, headed by Dr. K.P. Singh, consists of Chemical and Mechanical Engineers with specialized education and industrial experience in a variety of disciplines; namely applied mechanics, heat transfer, and transport phenomena. Oat engineers are extensivly experienced in ASME nuclear code design, pressure vessel stress analysis using the latest finite element techniques, seismic analysis, piping flexibility analysis, elevated temperature effects, and thermal fatigue evaluation. Oat's Engineering Department has designed and analyzed hundreds of nuclear heat exchangers and special purpose pressure vessels.

Process equipment includes heat exchangers, evaporators, degasifiers, demineralizers, and the many various holding and processing vessels required in a nuclear ...r plant.

... ...llaboration with Philadelphia area university professors, Oat Engineer's provide a consulting service in the name of THERMAC Associates, a division of Joseph Oat Corporation. This arrangement broadens our expertise over a very wide scope of industrial technology. Every consultant is an expert in his specialty.

Joseph Oat Corporation is a member of Heat Transfer Research, Incorporated; our Engineers and Consultants are active in the professional societies; our facilities include fast in-house batch computer terminals with direct line access to the most powerful computers in America.

QUALITY CONTROL SYSTEM

Oat's quality control system, approved by ASME Survey Team for ASME Section III (all classes) and Section VIII, conforms to 10CFR50 Appendix B, and ANSI N45.2.

BECHTEL

SUPPLIER SURVEY
MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

ATTACHMENT 7
(4410-85-L-0210)
23 Pages

FOR USE WITH PSQ-391G, SUPPLIER SURVEY, MANUFACTURING AND QUALITY CONTROL

SUPPLIER (NAME) Babcock & Wilcox Co. Commercial Nuclear Fuel Plant	ADDRESS (CITY/STATE) P. O. Box 11646, Lynchburg, Virginia 24506

COMMODITY/MATERIAL SURVEYED:	NAME OF SURVEY TEAM MEMBERS	DATE
Defueling Canister	L. J. McAnallen	8/6/85

I. CODE CONSTRUCTION

1) ASME CODE CERTIFICATES OF AUTHORIZATION (ATTACH COPIES TO THIS REPORT):

SECTION	STAMP/CERTIFICATION	EXPIRATION DATE
III	2660	January 4, 1988
III	NPT/2660-1	January 4, 1988
VIII	S/19902	December 5, 1987
VIII	U/19903	December 5, 1987
VIII	U2/19904	December 5, 1987

2) NATIONAL BOARD INSPECTION AGENCY:
The Hartford Steam Boiler Inspection and Insurance Company

3) OTHER:

API

AWS

TEMA

OTHER (SPECIFY)

SURVEY TEAM COMMENTS: Code certifications attached.

II. TOOLS AND EQUIPMENT

1) PRINCIPAL MACHINE TOOLS:

DESCRIPTION BY TYPE	QUANTITY	SIZE OF CAPACITY
CNC Milling Horz. and Vert.	4	24" x 24"
Manual Knee Type Mills, Vert. and Horiz.	10	24" x 72" Max.
Boring Mill Horz. 5"	1	48" x 8' Travel
Lathes, Automatic and CNC	4	10" x 24"
Lathes, Manual	8	24" x 86" Max. or 18"x120"
Laser Welding - CNC Controlled	1	1200 Watt

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SUPPLIER SURVEY

MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

2) PRINCIPAL METAL FORMING AND CUTTING EQUIPMENT:

DESCRIPTION BY TYPE	QUANTITY	SIZE OR CAPACITY
Plate Shear	1	1/4" x 8'
Forming	1	10 Ga. x 8'
Gas Burning, Automatic	1	2"
Gas Burning, Manual	2	3"
Cabinet and Portable Blasting Equipment	2	36" x 16" x 48"

3) TESTING EQUIPMENT:

TYPE	NO.	DESCRIPTION	CAPACITY	CALIBRATION
Hydrostatic	2	Incore, Plugs Test Fixtures	4,000 psi	3 months
Pneumatic				
Helium Leak	2	Veeco MS-90 Equipment	1×10^{-10}	Yearly 5.1×10^{-8}
Halogen Leak				
Tensile	1	Baldwin Tensile Machine	120,000 lbs.	Yearly
Bend	2	ASME Fixtures	055-036 Thickness	As Required
Impact				
Hardness	1	Rockwell Tester	15T to RC	Prior to Use
Other (specify)				

4) OTHER PRINCIPAL EQUIPMENT:

SURVEY TEAM COMMENTS: 1) The largest pump available to hydrostatically test the canisters has a 2 gal. capacity. 2) The supplier does not have facilities to machine shell pipe on completed canisters.

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SUPPLIER SURVEY
MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

III. SPECIAL PROCESSES

1) WELDING EQUIPMENT AND PERSONNEL:

	NO. OF MACHINES	NUMBER OF QUALIFIED WELDERS — ASME IX	AWS	OTHER (SPECIFY)
SHIELDED METAL ARC	4	None		
GAS TUNGSTEN ARC	10 (1)	3 (2)	---	20 (to progam 09-1212)
GAS METAL ARC				
FLUX CORED ARC				
SUBMERGED ARC				
ELECTROSLAG				
ELECTROGAS				
PLASMA ARC				
ELECTRON BEAM				

METALS AND ALLOYS NORMALLY WELDED: Stainless Steel, Inconel, Zirconium Alloys, Aluminum

SURVEY TEAM COMMENTS: (1) 10 machines are in service; 3 more are in storage. The supplier can make 5 available for the canister fabrication.

(2) B&W expects to qualify 2 more welders to ASME for the canister fabrication.

2) MELTING AND HEAT TREATING FURNACES:

TYPE	MAX. TEMP.	CAPACITY	AUTOMATIC OR MANUAL — RECORDER	CONTROLLER
Controlled Atmosphere	2400° F.	24" x 36" x 16"	Automatic	

SURVEY TEAM COMMENTS:

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SUPPLIER SURVEY
MANUFACTURING DATA CHECKLIST
PSQ-391 M (MECHANICAL)

3) NON-DESTRUCTIVE EXAMINATIONS (NDE):

a – NDE PERFORMED BY:

[X] SUPPLIER: (ALL OR PARTIAL)

[X] SUBCONTRACTOR: (NAME/LOCATION) Not available

b – NDE PROCEDURES:

METHOD	PROCEDURE DESIGNATION	*I.D.	REV.	DATE
MT – PROD				
MT – COIL				
MT – YOKE				
PT – SOLVENT REMOVABLE	QC-702 Liquid Penetrant ADD-1	S	4	2/20/85
PT – POST EMULSIFYING				
UT – ANGLE BEAM				
UT – STRAIGHT BEAM	QC-704 UT of Tubes	S	2	10/23/81
RT – X-RAY	QC-722 Radiographic QC-719 Radiographic	S&C	0 0	9/6/84 4/13/82
RT – GAMMA RAY		SC		
ET – EDDY CURRENT		SC		

*ENTER "S" FOR SUPPLIER: "S/C" FOR SUBCONTRACTOR

c – NDE PERSONNEL QUALIFICATIONS/TESTING EQUIPMENT

METHOD	PERSONNEL QUALIFICATION SNT-TC-1A LEVEL 1	SNT-TC-1A LEVEL 2	SNT-TC-1A LEVEL 3	DESCRIPTION OF TEST EQUIPMENT
MT				
PT		2	1*	Magnaflux/Solvent Removable
UT	2	1	1*	Sonic Instruments
RT	1	1	1*	Norolco MG-300, 300kv
ET				

SURVEY TEAM COMMENTS: * B&W has one man certified level III in PT, UT and RT.

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BECHTEL

SUPPLIER SURVEY
MANUFACTURING AND QUALITY CONTROL
PSQ-391 G

I. GENERAL

SUPPLIER: Babcock & Wilcox Company Commercial Nuclear Fuel Plant	ADDRESS (CITY/STATE): P. O. Box 11646, Lynchburg, Virginia
ZIP CODE: 24506 — AREA CODE / TELEPHONE: (804) 522-5538	NAME OF SURVEY TEAM MEMBER(S): T. Gillespie, (QA) ATL; P. Kunjeer, DE; R. Marshall, SQA; L. McAnallen, PSQS; T. McKearney, M&QS
JOB CHARGE(S): 15737-027 — DATE OF SURVEY: 8/6/85	

COMMODITY/MATERIAL SURVEYED (COMPLETE DESCRIPTION)	M/R OR SPECIFICATION NO.	Q-LISTED ITEM YES	NO
Defueling Canisters	15737-2M-101K	X	

TYPE SURVEY (CHECK ONE OR MORE)

- [X] FACILITY/MANUFACTURING CAPABILITY
- [X] QUALITY PROGRAM EVALUATION:
  - [ ] SUMMARY REVIEW ONLY (SECTION IX OF THIS FORM)
  - [X] IN DEPTH REVIEW TO SPECIFIED QUALITY REQUIREMENTS (SUPPLEMENTAL CHECKLIST)

II. KEY MANAGEMENT PERSONNEL IN ADMINISTRATION, ENGINEERING, PRODUCTION, QUALITY ASSURANCE AND QUALITY CONTROL

TITLE	NAME	CONTACTED DURING SURVEY YES	NO
Plant Manager	R. A. Alto	X	
Manager, Quality Assurance	W. T. Engelke	X	
Manager, Major Supplier Q.A.	J. Ficor	X	
Manager, Specialty Manufacturing	C. A. Moore	X	
Manager, Production and Materials Control	B. W. Pugh	X	
Manager, Inspection Operations	K. L. Harris	X	
Manager, Data Evaluation	J. L. Brown	X	
Manager, Manufacturing	D. V. Ferree		X

III. PRESENT MANPOWER CAPABILITY

DEPARTMENT/CLASSIFICATION	1ST SHIFT	2ND SHIFT	3RD SHIFT	UNION AFFILIATION
Shop Production	53	15		None
Engineers	9			None
Draftsmen	--			None
Quality Assurance	11			None
Quality Control)	Included			None
Shop Inspectors)	23			None

SURVEY TEAM COMMENTS: ____________

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BECHTEL

SUPPLIER SURVEY

MANUFACTURING AND QUALITY CONTROL
PSQ-391 G

IV. COMMODITY/MATERIAL

PRINCIPAL ITEMS MANUFACTURED/SUPPLIED

DESCRIPTION	SIZE MAXIMUM – MINIMUM	PRODUCTION CAPACITY
Nuclear Fuel Assemblies	---	700 MTU/YR
Nuclear Control Rod Assemblies	---	N/A
ASME Code Components	Up to 24" x 16'	N/A

SURVEY TEAM COMMENTS: ______

V. OLD/NEW CONTRACTS

1) PREVIOUS BECHTEL CONTRACTS

PURCHASE ORDER NO.	PROJECT NAME	MATERIAL/COMMODITY DESCRIPTION	YEAR COMPLETED
NOTE: No direct	Bechtel contracts	, however, B&W - CNFP fabricated in the	
canister	handling tooling f	or GPU (TMI-II)	1985

2) MAJOR WORK CURRENTLY IN PROCESS OR COMMITTED

CUSTOMER	MATERIAL/COMMODITY DESCRIPTION	QUANTITY	SCHEDULED COMPLETION DATE
DOE	Evacuation/Backfill Mechanism	2	August 15, 1985
NAVY	Handling Tooling (Navy Nuclear)	12	October 7, 1985
8 Electrical	Nuclear Fuel Assemblies, Control		
Utilities	Components and Incore Detectors		Continuing thru
			2004

3) NUMBER OF YEARS EXPERIENCE IN THE MANUFACTURING AND/OR SUPPLYING OF NUCLEAR SAFETY RELATED ITEMS:

SURVEY TEAM COMMENTS: ______

SUPPLIER SURVEY

MANUFACTURING AND QUALITY CONTROL
PSQ-391 G

VI. FACILITY/WORK AREAS

1) TOTAL OPERATING SPACE	INDOORS (SQ. FT.)	OUTDOORS (SQ. FT.)
	56,000	40,000

2) BUILDING BAYS

NUMBER	LENGTH (FEET)	WIDTH (FEET)	CRANE CAPACITY	UNDERHOOK HEIGHT (FEET)
Bay #1	675'	60'	(2) 5-ton, (1) 2-Ton	20'
Bay #2	300'	60'	None	N/A

3) DESCRIBE CLEAN ROOM, OR OTHER RESTRICTED ACCESS FACILITIES Clean room approximately 25 x 30 equipped to provide Class "B" nuclear clean parts. Assembly room approximately 35' x 60' Class B. The entire plant is basically a "Clean Area."

SURVEY TEAM COMMENTS: South end of Bay #1 will be used for canister fabrication; approximately 6000 sq. ft. This area contains (1) 5-ton crane.

A pit 5 ft. x 18 ft. x 14ft. deep is available to facilitate filter loading.

VII. SHIPPING DATA

TYPE		SERVICED BY
RAIL		
TRUCK	X	Six (6) commercial truck lines
WATER		
AIR	X	Lynchburg Airport - Piedmont and American

SURVEY TEAM COMMENTS:

VIII. MANUFACTURING DATA

REFER TO ATTACHED PSQ-391M (MECHANICAL) OR PSQ-391E (ELECTRICAL) CHECKLIST.

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BECHTEL

REPORT OF AUDIT
SUPPLIER QUALITY PROGRAM
PSQ-396 A

A. GENERAL

1. This Report of Audit on the supplier listed below consists of two parts;

PART I : AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY
PART II: AUDIT CHECKLIST (CONTROLLED DISTRIBUTION)

SUPPLIER
BABCOCK & WILCOX (NUCLEAR POWER DIV) COMMERCIAL NUCLEAR FUEL PLANT

ADDRESS	CITY	STATE	ZIP CODE	TELEPHONE NO.
P.O. BOX 11646	LYNCHBURG	VA.	24506	804) 522-5538

2. The audit was performed for the purpose of examining the supplier's implementation of his quality program and his adherence to technical requirements of the purchase order(s).

B. PART I—AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY

1. Type audit and date performed:

X	TYPE AUDIT	DATE PERFORMED
X	Full Scope	8/5-7/85
	Limited Scope	
	Progressive (P-1 or P-2)	

2. Supplier Quality Program Evaluated:

	TITLE	REVISION	DATE
Quality Manual(s): (Include Addendums, Supplements, etc.)	QA PROGRAM FOR COMMERCIAL NUCLEAR FUEL PLANT	12	2/14/84
	QA PROGRAM FOR ASME SECT. I & VIII, DIV 1 & 2	0	10/9/84
Other Q.C. Documents: (Exclusive of quality manual)			

3. Purchase Orders Covered by this audit

PURCHASE ORDER NO(S).	REVISION	DATE	*P.O. STATUS	DESCRIPTION OF COMMODITY/MATERIAL
PRE AWARD QUALIFICATION AUDIT				

*STATUS CODE: A=IN FABRICATION B=DESIGN/ENGINEERING C=INACTIVE

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REPORT OF AUDIT
SUPPLIER QUALITY PROGRAM
PSQ-396 A

Supplier BABCOCK & WILCOX

PART I – AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY (Continued)

4. Audit Meeting Data:

	NAME	MEMBER STATUS (Auditor, Observer, or Technical Specialist)	PROJECT/AREA OR DIVISION OFFICE	*ATTENDANCE A	B	C
BECHTEL	T. I. GILLESPIE	AUDIT TEAM LEADER	EASTERN POWER DIV Q.A.	✓	✓	✓
	P. KUNGEER	TECH. SPECIALIST	EPD DESIGN ENGR.	✓	✓	✓
	T. McKEARNEY	" "	EPD M&QS MGR	✓	✓	✓
	L. J. McANALLEN	AUDITOR	EPD PSQS	✓	✓	✓
	R. MARSHALL	"	SFHO ATL		✓	✓
OTHERS						
SUPPLIER	NAME	POSITION				
	R. A. ALTO	PLANT MGR			✓	✓
	C. A. MOORE	MGR. SPECIALTY MANU.			✓	✓
	W. T. ENGELKE	Q. A. MGR.			✓	✓
	J. L. BROWN	MGR. DATA EVALUATION			✓	✓
	K. L. HARRIS	MGR. INSP. OPER.			✓	✓

5. Audit Scope and Summary: (**)

SCOPE YES	SCOPE NO	QUALITY ELEMENT	FINDING	SCOPE YES	SCOPE NO	QUALITY ELEMENT	FINDING
✓		1. Organization	S	✓		11. Test Control	S
✓		2. Quality Assurance Program	S	✓		12. Control of Measuring and Test Equipment	S
✓		3. Design Control	S	✓		13. Handling, Storage and Shipping	S
✓		4. Procurement Document Control	AFR-1 X	✓		14. Inspection, Testing and Operating Status	S
✓		5. Instructions, Procedures and Drawings	S	✓		15. Nonconforming Items	S
✓		6. Document Control	S	✓		16. Corrective Action	S
✓		7. Control of Purchased Material, Equipment and Services	S	✓		17. Quality Assurance Records	S
✓		8. Identification and Control of Material, Parts, and Components	S	✓		18. Audits	S
✓		9. Control of Special Processes	S			19. Special Audit Requirements	
✓		10. Inspection	S				

*ATTENDANCE:
A–At Pre-Audit Meeting
B–At Entrance Meeting
C–At Exit Briefing

**AUDIT FINDING CODE:
S–Satisfactory
X–Program Deficiency
N/A–Not Applicable

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Supplier BABCOCK & WILCOX

BECHTEL

REPORT OF AUDIT
SUPPLIER QUALITY PROGRAM
PSQ-396 A

B. PART I—AUDIT ADMINISTRATIVE DATA AND AUDIT SUMMARY (Continued)

5. Audit Scope and Summary (Continued):

a. Comment on areas of the quality program observed to be functioning exceptionally well: ——

b. The Quality Assurance Program elements examined by this audit were found to be effectively implemented with the following exceptions:

AUDIT TEAM PERFORMED A FULL SCOPE AUDIT AT BABCOCK & WILCOX, LYNCHBURG, VA.

THE AUDIT INVESTIGATION REVEALED ONE DEFICIENCY AS IDENTIFIED IN AUDIT FINDING AFR#1 AND SUMMARIZED BELOW:

ELEMENT IV AFR #1

PROCUREMENT DOCUMENTS FAILED TO PASS ON THE REQUIREMENT TO IMPOSE REGULATION 96-295 ON THE VENDORS.

c. Restrictions imposed/recommended

1) Hold on release of material/equipment for shipment: NONE

2) Control measures on further processing of selected activities: NONE

PROJECT CONCURRENCE ON RESTRICTION 5c 2) ABOVE:	NAME	PROJECT	DATE
	NA		

ATTACHMENTS	SIGNATURE OF AUDIT TEAM LEADER	DATE
1 AUDIT FINDING REPORTS	T J Gillespie	

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BECHTEL

AUDIT FINDING REPORT
PSQ-395

AUDIT FINDING REPORT NO.	DATE	NAME OF EVALUATOR(S)
#1	8/7/85	L. J. McANALLEN

1. SUPPLIER: BABCOCK & WILCOX, LYNCHBURG, VA

2. CHECKLIST AUDIT ITEM NO: IV PROCUREMENT DOCUMENT CONTROL

3. CONTROLLING DOCUMENT(S): (Quality manual, Procedure, Spec. references) QAM FOR COMMERCIAL NUCLEAR FUEL PLANT REV 12 2/14/84

4. REQUIREMENT: (Quote or paraphrase the controlling document, i.e. Section, paragraph)

SECT. 4.2 QUALITY ASSURANCE SHALL VERIFY THAT PROCUREMENT DOCUMENTS ... ARE COMPLETE WITH RESPECT TO TECHNICAL AND QUALITY REQUIREMENTS.
SECT. 4.3.1 THE PURCHASED MATERIALS LIST SHALL BE REVIEWED BY DATA EVALUATION FOR CONFORMANCE WITH THE APPLICABLE CONTRACT

5. FINDING: (Describe the deficiency in detail, i.e. What? How many? Numbers? When?)

THE PROCUREMENT AUTHORIZATION 774540 REV 4 ON ORDER SC-975 REQUIRED IMPOSITION OF REGULATION 96-295 FOR ALL ITEMS PURCHASED. THIS REQUIREMENT WAS NOT INCORPORATED ON THE PURCHASED MATERIAL LIST FOR THE FUEL CANISTER GRAPPLE ASSEMBLY. THE PML WAS REVIEWED AND SIGNED BY DATA EVALUATION. THIS RESULTED IN NUMEROUS PURCHASE ORDERS BEING ISSUED WHICH DID NOT IMPOSE REGULATION 96-295.

6. IMPACT ON QUALITY: (List direct and potential impact on quality of material)

NO DIRECT IMPACT.
POTENTIAL EXISTS FOR FAILURE TO PASS ON TECHNICAL AND QUALITY REQUIREMENTS WHICH COULD IMPACT PRODUCT QUALITY.

7. RECOMMENDED CORRECTIVE ACTION: (Actions recommended are suggested methods only and not contractually binding. Specific action to be taken to resolve the finding is left to the discretion of the supplier.)

1) REVIEW SC-975 AND EVALUATE IMPACT OF NONCONFORMANCE.
2) REVIEW OTHER ORDERS FOR SIMILIAR NONCONFORMANCES.
3) REVIEW WITH PROCUREMENT AND DATA EVALUATION PERSONNEL

8. AUDIT FINDING DISCUSSED WITH:
a. Supplier Management Representative: Name: R. A. ALTO Position: CNFP PLANT MGR.
b. Assigned Bechtel Quality Representative: Name: NONE Date:

9. SUPPLIER AGREES TO COMPLETE CORRECTIVE ACTION BY (Date): 9/6/85 COMPLETION ☒ RESPONSE ☐

10. RESTRICTION IMPOSED AS A RESULT OF THIS FINDING a) Type Restriction: NONE b) Project(s) Affected: NONE

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SUPPLIER QUALITY PROGRAM
CONTINUATION SHEET

Supplier: BABCOCK & WILCOX LYNCHBURG, VA Date: 8/7/80

Continuation Sheet for: (Check Applicable Box)

- ☐ PSQ-391, Summary & Recommendations
- ☐ PSQ-391 – ______ (specify)
- ☐ PSQ-395-0, Program Omission No. ______
- ☐ PSQ-396 A, Supplier Quality Program Audit
- ☐ PSQ-396 R, Supplier Quality Program Review
- ☒ PSQ-395, Audit Finding Report No. 1

4) CONT'

PROCUREMENT AUTHORIZATIONS.

5) P.O. CHECKED WHICH DID NOT IMPOSE REG. 86-295 WERE 974713 PC, 974790 PC, 974799 PC, 974793 PC, 974881 PC, 974 806 PC, 974 795 PC.

7) THE NEED TO ACCURATELY PASS ON AND CHECK FOR TECHICAL AND QUALITY REQUIREMENTS.

BECHTEL

SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
PSQ-396 A

Supplier Babcock & Wilcox

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S X N/A	5) SUMMARY OF INVESTIGATION
	I ORGANIZATION			
I-1	**Responsibility and Authority for Attaining and Verifying Quality** Ref QAM SEC VIII SEC. 4	a Verify that the organization chart (scheme) depicts the current operating structure of the company. Focus attention on functional responsibilities, levels of authority and lines of communication for the management, direction and execution of the quality program VERIFIED by REVIEW OF ORGANIZATION CHARTS AND discussion with QA MANAGER	S	NEW ORGANIZATION CHARTS WERE issued on 5/1/85. The CHARTS Adequately REFLECT ON FUNCTIONAL RESPONSIBILITIES, LEVELS OF AUTHORITY, AND LINES OF COMMUNICATION. The Charts ARE in process of being included in QAM 09-1212 & QAM SEC VIII.
I-2	**Responsibility for Quality Assurance Program Management and Direction** Ref QAM SEC VIII SEC 4 6.1.5.2	a Verify the position and relationship of the following persons W.T. ENGELKE (Name of person who heads quality program) MGR QA (Title) R.A. ALTO (Name of person quality head reports to) PLANT MGR (Title) b Request for and review written evaluation reports on the effectiveness of the overall quality program submitted by the person in charge of the quality program, or as appropriate, internal audit reports. Check reports for distribution to senior management of the company VERIFIED by REVIEW OF MISC. Activity REPORTS & MEETING MINUTES	S S	Reviewed monthly activity Reports To Plant MGR (R.A. Alto) also Reviewed Corrective Action Reports Internal & Supplier Audits. The Above adequately summarize the QA Program to Management. Reports are distributed to the Plant MGR, MGR Fuel & Speciality Manufacturing and other Cognizant Supervision by the QA MANAGER W.T. ENGELKE
I-3	**Independence of Personnel Performing Verification Action** Ref QAM SEC VIII SEC 4 6.1.5-6.1.5.2	a Verify that quality personnel performing verification actions (Tests, inspections, etc.) have authority and organizational freedom to identify quality problems, initiate, recommend or provide solutions to problems, verify implementation of solutions, and control further processing of nonconformances until proper dispositioning has occurred Audit techniques: •Questioning of quality personnel and review of related documents is recommended VERIFIED by REVIEW OF documentation and discussion with PERSONNEL	S	VERIFIED by discussion with various QA Personnel that freedom to identify quality Problems has occurred. Reviewed Component Discrepancy Reports (CDR's) and Contract Variation Approval Requests.

Signature T J Gillespie Date 8/12/85

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SUPPLIER QUALITY PROGRAM

AUDIT CHECKLIST

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Supplier Babcock & Wilcox

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	II. QUALITY ASSURANCE PROGRAM			
II-1	**Management Review of Quality Program Status and Adequacy** Ref QAM SEC VIII 6.1.5.2 6.1.5.3-6.1.5.4 6.1.5.5-6.1.6	a. Verify functional managers review actions of the quality program for which they have prime responsibility for execution b. Review documentation submitted by responsible managers on quality activities or internal audit reports for evidence of implementation Verified by Review of monthly Activity Reports, Internal audits, Corrective Action Committee meeting minutes. Summary of CDR's & CVAR's	S	a) Reviewed Internal & Vendor audits IAFR 85- audit Reports 85-1, 85-3. Also Reviewed monthly activity Reports July 1985 to Plant MGR, Fuel & Specialty MGR. Also Reviewed June 26, 1985; May 24, 1985; April 24, 1985 Activity Reports. The above is an assessment of various discrepancies, audit findings, CVAR's written and Reported to Management
II-2	**Indoctrination and Training Program** QAM-09-1212 Ref QAM SEC XVIII QC-1416	a. Verify implementation of the indoctrination and training program. Examine training records for evidence of personnel proficiency levels, type of training and methods of instruction Verified by Review of Instruction and Training of CNFP Quality Audit Personnel QAM SEC XVIII & QC Procedure QC-1416.	S	Reviewed Training Records of Personnel for Professional accomplishments, Recertification, Instruction & Training of Audit Personnel. R.J. Flicker, K.L. Graham and W.L. Tibbs
II-3	**Revised and Distributed Through a Controlled System** Ref QAM SEC VIII SEC 2 QAM-09-1212 SEC 0	a. Verify implementation of the system in use for the control and distribution of the quality program (manual and procedures) to include changes b. Review changes (revisions) and check for review and approval actions. Check on requirement for customer acceptance prior to implementation c. Verify that quality program manual currently in use in the facility is the same revision and date as the copy accepted by Bechtel Verified by Review of Logs, Acknowledgement Sheets And Assurance of Current Revision with that Submitted	S	Reviewed implementation of manual control & distribution. Reviewed Revisions and approval actions and customer acceptance. Manuals were current with those Presented. Reviewed Log for SEC VIII manual & acknowledgement sheets 11/2/84 11/5/84 - 1/4/85 - 2/1/85 - 3/7/85. Reviewed Transmittals & acknowledgement sheets for manual 09-1212 #4 & 11 for Davis Besse - Northeast Utilities - Rev 12

Signature [illegible signature] Date 8/22/85

BECHTEL

SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
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Supplier B&W

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S, X, N/A	5) SUMMARY OF INVESTIGATION
	III. DESIGN CONTROL			
III-1	**Translation of Design Requirements Into Design Documents** Ref QAM 09-1212 Section 3 Section No. 5 ASME VIII Manual	a. Examine engineering specifications, drawings, instructions and procedures for inclusion of applicable technical requirements. NOTE: Requirements are based on contract requirements and applicable codes and standards referenced therein. b. Concurrent with the above, check for inclusion of applicable quality requirements. Examined Bid document review drawings, Bills of Materials (PO's) to verify inclusion of technical and quality requirements.	S	Examined CVAR SC239 for job SC-975 incorporating Component Discrepancy Report (Form 251) 3910, 3907, 3906, 3909, 3911, 3912 and 3914. Discrepancy listed, Disposition stated. Approval date required stated As stated per proc. QC 1423, Rev 3
III-2	**Control of Deviations from Design Requirement and Quality Standards** Ref QAM 09-1212 Section 3 ASME Manual Section No. 5	a. Verify implementation of the system governing control of deviations from design requirements and quality standards. Check that deviations are properly identified, documented and subjected to review and approval actions. Verified by review of Contract Variation Approval Requests (CVAR)	S	CVAR SC-247 for job SC-975 incorporating CDR's 3964, 3953, 3966 and 3970 Discrepancy listed, Disposition stated As per Proc.
III-3	**Identification and Control of Design Interfaces** Ref N/A	a. Verify implementation of the system governing control of design interfaces. Check documentation for evidence of coordination and the review, approval, release and distribution by organizations or departments involved. No Design Interface involved for this procurement.	N/A	Reviewed BOM for SC912, Checked Purchase order checklist, Discrepancies were listed As per Procedure QC1402, Rev. 2
III-4	**Independent Verification of Design Adequacy** Ref QAM 09-1212 Section 3 ASME Manual Section No. 5	a. Verify implementation of the system in use to verify or check the adequacy of design. Review records for evidence that the verification or checking process is performed by individuals or groups other than those who performed the original design. Verified by examination of Fabrication dwgs., appropriate P.O. revisions and signoffs.	S	Reviewed BOM for SC975 10CFR21 requirements listed on P.O. P.O. Checklist checked and signed off. (P.O. NO 974799PC)
III-5	**Control of Design Changes** Ref QAM 09-1212 Section 3 ASME Manual Section No. 5	a. Cross reference Audit Item No. III-2. Examine documentation to verify that design changes, including field changes, were made by design control measures commensurate with those applied to the original design. Check changes to assure that they were reviewed and approved by the same organization that performed the original review and approval, or as applicable, other designated responsible design organization. Reviewed contract variation Approval Requests and P.O. revisions to verify that revisions are subjected to the same review/approval cycles as originals.	S	Reviewed BOM for SC975 checked P.O. 974796. 10CFR 21 requirements listed. Supplier not on Approval listed was stated on P.O. Checklist, and suggesting corrective action to be taken. Corrective action was taken to add the supplier on approved vendor list.

Signature [signature] Date 8/08/85

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SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
PSQ-396 A

Supplier ~~J. OATS~~ BABCOCK & WILCOX

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S, X, N/A
	IV. PROCUREMENT DOCUMENT CONTROL		
IV-1	Inclusion of All Applicable Requirements in Procurement Documents Ref 09-1212 SECT 4.2 4.3.2 4.3.3	a. Examine supplier procurement documents (P.O., M/R, specifications, etc.) for inclusion of specific technical and quality requirements, to include those quality requirements and controls that must be further extended to subcontractors and suppliers. NOTE: Requirements are based on contract requirements and applicable codes, standards and specifications referenced therein. (For standard catalog items, supplier may be using internal "code" system to identify requirements.) VERIFY BY REVIEW OF PURCHASE MATERIAL LIST (PML), PURCHASE REQUISTION, AND P.O. THAT TECHNICAL AND QUALITY REQUIREMENTS ARE PASSED ON.	X AFR-1
IV-2	Release and Control of Procurement Documents Ref 09-1212 SECT. 4.3.1 4.3.3	a. Verify implementation of the system used to control and release procurement documents. Examine documents for review and approvals required prior to release. REVIEW PML AND P.O. FOR DATA EVALUATION REVIEW.	S
IV-3	Changes Controlled as Original Procurement Documents Ref 09-1212 SECT 4.2	a. Examine changes (revisions) to procurement documents to verify that controls exercised were the same as that applied to the original procurement documents. VERIFY BY REVIEW OF PML, PR AND P.O. THAT CHANGES WERE CONTROLLED THE SAME AS ORIGINAL.	S

5) SUMMARY OF INVESTIGATION

VERIFIED INCLUSION OF TECHNICAL AND QUALITY REQUIREMENTS THROUGH THE FOLLOWING DOCUMENTS

SHOP ORDER - SC-975

DRWG. 1155231E REV 4

PURCHASE AUTHORIZATION 774540 REV 0, 1, 2, 3, 4

PML FOR - FUEL CANISTER GRAPPLE ASSEMBLY; CENTER POINT GRAPPLE ASSEMBLY; STAGING HANDLE, LONG.

PURCHASE REQUISTION	P.O
SC-975-47	9747~~39~~ 33 PC
-65	974881 PC
-63	974806 PC
-42	974793 PC
-28	974795 PC
-02	974713 PC
-10	974713 PC
-27	974799 PC

Signature [signature] Date 8/7/85

BECHTEL

SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
PSQ-396 A

Supplier Babcock + Wilcox Lynchburg, VA.

1) AUDIT ITEM NO.	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	V. INSTRUCTIONS, PROCEDURES AND DRAWINGS			Drawings reviewed: 1153231, Rev. 4; 1155263, Rev. 4 (both for SC-975) 135444, Rev. 1 (SC-1033) 1138417C, Rev. 6 (SC-1044) 134518C, Rev. 7 (BB-0002) 02-1104604042E, Rev. 2 (BB0028) Procedures Reviewed: PC-1330, Rev. 6 QC-1421, Rev. 1 QC-1425, Rev. 8 MA-1200, Rev. 12 QC-1432, Rev. 6 QC-1404, Rev. 0 QC-1434, Rev. 2 MA-232, Rev. 4 QC-1406, Rev. 0 QC-521, Rev. 3 Other Instructions reviewed include: Route Cards listed in Quality Element X Welding and NDE procedures listed in Quality Element IX.
V-1	Documented Description of Activities Affecting Quality	a. Auditing of this criterion requires the efforts of the entire audit team — with each auditor focusing his attention on those activities within his assigned area of audit responsibility.	S	
V-2	Compliance with Documented Description	b. Each auditor should: 1) Verify that written procedures and/or plans referenced in the quality program are in fact established, documented and in use in the facility. 2) Verify that instructions, procedures and/or drawings used for both work performance and verification action include qualitative (characteristics for determining satisfactory performance) and quantitative (dimensions, tolerances and operating limits) criteria. Focus attention on those documents used for quality verification actions (inspections, test control).		
V-3	Inclusion of Acceptance Criteria in Prescribed Documents NOTE: Lead Auditor will instruct all auditors on this criterion, and require each to provide input on those deficiencies that relate directly to the sub-elements indicated above. Lead Auditor will consolidate input and formulate the necessary reports. Ref. 09-1212 QAM, Section 5 Section VIII QAM Section 5	c. Lack of compliance to procedures, instructions and/or drawings within a certain activity of the facility is a program deficiency to that specific quality element and not this quality element. d. Program deficiencies in this quality element will normally form the basis for an Audit finding. This element was verified by each audit team member reviewing documents available at work locations throughout the facility.		

LYNCHBURG
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SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
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Supplier Babcock + Wilcox Lynchburg, VA.

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S X N/A	5) SUMMARY OF INVESTIGATION
	VI. DOCUMENT CONTROL			Reviewed the following procedures:
VI-1	Release and Control of Documents Ref 09-1212 QAM Section 5 Section VIII QAM Sect. 5	IF THE SUPPLIER OPERATES THIS FUNCTION ON A CENTRALIZED BASIS AUDIT AS FOLLOWS a. Verify that document control procedures are available and in use b. Examine distribution system used and verify that records indicate what documents have been issued and to whom, and that obsolete documents are controlled and dispositioned Verified by review of Procedures, Procedure Matrix Listings, Plan Lists, and Document Control Vouchers.	S	QC-1410, Rev. 0 - Prep., Approval, + Dist. of Quality Admin. and Operative Procedures PC-1330, Rev. 6 - Prep. & Approval of CNFP Admin. + Operative Procedures. QC-1425, Rev. 8 - Dist. of CNFP QC/QA Documents
VI-2	Review and Approval of Documents by Authorized Personnel Ref 09-1212 QAM Sections 5+6 Section VIII QAM Sect. 5	a. Examine selected quality documents and verify that reviews for adequacy and approval by authorized personnel have been accomplished Verified by review of drawings and procedures.		QC-1421, Rev. 1 - Review + Approval of Drawings, Specifications, and Procedures. MA-1200, Rev. 12 - Dist. of CNFP Mfg. Eng. Documents. Reviewed Procedure Matrix Listings + Plan Lists for Q.C. Admin. and Operative Procedures.
VI-3	Changes Controlled as Original Documents Ref 09-1212 QAM Sections 5+6 Section VIII QAM Sect. 5 NOTE: Lead Auditor will instruct all auditors on this criterion and require each to provide input on those deficiencies that relate directly to the sub-elements shown above Responsible auditor for this criterion will consolidate data and formulate necessary reports	a. Examine recent changes (revisions) to documents and verify that issuance was within the scope and authority of the contract, and that those requiring customer approval prior to implementation have been accepted b. Verify that the effectivity point, review action and approval for release are documented c. Verify that the control measures applied to the changes (reviews, and approvals) were the same as that used for the original documents d. Examine the control register/log used for recording changes and verify that a record reflecting history of change incorporation is being maintained Verified by review of revised drawings and procedures, Verified distribution of correct revisions of drawings by review of Applicable Documents Lists NOTE: If this function is not under centralized control, check as a minimum, the inspection and test documents for latest revisions		Reviewed Document Control Vouchers: Purge of QC Procedures dtd 7/5/85 Operative Procedure dist.s dtd 1/17/85, 3/12/85, 4/1/85, 5/8/85, 6/5/85, + 6/29/85 Admin Procedures dist.s dtd 12/3/84, 12/13/84, 1/17/85, 1/31/85, 4/1/85, + 5/8/85 File Purge of Mfg. Eng. Admin + OP. Procs dtd 6/26/85 Reviewed drawings, procedures, and Applicable Documents Lists listed in Quality Element X. Signature [signature] Date 8/7/85

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SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
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BABCOCK & WILCOX

Supplier ~~J. OATS~~

1) AUDIT ITEM NO.	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S X N/A	5) SUMMARY OF INVESTIGATION
	VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES			
VII-1	Conformance of Purchased Items and Services to Procurement Documents Ref: 09-1212 SECT 7.7	a. Verify that written procedures for this activity are available and in use. VERIFIED WRITTEN PROCEDURE IN QAM	S	QAM 09-1212 SECT. 7.7
VII-2	Evaluation and Selection of Subcontractors, Suppliers, or Manufacturers Ref: 09-1212 SECT 7.3.1	a. Verify implementation of the system used for the selection and evaluation of subcontractors, suppliers or manufacturers. NOTE: System may include the use of historical quality performance data, source surveys or audits, or source qualification program. Program for external audits should meet the requirements of Quality element XVIII. b. Examine related documentation to verify that evaluations were performed prior to award of contracts and at the specified frequency. Check the qualifications of personnel performing the evaluations (surveys and audits). VERIFY THROUGH REVIEW OF P.O., APPROVED VENDOR LIST, VENDOR AUDITS AND AUDITOR QUALIFICATIONS	S	VERIFIED BY REVIEW OF APPROVED VENDOR LIST AND VENDOR FILES FOR THE FOLLOWING VENDORS SUHM COIL SPRING WORKS 2/85 CADMET CORP 4/85
VII-3	Source Inspection or Audit Ref: 09-1212 SECT 7.5	a. Verify implementation of the system for source inspection or audit, as necessary to assure quality of an item (may not be necessary when quality of item (s) can be verified by review of test reports, receipt inspection, or other means. b. Program for lower tier audits should meet basic requirements of quality element XVIII. VERIFY THROUGH REVIEW OF SOURCE AUDIT REPORTS AND/OR MATERIAL/COMPONENT RELEASES.	S	DYNAMET INC 2/85 CONRAD SPRING CO. 9/84 VIRGINIA METAL SERVICES * DIBERT VALVE * METAL GOODS * * ON APPROVED VENDOR LIST WITHOUT AUDIT BASED ON RECIEPT INSPECTION AND MATERIAL OVERCHECK.
VII-4	Inspection of Purchased Items on Receipt Ref: 09-1212 SECT 7.6	a. Verify implementation of the system used for receiving inspection by reviewing related documents, or as appropriate, observing the operation — points of audit: 1) Receiving checks incoming shipments to requirements of the purchase order, referenced specification, or applicable drawings. 2) Material accepted on test reports or statements of conformance are subject to verification tests. 3) Receiving inspection records indicate acceptance of material, or rejection of material with reasons therefor. 4) Rejected material is identified and controlled. 5) Inspected items controlled and identified from material awaiting inspection. 6) Inspection personnel are qualified. VERIFY THROUGH REVIEW OF MATERIAL/COMPONENT RELEASE	S	QUALIFICATION OF AUDITOR R.J. FRICKER COVERED UNDER ELEMENT II-2.

Signature [signature] Date 8/7/85

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SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
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Supplier: BABCOCK & WILCOX ~~J. OATS~~

1) AUDIT ITEM NO.	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS (S, X, N/A)	5) SUMMARY OF INVESTIGATION
	VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES (Cont'd)			
VII-5	Documented Evidence of Conformance Ref: QAM 09-1212 SECT 7.6.1	a. As required by customer contract or referenced codes, standards and specifications therein, verify that supplier or subcontractor generated documents (drawings, quality manuals, certifications, test results and inspection data for completeness, acceptability and conformance to contract requirements) were submitted and approved prior to acceptance of material. VERIFY THROUGH REVIEW OF MATERIAL/COMPONENT RELEASE	S	REVIEWED THE FOLLOWING MATERIAL/COMPONENT RELEASE. P.O. — MATERIAL/COMPONENT RELEASE 974713 — R-2327 974714 — R-2364 974793 — R-2430 974792 — R-2441 974790 — R-2463 974795 — R-2525 REV
VII-6	Assessment of Supplier Quality Related Activities Ref: QAM 09-1212 SECT 7.4	a. Request for and review documentation to verify that the functions for the control of quality of purchased material, equipment or services by lower tier suppliers/manufacturers is assessed at intervals consistent with importance, complexity, quality of the item, or customer requirements. b. Reference Audit Item No. VII-2, VII-3 and VII-4 as applicable. REFER TO ELEMENT CHECKLIST ITEM VII-2, VII-3, VII-4	S	

Signature: [signature] Date: 8/7/85

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Supplier BABCOCK & WILCOX

1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	VIII. IDENTIFICATION AND CONTROL OF MATERIAL, PARTS AND COMPONENTS			
VIII-1	Establishment and Maintenance of Item Identification and Control Ref Sect. 8, 09-1212 QAM 8.3 8.4 8.5	a. Examine items on the floor, or related documentation to verify implementation of the system used for *identification* of material, parts and/or components. NOTE: Identification system may include the use of *HEAT NUMBER, SERIAL NUMBER OR OTHER MEANS*. 1) Check to ensure markings have not caused a detrimental effect on material. 2) Check items subdivided for transfer of markings to each part. Verified by review of Mat'l on Floor being processed.	S	Job No SC1013 - Stabilizer Ribbed Plug Assy Material checked - Serial Nos Traced back to Release Cards. Marking did not damage parts - Item serial numbers traceable to heat numbers of bar stock supplied by B&W Nuclear Parts Plant Heat # 30K6XK Inconel X750 Heat # W387-1 Inco 600
		b. Verify implementation of the system used to *control* material, parts and/or components. Points of audit: 1) Handling and storage methods used to prevent damage, contamination or loss. 2) Control of items awaiting inspection and/or test results; and items that have been rejected. 3) Identification and acceptance status of items of production (batch, lot, part, etc.) is maintained throughout all phases of manufacture. Verified by review of material on the shop floor and storage areas	S	Material stored in a neat, orderly manner where required mat'l is packaged to prevent contamination. Material checked was identified and Route Cards signed off to reflect status.
VIII-2	Traceability of Items Ref Sect 8, 09-1212 QAM 8.4 8.5 A,B,C,D Table 1	a. Examine items on the floor, or related documentation, to verify implementation of the system used for traceability of material, parts or components. b. Verify that material is traceable to specific chemical/physical analysis, statements of conformance, test documents, purchase order, or other documents. Verified by review of documentation on Job SC 975 - Grapple Hook Lower Extension	S	Material verified as being 304L - by review of Route Cards and Release numbers, Copy of CMTR's and QC inspection verification records.
		Verified by review of Parts and documentation on SC1013 - Stabilizer Ribbed Plug Assy	S	Mat'l verified as being Inco 600 & X750 by review of Route Cards and Release No's. 2922, 2924, 2925. Heat No. verified. Mat'l supplied by B&W Nuclear Parts Plant.

Signature G.A. McKearney Date 8-7-85

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1) AUDIT ITEM NO	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	IX. CONTROL OF SPECIAL PROCESSES			
IX-1	**Establishment of Process Controls and Qualification of Personnel, Procedures and Equipment** Ref Sect 9, QAM 09-1212 9.2 9.3 9.4	a Determine applicable special processes and verify that implementation is being accomplished under controlled conditions in accordance with contract requirements or codes, standards and specifications referenced therein. Points of audit: 1) Welding (verify the following) a) Procedure qualified and approved, as required b) Welders' qualifications current and on file c) Welding filler material controlled, properly disbursed and traceable d) Rework records maintained Verified by a review of documentation on completed jobs SC-1013	S	Route Card specifies the applicable procedure, this procedure references the PQR - WP#3 and PQR#3 comply with the requirements of ASME Sect. IX. Welder Qualifications for A. Alhot and W. Huffman - up to date. Welding wire storage, control and issue controlled by route card and foreman - all wire flag tagged - release slip with wire.
	Ref Sect 9, QAM 09-1212 9.2 9.3 9.4	2) Heat Treat (Verify the following) a) Procedures qualified and approved, as required b) Control charts/records in use and maintained c) Verify calibration of: 1. temperature measuring equipment 2. chart/recording equipment d) Verify calibration of furnaces when furnace temperature indicators are used to verify part temperature Verified by review of hardware and documentation on parts which were heattreated	↓	Job No SC1013 - Route Card 1654 Operation 8 specifies HT per proc MA219 Attach "C" - Proc. Review against Job Spec 27-1146710-02 indicates compliance with spec. Furnace chart Run 140 indicates heating & cooling rates - hold time & temp complied with Proc. Visual examination of parts show no discoloration which indicates furnace atmosphere was good.
	Ref Sect 9, QAM 09-1212 9.2 9.3 9.4	3) Nondestructive Examination (Verify the following) a) Procedures qualified and approved, as required b) Personnel qualification records in accordance with SNT-TC-1A or other standards c) Personnel qualifications current and on file d) Records of NDE performed available Verified by review of documentation	↓	NDE Procedures QC 702 PT and QC 722 RT comply with the requirements of ASME Sect. V. Personnel Qualifications for G.W. Day Level II PT and G R S Thomas Level III comply with the written practice found in QC 710 and QC 709 which also complies with the recommended practice in ASNT-SNT-TC-1A. Personnel eye examinations [illegible] checks for visual accuracy and color perception - Pickups of film [illegible] reviewed - film meets requirements
	Ref	4) Other special processes (specify requirements and methods of verification) N/A	↓	

Signature [signature] Date 5-7-85

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SUPPLIER QUALITY PROGRAM
AUDIT CHECKLIST
PSQ-396 A

Babcock + Wilcox
Supplier Lynchburg, VA.

1) AUDIT ITEM NO.	2) QUALITY ELEMENT & REFERENCES	3) STANDARD QUALITY REQUIREMENTS AND AUDIT GUIDELINES	4) RESULTS S. X. N/A	5) SUMMARY OF INVESTIGATION
	X. INSPECTION			
X-1	**Establishment and Execution of Inspection Program** Ref: 09-1212 QAM Section 10 Section VIII QAM Section 9	a. Verify implementation of the inspection program in use by the supplier to verify his company's performance to documented instructions, procedures and drawings. NOTE: The program should cover those work operations necessary to assure quality. Points of audit: 1) In-process inspections (Fabrication and Assembly) 2) Final Assembly and Inspection. Verified by review of Route Cards, Applicable Document Lists (ADLs), and drawings	S	Reviewed the following Route Cards and associated ADLs, Specifications and Drawings: SC-1033 (Route Card not yet issued) ADL#21-1101884-03 Spec. 06-1101523-06 Dwg. 135444, Rev. 1 Prim. Manway Backing R. SC-1044 Route Card# 9669-01 ADL#21-1153161-00 QA Data Sheet 22-1153162-00 Dwg. 1138917C, Rev. 6 Rolled Plugs BB-0002 Route Card # 9110-09 Production Order #85-338 Drawing 134518C, Rev. 7 End Cap - Mk B End Cap Inspection Report Form QC-R-243, Rev. 10 and Proc. QC-526, Rev. 3 BB-0028 Route Card No. 9656-09 Dwg. 02-1104604042E, Rev. 2: Cable Support Assy. Angle Inspection Data Sht. PlwIC-191-A Discussed QA/QC independence from production supervision with: T.L. Wilcox - Chief Inspector J.L. Brown - Data Eval. Supvr. (Cont. Next page)
X-2	**Independence of Inspectors** Ref: 09-1212 QAM Sect. 0 Statement of Policy + Sect. 2.	a. Question personnel and review related documentation to verify that personnel performing verification actions are other than those who perform the acitivty being inspected and that they do not report directly to the supervisors who are responsible for the work being inspected. Verified by discussion with QA/QC personnel and by review of 09-1212 QAM Statement of Policy and Sect. 2.		
X-3	**In-Process and Final Inspections** Ref: 09-1212 QAM Section 10 Section VIII QAM Sect. 9	a. Cross reference Audit Item No. X-1. Check work or inspection instruction (shop traveler, processing plans, etc.) in use for inclusion of the following minimum data; as applicable: 1) Function to be performed and sequence of operations. 2) Inspection Points and/or Hold Points. 3) Specifications to be used, to include drawing numbers and revisions applied. 4) Definition of acceptance criteria. 5) Material, tools, gages and inspection equipment used. 6) Workmanship criteria to include characteristics to be inspected (dimensions, tolerances, operating limits). b. Check inspection equipment used for current calibration status. c. Check qualifications of inspection personnel, per QA Program requirements. Verified by review of Route Cards, Specifications, Drawings, ADL's, and QC Inspector Qualification Records and by examination of tools in use to verify current calibration status.		

Signature [signature] Date 8/7/85

ATTACHMENT 8
(4410-85-L-0210)
3 Pages

Nuclear

GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191
717 944-7621
TELEX 84-2386
Writer's Direct Dial Number:
(717) 948-8321

October 17, 1985
4300S-85-0317

Mr. H. M. Burton
Manager, TMI-2 Programs Division
EG&G Idaho
P.O. Box 88
Middletown, PA 17057

SUBJECT: Hydraulic Fluid/Catalyst Poison Tests

References: 1. J. O. Henrie and J. N. Apel, Evaluation of Special Safety Issues Associated with Handling the Three Mile Island Unit 2 Core Debris, GEND-051 (June 1985).

2. Interoffice Correspondence, F. R. Standerfer (GPUNC) to H. M. Burton (EG&G Idaho), "Request For Additional Canister Catalyst Testing," (11 October 1985).

Dear Mr. Burton:

This letter is to confirm our verbal test materials list and priorities provided to EG&G Idaho and RHO personnel for laboratory tests involving the catalytic recombiner materials (reference 1) as requested in reference 2.

The tests are to ascertain the "poisoning" effect, if any, that these hydraulic fluids may have on the catalytic recombinating capacity. These test data are to answer bounding questings regarding if these hydraulic fluids adversely impact the catalytic capacity. Written documentation is requested within two weeks. Consequently, we request that the bounding tests include only two (2) concentrations for each of the hydraulic fluids:

1. The undiluted hydraulic fluids and,
2. A 2 volume percent mixture of the hydraulic fluids with simulated reactor coolant system (RCS) fluid. Note, the volume percent mixture has been changed from that in reference 2. The simulated RCS fluid is to be demineralized water which contains 5200 ppm B (via boric acid) and buffered with sodium hydroxide to a pH = 7.6.

The hydraulic fluid^r on which we request you to carry out these bounding tests are:

1. A 25/75 volume percent mixture of borate ester and UCON WS-34, respectively. The Borate Ester and UCON WS-34 fluids will be supplied and you will prepare the 25/75 volume percent mixture.

2. Borated UCON-WS-34 (5000 ppm B). The borated UCON-WS-34 will be supplied.

3. Houghto-Safe-620. The Houghto-Safe-620 will be supplied.

Consequently, the general test matrix includes six (6) solutions:

25/75 Vol. % Borate Ester/UCON	Borated UCON	Houghto-Safe-620
Undiluted	undiluted	undiluted
2 vol. % in RCS simulate	2 vol. % in RCS simulate	2 vol. % in RCS simulate

The priority and sequence for performing these tests are:

1. 25/75 volume percent Borate Ester/UCON - Undiluted
2. 25/75 volume percent Borate Ester/UCON - RCS diluted - 2 vol. % in RCS simulate.
3. Borated UCON - undiluted
4. Borated UCON - RCS diluted - 2 vol. % in RCS simulate
5. Houghto-Safe-620 - undiluted
6. Houghto-Safe-620 - RCS diluted - 2 vol. % in RCS simulate

A brief description of the hydraulic fluids we have requested to be tested are as follows. Commercially available hydraulic fluids are mixtures of organic compounds and selected additives whose specific chemical compositions are considered propriety by the hydraulic fluid vendors. However, in general the principal organic compounds in the mixtures are "glycol" and "polyglycols" (d.h. adducts of simple glycols and distinguished by intervening ether and/or ester linkages).

UCON-WS-34

UCON fluids are linear polymers of ethylene and propylene oxide with the generalized formula

$$RO-\left[CH_2\underset{}{\overset{CH_3}{\overset{|}{C}}}HO\right]_n\left[CH_2CH_2O\right]_m-OH$$

The approximate molecular weight of UCON WS-34 is stated to be 720 g/gmole. Product information provides the following property data: Specific Gravity $\cong$1.029 (20/20^oC), viscosity $\cong$176 S.U.S. (100^oF), Flash point = 465^oF (COC).

Borate Ester

This polyalkylene glycol ether is stated to be prepared from

3 moles $C_2H_5(OC_2H_4)_3OH$	+ 1 mole $B(OH)_3$	$\rightarrow$	polysol borate ester
polysol TE	Boric Acid		Specific product data not available

The approximate molecular weight of the borate ester is stated to be 600 g/gmole and the viscosity = 60 S.U.S. (100^oF).

Houghto-Safe-620

Houghto-Safe 620 is essentially a three-component mixture of water, ethylene glycol, and a high molecular-weight, water soluble polyglycol. The approximate percentages of these components in the mix are: Water, 40%; ethylene glycol, 40%; and polyglycol, 15%. Additionally, the fluid will contain up to 5% additives designed to impart corrosion protection, metal passivation, anti-wear properties, friction coefficient reduction, etc. The major components of the additive package are amine soaps of fatty acids. These amines can be generally classified as short-chain alkly and/or alkanol amines. The package will also contain a very small quantity (less than 0.01%) of an aromatic nitrogen compound. It contains no slufur, halogen, phosphorous or heavy metal elements.

We request verbal communication with EG&G Idaho/GPU Technical Staff regarding test procedures and measurements. We also request verbal reports as soon as test data becomes available with formal written report(s) to follow.

Sincerely,

D. R. Buchanan
Task Leader
Reactor Disassembly and Defueling

DRB/VFB/lz

cc: Manager, Site Engineering - R. E. Gallagher
Deputy Manager, Recovery Programs - C. W. Hultman
Manager, Recovery Programs - W. H. Linton
Site Operations Director - S. Levin
Director, Licensing & Nuclear Safety - R. E. Rogan
Director, TMI-2 - F. R. Standerfer

15737-2-M101A-OC 385-01

ATTACHMENT 9
(4410-85-L-0210)
6 Pages

Process Inspection of Boron Carbide Pellets

Nuclear Energy Services

BECHTEL NORTH AMERICAN POWER CORPORATION				JOB NO. 15737	
SUPPLIER DOCUMENT REVIEW STATUS					
STATUS NO 1 ☑ Work may proceed 2 ☐ Revise and resubmit. Work may proceed subject to incorporation of changes indicated 3 ☐ Revise and resubmit. Work may not proceed. 4 ☐ Review not required. Work may proceed					
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations					
Reviewed	CIVIL	E/CS	M/PF	NUC	
	—	—	JWS	—	
BY SF Sterling		DATE 4/18/85			

EPD-13743 Rev. 10/84

ADVANCED

REFRACTORY TECHNOLOGIES, INC.

QUALITY ASSURANCE OPERATING PROCEDURES

Title: Process Inspection of Boron Carbide Pellets

NES/SELAMCO

1. DEFINITIONS

1.1 Mix Lot - A mix lot is defined as a quantity of boron carbide powder which has been blended together in a single container. A number is assigned to each mix lot and recorded in the blending log book.

1.2 Pellet Lot - A pellet lot is defined as that quantity of pellets produced from a portion (or all of) a mix lot, processed under a consistent set of parameters, and fired in the same sintering run. The number of pellets in a sinter lot is not to exceed 15,000 pellets. The sinter lot number or identification shall be comprised the powder blend number followed by the specific sintering run for that powder blend, i.e., Sinter Lot N88-9 would be the ninth sintering run of pellets from Powder Blend N88.

1.3 Supplier Lot - A lot of powder purchased by ART all of which was processed at the same time under the same set of conditions.

2. CONTROL OF MEASURING AND TEST EQUIPMENT

Measuring and test equipment used during the production of pellets shall consist of weighing balances, micrometers and vernier capiers.

2.1 Each working day the Process Control Inspector shall verify that all measuring and testing equipment used during the production of pellets are within scheduled calibration dates. The date calibrated and the due date of the next calibration shall be displayed on each item of inspection, measuring, and test equipment or tools.

If any measuring or testing equipment does not display a valid label showing the date calibrated and the due date of the next calibration, the inspector shall place a DO NOT USE tag on the item and report the condition on the Daily Inspection Report ART-0027.

2.2 A dialy operational check shall be performed on all balances used in the production process.

2.2.1 A certified balance shall be used in the determination of pressed densities in the production of boron carbide pellets. The balance shall be checked using certified weights on a daily basis. These checks shall be recorded in the balance log book which shall be maintained in the balance area. If deviation from the stated accuracy (latest certificate of calibration) is found the inspector shall attach a DO NOT USE tag and notify the Quality Assurance Manager.

2.2.2 The Ohaus beam balance shall be used for weighing boron carbide for the powder lots. The balance shall be checked using certified weights of 1000; 2500, 5500 gram values. These checks shall be recorded in the balance log book which shall be maintained in the balance area. If deviation from the stated accuracy (latest certificate of calibration) of the balance is found the inspector shall attach a DO NOT USE tag and notify the Quality Assurance Manager.

2.3 A daily operational check shall be performed on all micrometers used in the production process.

2.3.1 Micrometers shall be used furing the determination of pressed densities in the production of boron carbide pellets. An operational check shall be performed for each micrometer on a daily basis. The zero setting of each micrometer shall be checked and adjusted if necessary by the inspector. Each micrometer shall be checked at 0.600 inch location using a certified grade A+ steel gage block. If the micrometer checks within 0.0002 inch of the standards the inspector shall record on the manufacturing route card that the micrometer is approved for use. If the micrometer does not check within 0.0002 inch of the standards, it shall be removed from the production area and replaced with an approved micrometer.

3. CLEANLINESS

3.1 Cross Contamination

3.1.1 Only one concentration or contract of powder or pellets may be processed at a work station at any time. Equipment, containers, and process area shall be thoroughly cleaned after completion of each "concentration" of powder or pellets. The Quality Assurance Inspector shall verify on form ART-0029 that this has been accomplished.

3.1.2 Manufacturing route cards shall be used to maintain control of pellets.

3.1.3 The labeling, moving and storage of powder or pellets shall be under the direction of the process inspector.

3.2 Halogens

3.2.1 Clean cotton gloves shall be worn during all powder and pellet process operations.

3.2.2 The use of cleaning agents, solvents, and grinding lubricants containing halogens shall be avoided.

3.3 Foreign Materials

The pellets shall be inspected, handled, stored and packed by methods that will avoid the possibility of contamination by oil, grease, sand, packaging, or other foreign materials.

3.4 Plant, Equipment and Materials

Solvents, oils, grease, and other chemicals used for general shop maintenance shall be stored in an area separated from the production, assembly, inspection, and shipping area.

4. POWDER MIXING AND BLENDING

The Production Manager's office shall issue an instruction sheet, showing boron carbide weight calculations for each powder blend of each particle size, which shall be part of the blending log book.

4.1 Prior to weighing of the boron carbide powder for a powder lot the Production Manager or his delegate shall obtain and complete a manufacturing route card for each powder lot showing powder lot number and weight calculations of components to be used in the blending operation.

4.2 The operator shall veridy on the manufacturing route card that the containers of boron carbide powders are labeled acceptable and their basic lot numbers recorded in the blending log.

4.3 Weighing of powder lot components for the blending operation shall be in accordance with Manufacturing Procedures ART-MP-0056.

4.3.1 The operator shall verify on the manufacturing route card that operational checks have been performed on the Ohaus beam balance and that they are acceptable for use.

4.4 Powder mixing and blending operations shall be in accordance with Manufacturing Procedure ART-MP-0056.

4.4.1 The operator shall veridy on the manufacturing route card that the components have been added.

4.5 If all phases of powder mixing and blending are acceptable the containers shall be identified with a label showing the powder lot number and concentration number. The inspector shall approve the label releasing the powder for use.

5. BORON CARBIDE PELLET PRESSING

The pressing of pellets shall be in accordance with Manufacturing Procedures ART-MP-0057.

NOTE: Only one contract of pellets may be in the pressing and sintering work station at any time. Clean cotton gloves shall be worn during the pressing and sintering operations.

5.1 Prior to pressing each pellet lot the operator shall verify on the manufacturing route card the following:

5.1.1 That the powder is acceptable and released for pressing. Pellet lots shall not be mixed.

5.1.2 The micrometers to be used are within calibration and operational checks have been performed per paragraph 2.3.1 and are acceptable for use.

5.1.3 The balance is in calibration and operational checks per paragraph 2.2.2 have been performed and the balance is acceptable for use.

5.2 The operator shall at a minimum perform one check for each 500 pellets pressed. The initial check shall take place during the pressing of the first one hundred (100) pellets.

5.2.1 If all phases of pellet pressing operations are complete, the pellets shall be released for bakeout.

6. Bakeout of Boron Carbide Pellets

The pellets shall be baked out in accordance with Manufacturing Procedure ART-MP-0057.

7. Sintering of Boron Carbide Pellets

The pellets shall be sintered in accordance with Manufacturing Procedure ART-MP-0058.

8. Rework of Boron Carbide Pellets

Pellets which do not meet final dimensional requirements may be reworked by re-sintering according to ART-MP-0059. Pellets shall be assigned to rework manufacturing route cards and shall carry a (-2) designation on the sinter lot number.

ATTACHMENT 10
(4410-85-L-0210)
7 Pages

15737-2-M101A-00023-03

INSPECTION OF FINISHED BORON CARBIDE PELLETS

NES MANUFACTURING

BECHTEL NORTH AMERICAN POWER CORPORATION	JOB NO. 15737

SUPPLIER DOCUMENT REVIEW STATUS

STATUS NO

1 ☑ Work may proceed
2 ☐ Revise and resubmit. Work may proceed subject to incorporation of changes indicated
3 ☐ Revise and resubmit. Work may not proceed
4 ☐ Review not required. Work may proceed

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.

Reviewer	CIVIL	E/CS	M/PF	NUC		
	—	—	R	[illegible]		

BY [signature] DATE 5/10/85

EPD 13743 Rev 10/84

Document Control No: ART-QAAP-0077-02

Copy:

Original Issue Date: April 10, 1985

Latest Revision Date: May 2, 1985

Approved By:

H H Blakely (KB)

ADVANCED REFRACTORY TECHNOLOGIES, INC.

QUALITY ASSURANCE OPERATING PROCEDURES

Title: Inspection of Finished Boron Carbide Pellets NES/Selamco

Harvey H. Blakely
Quality Assurance

1. MATERIAL CONTROL

1.1 Identification

1.1.1 Mix Lot: A mix lot is a quantity of boron carbide powder and binder which has been blended together in a single container. A number is assigned to each mix lot and recorded in the blending log book.

1.1.2 Pellet Lot: A pellet lot is comprised of pellets produced from a portion of a powder blend and processed under a consistent set of parameters. The number of pellets in a pellet lot is not to exceed 15,000. The pellet lot number or identification shall be comprised of the mix lot followed by the specific processing run for that mix lot, e.g., Pellet Lot B88-9 would be the ninth processing run made from Mix Lot B88.

1.1.3 Stack: The quantity of finished pellets placed end to end required to form the length of boron carbide specified for a completed knock-out or filter canister tube.

1.2 Manufacturing Route Cards

1.2.1 Manufacturing route cards shall be used to maintain control of the pellets.

1.2.2 The mix lot and pellet lot numbers stated on the route card shall accompany the pellets through inspection, stacking, loading, and shipment.

1.3 Labeling and Moving

1.3.1 The labeling, moving, and storage of pellets shall be under direction of the Quality Assurance (QA) Inspector.

1.3.2 Types of Labels:

White - Used to identify pellets as to pellet lot and mix lot.
Green - Used to identify acceptable finished pellets
Yellow - Used to identify withheld pellets
Red - Used to identify rejected pellets.

1.4 Cleanliness

1.41. Only pellets made to the same specification shall be at an inspection work station at one time. The work station shall be cleaned after removing one contract and prior to receiving the next scheduled contract. The inspector shall verify on form ART-0029 that this has been accomplished.

1.4.2 Clean cotton gloves shall be worn during all inspection operations of pellets.

1.4.3 The pellets shall be inspected, handled, stored, and packed by methods that will avoid the possibility of contamination by oil, grease, sand, packaging, or other foreign materials.

2. DIMENSIONAL INSPECTION

2.1 Records

2.1.1 Final Density/Boron Inspection Report (ART-0309) for Sintered B4C Pellets for NES/Selamco, will be used to report the results of this inspection.

2.1.2 Material Review Work Sheet, ART-0040, will be used to report the condition of any pellet lot which is found to be rejectable.

2.1.3 Final results of this inspection, acceptable or rejectable, shall be recorded on the Inspection Status Report for NES/Selamco, ART-0211.

2.2 Sample Selection

2.2.1 Obtain sample in accord with Mil. Std. 105D Inspection level II multiple sampling plan, and ART form 0314 which meets a 95/95 confidence level of acceptance.

2.2.2 Additional samples, if needed, will be selected randomly as required.

2.3 Operational Check

2.3.1 All gages used for the dimensional inspection shall be checked before and after each pellet lot is inspected.

2.3.2 Micrometers and Vernier calipers shall be checked with .600" AA+ steel gage block prior to and after the inspection of each individual powder lot.

2.3.3 If any gage does not pass these checks, notify the QA Supervisor. Do not inspect pellets until all gages are acceptable to the checks described.

2.3.4 Repeat steps 2.3.1 through 2.3.2 after inspection of each pellet lot.

2.4 Required Dimensional Inspections

2.4.1 Length: Pellets shall be measured using calipers described in 4.1. Use form 0309 to record the length to the nearest thousand (.000).

2.4.2 The diameter shall be checked with go gages supplied by Customer. ID of gage shall be maximum acceptable diameter of pellet. The diameter check shall be a 100% inspection that will be performed at the sintering work station.

2.4.3 Weight: Pellets shall be weighed on a A163 Mettler balance to the nearest thousandth (.000). The balance shall be checked on a daily basis with the results being recorded in a log book.

2.4.4 Recheck gages as required per paragraph 2.3.2. If all the gages are acceptable, record on Final Density Inspection Sheet for Sintered B4C Pellets for NES/Selamco that the gages were checked after inspection and are acceptable. If one or more of the gages is not acceptable on recheck, notify the QA Supervisor, and reinspect the entire sample after the gage or gages have been corrected or replaced with acceptable gages.

3. SELECTION OF CHEMICAL TEST SAMPLES

The chemical test samples shall be the randomly selected inspection sample which was used for dimensional inspection. Select the following samples and place in appropriate, pre-labeled bottles.

3.1 Boron Analysis: (5) five pellets selected from each pellet lot of the respective mix lot will be accumulated and submitted in a pre-labeled bottle "Boron Test Pellet Lot No.____." The results of the analyses shall be averaged and the average value used to calculate B-10 density per paragraph 4.4.

3.2 Density as per paragraph 4.

3.3 Two (2) isotopic analyses shall be made of each lot of B4C Powder used to manufacture the pellets. In the event the powder supplier can certify that the boron carbide was made from natural boron, only one overcheck analysis will be required per purchased powder lot.

4. BORON DENSITY DETERMINATION

4.1 Measuring and test equipment used in determining the shall consist of a Mettler H-20, or equivalent, analytical balance, a 0-1 inch micrometer with 0.000 graduations, and a 0-6 inch or 0-9 inch Vernier caliper, with .001 inch dial graduations.

4.2 The balance must display a label which shows it to be within the scheduled calibration dates. Prior to weighing the selected pellets from a powder lot, perform an operational check. If deviation from the stated accuracy (latest certificate of calibration) of the balance is found, the inspector shall attach a "DO NOT USE" tag and notify the QA Manager.

4.3 The micrometer or caliper must display a label which shows it to be within the scheduled calibration dates. Prior to measuring the selected pellets from a pellet lot, perform an operational check on the caliper or micrometer. The zero setting shall be checked and adjusted if necessary by the inspector.

4.4 To aaure compliance with the level required boron density in NES/Selamco 0085 Y, Energy Products Department will calculate B-10 density as follows:

$$\frac{(\%\ \text{B-10 in Powder})(\text{Sample Weight})(\%\ \text{B of Powder Lot})}{\text{Sample Length}}$$

4.5 The minimum value of the confidence shall meet or exceed NES/Selamco 0085Y, Section 4.1 or the pellet lot shall be rejected.

5. Five archive samples shall be selected for and sent to the customer from each pellet lot that passes both dimensional and chemical inspections.

MIL STANDARD 105D　　INSPECTION LEVEL II　　MULTIPLE SAMPLING PLAN

LOT SIZE	LETTER CODE	A Q L	FIRST SAMPLE			SECOND SAMPLE			THIRD SAMPLE			FOURTH SAMPLE			FIFTH SAMPLE			SIXTH SAMPLE			SEVENTH SAMPLE		
			SAMP SIZE	ACC	REJ	SAMP SIZE	ACC	REJ	SAMP SIZE	ACC	REJ	SAMP SIZE	ACC	REJ	SAMP SIZE	ACC	REJ	SAMP SIZE	ACC	REJ	SAMP SIZE	ACC	REJ
281/500	M	1.0	80	0	4	80	1	6	80	3	8	80	5	10	80	7	11	80	10	12	80	13	14
501/1200	M	1.0	80	0	4	80	1	6	80	3	8	80	5	10	80	7	11	80	10	12	80	13	14
1201/3200	K	0.65	32	•	2	32	0	3	32	0	3	32	1	4	32	2	4	32	3	5	32	4	5
3201/10000	L	1.0	50	•	4	50	1	5	50	2	6	50	3	7	50	5	8	50	7	9	50	9	10

ART-0314-00

June 21, 1985

699 HERTEL AVE.
BUFFALO, NY 14207
716/875-4091

Advanced Refractory Technologies, Inc. certifies that the neutron absorber pellets identified on the accompanying loading sheets meet all the specifications of NES Manufacturing, Technical Document 0394Y which is part of P. O. 04789-84091.

Harvey H Blakely
Harvey H. Blakely
Manager, Quality Assurance

W.O. # 84091
P.O. # S-04789
(1155233 D)
6-27-85

BEL/MCO
2

BECHTEL
354

Advanced Refractory
Technologies, Inc.

15737-2-M101A-00031-02

ATTACHMENT 12
(4410-85-L-0210)
3 Pages

Poison Tube Loading Procedure

NES Manufacturing

BECHTEL NORTH AMERICAN POWER CORPORATION						JOB NO. 15737
SUPPLIER DOCUMENT REVIEW STATUS						

STATUS NO

1 ☑ Work may proceed

2 ☐ Revise and resubmit. Work may proceed subject to incorporation of changes indicated

3 ☐ Revise and resubmit. Work may not proceed

4 ☐ Review not required. Work may proceed

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.

Reviewed	CIVIL	E/CS	M/PF	NUC		
	—	—	RP	—		

BY PBhuijan DATE 6/03/85

EPD-13743 Rev. 10/84

nes/selamco
101 Swing Road Greensboro, North Carolina 27409

MANUFACTURING
PROCEDURE / SPECIFICATION

NO 84091-B4C
REV. 1

TITLE POISON TUBE LOADING PROCEDURE

1.0 PURPOSE

1.1 To define an acceptable Poison Tube Loading Procedure for the Defueling Canisters for the TMI-2 Nuclear Power Plant.

2.0 SCOPE

2.1 This procedure will cover Poison Tube Loading for the Knockout and Filter Canisters.

2.2 Two sizes of Poison Pellets will be loaded: 1.955" O.D. x 2.0" long; .770"O.D. x 1.0" long.

2.3 Two lengths of 2.125 diameter tube will be loaded with the 1.955 diameter pellets.

3.0 EQUIPMENT

3.1 Clean work area.

3.2 Bucks to support poison tubes in line with loading tray.

3.3 "V" shaped loading tray supported on bucks.

4.0 PROCEDURE

4.1 Place poison tube with one end plug welded in place on loading bucks.

4.2 Select appropriate package of poison pellets for size and length of tube and load into loading tray. All of pellets from package must be placed in tray.

4.3 Slide pellets into poison tube; horizontal.

4.4 Quality Control to verify all pellets installed and complete C of C for each pipe filled. If necessary add one or more B4C Spacers to fill tube within ¼" of its fill length.

4.5 Place end plug in tube and secure per applicable traveler.

REV.	DESCRIPTION	DATE		MFG. ENGR.	Q.C.
		-			
A	Rev A 4.4. added COFC form.	5/30/85		SELAMCO ENG	
0	Original Issue	5/15/85		SELAMCO ENG	SELAMCO QC

REVISIONS — APPROVALS

NES MANUFACTURING

POISON TUBE LOADING
C OF C

W/O # 84091

PART DESCRIPTION POISON TUBE

SERIAL NUMBER	DATE	NES	BECHTEL	SERIAL NUMBER	DATE	NES	BECHTEL

ATTACHMENT 13
(4410-85-L-0210)
190 Pages

Bechtel North American Power Corporation

Engineers — Constructors

15740 Shady Grove Road
Gaithersburg, Maryland 20877-1454
301—258-3000

October 18, 1985

Mr. B. E. Ballard
Manager, TMI QA Modifications/Operations
Three Mile Island Unit 2
P.O. Box 480
Middletown, PA 17057

TMI-2 Project, Job No. 15737
Completed Checklists Rev.
2 for Filter Canisters F-401,
F-402, F-403 and F-404
File 15737-85-086

Dear Mr. Ballard:

We are enclosing herewith for your review and use the verified checklist for Filter Canisters F-401, F-402, F-403, and F-404.

Please note that we have prepared one Checklist package for all four canisters. Previously there was a separate Checklist package for each canister.

If you have any questions, please advise.

Very truly yours,

T. I. Gillespie

T. I. Gillespie
QA Manager, Projects

WCL:ajj
Attachment: Filter Canisters Checklist for F-401, F-402, F-403 and F-404.

cc: F. R. Standerfer, w/1
T. F. Demmitt, w/o
W. H. Linton, w/o
[redacted]
N. C. Kazanas, w/o
P. Bradbury, w/o
S. A. Bernsen, w/1
R. L. Rider, w/o
T. V. Sarma, w/1
A. Stowe, w/1
H. J. Porter, w/o
T. A. McKearney, w/o

Filter Canister
Checklist Package
Index

<u>NOTE</u>: Where the checklist denotes Selamco, it means the same as NES.

1. **Checklist Verification Summary pages (22 pages)**

2. **Materials (M) Checklists** (Note 1)

Checklist	**Drawing No.**	**Subject**
M-1	**1150917D**	**Canister Lower Head**
M-2	**1150940A**	**Recombiner Catalyst Pellet**
M-3	**1150944C**	**Skirt**
M-4	**1150945C**	**Shell**
M-5	**1150949D**	**Tube**
M-6-A	**1150949D**	**Top & Bottom End Plugs**
M-6-B	**1150949D**	**Top & Bottom End Plugs**
M-7	**1150949D**	**B_4C Pellets**
M-8-A	**1150957B**	**Plug**
M-8-B	**1150957B**	**Plug**
M-9-A	**1150958D**	**Upper Head**
M-9-B	**1150958D**	**Upper Head**
M-10	**1150972A**	**Silicon-Coated Recombiner Catalyst**
M-11	**1154097A**	**Hansen Part No.**
M-12	**1154098A**	**Hansen Part No.**
M-13	**1154099A**	**Hansen Part No.**
M-14	**1154110A**	**Hansen Part No.**
M-15	**1154114A**	**Hansen Part No.**
M-16	1154044	Inlet Outlet/Coupler

3. **Fabrication (F) Checklist** (F-1 & F-2 Note 2, all others Note 1)

Checklist	**Drawing No.**	**Subject**
F-1	**1154018F**	**Assembly** (Note 2)
F-2	**1154020E**	**Subassembly** (Note 2)
F-3	**1150959D**	**Upper Head**
F-4	**1154045D**	**Lower Head - Catalysts**

Note 1: One Material Checklist applies to F-401, F-402, F-403 and F-404.
Note 2: Seperate Checklists for F-401, F-402, F-403 and F-404.

Filter Canister
Checklist Package
Index
(Cont.)

3. Fabrication (f) Checklist (Cont.)

Checklist	Drawing No.	Subject
F-5	1150917D	Lower Head
F-6	1150944C	Skirt
F-7	1150945C	Shell
F-8	1150949D	Tubes - Loaded Pellets
F-9	1150957B	Plug
F-10	1150958D	Upper Head
F-11	1154044C	Inlet/Outlet Coupler

4. Welding (W) and NDE Checklists (Note 2)

Checklist	Drawing No.	Subject
W-1	1154018F	Upper Head
W-2	1154020E	Subassembly
W-3	1150959D	Upper Head
W-4	1150949D	Top & Bottom End Plugs

5. Canister Checklist Verification Discrepant Items for which no NES action is required (Attachment No. 1)

Item No.	Subject
1.	Calibration of Receipt Inspected Equipment/Tools
2.	Details on Receipt Inspection Records
3.	Part 21 not Imposed on Sub-suppliers
4.	ANSI N 45.2 Requirements not Identified
5.	NCR Review
6.	SDDR Review
7.	Calibration of Incoming, Inprocess, and Final Inspection Equipment and Tools

Filter Canister
Checklist Package
Index
(Cont.)

6. Comments

   1. Resolution of NES Receipt Inspection(s) on Customer (Bechtel)-furnished material.

   2. SDDRs

   3. Calibration of Incoming, Inprocess and Final Inspection Equipment and Tools.

   4. Upper head traceability.

   5. Catalyst Inspection.

CHECKLIST COMPLETION FORMAT

The first 22 pages of the checklist consist of the identification of critical attributes required to be verified for all four (4) Filter Canisters. The balance of the checklist package reflects documentation of the verifications. In most of the checklists, verification of the attributes were performed simultaneously for all four Filter Canisters. The checklists bearing Nos. M1 to M16 and F-3 to F-11 were determined to be common for all four Filter Canisters. These checklists bear identification number F-402. The remaining checklists F-1, F-2, W-1, W-2, W-3, and W-4 are unique for each of the four Filter Canisters bearing identifications F-401, F-402, F-403, and F-404 respectively.

Bechtel Review Team

W. C. Lowery, Bechtel Quality Assurance
P. C. Kochis, Bechtel Engineer
B. Bain, Bechtel Material and Quality Services

Review Dates - July 29 through September 27, 1985

T-401

Revision Index Page

Revision	Date	Description
0	10-2-85	Issued for comment.
1	10-10-85	Revised several index and checklist pages to incorporate administrative corrections of typo items and to incorporate comments from GPU QA.
2	10-13-85	Reissued, for configuration control purpose, all pages of the checklists packages and identified as Revision 2. Also revised checklist pages M-6B page 1, M-7 page 1, M-16 pages 1 and 2, F-3 page 1, F-3 page 2, F-4 page 2, F-8 page 1, F-8 page 2.

F-403 F-401
F-404 F-402
Rev. 2

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		DIM. 149 3/4 ± 1/4 (12' - 5 3/4")	Refer to Fabrication Checklist F-1	Verified
	2		DIM. 3.200 Typ Max		
	3		Weld - Upper Head Weld 1	Refer to Welding & NDE Checklist W-1	Verified
	4		Weld - Lower Head Weld 2		
	5		Weld - Drain Tube To Upper Head 1/16 Weld 3		
	P/N 2	1	Upper Head Weldment 1150959D	Refer to Sheet 3	
	P/N 3	1	Lower Head Ass'y 1154045D	Refer to Sheet 5	
	P/N 4	1	Filter Canister Sub - Ass'y 1154020E	Refer to Sheet 2	
	Note 13		Envelope of Canister Within Perfect Cylinder of 14 15/16" DIA.	Refer to Fabrication Checklist F-1	Verified

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		DIM. $1\frac{1}{4} \pm \frac{1}{16}$ Zone C-12	Refer to Fabrication Checklist F-2	Verified
	2		DIM. $1 \pm \frac{1}{16}$ Zone C-4		
	3		Weld - Zone D-12 1/16 V Weld 1	Refer to Welding And NDE Checklist W-2	Verified
	4		Weld - Zone F-4 1/4 V Weld 2		
	P/N 3	1	Shell, Filter Canister 1150945C	Refer to Sheet 9	
	P/N 6	1	Poison Tube Ass'y 1150949D	Refer to Sheets 10 & 11	

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4	1		DIM. 6 $\frac{+}{-}$ $\frac{1}{4}$ ° Zone B-7	Refer to Fabrication Checklist F-3	Verified
	2		DIM. 90° Zone C-6		
	3	2	DIM. .750 $\pm$ .005 ⌖ | D | .010 Ⓜ	(Continued on Next Sht)	
	4		Weld - Zone D-5 Weld 1	Refer to Welding & NDE Checklist W-3	Verified
	5		Weld - Zone C-4 $\frac{1}{16}$ Weld 2	(Continued on Next Sheet)	
	P/N 3	1	Plug 1150957B	Refer to Sheet 12	
	P/N 4	A/R	Recombiner Catalyst (Englehard-Deoxo-D) 1150940A	Refer to Sheet 7	
	P/N 5	1	Upper Head, Filter Canister 1150958D	Refer to Sheet 13	
	P/N 6	A/R	Recombiner Catalyst (AECL) 1150972A	Refer to Sheet 14	
	P/N 7	1	Skirt 1150944C	Refer to Sheet 8	

F-402 F-401
F-403
F-404

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4 (Cont'd)	Note 2		PT in Accordance w/ ASME Sect. V, Art. 6 (1983 w/ no Addenda)	Refer to Welding & NDE Checklist W-3	Verified
	Note 3		Add Catalysts (P/Ns 4 & 6) in Portions Specified Prior to Welding of Screen Assy.	Refer to Fabrication Checklist F-3	Verified

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154045D REV. 5	P/N 2	1	Canister Lower Head 1150917D	Refer to Sheet 6	verified
	P/N 4	A/R	Recombiner Catalyst Particle (Englehard Deoxo-D) 1150940A	Refer to Sheet 7	
	P/N 5	A/R	Silicon Coated Recombiner Catalyst Particle (AECL) 1150972A	Refer to Sheet 14	
	Note 2		Add Catalysts (P/Ns 4&5)in portions Specified Prior to Welding of Screen Assy.	Refer to Fabrication Checklist F-4	Verified
	A		SDDR 2-M101A-20	Programmatic Only	
	B		SDDR 2-R200C-3	Programmatic Only	

CANISTER
CHECKLIST

F-403 F-401
F-404 F-402
Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150917D REV. 1	1		DIM. $\frac{14.093}{13.969}$ O.D. Zone C-6	Refer to Fabrication Checklist F-5	Verified
	2		DIM. 3/8 Zone C-8	↓	↓
	3		DIM. 5/16 MIN. Zone B-5	↓	↓
	4		DIM. 2 3/4 Zone B-4	↓	↓
	P/N 1	-	Canister Lower Head 1150917D	Refer to Material Checklist M-1	Verified
	A		SDDR 2-M101A-13	Programmatic Only	↓

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150940A REV. 2	1		Recombiner Catalyst Pellet: Reqmts Defined in 6 Notes	Refer to Material Checklist M-2	Verified

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150944C REV. 1	1		DIM. $\frac{14.062}{13.969}$ DIA. Zone B-3	Refer to Fabrication Checklist F-6	Verified
	2		DIM. $4\frac{1}{2}$ Zone D-2		
	P/N 1	1	Skirt 1150944C	Refer to Material Checklist M-3	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150945C REV. 1	1		DIM. 14.000 +.093 DIA. -.031 Zone C-2	Refer to Fabrication Checklist F-7	Verified
	P/N 1	1	Shell 1150945C	Refer to Material Checklist M-4	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D REV. 5	1		DIM. $136\frac{1}{8} \pm \frac{1}{16}$ (11' - $4\frac{1}{8}$") Zone D-6	Refer to Fabrication Checklist F-8	Verified
	2		DIM. 3/4 Zone C-7		
	3		DIM. 1 3/8 Zone C-4	(Continued on Next Sht.)	
	4		Weld Zone D-7 Weld 1	Refer to Welding & NDE Checklist W-4	Verified
	5		Weld - Zone D-4 Weld 2	(Continued Below)	
	P/N 2	1	Tube $2\frac{1}{8}$ O.D.X.069 Wall 1150949D	Refer to Material Checklist M-5	Verified
	P/N 3	1	Bottom End Plug 1150949D	Refer to Material Checklist M-6	Verified
	P/N 4	1	Top End Plug 1150949D		
	P/N 5	A/R	B_4C Pellet 1150949D	Refer to Material Checklist M-7	Verified
	Note5		PT in Accordance w/ ASTM E 165	Refer to Welding & NDE Checklist W-4	Verified

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SERIAL NO. ____

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F-403 F-401
F-404 Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D REV. 5 (Cont'd)	Note10		Pellets Loaded Within $\frac{1}{4}$" of the Tube Fill Length.	See Fabrication Checklist F-8	Verified
	A		SDDR 2-M101A-12	Programmatic Only	

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150957B REV. 1	1		DIM. 1 Length of Plug	Refer to Fabrication Checklist F-9	Verified
	2		DIM. $\frac{.999}{.997}$ DIA.	↓	↓
	P/N 1	-	Plug 1150957B	Refer to Materials Checklist M-8	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150958D REV. 3	1		DIM. $\boxed{4.500}$ R Zone D-7	Refer to Fabrication Checklist F-10	Verified
	2		DIM. $\boxed{4.800}$ Zone C-6		
	3		DIM. $\frac{14.083}{14.093}$ DIA. Zone B-6		
	4		DIM. $13.437^{+.015}_{-.000}$ DIA. Zone A-6		
	5		DIM. 3 3/8 Zone B-8		
	6		DIM. 3 7/8 Zone B-8		
	7		DIMS. For Lifting Socket (Zone D-3): a. 2.125 DIA. b. 1/4 X 45° c. 13/16 d. 8° e. 3 1/8 DIA. f. 2 3/8		
	8		DIM. 2.625 DIA. Thru 2 1/2 NPT(Typ 2 Plcs) ⊕ A Ⓢ ∅.20 Ⓢ Zone C-4		
	P/N 1	-	Filter Canister Upper Head 1150958D	Refer to Material Checklist M-9	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150972A REV. 1	1		Silicon-Coated Recombiner Catalyst: Reqmts Defined in 6 Notes	Refer to Material Checklist M-10	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154044C REV. 2	1		DIM. $\frac{2.218}{2.223}$ DIA. Thru ◎ | A Ⓜ | Ø .010 Ⓜ Zone B-4	Refer to Fabrication Checklsit F-11	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154075C REV. 2	A		SDDR 2-R200C-8	Programmatic Only	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154097A REV. 2	A		SDDR 2-R200C-7 (Seal Material)	Refer to Material Checklist M-11	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154098A REV. 2	A		SDDR 2-R200C-7 (Seal Material)	Refer to Material Checklist M-12	Verified

CANISTER CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154099A REV. 0	A		SDDR 2-R200C-7 (Seal Material)	Refer to Material Checklist M-13	Verified

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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154106B REV. 1	A		SDDR 2-M101A-2	Programmatic Only	Verified

CANISTER
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IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154110A REV. 0	A		SDDR 2-R200C-7 (Seal Material)	Refer to Material Checklist M-14	Verified

CANISTER
CHECKLIST

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154114A REV. 0	A		SDDR 2-R200C-7 (Seal Material)	Refer to Material Checklist M-15	Verified

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150917D Rev. 1	P/M 1		Canister Lower Head Material: ASME SA-479 or SA-240 type 304L or type 316L stainless steel LOWER HEAD	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals. 2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve c. Evidence of Auditor Certifications 3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	Bechtel P.O. TC-016160-3 This MATERIAL was supplied by GPU NUCLEAR, INC. (Bechtel North American Power Corp.) Therefore checklist items 1, (P.O.) and 2. (suppliers) are not applicable to NES. 3. Receipt Inspection: • NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. (See comment No. 1) • CMTR for HEAT # 20800 Allied Metals, Inc. for lower heads in F401, F 402, F 403 and F 404. • No other documents re uired to be submitted. Therefore, no review of documents required.

*This Checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1160917D Rev. 1	P/N 1			3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs written for Receipt Inspected material. See Attachment 1 item 5
				f. Calibration of Inspection Equipment	. See comment 1
				g. Dimensional Inspection	. See comment 1
				h. Documented RI and acceptance of the material for further use	. Document submittals stamped by QC Inspector,* (See Comment 1)
				4. Verify Release to Shop	4 Traveler NO. 003697
					* Receipt inspected by Selamco No. 2 on 2-12-85

SHELL S?N 43P1

.NISTER (FILTER)
CHECKLIST (Materials) (M-2)

Serial No.* P-402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150940A Rev. 2	1		Recombiner Catalyst Pellet: Requirements defined in 6 notes CATALYST	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals. 2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve c. Evidence of Auditor Certifications 3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	Bechtel P.O. TC-018139-1 This MATERIAL was supplied by GPU NUCLEAR, INC. (Bechtel North American Power Corp.) There for checklist items 1, (P.O.) and 2. (suppliers) are not applicable to NES. 3. Receipt Inspection: • NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. (See comment No. 1) • C of C (Engelhard Corp.. dated 3-29-85) • No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150940A Rev. 2				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs written for Receipt Inspected material. See Attachment 1 item 5
				f. Calibration of Inspection Equipment	. See comment 1
				g. Dimensional Inspection	. See comment 1
				h. Documented RI and acceptance of the material for further use	. Document submittals stamped by QC Inspector*, (See Comment 1)
				4. Verify Release to Shop	4. Traveler NO. 003697
					* Receipt inspected by Selamco No. 2

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-3)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150944C Rev. 1	P/N 1	1	Skirt 1150944C Material ASTM A-312 Grade 304L or Grade TP 316L Stainless Steel Pipe	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals 2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve[illegible] c. Evidence of Auditor Certifications 3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	Bechtel P.O. TC-016162 This MATERIAL was supplied by GPU NUCLEAR, INC. (Bechtel North American Power Corp.) There for checklist items 1, (P.O.) and 2. (suppliers) are not applicable to NES. 3. Receipt Inspection: • NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. (See comment No. 1) • CMTR from ARMCO, INC. Heat no. 341158. Inspected by NES/Selamco inspector (INSP.) No. 2 • No other documents required to be submitted. Therefore, no review of documents required

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150944C Rev. 1				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs written for Receipt Inspected material. See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. See Comment 1
				g. Dimensional Inspection	. See comment 1
				h. Documented RI and acceptance of the material for further use	. Document submittals stamped by QC Inspector. (See Comment 1) *
				4. Verify Release to Shop	4 Traveler NO. 003570
					* Receipt inspected by Selamco No. 2

SHELL S/N 43P1

CANISTER (FILTER) CHECKLIST (Materials) (M-4)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150945C Rev. 1	P/N 1		Shell 1150945C Material: ASME SA-312 Grade TP 304L or Grade TP 316L Stainless Steel Pipe 13.500" $\pm$ 0.000" I.D − 0.063 x .250" Wall Nominal (.219 minimum)	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals	Bechtel P.O. TC-016162 This MATERIAL was supplied by GPU NUCLEAR, INC. (Bechtel North American Power Corp.) There for checklist items 1, (P.O.) and 2. (suppliers) are not applicable to NES.
				2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve c. Evidence of Auditor Certifications	
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: • NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. (See comment No. 1) • CMTR from ARMCO, INC; Heat no. 240910 , 341158 • No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-403 (Shell s/n 11P2)

For F-404, refer to verification package that contains data unique to that canister.

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-4)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150945C Rev. 1	P/N 1			3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs written for Receipt Inspected material. See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. See comment 1
				g. Dimensional Inspection	. See comment 1
				h. Documented RI and acceptance of the material for further use	. Document submittals stamped by QC Inspector. (See Comment 1) *
				4. Verify Release to Shop	4. Traveler NO. 003568
					* Receipt inspected by Selamco No. 2

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-5)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5	P/N 2	1	Tube 2-1/8 O.D. x 0.065 Wall Material ASTM-A-269 Grade TP 316L Stainless Steel Tube	MATERIALS	P.O.: S03938-4 SUPPLIER: Marmon Keystone Corp HT-71393 Charlotte N.C.
				1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4)
				b. Identification of Part 21 applicability	. Part 21 identified on PO
				c. Is Source/Receipt Inspection identified	. Receipt Inspection Performed at NES.
				d. Identification of Document submittals.	. CMTR submittal identified on PO
				2. Suppliers	2. Suppliers:
				a. Included on Qualified Source List	. Supplier included on NES corp. AVL dated 3/27/85
				b. Evidence of Audit/Survey	. Corp. AVL indicates that this supplier was approved based on the history of Receipt Inspections by NES. and is ASME certified.
				c. Evidence of Auditor Certifications	
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	. Marmon Keystone, Heat No. 71393
				c. Other P.O. required documents review	. No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

.NISTER (FILTER)
CHECKLIST (Materials) (M-5)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs written for Receipt Inspected material. See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. See comment 1
				g. Dimensional Inspection	. See comment 1
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Receipt inspected by Selamco No 2
				4. Verify Release to Shop	4. Traveler NO. 003662 Poison Tube Assy

SHELL S/N 43P1

.ISTER (FILTER)
CHECKLIST (Materials) (M-6A)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS. Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION MAT'L P.O.: S03941-2-3 Dubose Steel
11509490 Rev. 5	P/N 3	1	Bottom end plug material: ASTM A-479 or A-276, Type 316L Stainless Steel Bar	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification	a. ~~NO ANSI N 45 2 requirements~~ identified (For resolution see Attachment 1, Item 4)
	P/N 4	1	Top End Plug Material: ASTM A-479 or A-276 Type 316L Stainless Steel Bar	b. Identification of Part 21 applicability	b. Part 21 identified on PO
				c. Is Source/Receipt Inspection identified	c. Receipt Inspection Performed at NES.
				d. Identification of Document submittals	d. CMTR submittal identified on PO
				2. Suppliers	2. Suppliers:
				a. Included on Qualified Source List	. Supplier included on NES AVL dated 8-2-85
				b. Evidence of Audit/Surve	. AVL indicates that this supplier was approved based on the history of Receipt Inspection by NES and is ASME Certified
				c. Evidence of Auditor Certifications	
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	a. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	b. Item No. 2, on PO-S-3941 . CMTRs Armco, Inc., Heat No. 626532. insp by Selamco 2 b. Item No. 3, on PO-S-3941, . CMTR from Slater Stee . Heat No.86949 insp. by Selamco 2
				c. Other P.O. required documents review	c. No other documents required to be submitted. Therefore no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on the Receipt Inspection Report. See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco No 2,
				4. Verify Release to Shop	4. Traveler NO. 003662

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-6B)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION (FAB)
				MATERIALS	P.O.: S04337-3 SUPPLIER: K & C Machine, Greensboro NC
11509490 Rev. 5	P/N 3	1	Bottom end plug material: ASTM A-479 or A-276, Type 316L Stainless Steel Bar	1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	a. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4)
	P/N 4	1	Top End Plug Material: ASTM A-479 or A-276 Type 316L Stainless Steel Bar	b. Identification of Part 21 applicability	b. Part 21 applicability not included in the P.O. (For Resolution see Attachment 1, Item 3)
				c. Is Source/Receipt Inspection identified	c. Receipt Inspection Performed at NES.
				d. Identification of Document submittals	d. N/A on PO however C of C submitted
			For P/n - 3 see FAB checklist No F-8	2. Suppliers	2. Suppliers:
				a. Included on Qualified Source List	a. No, at time of PO placment. NCR No.176 documents nonqualified sources now on qualified source list.
				b. Evidence of Audit/Surve	b. K & C Machine was post qualified (audited) on 6/85. K & C Machine is now qualified
				c. Evidence of Auditor Certifications	c. Yes.
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	. C of C, Insp. by Selamco 2
				c. Other P.O. required documents review	. No other documents required to be submitted. Therefore no review of documents required

This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

NISTER (FILTER)
CHECKLIST (Materials) (M-6-B)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on Receiving Report See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	. Traveler NO. 003662

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5	P/N 5	A/R	B_4C Pellet Material: ASTM C-750 Type 2 Boron Carbide	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals 2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Survey c. Evidence of Auditor Certifications 3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	P.O.: 04789-2 SUPPLIER: Advanced Refractory Technologies . ANSI N 45 2 requirements identified. . Part 21 identified on PO via Bechtel Spec. . Receipt Inspection Performed at NES. . C of C submittal identified on PO 2. Suppliers: a. Yes, Included on NES Corp. List dated 9/16/85 b. Audit performed on 4/12/85 Audit No. QAA-314 PO No. 04789 was issued on 4-22-85 which is after the date the Audit/Survey was performed. c. Yes. 3. Receipt Inspection: . NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. . C/C and special processes from Advanced NES stamp Selamco 5,9-9-85 . No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

NOTE: Traveler 003662 references P.O. S04032 which no longer applies to B & C pellets; Traveler 004096 which is linked to Traveler 003662 references P.O. S04789 which is correct

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on Receiving Report. See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	4 Traveler NO. 003662 & 004096

SHELL S/N 43P1

NISTER (FILTER)
CHECKLIST (Materials) (M-8A)

Serial No.* F- 402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION MAT'L
11509578 Rev. 1	P/N 1	--	Plug Material: ASME SA-479 Type 316L or ASME SA-479 type 304L Stainless Steel Bar Stock	MATERIALS	P.O.: 03941-4 SUPPLIER: Dubose Stell, Roseboro NC
				1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4)
				b. Identification of Part 21 applicability	. Part 21 identified on PO
				c. Is Source/Receipt Inspection identified	. Receipt Inspection Performed at NES.
				d. Identification of Document submittals.	. CMTR submittal identified on PO
				2. Suppliers	2. Suppliers:
				a. Included on Qualified Source List	. Supplier included on NES corp. AVL dated 8-2-85
				b. Evidence of Audit/Surve[illegible]	. AVL indicates that this supplier is approved based on the history of Receipt Inspection by NES and ASME Certification.
				c. Evidence of Auditor Certifications	
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	. Yes, CMTR, stamped by Delamco 2
				c. Other P.O. required documents review	. No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

HSTER (FILTER)
CHECKLIST (Materials) (N-8A)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION MAT'L
1150957B Rev. 1				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on Receipt Insp. see Att. 1 item 5.
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	. Traveler NO. 003778

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION FAB
11509578 Rev. 1	P/N 1	--	Plug Material: ASME SA-479 Type 316L or ASME SA-479 type 304L Stainless Steel Bar Stock	MATERIALS	P.O.: 04337-8 SUPPLIER: K&C Machine Co., Greensboro NC
				1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4)
				b. Identification of Part 21 applicability	• Part 21 applicability not included in th P.O. (For Resolution see Attachment 1, Item 3)
				c. Is Source/Receipt Inspection identified	Receipt inspection performed at NES Machining operation only, items were Receipt inspected by NES.
				d. Identification of Document submittals.	
				2. Suppliers	2. Suppliers:
				a. Included on Qualified Source List	. No, at time of PO placement. NCR No. 176 documents nonqualified sources. K & C Machine Co. was post qualified on 6/85.
				b. Evidence of Audit/Surve	. K & C Machine is now qualified
				c. Evidence of Auditor Certifications	· Yes.
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	. None required by PO
				c. Other P.O. required documents review	. No other documents requ red to be submitted. Therefore, o review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 4321

C[illegible]STER (FILTER)
CHECKLIST (Materials) (M-8-B)

Serial No. F- 402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION FAB
1150957B Rev. 1				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on Receiving Report See Attachment 1 item 5
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	. Traveler NO. 003778

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150958D Rev. 3	P/N 1	--	Filter Canister Upper Head Material: ASME SA-240 Type 316L or Type 304L Stainless Steel Plate	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals. 2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve c. Evidence of Auditor Certifications	Bechtel P.O. TC-016160 This MATERIAL was supplied by GPU NUCLEAR, INC. (Bechtel North American Power Corp.) Therefore checklist items 1. (P.O.) and 2. (suppliers) are not applicable to NES.
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: • NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. (See comment No. 1) • See Page 2 for identification of CMTRs • No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509580 Rev. 3				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs written for Receipt Inspected material. See Attachment 1, item 5
				f. Calibration of Inspection Equipment	. On the receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Document submittals stamped by QC Inspector. (See Comment 1)*
				4. Verify Release to Shop	. Traveler NO. 003778
					* inspected by Selamco No.2 & No. 5

The following is a list of CMTRs and C of Cs:

Item	Date	Origin
C of C	2/21/85	Guyon Alloys, Inc
C of C	1/16/85	Guyon Alloys, Inc
C of C	2/25/85	Jessop Steel, Co.
C of C	1/18/85	Jessop Steel, Co.
C of C	5/23/85	Jessop Steel, Co.
C of C	5/23/85	Jessop Steel, Co.
CMTR	accept 6/4/85	Jessop Steel, Co.
CMTR	accept 1/15/85	Jessop Steel, Co.
CMTR	accept 3/21/85	Jessop Steel, Co.
CMTR	accept 5/8/85	Jessop Steel, Co.

Heat Nos: 20933, 21090, 33577, 35579, 20794, 20840, 33578

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-9B)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION FAB
					P.O.: S-03942 SUPPLIER: Brown Boveri
1150958D Rev. 3	P/N 1	--	Filter Canister Upper Head Material: ASME SA-240 Type 316L or Type 304L Stainless Steel Plate	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals.	. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4) . Part 21 identified on PO . Receipt Inspection Performed at NES. . CMTR submittal identified on PO . Material conformance (MC) identified on P.O.
				2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve[y] c. Evidence of Auditor Certifications	2. Suppliers: . Supplier included on NES corp. AVL dated 3/27/85 . AVL indicates that this supplier is approved based on the history of Receipt Inspection by NES. Supplier surveyed 2/85.
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: . NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements . MC . accepted 4-17-85, by Selamco 2 cmtr is not necessary . No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

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SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-9'B)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION FAB
1150958D Rev. 3				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. , NCRs identified on Receipt Insp. Report NCR 323 and 322, closed Request No. 453, closed 4/16/85
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	4 Traveler NO. 003778

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-10)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150972A Rev. 1	1		Silicon - Coated recombiner catalyst requirements defined in 6 notes.	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals.	Bechtel P.O. TC-016181 TC-018139 This MATERIAL was supplied by GPU NUCLEAR, INC. (Bechtel North American Power Corp.) There for checklist items 1, (P.O.) and 2. (suppliers) are not applicable to NES.
				2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve c. Evidence of Auditor Certifications	
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: • NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements. (See comment No. 1) • C of C from AECL Se[illegible] mco 2 • No other documents re[illegible]ired to be submitted. Therefore no review of documents required

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150972A Rev. 1				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on the Receiving Report See attachment 1, Item 5
				f. Calibration of Inspection Equipment	. On the receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Document submittals stamped by QC Inspector. (See Comment 1)*
				4. Verify Release to Shop	. Traveler NO. 003734
					* Receipt inspected by Selamco No. 2

SHELL S/N 43P1

NISTER (FILTER)
CHECKLIST (Materials) (M-11)

Serial No.* F-402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154097A Rev. 2	A		Confirm Hansen part numbers end in "_192" (For Ethylene Propylene Diem Monomer Seal Materials) Ref: SDDR 2- R200C-7	MATERIALS	P.O.: S04291-5 SUPPLIER: Air Products Co., Cumming, GA
				1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4)
				b. Identification of Part 21 applicability	. Part 21 not identified on PO See Attachment No. 1, item 3
				c. Is Source/Receipt Inspection identified	. Receipt Inspection Performed at NES.
				d. Identification of Document submittals	. C of C submittal identified on PO
				2. Suppliers	2. Suppliers:
				a. Included on Qualified Source List	No at the time of PO placement.
				b. Evidence of Audit/Survey	. NCR No. 176 documents nonqualified sources. Air Products Co. now been evaluated by NES and determined not to need a survey as Air Products is a distributer.
				c. Evidence of Auditor Certifications	.
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	. C of C Air Products inspected by Selamco 2
				c. Other P.O. required documents review	. No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

CA..STER (FILTER)
CHECKLIST (Materials) (M-11)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154097A Rev. 2				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on Receiving Report (See Attachment 1, Item 5
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	4. Traveler NO. 003821

SHELL S/N 43P1

NISTER (FILTER) CHECKLIST (Materials) (M-12)

Serial No:* F-402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154098A Rev. 2	A		Confirm Hansen Part Numbers end in "_192" (For Ethylene Propylene Diem Monomer Seal Materials) Ref: SDDR 2- R200C-7	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals.	P.O.: S04291-4 SUPPLIER: Air Products Co., Cumming, GA . NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4) -- . Part 21 not identified on PO See Attachment No. 1, item 3 . Receipt Inspection Performed at NES. . C of C submittal identified on PO
				2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Survey c. Evidence of Auditor Certifications	2. Suppliers: No at the time of PO placement. . NCR No. 176 documents nonqualified sources. Air Products Co.now been evaluated by NES and determined not to . need a survey as Air Products is a distributer. .
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: . NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements . C of C Air Products inspected by Selamco 2 . No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

MISTER (FILTER)
CHECKLIST (Materials) (M-12)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154098A Rev. 2				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on Receiving Report. (See Attachment 1, item 5)
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector by Selamco no 2
				4. Verify Release to Shop	4. Traveler NO. 003820

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154099A Rev. 0	A		Confirm Hansen Part Numbers end in "_192" (For Ethylene Propylene Diem Monomer Seal Materials) Ref: SDDR 2- R200C-7	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals	P.O.: S04291-2 SUPPLIER: Air Products Co. . .. ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4) . Part 21 not identified on PO See Attachment No. 1, item 3 . Receipt Inspection Performed at NES. . C of C submittal identified on PO
				2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Survey c. Evidence of Auditor Certifications	2. Suppliers: No at the time of PO placement. . NCR No. 176 documents nonqualified sources. Air Products Co. now been evaluated by NES and determined not to need a survey as Air Products is a distributer. .
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: . NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements . C of C Air Products inspected by Selamco 2 . No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154099A Rev. 0				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on the Receiving Report. (See attachment 1, item 5)
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	. Traveler NO. 003832

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154110A Rev. 0	A		Confirm Hansen Part Numbers end in "_192" (For Ethylene Propylene Diem Monomer Seal Materials) Ref: SDDR 2- R200C-7	MATERIALS	P.O.: S04291-3 SUPPLIER: Air Products Co. Cummings GA
				1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	. NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4)
				b. Identification of Part 21 applicability	. Part 21 not identified on PO See Attachment No. 1, item 3
				c. Is Source/Receipt Inspection identified	. Receipt Inspection Performed at NES.
				d. Identification of Document submittals	. C of C submittal identified on PO
				2. Suppliers	2. Suppliers: No at the time of PO placement.
				a. Included on Qualified Source List	. NCR No. 176 documents nonqualified sources. Air Products Co. now been evaluated by NES and determined not to
				b. Evidence of Audit/Surve	. need a survey as Air Products is a distributer.
				c. Evidence of Auditor Certifications	.
				3. Receipt Inspection (RI)	3. Receipt Inspection:
				a. Documented approval of RI requirements	. NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements
				b. CMTRs/C of Cs review	. C of C Air Products, inspected by Selamco 2
				c. Other P.O. required documents review	. No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

CANISTER (FILTER)
CHECKLIST (Materials) (M-14)

Serial No. F-402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154110A Rev. 0				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on the Receiving Report (See attachement 1 item 5)
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2
				4. Verify Release to Shop	4. Traveler NO. 003840

SHELL S/N 43P1

'ISTER (FILTER)
CHECKLIST (Materials) (M-15)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154114A Rev. 0	A		Confirm Hansen Part Numbers end in "_192" (For Ethylene Propylene Diem Monomer Seal Material) Ref: SDDR 2- R200C-7	MATERIALS 1. Purchase Order (P.O.) a. ANSI N45.2 requirements identification b. Identification of Part 21 applicability c. Is Source/Receipt Inspection identified d. Identification of Document submittals	P.O.: 04291 SUPPLIER: Air Products Co Cumming GA . NO ANSI N 45 2 requirements identified (For resolution see Attachment 1, Item 4) . Part 21 not identified on PO See Attachment No. 1, item 3 . Receipt Inspection Performed at NES. . C of C submittal identified on PO
				2. Suppliers a. Included on Qualified Source List b. Evidence of Audit/Surve c. Evidence of Auditor Certifications	2. Suppliers: No at the time of PO placement. • NCR No. 176 documents nonqualified sources. Air Products Co. now been evaluated by NES and determined not to • need a survey as Air Products is a distributer.
				3. Receipt Inspection (RI) a. Documented approval of RI requirements b. CMTRs/C of Cs review c. Other P.O. required documents review	3. Receipt Inspection: . NES Policies and Procedures Manual, Q-12 includes Receipt Inspection requirements . C of C Air Products inspected by Selamco 2 . No other documents required to be submitted. Therefore, no review of documents required.

* This checklist also applies to canister:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

SHELL S/N 43P1

...STER (FILTER)
CHECKLIST (Materials) (M-15)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154114A Rev. 0				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on the Receiving Report (See attachment 1, item 5)
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Receiving copy of the PO stamped by QC Inspector Selamco 2.
				4. Verify Release to Shop	. Traveler NO. 003820

SHELL s/n 43P1

IISTER (FILTER)
CHECKLIST (Materials) (M-16)

Serial No.* F- 402
Page 1 of 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154044 Rev. 2	P/N 1	1	DIM 2.218 / 2.223 DIA THRU | ◎ | A Ⓢ | ⌀.010 Ⓢ | ZONE B-4 Inlet/outlet Coupler	MATERIALS	B & B Hose & Rubber, Co.; P.O. S-04293, item 2
				1. Purchase Order (P.O.)	
				a. ANSI N45.2 requirements identification	. Not specified by Nes in P.O. . Not specified by NES in P.O.
				b. Identification of Part 21 applicability	See Attachment 1, item 4 See Attachment 1, item 3
				c. Is Source/Receipt Inspection identified	. Source inspection not specified by NES in P.O.; NES performed receipt inspection
				d. Identification of Document submittals	. Yes, Item 3. (compliance certification)
				2. Suppliers	
				a. Included on Qualified Source List b. Evidence of Audit/Survey c. Evidence of Auditor Certifications	• Not at the time of PO placement. NCR No. 176 documents nonqualified sources. B&B Hose and Rubber Co. was post surveyed on 7/9/85 by NES QA and has now been evaluated by NES and determined not to need additional surveys as the company is a distributor.
				3. Receipt Inspection (RI)	
				a. Documented approval of RI requirements	. Policy procedures manual, Q-12
				b. CMTRs/C of Cs review	. Yes, 3.1, PT coupling C(. to B.B. Rubber, inspected by Sel mco 2
				c. Other P.O. required documents review	. No other documents requ red to be submitted. Therefore,) review of documents required.

* This checklist also applies to canisters:

s/n F-401 (Shell s/n 45P2)
s/n F-404 (Shell s/n 140P2)
s/n F-403 (Shell s/n 11P2)

ANISTER (FILTER)
CHECKLIST (Materials) (M-16)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154044 Rev. 2				3. (Continued)	
				d. Inspector's Certification	. Receiving Inspector Certification acceptable.
				e. Identification and Disposition of NCRs	. No NCRs identified on the Receipt Inspection Report. See Requests (REQ) . REQ 750, Cleared 2-18-85 REQ 318, cleared 5-7-85
				f. Calibration of Inspection Equipment	. On the Receipt Inspection Record tools/ gages used are not recorded (For resolution see Attachment 1, Item 1)
				g. Dimensional Inspection	. Dimensional Inspection not specifically documented on RI Records (For resolution see Attachment 1, Item 2)
				h. Documented RI and acceptance of the material for further use	. Yes, accepted b~ Selamco 2 as P.O. item 2
				4. Verify Release to Shop	4 Yes Traveler 003840

SHELI /N 45P2

FILTER
Serial No. F- 401

CANISTER
CHECKLIST (FABRICATION)(F-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		DIM. 149¾" ± ¼" (12' - 5¾")	1. Issuance of Material for next operation (release to shop)	1. Yes, Traveler 003842
	2		DIM. 3.200 Typ (MAX.)	2. Identification of latest approved drawings on Traveller	2. Yes, Traveler 003842
	3 Note 13		Envelope of Canister Within Perfect Cylinder of 14 15/16" DIA.	IN PROCESS INSPECTIONS	
				3. Machining Operations	3.a Not applicable
				a. Supplier performed - (Refer to Material Checklist)	
			Ref. Traveler 003842	b. If NES performed -	
				1) Identification of Requirements	1) See Item 5.C on Page 2
				2) Inspection and Acceptance for further use	2) See Item 5.C on Page 2
				3) Certification of Inspectors	3) See Item 5.a on Page 2
				4. Welding Operations	4. Not applicable to the items being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1.		Dim. $149^{3/4"}$ $\pm\frac{1}{4}$"	5. Dimensional Inspection	
				a. Qualification of Inspectors	a. Item 1 inspected by Selamco 6 on 5-20-85 and by RDH on 6/4/85; Items 2 & 3 inspected by RDH on 9/14/85. The inspector's qualifications are satisfactory.
	2		Dim 3.200 (Typ) (Max)	b. Use of calibrated equipment	b. Yes, see Attachment 1, Iitem 7.
	Note 13		14 5/16" Cylinder	c. Evidence of inspection and acceptance to required criteria	c. Yes, Traveler 003842 for Items 1, 2 and 3 has applicable requirements.
				6. Identification, Control, and Disposition of NCRs	No NCRs written against items 1, 2 and 3. See Att. 1, Item 5.
				7. Implementation of SDDRs	None written for Items 1, 2 and 3 See Attachment 1, Item 6.
				8. Assembly Inspection	Yes, Traveler 003842

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		DIM. 149¾" ± ¼" (12' - 5¾")	1. Issuance of Material for next operation (release to shop)	1. Yes, Traveler 003840
	2		DIM. 3.200 Typ (MAX.)	2. Identification of latest approved drawings on Traveller	2. Yes, Traveler 003840
	Note 13		Envelope of Canister Within Perfect Cylinder of 14 15/16" DIA.	IN PROCESS INSPECTIONS	
				3. Machining Operations	3.
			REF: Traveler 003840	a. Supplier performed - (Refer to Material Checklist)	a. Not applicable
				b. If NES performed -	
				1) Identification of Requirements	1) See Item 5.c on Page 2
				2) Inspection and Acceptance for further use	2) See Item 5.c on Page 2
				3) Certification of Inspectors	3) See Item 5.a on Page 2
				4. Welding Operations	4. Not applicable to the items being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		DIM 149 3/4 ± 1/4	5. Dimensional Inspection	
	2		DIM 3.200	a. Qualification of Inspectors	a) Item 1 was QC inspected by RDH on 6/4/85, and Selamco 6 on 5-10-85 Selamco 6 on Master Selamco QA Issuance Log Item 2 and 3 inspected on 9-14-85
	Note 13		Cylinder of 14 5/16"	b. Use of calibrated equipment	b) Yes, see Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	c) Yes, Traveler 003840 for items 1, 2 and 3
				6. Identification, Control, and Disposition of NCRs	6. No NCRs written against items #1, 2 and 3 See Attachment 1, Item 5.
				7. Implementation of SDDRs	7. Not applicable to items #1, 2 and 3 See Attachment 1, Item 6.
				8. Assembly Inspection	8. Traveler 003840

SHELL S/N 11P2

CANISTER CHECKLIST (FABRICATION)(F-1)

FILTER
Serial No. F-403

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		DIM. 149¾" ± ¼" (12' - 5¾")	1. Issuance of Material for next operation (release to shop)	Yes, Traveler 003838
	2		DIM. 3.200 Typ (MAX.)	2. Identification of latest approved drawings on Traveller	Yes, Traveler 003838
	Note 13		Envelope of Canister Within Perfect Cylinder of 14 15/16" DIA.	IN PROCESS INSPECTIONS	
				3. Machining Operations	Not applicable to the items being verified.
				a. Supplier performed - (Refer to Material Checklist)	
				b. If NES performed -	
				1) Identification of Requirements	See Item 5.C on Page 2
				2) Inspection and Acceptance for further use	See Item 5.C on Page 2
				3) Certification of Inspectors	See Item 5.a on Page 2
				4. Welding Operations	Not applicable to the items being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

CANISTER
CHECKLIST (FABRICATION)(F-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		Dim. $149^{3/4} \pm \frac{1}{4}$"	5. Dimensional Inspection	
				a. Qualification of Inspectors	a. Selmaco 6 and RDH are qualified for inprocess and final inspection per QA issuance log.
	2		Dim. 3.200 Typ (Max)	b. Use of calibrated equipment	b. Tools/gauges calibrated. See Attachment 1, Item 7.
	Note 13		14 5/16" Cylinder	c. Evidence of inspection and acceptance to required criteria	c. Yes, Traveler 003838 except for Item 2 (on inlet coupler) NCR 385 written.
				6. Identification, Control, and Disposition of NCRs	NCR 385 - open. See Attachment 1, Item 5.
				7. Implementation of SDDRs	No SDDRs. See Attachment 1, Item 6.
				8. Assembly Inspection	Yes, Traveler 003838

CANISTER
CHECKLIST (FABRICATION)(F-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		DIM. 149¾" ± ¼" (12' - 5¾")	1. Issuance of Material for next operation (release to shop)	Yes, Traveler 003839
	2		DIM. 3.200 Typ (MAX.)	2. Identification of latest approved drawings on Traveller	Yes, Traveler 003839
	Note 13		Envelope of Canister Within Perfect Cylinder of 14 15/16" DIA.	IN PROCESS INSPECTIONS	
				3. Machining Operations	Not applicable to the items being verified.
				a. Supplier performed - (Refer to Material Checklist)	
				b. If NES performed -	
				1) Identification of Requirements	1) See Item 5.C on Page 2
				2) Inspection and Acceptance for further use	2) See Item 5.C on Page 2
				3) Certification of Inspectors	3) See Item 5.a on Page 2
				4. Welding Operations	Not applicable to the items being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

CANISTER
CHECKLIST (FABRICATION)(F-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5	1		Dim. $149^{3/4} \pm \frac{1}{4}$	5. Dimensional Inspection	
				a. Qualification of Inspectors	a) RDH is qualified for inprocess and final inspection - See NES QA issuance log.
	2		Dim. 3.200 Typ (Max)	b. Use of calibrated equipment	b) Tools/gauges calibrated See Attachment 1, item 7.
	Note 13		14 5/16" Cylinder	c. Evidence of inspection and acceptance to required criteria	Yes, Traveler 003839
				6. Identification, Control, and Disposition of NCRs	None written against the items being verified.
				7. Implementation of SDDRs	None written for any of the items being verified.
				8. Assembly Inspection	Yes, Traveler 003839

SHELL N 45P2

FILTER
Serial No. F- 401

CANISTER
CHECKLIST (FABRICATION)(F-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		DIM. $1\frac{1}{4}" \pm \frac{1}{16}"$ Zone C-12	1. Issuance of Material for next operation (release to shop)	Traveler 003751
	2		DIM. $1" \pm \frac{1}{16}"$ Zone C-4	2. Identification of latest approved drawings on Traveller	Yes, Traveler 003751
				IN PROCESS INSPECTIONS	
				3. Machining Operations	
				a. Supplier performed - (Refer to Material Checklist)	a. Not applicable
			Filter canister sub-assembly	b. If NES performed -	b. See Sheet 2
				1) Identification of Requirements	1) See Item 5.c on Page 2
				2) Inspection and Acceptance for further use	2) See Item 5.c on Page 2
				3) Certification of Inspectors	3) See Item 5.a on Page 2
				4. Welding Operations	Not applicable to the item being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		Dim. 1¼ ± 1/16"	5. Dimensional Inspection	
				a. Qualification of Inspectors	a) Selamco inspector 4 was on NES Master Log at the time on the inspection. The inspector's qualifications are satisfactory.
	2		Dim. 1" ± 1/16"	b. Use of calibrated equipment	b) Tools/gauges calibrated. See Attachment 1, item 7
				c. Evidence of inspection and acceptance to required criteria	c) Yes, on Traveler 003751 However, dimension on traveler is not in accordance with Dwg. SDDR 73 written and approved.
				6. Identification, Control, and Disposition of NCRs	NCR 197; closed. See Attachment 1, Item 5.
				7. Implementation of SDDRs	Yes, SDDR 73 - approved See Attachment 1, Item 6.
				8. Assembly Inspection	Yes, see Traveler 003842
					Dimensions shown in operation 100 on Traveler 003751 showed 1 1/8" and 1 1/8" instead 1¼" and 1" as required by the drawing. NCR 197 and SDDR 73 were written and closed.

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		DIM. $1\frac{1}{4}$" $\pm$ $\frac{1}{16}$" Zone C-12	1. Issuance of Material for next operation (release to shop)	Yes, Traveler 003753
	2		DIM. 1" $\pm$ $\frac{1}{16}$" Zone C-4	2. Identification of latest approved drawings on Traveller	Yes, Traveler 003753
				IN PROCESS INSPECTIONS	
			Filter Canister Subassembly	3. Machining Operations	Not Applicable to the items being verified
				a. Supplier performed - (Refer to Material Checklist)	
				b. If NES performed -	
				1) Identification of Requirements	1) See item 5.c on Page 2
				2) Inspection and Acceptance for further use	2) See item 5.c on Page 2
				3) Certification of Inspectors	3) See Item 5.a on page 2
				4. Welding Operations	Not applicable to the items being verified
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

.STER
CHECKLIST (FABRICATION)(F-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		DIM 1¼" ± 1/16"	5. Dimensional Inspection	
	2		DIM 1" ± 1/16"	a. Qualification of Inspectors	a) Selamco inspector 3 is qualified for inprocess inspection per the NES QA issuance log
				b. Use of calibrated equipment	b) Tools/gauges calibrated. See Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	c) Yes, on traveler 003753 However, the dimensions on the traveler do not agree with the drawing (NCR 197 written)
				6. Identification, Control, and Disposition of NCRs	6. NCR 197 closed. See Att. 1, Item 5.
				7. Implementation of SDDRs	7. Yes, SDDR 73-approved. See Att. 1, Item 6.
				8. Assembly Inspection	8. Yes traveler 003840
					The traveler specifies dimensions of 1 " and 1 1/16" in place of 1⅛" and 1", respectively as required by the drawing.

Shell S/N 11P2

CANISTER
CHECKLIST (FABRICATION)(F-2)

FILTER
Serial No. F- 403

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		DIM. 1¼" ± 1/16" Zone C-12	1. Issuance of Material for next operation (release to shop)	Yes, Traveler 003754
	2		DIM. 1" ± 1/16" Zone C-4	2. Identification of latest approved drawings on Traveller	Yes, Traveler 003754
				IN PROCESS INSPECTIONS	
				3. Machining Operations	Not applicable to the items being verified.
				a. Supplier performed - (Refer to Material Checklist)	
				b. If NES performed -	
				1) Identification of Requirements	1) See Item 5.C on Page 2
				2) Inspection and Acceptance for further use	2) See Item 5.C on Page 2
				3) Certification of Inspectors	3) See Item 5.a on Page 2
				4. Welding Operations	Not applicable to the items being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

CANISTER
CHECKLIST (FABRICATION)(F-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		Dm. 1¼" ± 1/16"	5. Dimensional Inspection	
				a. Qualification of Inspectors	a) Selamco 3 is qualified for inprocess inspection per NES QA issuance log.
				b. Use of calibrated equipment	b) Tools/gauges calibrated. See Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	c) Yes, Traveler 003754 the dimensional criteria on Traveler 003754 is not in accordance with drawing (see below)
				6. Identification, Control, and Disposition of NCRs	NCR 197 written for Item 5.C, above; NCR 197 - open. See Att. 1, Item 5.
				7. Implementation of SDDRs	Yes SDDR 73 - approved. See Att. 1, Item 6.
				8. Assembly Inspection	Yes, Traveler 003838
					Traveler 003754 requires dimensions of 1 1/8" and 1 1/8" instead of 1¼" and 1" (NCR 197 written) as required at the drawing.

SHELL S/N 140P2

FILTER
Serial No. F- 404

CANISTER
CHECKLIST (FABRICATION)(F-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		DIM. $1\frac{1}{4}" \pm \frac{1}{16}"$ Zone C-12	1. Issuance of Material for next operation (release to shop)	Yes, Traveler 003741
	2		DIM. $1" \pm \frac{1}{16}"$ Zone C-4	2. Identification of latest approved drawings on Traveller	Yes, Traveler 003741
				IN PROCESS INSPECTIONS	
				3. Machining Operations	Not applicable to the items being verified.
				a. Supplier performed - (Refer to Material Checklist)	
				b. If NES performed -	
				1) Identification of Requirements	1) See Item 5.c on Page 2
				2) Inspection and Acceptance for further use	2) See Item 5.C on Page 2
				3) Certification of Inspectors	3) See Item 5.a on Page 2
				4. Welding Operations	Not applicable to the items being verified.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	1		Dim. 1¼" ± 1/16"	5. Dimensional Inspection	
				a. Qualification of Inspectors	Yes, Selamco 2 is on Master QA issuance log.
	2		Dim 1" ± 1/16"	b. Use of calibrated equipment	Tools/gauges are calibrated See Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	Yes, on Traveler 003741 The dimensional criteria on Travelor 003741 is not in accordance with Drawing (See Below)
				6. Identification, Control, and Disposition of NCRs	NCR 197 written for item 5.C, above; NCR 197-open
				7. Implementation of SDDRs	Yes, SDDR 73-approved
				8. Assembly Inspection	Yes, Traveler 003839
					Traveler 003741 requires dimensions of 11/8" and 1 1/8" instead of 1¼" and 1" (NCR 197 written) as required by the drawing.

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4	1		DIM. 6 ± Zone B-7	1. Issuance of Material for next operation (release to shop)	TVR.003778, ------ Assy
	2		DIM. 90° Zone C-6	2. Identification of latest approved drawings on Traveller	2. No. TVR 003778 (issued 2-4-85) @ Rev 3 DWG. Rev. 4. (2/7/85) Work on TVR performed ~ 4/85 The drawing revision conflict was resolved by the note added to the TVR on 4/85 requiring "Add more Englehard Catalyst if required to fill" and SDDR No. 2-M101-99.
	3	2	DIM. .750" ± .005" ⊕ D .010		
	Note 3		Add Catalysts (P/Ns 4 & 6) in Portions Specified Prior to Welding of Screen Assy.	IN PROCESS INSPECTIONS 3. Machining Operations	3.
				a. Supplier performed - (Refer to Material Checklist)	a) Not applicable
			Filter Canister upper Head weldment	b. If NES performed -	b) see below items 1 and 3
				1) Identification of Requirements	1) Yes. TVR 003778, verified
				2) Inspection and Acceptance for further use	2) Yes. TVR 003778, verified
				3) Certification of Inspectors	3) Yes. Selamco (2) performed final inspection
				4. Welding Operations a. Welding b. NDE c. Visual Examination (Refer to Welding & NDE Checklist)	4 Refer to welding & NDE checklist No. W-3, in each canister verification package, accept.

This Checklist also applies to canister:

S/N F401 (Shell S/N 45P2)
S/N F404 (Shell S/N 140P2)
S/N F403 (Shell S/N 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
				5. Dimensional inspection	
11509590 REV. 4	1		DIM 6 ¾"	a. Qualification of Inspectors	a. Selamco Inspectors on the Master Selamco QA Issuance Log.
	2		DIM 90°		
	3		DIM 0.750" ± 0.005	b. Use of calibrated equipment	b. Tools/gauges calibrated. See Attachment 1, Item 7.
	Note 3		Add Catalysts	c. Evidence of inspection and acceptance to required criteria	c. Yes. TVR 003778
				6. Identification, Control, and Disposition of NCRs	6. Not applicable. There are NO NCRs documented on this TVR.* See Attachment 1, Item 5.
				7. Implementation of SDDRs	7. SDDR* on this item, 2-M101-99, close See Attachment 1, Item 6.
				8. Assembly Inspection	8. • TVR 003840 by Sel ② 5/85, F402 • TVR 003842 by Sel ② 5-8-85, F401 • TVR 003839 by Sel ② 5-10-85, F404 • TVR 003838 by Sel ② on 5-9-85, F403

*Related NCR No. 245 and SDDR No. 68 closed, 8/22/85.

See comment no. 5.

FILTER
Serial No. F- 402

SHELL S/N 43P1 | CANISTER CHECKLIST (FABRICATION)(F-4) | Page 1 of 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154045D REV. 5	Note 2		Add Catalysts (P/Ns 4 & 5) in Portions Specified Prior to Welding of Screen Assy. Canister Lower Head Assy.	1. Issuance of Material for next operation (release to shop) 2. Identification of latest approved drawings on Traveller	TVR 3697 added catalyst prior to welding. TVR 003734 weighted catalyst. Source catalysts-P.O.(Bechtel) TC 016181 TVR No. 003697 does not have the DWG Rev. NES review of drawing files denotes that Rev. 5 was used. Also TVR 003734 has Rev. 5 weights.
				IN PROCESS INSPECTIONS	
				3. Machining Operations a. Supplier performed - (Refer to Material Checklist) b. If NES performed - 1) Identification of Requirements 2) Inspection and Acceptance for further use 3) Certification of Inspectors	3. Not applicable (NA)
				4. Welding Operations a. Welding b. NDE c. Visual Examination (Refer to Welding & NDE Checklist)	4. NA

This Checklist also applies to canister:

S/N F403 (Shell S/N 45P2)
S/N F404 (Shell S/N 140P2)
S/N F408 (Shell S/N 11P2)

SHELL S/N 43P1

L...ISTER
CHECKLIST (FABRICATION)(F-4)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11540450 REV. 5	Note 2		Add Catalysts	5. Dimensional Inspection	
				a. Qualification of Inspectors	a. Selamco Inspectors on the Master Selamco QA Issuance Log.
				b. Use of calibrated equipment	b. Tools/gauges calibrated. See Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	c. Yes, TVR 3697.
				6. Identification, Control, and Disposition of NCRs	6.* NCR-245 closed 8-22-85. See Attachment No. 1, item 5.
				7. Implementation of SDDRs	7.* SDDR 68 (NES NO.), Bechtel NO. 2M-101A 68 closed-----8-22-85. See Attachment 1, Item 6.
				8. Assembly Inspection	8. TVR 003697
					* See comment no. 5.

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS — Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150917D REV. 1	1		DIM. $\frac{14.093}{13.969}$ O.D. Zone C-6	1. Issuance of Material for next operation (release to shop)	Detail TVR 003690 Source PO# TC-016160-3 Heat 20800
	2		DIM. 3/8 Zone C-8	2. Identification of latest approved drawings on Traveller	2. Yes
	3		DIM. 5/16 MIN. Zone B-5	IN PROCESS INSPECTIONS	
	4		DIM. 2 3/4 Zone B-4	3. Machining Operations	3. see below
			Canister Lower Head	a. Supplier performed - (Refer to Material Checklist)	a. $\frac{14.093}{13.969}$, 3/8, & 5/16 MIN Performed on PO NO. TC-016160-3, which was Bechtel supplied material.
				b. If NES performed -	
				1) Identification of Requirements	1. Yes, 2 3/4, on TVR 3690.
				2) Inspection and Acceptance for further use	2. Yes on TVR 3690
				3) Certification of Inspectors	3. Yes Selamco 2
				4. Welding Operations	4. Not applicable to Item 4 in "Description"
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

This Checklist Also Applies to Canister:

S/N F401 (Shell S/N 45P2)
S/N F404 (Shell S/N 140P2)
S/N F403 (Shell S/N 11P2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150917D REV. 1	1		DIM. 14.093 / 13.969	5. Dimensional Inspection	
				a. Qualification of Inspectors	a. Selamco Inspector 2 on the master Selamco QA Issuance Log.
	2		DIM. 3/8		
	3		DIM. 5/16 Min	b. Use of calibrated equipment	b. Tools/gauges calibrated. See Attachment 1, Item 7.
	4		DIM. 2 3/4	c. Evidence of inspection and acceptance to required criteria	c. Yes. TVR 003690
				6. Identification, Control, and Disposition of NCRs	6. None written for items being verified See Attachment 1, Item 5.
				7. Implementation of SDDRs	7. None. See Attachment 1, Item 6.
				8. Assembly Inspection	8. TVR 003840 (11P2) TVR 003842 (45P2) TVR 003839 (140P2) TVR 003838 (11P2)

FILTER
Serial No. F- 402

SHELL S/N 43P1 C...ISTER CHECKLIST (Fabrication) (F-6) Page 1 of 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150944C Rev. 1	1		Dim. $\frac{14.062}{13.969}$ Dia. Zone B-3	1. Issuance of Material for next operation (release to shop)	TVR 003570 Det 1
	2		Dim. 4-1/2 Zone D-2	2. Identification of latest approved drawings on Traveller	2. Yes. TVR 003570
			Filter and knockout canister skirt	IN PROCESS INSPECTIONS	
				3. Machining Operations	
This Checklist also applies to Canister: S/N F401 (Shell S/N 45P2) S/N F404 (Shell S/N 140P2) S/N F403 (Shell S/N 11P2)				a. Supplier performed - (Refer to Material Checklist)	a. Not applicable
				b. If NES performed -	b. see below
				1) Identification of Requirements	1. Yes, for 4 ½, TVR 003570 1. Yes, for $\frac{14.062}{13.969}$, TVR 003570
				2) Inspection and Acceptance for further use	2. Yes, for 4 ½, TVR 003570 Yes, for $\frac{14.062}{13.969}$, TVR 003570
				3) Certification of Inspectors	3. Yes, for 4 ½, TVR 003570 by 2 Selamco, first Art, 2-27-85 and 2 Selamco 8-23-85 3. Yes, for 14.062/13.969 by 2 Selamco (Operation 70) discussed with Selamco 2 4-19-85
				4. Welding Operations a. Welding b. NDE c. Visual Examination (Refer to Welding & NDE Checklist)	4. No welding operations were performed not applicable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150944C Rev. 1	1		DIM. $\frac{14.062}{13.969}$ DIA.	5. Dimensional Inspection	5.
	2		DIM. 4 ½	a. Qualification of Inspectors	a. Selamco Inspector 2 on the Master Selamco QA Issuance Log.
				b. Use of calibrated equipment	b. Tools/gauges calbrated. See Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	c. Yes. TVR 003570
				6. Identification, Control, and Disposition of NCRs	6. No NCRs on TVR. See Attachment 1, Item 5.
				7. Implementation of SDDRs	7. None. See Attachment 1, Item 6.
				8. Assembly Inspection	8. TVR-003778 Assy.
					Note material supplied by Bechtel - see M-3.

FILTER
Serial No. F- 402

SHELL S/N 43P1

CANISTER
CHECKLIST (Fabrication) (F-7) Page 1 of 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150945C Rev. 1	1		Dim. 14.000 + .093 Dia. - .031 Zone C-2 Shell Filter & knockout canister.	1. Issuance of Material for next operation (release to shop)	1. TVR 003568 TVR 003450
				2. Identification of latest approved drawings on Traveller	2. Yes. Rev. 0, on TVR 003568
				IN PROCESS INSPECTIONS	
This Checklist also applies to Canister:				3. Machining Operations	
S/N F401 (Shell S/N 45P2) S/N F404 (Shell S/N 140P2) S/N F403 (Shell S/N 11P2)				a. Supplier performed - (Refer to Material Checklist)	a. see Material checklist No. M-4 The shell, which includes the 14,000 dia. is supplied by GPU Nuclear Inc. via PO. TC-016162
				b. If NES performed -	
				1) Identification of Requirements	1. Yes, for 14.00 +.093 -.031 TVR 3450 TVR 3568
				2) Inspection and Acceptance for further use	2. Yes for 14.00 +.093 -.031 TVR 3450 TVR 3568
				3) Certification of Inspectors	3. Yes
				4. Welding Operations	4. Welding is not part of this "Description" review.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

SHELL S/N 43P1

..NISTER
CHECKLIST (Fabrication) (F-7)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150945C Rev. 1	1		DIM. 14.000 + 0.093 DIA - 0.031	5. Dimensional Inspection	
				a. Qualification of Inspectors	a. Selamco Inspector 9 on the Master Selamco QA Issuance Log. (Inspector's initials are RDH)
				b. Use of calibrated equipment	b. Tools/gauges calibrated. See Attachment 1, Item 7.
				c. Evidence of inspection and acceptance to required criteria	c. Inspection data traveler 003840 TVR 3568
				6. Identification, Control, and Disposition of NCRs	6. NCR 180-Void NCR 427-Closed. See Att. 1, Item 5.
				7. Implementation of SDDRs	7. None. See Attachment 1, Item 6.
				8. Assembly Inspection	8. See below.
				Heat No	Assembly TVR
				240910	003751 (45P2)
				240910	003753 (43P1)
				341158	003741 (140P2)
				240910	003754 (11P2)

FILTER
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SHELL S/N 43P1

CANISTER CHECKLIST (Fabrication) (F-8) Page 1 of 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5	1		Dim. 136-1/8 ± 1/16 (11' - 4-1/8") Zone D-6	1. Issuance of Material for next operation (release to shop)	Assy TVR 03662, Tube Assy, 1150949, Rev. 4 Assy TVR 04096: A, B, C, D. Tube Assy, 1150949-1, Rev. 5 Det'l TVR 003563-Tube, 1150949-2, Rev. 4 Det'l TVR 003553-Plug, 1150949-3, Rev. 3
	2		Dim. 3/4 Zone C-7	2. Identification of latest approved drawings on Traveller	2. Yes, Assembly is to TVRs 04096, A, B, C, & D which are Rev. 5. Work performed on TVRs 3662, 3563, 3553 is per Rev. 5 requirements.
	3		Dim. 1-3/8 Zone C-4	IN PROCESS INSPECTIONS	
	Note 10		Pellets loaded within 1/4" of the tube fill length	3. Machining Operations	
				a. Supplier performed - (refer to Material Checklist)	a. Yes, on Mat's checklist No. M-6 for DIM 3/4 PO 4337
This Checklist also applies to Canister:				b. If NES performed -	b. Below
S/N F401 (Shell S/N 45P2) S/N F404 (Shell S/N 40P2) S/N F403 (Shell S/N 11P2)				1) Identification of Requirements	1. Yes, DIM 136 1/8 + 1/16, TVR 003563 1. Yes DIM 1 3/8 ± 1764, TVR 003553
				2) Inspection and Acceptance for further use	2. Yes, Dim 136, TVR 003563 2. Yes. Dim 1 3/8 TVR 003553
				3) Certification of Inspectors	3. Yes, Dim 136 1/8, Sel 2 2-11-85 3. Yes, Dim 1 3/8, Sel 2 1-15-85
				4. Welding Operations	4. See Welding Checklist
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

SHELL S/N 43P1

CANISTER CHECKLIST (Fabrication) (F-8)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5	1		Dim. 136 1/8" ± 1/16"	5. Dimensional Inspection	
				a. Qualification of Inspectors	a. Yes, Selamco Inspectors on the Master Selamco QA Issuance Log.
	2		Dim. 3/4"		
	3		Dim. 1 3/8"	b. Use of calibrated equipment	b. Tools/gauges calibrated. See Attachment 1, Item 7.
	Note 10		Pellets	c. Evidence of inspection and acceptance to required criteria	c. Yes PO. S04337 TVR. 003563 TVR. 003553 TVR 004096,A,B,C,D
				6. Identification, Control, and Disposition of NCRs	6. None listed on PO's or TVRs NCR No. 125 and 126, closed. See Attachment 1, Item 5.
				7. Implementation of SDDRs	7.* NCR 126, resulted in SDDR 75 which was approved by Bechtel 9-9-85 and closed by NES QA on 9-12-85 See Attachment 1, Item 6.
				8. Assembly Inspection	8. TVR 003754 (11P2) 003753 (43P1) 003751 (45P2) 003741 (140P2)
					*Also, SDDR 2-M101A-12 closed by NES 5/22/85.

SHELL S/N 43P1

CANISTER CHECKLIST (Fabrication) (F-9)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS   Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150957B Rev. 1	1		Dim. 1" Length of Plug	1. Issuance of Material for next operation (release to shop)	Source P.O. - S- 04337-8
	2		Dim. $\frac{.999}{.997}$ Dia. Plug, Det. 3	2. Identification of latest approved drawings on Traveller	Not applicable - machining done by vendor (K*C Machine Co, Inc)
				IN PROCESS INSPECTIONS	
This Checklist also applies to Canister: S/N F401 (Shell S/N 45P2) S/N F404 (Shell S/N 140 P2) S/N F403 (Shell S/N 11P2)				3. Machining Operations	
				a. Supplier performed - (Refer to Material Checklist)	Yes, P.O. S04337, Item 8 see Material Checklist M-8
				b. If NES performed -	Not applicable, see item 2, above
				1) Identification of Requirements	
				2) Inspection and Acceptance for further use	
				3) Certification of Inspectors	
				4. Welding Operations	Not applicable to the "tasks listed under "Description""
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

SHELL S/N 43P1

CANISTER
CHECKLIST (Fabrication) (F-9)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150957B Rev. 1	1		Dim. 1"	5. Dimensional Inspection	5. Not applicable, refer to material checklist
	2		Dim. .999/.997 DIA.	a. Qualification of Inspectors	
				b. Use of calibrated equipment	
				c. Evidence of inspection and acceptance to required criteria	
				6. Identification, Control, and Disposition of NCRs	6. No NCRs written against the plug. See Att. 1, Item 5.
				7. Implementation of SDDRs	7. Not applicable, no SDDRs were written for the plugs. See Attachment 1, Item 6.
				8. Assembly Inspection	8. Yes, traveler 003778 for 140P2, 45P2, 43P1, 11P2

FILTER
Serial No. F-402

SHELL S/N 43P1

CANISTER CHECKLIST (Fabrication) (F-10) Page 1 of 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS   Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150958D Rev. 3	1		Dim. $\boxed{4.500}$ R Zone D-7	1. Issuance of Material for next operation (release to shop)	1 PO-S-3942-2
	2		Dim. $\boxed{4.800}$ Zone C-6	2. Identification of latest approved drawings on Traveller	2. See mat'l list M-9b
Upper Head	3		Dim. $\frac{14.083}{14.093}$ Dia. Zone B-6	IN PROCESS INSPECTIONS	
	4		Dim. $13.437 \begin{smallmatrix} +0.015 \\ -0.000 \end{smallmatrix}$ Dia. Zone A-6	3. Machining Operations	
				a. Supplier performed - (Refer to Material Checklist)	a. Machining for this item was performed on PO No. 03942 by Brown-Boveri Inc.
	5		Dim. 3-3/8 Zone B-8	b. If NES performed -	↓
	6		Dim. 3-7/8 Zone B-8	1) Identification of Requirements	
	7		Dims. for lifting socket (Zone D-3) a. 2.125 dia. b. 1/4 x 45° c. 13/16 d. 8° e. 3-1/8 Dia. f. 2-3/8	2) Inspection and Acceptance for further use 3) Certification of Inspectors	
	8		Dim. 2.625 Dia. thru 2-1/2 NPT Type 2 Places Zone C-4 | ⊕ | A Ⓢ | Ø.020 Ⓢ |	4. Welding Operations a. Welding b. NDE c. Visual Examination (Refer to Welding & NDE Checklist)	

SHELL S/N 43P1

CANISTER CHECKLIST (Fabrication) (F-10)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150958D Rev. 3 UPPER HEAD	1 thru 8		"various dimensions"	5. Dimensional Inspection a. Qualification of Inspectors b. Use of calibrated equipment c. Evidence of inspection and acceptance to required criteria 6. Identification, Control, and Disposition of NCRs 7. Implementation of SDDRs 8. Assembly Inspection	8. TVR-003778 for 43P1, 45P2, 140P2, 11P2

This checklist also applies to Canister:

S/N F401 (Shell S/N 45P2)
S/N F404 (Shell S/N 140P2)
S/N F403 (Shell S/N 11P2)

SHELL S/N 43P1

CANISTER
CHECKLIST (Fabrication) (F-11)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154044C Rev. 2	1		Dim. $\frac{2.218}{2.223}$ Dia. thru | ⌖ | A Ⓢ | ⌀ .010 Ⓢ | Zone B-4 Inlet/Outlet Coupler	1. Issuance of Material for next operation (release to shop)	Source P.O. S-04293-2
				2. Identification of latest approved drawings on Traveller	Not Applicable; refer to attached material checklist
				IN PROCESS INSPECTIONS	
				3. Machining Operations	
This Checklist also applies to Canister:				a. Supplier performed - (Refer to Material Checklist)	a. Yes, P.O. S04293, item 2 Material checklist M-16
S/N F401 (Shell S/N 45P2) S/N F404 (Shell S/N 40P2) S/N F403 (Shell S/N 11 P2)				b. if NES performed -	b. Not applicable, machining was performed by vendor
				1) Identification of Requirements	
				2) Inspection and Acceptance for further use	
				3) Certification of Inspectors	
				4. Welding Operations	4. Not applicable, welding is not one of of the items being reviewed as part of this checklist.
				a. Welding	
				b. NDE	
				c. Visual Examination	
				(Refer to Welding & NDE Checklist)	

SHELL S/N 43P1

CANISTER
CHECKLIST (Fabrication) (F-11)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154044C Rev. 2			Inlet/Outlet Coupler	5. Dimensional Inspection a. Qualification of Inspectors b. Use of calibrated equipment c. Evidence of inspection and acceptance to required criteria	5. Receipt inspection of machined coupler performed by NES. Refer to the material checklist M-16
				6. Identification, Control, and Disposition of NCRs	6. No NCRs during fabrication. See Attachment 1, Item 5.
				7. Implementation of SDDRs	7. Not applicable; no SDDRs written for the coupler. See Att. 1, Item 6.
				8. Assembly Inspection	8. Traveler 003840 (43P1) 003839 (140P2) 003842 (45P2) 003838 (11P2)

SHELL s/n 45P2

CAN. ER

CHECKLIST (Welding & NDE) (W-1)

Serial No. ________

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154Q18F REV. 5	3 4 5		Weld - Upper Head Weld 1 Weld - Lower Head Weld 2 Weld - Drain Tube To Upper Head 3/16 V Weld 3	**WELDING** • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine **IN PROCESS INSPECTION/ EXAMINATION** • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. O, is approved . *Welders are qualified Welder no's 24,39,40 . Filler Material is controlled/ disbursed . The correct WPS was utilized . The welding machines are calibrated. NCR 192 for one missing record was satisfactorily closed out. **IN PROCESS/INSPECTION/EXAMINATION** a. Fit up by Selamco Inspector Fit up witnessed by Bechtel Supplier Quality Rep (SQR) b. Cleanliness is not specifically addressed on the Traveler * c. The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

CANISTER
CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				COMPLETED WELD VERIFICATION	COMPLETED WELD VERIFICATION
				• Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	. *Visual Examination by Selamco No 6 . RT & UT procedures are approved by Bechtel . RT & UT not required in process . PT by Selamco No. 3 & 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION	NON-DESTRUCTIVE EXAMINATION
				• RADIOGRAPHIC/ULTRASONIC EXAMINATION	• RADIOGRAPHIC/ULTRASONIC EXAMINATION
				Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination	. *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcontracted to (PTL) Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1
				(1) Review RT (or UT) personnel education, training and work history records including current eye exam.	. Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

SHELL s/n 45P2

CANISTER
CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• LIQUID PENETRANT EXAMINATION	° LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 3 Selamco QC 4
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: PENETRANT URESCO H233 REMOVER 1520 DEVELOPER 1522

CANISTER CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				° VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 4,6
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS

Rev. 2

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/C	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW)	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G003	W-005
[illegible]	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
[illegible]	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PO# S04243 HT# 6259-57		H-295		84-F-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04289 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	X	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
27	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						PO# S01885 HT# 3932-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II, PT&VT, 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 45P2

FILTER
Serial No. F-401

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	3 4		Weld - Zone D-12 1/16 V Weld 1 Weld - Zone F-4 1/4 V Weld 2	**WELDING** ° Verify Qualification and approval of WPS utilized ° Verify welder qualification for WPS utilized ° Verify filler material control and disbursal ° Verify by a review of traveller that the correct WPS was utilized ° Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. 0, is approved . *Welders are qualified Welder no's 21,22,40 . Filler Material is controlled/disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION ° Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	**IN PROCESS/INSPECTION/EXAMINATION** . Fit up by Selamco 3 Fit up witnessed by Bechtel Suppler Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) for in-process. . I & E is not applicable (N/A) as NDE is not required * See Page 4

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 3 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 3 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				° LIQUID PENETRANT EXAMINATION	° LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 3
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: PENTRANT 84J044 REMOVER 84F047 DEVELOPER 85A015

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 5				° VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 3
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

Rev. 2

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/E	NO. 004/O
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)
1		X	X	X
3	X	X	X	X(DCP)
4	X	X	X	X(SEB/RMW)
5	X	X	X	X(DLS)
6	X	X	X	X(GT/SRD) Note 1
7	X	X	X	X(RAS/MG) Note 2
8	X	X	X	X(LL)

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04280 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 47[illegible]0-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G-003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 45P2

CA[illegible]TER
CHECKLIST (Welding & NDE) (W-3)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4	4 5 Note 2		Weld - Zone D-5 Weld 1 Weld - Zone C-4 1/16 Weld 2 PT in Accordance with ASME Sect. V, ART. 6 (1983 W/No Addenda)	WELDING • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. 0, is approved . *Welders are qualified Welder no's 22,23,25,39 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco inspector. Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler* . The correct items were welded* . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 4 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labstory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				° LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	° LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: 85B066 85A015 85C003 83H041 84L010 84F057 83A051 84D024 84T044

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				• VISUAL EXAMINATION	
				Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 4
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS[illegible]

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

Rev. 2

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/0	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)
2	X	X	X	1		X	X	X
3	X	X	X	3	X	X	X	X(DCP)
5	X	X	X	4	X	X	X	X(SEB/RMW)
12	X	X		5	X	X	X	X(DLS)
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2
20	X	X	X	8	X	X	X	X(LL)
21	X	X	X					
22	X	X	X					
23	X	X	X					
24	X	X	X					
25	X	X	X					
27	Renumbered to NO. 40							
28	X	X	X					
30	X	X	X					
32	X	X	X					
39	X	X						
40	Renumbered to NO.28							
41	X	X	X					

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04289 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT, 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

CA[illegible]TER
CHECKLIST (Welding & NDE) (W-4)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5	4 5 Note 5		Weld - Zone D-7 Weld 1 Weld - Zone D-4 Weld 2 PT in accordance with ASTM E165	WELDING ° Verify Qualification and approval of WPS utilized ° Verify welder qualification for WPS utilized ° Verify filler material control and disbursal ° Verify by a review of traveller that the correct WPS was utilized ° Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine IN PROCESS INSPECTION/ EXAMINATION ° Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. 0, is approved . *Welders are qualified Welder no's 22,30 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco 2 Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
115 9D Rev. 5				° LIQUID PENETRANT EXAMINATION	° LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 4
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: H233 H295 H305

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				o VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS[illegible]

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

Rev. 2

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/E	NO. 004/O	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW)	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G-003	W-005
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PO# S04243 HT# 6259-57		H-295		84-F-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04280 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	X	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
27	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						PO# S01885 HT# 3932-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

CANISTER CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154Q18F REV. 5	3		Weld - Upper Head Weld 1	**WELDING** • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. O, is approved . *Welders are qualified Welder no's 24,25,40
	4		Weld - Lower Head Weld 2	• Verify filler material control and disbursal	. Filler Material is controlled/dispursed
	5		Weld - Drain Tube To Upper Head Weld 3	• Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	. The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure	IN PROCESS/INSPECTION/EXAMINATION
				a. Fit-up Inspection	. Fit up by Selamco Inspector Fit up witnessed by Bechtel supplier control Rep(QSR)
				b. Cleanliness Inspection	. Cleanliness is not specifically addressed on the Traveler*
				c. Correct items were welded	. The correct items were welded*
				d. Minimum ~~Interpass~~ temperature	. Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR.
				e. Maximum Interpass temperature	. Max. interpass temp. monitored by welders
				f. NDE (in process)	. NDE is not required (N/R)
				g. Inspection/Examination personnel certified	. I & E is not applicable (NIA) as NDE is not required
					* See Page 4

CANISTER
CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1159018F REV. 5				COMPLETED WELD VERIFICATION • Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 6 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 6 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

S. ELL
SERIAL NO. 43P1

CANISTER
CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	• LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified Selamco QC- 3 Selamco QC 6 . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: PENETRANT URESCO H233 REMOVER 1520 DEVELOPER 1522

SHELL SERIAL NO. 43P1

CANISTER CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• **VISUAL EXAMINATION** Verify the following requirements/activities a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 6
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS. .S

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/E	NO. 004/O	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)
2	X	X	X	1		X	X	X
3	X	X	X	3	X	X	X	X(DCP)
5	X	X	X	4	X	X	X	X(SEB/RMW)
12	X	X		5	X	X	X	X(DLS)
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2
20	X	X	X	8	X	X	X	X(LL)
21	X	X	X					
22	X	X	X					
23	X	X	X					
24	X	X	X					
25	X	X	X					
27	Renumbered to NO. 40							
28	X	X	X					
30	X	X	X					
32	X	X	X					
39	X	X						
40	Renumbered to NO.28							
41	X	X	X					

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PC# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04289 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G-003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT, 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 43P1

CANISTER
CHECKLIST (Welding & NDE) (W-2)

FILTER
Serial No. F- 402

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	3		Weld - Zone D-12 1/16 V Weld 1	WELDING • Verify Qualification and approval of WPS utilized	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. 0, is approved
	4		Weld - Zone F-4 1/4 V Weld 2	• Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	. *Welders are qualified Welder no's 22,23,25,39,40 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco 3 Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler* . The correct items were welded* . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

CANISTER CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 3 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 3 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				° LIQUID PENETRANT EXAMINATION Verify the following requirements/activities	° LIQUID PENETRANT EXAMINATION
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 3
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: PENETRANT 84J044 REMOVER 84F057 DEVELOPER 85A015

SHELL s/n 43P1

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 5				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 3
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

Rev. 2

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	Weld Procedures NO. 002/B	Weld Procedures NO. 004/O
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	NDE Procedures QIP-PT-V/O	NDE Personnel Qual Level II VT	NDE Personnel Qual Level II PT(INT)
1		X	X	X
3	X	X	X	X(DCP)
4	X	X	X	X(SEB/RMW)
5	X	X	X	X(DLS)
6	X	X	X	X(GT/SRD) Note 1
7	X	X	X	X(RAS/MG) Note 2
8	X	X	X	X(LL)

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04289 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

CANISTER
CHECKLIST (Welding & NDE) (W-3)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4	4 5 Note 2		Weld - Zone D-5 Weld 1 Weld - Zone C-4 1/16 Weld 2 PT in Accordance with ASME Sect. V, ART. 6 (1983 W/No Addenda)	WELDING • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. O, is approved . *Welders are qualified Welder no's 22,23,25,39 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure	IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco inspector. Fit up witnessed by Bechtel Supplier Quality Rep (SQR)
				a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	. Cleanliness is not specifically addressed on the Traveler* . The correct items were welded* . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required

* See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 4 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				° LIQUID PENETRANT EXAMINATION	° LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: 85B066 85A015 85C003 83H041 84L010 84F057 83A051 84D024 84T044

CANISTER
CHECKLIST (Welding & NDE) (W-3)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 4
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

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MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

Rev. 2

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	Weld Procedures NO. 002/E	Weld Procedures NO. 004/O
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	NDE Procedures QIP-PT-V/O	NDE Personnel Qual Level II VT	NDE Personnel Qual Level II PT(INT)
1		X	X	X
3	X	X	X	X(DCP)
4	X	X	X	X(SEB/RMW)
5	X	X	X	X(DLS)
6	X	X	X	X(GT/SRD) Note 1
7	X	X	X	X(RAS/MG) Note 2
8	X	X	X	X(LL)

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04280 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-95
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

CANISTER
CHECKLIST (Welding & NDE) (W-4)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5	4 5 Note 5		Weld - Zone D-7 Weld 1 Weld - Zone D-4 Weld 2 PT in accordance with ASTM E165	**WELDING** • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine **IN PROCESS INSPECTION/ EXAMINATION** • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. O, is approved . *Welders are qualified Welder no's 22,30 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated **IN PROCESS/INSPECTION/EXAMINATION** . Fit up by Selamco 2 Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

SHELL s/n 43P1

CANISTER CHECKLIST (Welding & NDE) (W-4)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS F-402

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				° LIQUID PENETRANT EXAMINATION	° LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 4
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: H233 H295 H305

SHELL s/n 43P1

CANISTER
CHECKLIST (Welding & NDE) (W-4)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C. Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/E	NO. 004/O
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)
1		X	X	X
3	X	X	X	X(DCP)
4	X	X	X	X(SEB/RMW)
5	X	X	X	X(DLS)
6	X	X	X	X(GT/SRD) Note 1
7	X	X	X	X(RAS/MG) Note 2
8	X	X	X	X(LL)

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S010587 HT# 25131
PC# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04280 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154Q18F REV. 5	3 4 5		Weld - Upper Head Weld 1 Weld - Lower Head Weld 2 Weld - Drain Tube To Upper Head Weld 3	**WELDING** • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine **IN PROCESS INSPECTION/ EXAMINATION** • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum ~~Interpass~~ temperature e. Maximum interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. 0, is approved . *Welders are qualified Welder no's 24,39,40 . Filler Material is controlled/ dispursed . The correct WPS was utilized . The welding machines are calibrated IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco Inspector Fit up witnessed by Bechtel supplier control Rep(QSR) . Cleanliness is not specifically addressed on the Traveler* . The correct items were welded* . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (NIA) as NDE is not required * See Page 4

SHELL s/n 11P2

CANISTER
CHECKLIST (Welding & NDE) (W-1)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				COMPLETED WELD VERIFICATION • Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map) NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 6 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 3 & 4 . Welder and weld no.(s) are identified NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

CANISTER
CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• LIQUID PENETRANT EXAMINATION	• LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 3 Selamco QC 4
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: URESCO H 233 REMOVER 1520 DEVELOPER 1522

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• VISUAL EXAMINATION Verify the following requirements/activities a. Latest approved procedure used b. Personnel qualified to perform the examination (1) Review visual examination personnel education, training and work history records, including current eye examination. c. Calibrated inspection tools were utilized	. *Procedure used is acceptable . *Personnel qualified Selamco no. 3,4,6 . *Personnel, education, training and eye examination are acceptable . Not applicable for weld inspection o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness. o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS. 3

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/O	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G003	W-005
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PO# S04243 HT# 6259-57		H-295		84-F-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04289 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	X	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
27	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						PO# S01885 HT# 3932-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 11P2

FILTER
Serial No. F- 403

CANISTER
CHECKLIST (Welding & NDE) (W-2)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	3 4		Weld - Zone D-12 1/16 V Weld 1 Weld - Zone F-4 1/4 V Weld 2	WELDING ° Verify Qualification and approval of WPS utilized ° Verify welder qualification for WPS utilized ° Verify filler material control and disbursal ° Verify by a review of traveller that the correct WPS was utilized ° Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine IN PROCESS INSPECTION/ EXAMINATION ° Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. 0, is approved . *Welders are qualified Welder no's 21, 22, 40 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco 3 Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler* . The correct items were welded* . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

SHELL s/n 11P2

FILTER
Serial No. F- 403

CANISTER CHECKLIST (Welding & NDE) (W-2)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 3 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 3 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

SHELL s/n 11P2

CANISTER CHECKLIST (Welding & NDE) (W-2)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				• LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	• LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified Selamco QC 3 . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: Penetrant 84J044 Remover 84F057 Developer 85A015

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 5				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 3
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C. Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/O	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW)	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G003	W-005
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PC# S04243 HT# 6259-57		H-295		84-F-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04280 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	X	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
27	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						PO# S01885 HT# 3932-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6
   L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6
   L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7
   L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7
   L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 11P2

CA TER
CHECKLIST (Welding & NDE) (W-3)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4	4		Weld - Zone D-5 Weld 1	WELDING • Verify Qualification and approval of WPS utilized	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. 0, is approved
	5		Weld - Zone C-4 1/16 Weld 2	• Verify welder qualification for WPS utilized • Verify filler material control and disbursal	. *Welders are qualified Welder no's 22,23,25,39
	Note 2		PT in Accordance with ASME Sect. V, ART. 6 (1983 W/No Addenda)	• Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	. Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure	IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco inspector. Fit up witnessed by Bechtel Supplier Quality Rep (SQR)
				a. Fit-up Inspection b. Cleanliness Inspection	. Cleanliness is not specifically addressed on the Traveler*
				c. Correct items were welded	. The correct items were welded*
				d. Minimum Preheat temperature	. Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR.
				e. Maximum Interpass temperature	. Max. interpass temp. monitored by welders
				f. NDE (in process)	. NDE is not required (N/R)
				g. Inspection/Examination personnel certified	. I & E is not applicable (N/A) as NDE is not required

* See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				COMPLETED WELD VERIFICATION • Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 4 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				• LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	• LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: 85B066 85A015 85C003 83H041 84L010 84F057 83A051 84D024 84T044

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CA STER
CHECKLIST (Welding & NDE) (W-3)

Serial No. F-403

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 4
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

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MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

Rev. 2

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/E	NO. 004/O	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX. CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW)	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G003	W-005
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PC# S04243 HT# 6259-57		H-295		84-F-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04289 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	X	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
27	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						...01885 H... ...2-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT, 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

CA TER
CHECKLIST (Welding & NDE) (W-4)

F-403
Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5	4 5 Note 5		Weld - Zone D-7 Weld 1 Weld - Zone D-4 Weld 2 PT in accordance with ASTM E165	WELDING • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. 0, is approved . *Welders are qualified Welder no's 22,30 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco 2 Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded* . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

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CHECKLIST (Welding & NDE (W-4)

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Serial No. ______

F-403

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				• LIQUID PENETRANT EXAMINATION	• LIQUID PENETRANT EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 4
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: H233 H295 H305

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
11509490 Rev. 5				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travele document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, Tl correct items were welded. The correct items are documented on the traveler(s).

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MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/C	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW)	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G003	W-005
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PO# S04243 HT# 6259-57		H-295		84-[illegible]-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04289 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	X	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
27	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						PO# S01885 HT# 3932-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II, PT&VT, 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 140P2

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CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154Q18F REV. 5	3 4 5		Weld - Upper Head Weld 1 Weld - Lower Head Weld 2 Weld - Drain Tube To Upper Head 1/16 V Weld 3	WELDING • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. O, is approved . *Welders are qualified Welder no's 24,39,40 . Filler Material is controlled/disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/ EXAMINATION • Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco Inspector Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (NIA) as NDE is not required * See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				COMPLETED WELD VERIFICATION • Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 6 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 3 & 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination	NON-DESTRUCTIVE EXAMINATION • RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcontracted to (PTL) Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1
				(1) Review RT (or UT) personnel education, training and work history records including current eye exam.	. Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	• LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified Selamco QC- 3 Selamco QC 4 . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: PENETRANT URESCO H233 REMOVER 1520 DEVELOPER 1522

CANISTER
CHECKLIST (Welding & NDE) (W-1)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154018F REV. 5				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 3,4,6
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

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MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/C
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
1		X	X	X	H233	1386	1522	85-B-066
3	X	X	X	X(DCP)	H294	1520	H251	83-H-041
4	X	X	X	X(SEB/RMW)		H-236	H305	83-A-015
5	X	X	X	X(DLS)		H-244		85-G-003
6	X	X	X	X(GT/SRD) Note 1		H-220		84-L-010
7	X	X	X	X(RAS/MG) Note 2		H-295		84-F-057
8	X	X	X	X(LL)		H-271		84-D-024
						1586		84-T-044

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04289 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 140P2

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2	3 4		Weld - Zone D-12 1/16 V Weld 1 Weld - Zone F-4 1/4 V Weld 2	WELDING ° Verify Qualification and approval of WPS utilized ° Verify welder qualification for WPS utilized ° Verify filler material control and disbursal ° Verify by a review of traveller that the correct WPS was utilized ° Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine IN PROCESS INSPECTION/ EXAMINATION ° Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 ,Rev. 0, is approved . *Welders are qualified Welder no's 2,21,22,38,40 . Filler Material is controlled/ disbursed. . The correct WPS was utilized . The welding machines are calibrated IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco 3 Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

CANISTER
CHECKLIST (Welding & NDE) (W-2)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco No 3 . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 2				° LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	° LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified Selamco QC- 4 . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: H233 H295 H305 URESCO 84J044 85C003 85A015 MAGNAFLUX

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1154020E REV. 5				° VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 3 & 4
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/C
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)
1		X	X	X
3	X	X	X	X(DCP)
4	X	X	X	X(SEB/RMW)
5	X	X	X	X(DLS)
6	X	X	X	X(GT/SRD) Note 1
7	X	X	X	X(RAS/MG) Note 2
8	X	X	X	X(LL)

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04280 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer
H233	1386	1522
H294	1520	H251
	H-236	H305
	H-244	
	H-220	
	H-295	
	H-271	
	1586	

MAGNAFLUX CERTS Batch Nos.
85-B-066
83-H-041
83-A-015
85-G003
84-L-010
84-F-057
84-D-024
84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-95
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 140P2

Serial No. F-404

CA[illegible]TER
CHECKLIST (Welding & NDE) (W-3)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150059D REV. 4	4		Weld - Zone D-5 Weld 1	WELDING ° Verify Qualification and approval of WPS utilized ° Verify welder qualification for WPS utilized ° Verify filler material control and disbursal ° Verify by a review of traveller that the correct WPS was utilized ° Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding. . *WPs-001 Rev. B, is approved WPS-004 Rev. 0, is approved . *Welders are qualified Welder no's 22,23,25,39 . Filler Material is controlled/disbursed. . The correct WPS was utilized . The welding machines are calibrated
	5		Weld - Zone C-4 1/16 Weld 2		
	Note 2		PT in Accordance with ASME Sect. V, ART. 6 (1983 W/No Addenda)		
				IN PROCESS INSPECTION/ EXAMINATION ° Verify the following activities were performed using latest approved procedure a. Fit-up Inspection b. Cleanliness Inspection c. Correct items were welded d. Minimum Preheat temperature e. Maximum Interpass temperature f. NDE (in process) g. Inspection/Examination personnel certified	IN PROCESS/INSPECTION/EXAMINATION . Fit up by Selamco inspector. Fit up witnessed by Bechtel Supplier Quality Rep (SQR) . Cleanliness is not specifically addressed on the Traveler * . The correct items were welded * . Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR. . Max. interpass temp. monitored by welders . NDE is not required (N/R) . I & E is not applicable (N/A) as NDE is not required * See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				COMPLETED WELD VERIFICATION	COMPLETED WELD VERIFICATION
				° Verify the following activities were performed using the latest approved procedure:	. *Visual Examination by Selamco No 4
				a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	. RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION	NON-DESTRUCTIVE EXAMINATION
				° RADIOGRAPHIC/ULTRASONIC EXAMINATION	° RADIOGRAPHIC/ULTRASONIC EXAMINATION
				Verify the following requirements/activities	
				a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination	. *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1
				(1) Review RT (or UT) personnel education, training and work history records including current eye exam.	. Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

SHELL s/n 140P2

CANISTER
CHECKLIST (Welding & NDE) (W-3)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				• LIQUID PENETRANT EXAMINATION Verify the following requirements/activities a. Latest approved PT procedure used b. Personnel qualified to perform the examination (1) Review PT personnel education, training and work history records, including current eye examination. c. PT materials utilized are acceptable materials and certificates of compliance are available for review d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.) e. PT material batch numbers recorded on traveller	• LIQUID PENETRANT EXAMINATION . *Latest approved procedure was used . Personnel qualified . *Personnel, education, training and eye examination are acceptable . PT materials are acceptable C of C(s) are available . PT materials comply to project specification . *Batch no's are acceptable Batch no's used are: 85B066 85A015 85C003 83H041 84L010 84F057 83A051 84D024 84T044

CANISTER
CHECKLIST (Welding & NDE) (W-3)

Rev. 2

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150959D REV. 4				° VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perform the examination	. *Personnel qualified Selamco no. 4
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIST[illegible]

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/O	QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)	Filler Metal PO & HT NOS.	PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.	Calibration Weld Mach. Serial Nos.
2	X	X	X	1		X	X	X	PO-S-010587	H233	1386	1522	85-B-066	W-001 W-002
3	X	X	X	3	X	X	X	X(DCP)	HT-A4402R308	H294	1520	H251	83-H-041	W-003
5	X	X	X	4	X	X	X	X(SEB/RMW)	PO-S-04707		H-236	H305	83-A-015	W-004
12	X	X		5	X	X	X	X(DLS)	HT-5382-308		H-244		85-G003	W-005
14	X	X	X	6	X	X	X	X(GT/SRD) Note 1	PO# S011687 HT# 25131		H-220		84-L-010	W-006
19	X	X	X	7	X	X	X	X(RAS/MG) Note 2	PO# S04243 HT# 6259-57		H-295		84-F-057	W-007
20	X	X	X	8	X	X	X	X(LL)	PO# S04056 HT# 19481		H-271		84-D-024	W-008
21	X	X	X						PO# S04289 HT# 41039		1586		84-T-044	W-009
22	X	X	X						PO# S03854 HT# 48291					W-010
23	X	^	X						PO# S03854 HT# 57731					W-011
24	X	X	X						PO# S04056 HT# 49586					W-012
25	X	X	X						PO# S04631/04816 HT# 4740-57					W-013
	Renumbered to NO. 40								PO# S04819 HT# 5250-0076					W-014
28	X	X	X						PO# S04819 HT# 7621-57					W-015
30	X	X	X						PO# S04819 HT# D4829R308L					W-016
32	X	X	X						PO# S01885 HT# 3932-57					W-017
39	X	X												W-018
40	Renumbered to NO.28													W-019
41	X	X	X											W-020
														W-021
														W-022
														W-023
														W-024
														W-025 W-026 Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-6-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II. PT&VT. 7-22-85
2. • Mr. Manfred Grail Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

SHELL s/n 140P2

CARTER
CHECKLIST (Welding & NDE) (W-4)

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
					*Details on the attached MATRIX of approved/certified welding and NDE Procedures, Personnel & Materials Welding.
1150949D Rev. 5	4 5 Note 5		Weld - Zone D-7 Weld 1 Weld - Zone D-4 Weld 2 PT in accordance with ASTM E165	WELDING • Verify Qualification and approval of WPS utilized • Verify welder qualification for WPS utilized • Verify filler material control and disbursal • Verify by a review of traveller that the correct WPS was utilized • Verify calibration (affixed sticker and calibration record) of AMP meter on welding machine	. *WPs-001 Rev. B, is approved WPS-004 Rev. O, is approved . *Welders are qualified Welder no's 22,30 . Filler Material is controlled/disbursed. . The correct WPS was utilized . The welding machines are calibrated
				IN PROCESS INSPECTION/EXAMINATION • Verify the following activities were performed using latest approved procedure	IN PROCESS/INSPECTION/EXAMINATION
				a. Fit-up Inspection	. Fit up by Selamco 2 Fit up witnessed by Bechtel Supplier Quality Rep (SQR)
				b. Cleanliness Inspection	. Cleanliness is not specifically addressed on the Traveler *
				c. Correct items were welded	. The correct items were welded *
				d. Minimum Preheat temperature	. Preheat temperature is welding procedure, for implementation by welder. Task monitored by Bechtel SQR.
				e. Maximum Interpass temperature	. Max. interpass temp. monitored by welders
				f. NDE (in process)	. NDE is not required (N/R)
				g. Inspection/Examination personnel certified	. I & E is not applicable (N/A) as NDE is not required

* See Page 4

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				COMPLETED WELD VERIFICATION ° Verify the following activities were performed using the latest approved procedure: a. Visual Examination b. Radiographic (or Ultrasonic) Examination c. Liquid Penetrant Examination d. Welder and weld number identified on weld or on documentation, i.e. (weld map)	COMPLETED WELD VERIFICATION . *Visual Examination by Selamco . RT & UT procedures are approved by Bechtel . RT & UT not required . PT by Selamco No. 4 . Welder and weld no.(s) are identified
				NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION Verify the following requirements/activities a. Latest approved RT (or UT) procedure used b. Personnel qualified to perform the examination (1) Review RT (or UT) personnel education, training and work history records including current eye exam.	NON-DESTRUCTIVE EXAMINATION ° RADIOGRAPHIC/ULTRASONIC EXAMINATION . *Procedures approved by Bechtel QC-RT, Rev. 13, QC-UT, Rev. 10 RT & UT subcon tracted to PTL Pittsburgh testing labatory via procedures; PTL-QC-RT-1, PTL-QC-UT-1 . Personnel qualified: Selamco. L. Ludwig, Level III Selamco No. 6 . Personnel Education: Training & Eye exam are acceptable

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

Rev. 2

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				° LIQUID PENETRANT EXAMINATION Verify the following requirements/activities	° LIQUID PENETRANT EXAMINATION
				a. Latest approved PT procedure used	. *Latest approved procedure was used
				b. Personnel qualified to perform the examination	. Personnel qualified Selamco QC- 4
				(1) Review PT personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. PT materials utilized are acceptable materials and certificates of compliance are available for review	. PT materials are acceptable C of C(s) are available
				d. PT materials comply with the requirements of the project specifications for chemical content (contaminants, etc.)	. PT materials comply to project specification
				e. PT material batch numbers recorded on traveller	. *Batch no's are acceptable Batch no's used are: H233 H295 H305

IDENTIFICATION OF ATTRIBUTES, VERIFICATION REQUIREMENTS, AND VERIFICATIONS

DRAWING NO	ITEM NO	QUANTITY	DESCRIPTION	REQUIREMENT FOR VERIFICATION	VERIFICATION
1150949D Rev. 5				• VISUAL EXAMINATION Verify the following requirements/activities	
				a. Latest approved procedure used	. *Procedure used is acceptable
				b. Personnel qualified to perfo... the examination	. *Personnel qualified
				(1) Review visual examination personnel education, training and work history records, including current eye examination.	. *Personnel, education, training and eye examination are acceptable
				c. Calibrated inspection tools were utilized	. Not applicable for weld inspection
					o Continued from Page 1, Item b, Cleanliness The Bechtel Resident Inspector has performed surveillance for cleanliness; also several travelers document the Resident Inspector's inspection for cleanliness.
					o Continued from Page 1, Item c, The correct items were welded. The correct items are documented on the traveler(s).

CANIS1

MATRIX OF APPROVED/CERTIFIED WELDING AND NDE PROCEDURES, PERSONNEL AND MATERIALS.

This matrix has been developed as a result of review, verification and/or approval of welding procedures, welder qualifications, filler material certifications, NDE procedures, NDE personnel certifications, NDE material certifications and equipment calibrations for this project at NES Greensboro, N.C.

Rev. 2

Certified Welders Symbol	Weld Procedures NO. 001/A	NO. 002/B	NO. 004/O
2	X	X	X
3	X	X	X
5	X	X	X
12	X	X	
14	X	X	X
19	X	X	X
20	X	X	X
21	X	X	X
22	X	X	X
23	X	X	X
24	X	X	X
25	X	X	X
27	Renumbered to NO. 40		
28	X	X	X
30	X	X	X
32	X	X	X
39	X	X	
40	Renumbered to NO.28		
41	X	X	X

QC INSP Symbols	NDE Procedures QIP VT/O	QIP-PT-V/O	NDE Personnel Qual Level II VT	Level II PT(INT)
1		X	X	X
3	X	X	X	X(DCP)
4	X	X	X	X(SEB/RMW)
5	X	X	X	X(DLS)
6	X	X	X	X(GT/SRD) Note 1
7	X	X	X	X(RAS/MG) Note 2
8	X	X	X	X(LL)

Filler Metal PO & HT NOS.
PO-S-010587
HT-A4402R308
PO-S-04707
HT-5382-308
PO# S011687 HT# 25131
PO# S04243 HT# 6259-57
PO# S04056 HT# 19481
PO# S04289 HT# 41039
PO# S03854 HT# 48291
PO# S03854 HT# 57731
PO# S04056 HT# 49586
PO# S04631/04816 HT# 4740-57
PO# S04819 HT# 5250-0076
PO# S04819 HT# 7621-57
PO# S04819 HT# D4829R308L
PO# S01885 HT# 3932-57

PT Certs from URESCO BATCH NOS. DYE	REMOVER	Developer	MAGNAFLUX CERTS Batch Nos.
H233	1386	1522	85-B-066
H294	1520	H251	83-H-041
	H-236	H305	83-A-015
	H-244		85-G003
	H-220		84-L-010
	H-295		84-F-057
	H-271		84-D-024
	1586		84-T-044

Calibration Weld Mach. Serial Nos.
W-001
W-002
W-003
W-004
W-005
W-006
W-007
W-008
W-009
W-010
W-011
W-012
W-013
W-014
W-015
W-016
W-017
W-018
W-019
W-020
W-021
W-022
W-023
W-024
W-025
W-026
Note 3

NOTES:

1. • Mr. Gary Talley Symbol No. 6 L II, PT&VT. 5-8-85 to 5-31-85
   • Mr. Steve Detrich Symbol No. 6 L II, PT&VT, 7-22-85
2. • Mr. Manfred Grell Symbol No.7 L II, PT&VT as of 7-22-85
   • Mr. Rick A. Sellers Symbol No.7 L II, PT&VT, from 4-24-85 to 5-31-85
3. All the welding machines were calibrated into 1986.

CANISTER CHECKLIST VERIFICATION ITEMS

FOR WHICH NO NES ACTION IS REQUIRED

1. Calibration of Receipt Inspection Equipment/Tools

NES's QA procedures do not require them to record the tool identifications of Receipt Inspection Records. Also, since the fact that parts were assembled to the drawing requirements, the NES practice was determined to be acceptable. Ref. item 7 for additional calibration data.

2. Details on Receipt Inspection Records

NES Manufacturing Policy and Procedures Manual, Procedure Q-12, requires the Receipt Inspector to check/verify the individual attributes of receiving inspection but, however, does not require the inspector to document each attribute per procedures; inspector's sign-off indicates completion of inspection. On the basis of above, absence of recording all attributes by NES was accepted. Also, the Bechtel Resident has performed surveillance on Receipt Inspection Records.
For NES receipt inspection on Contractor-Furnished Material, see Comment No. 1.

3. Part 21 not Imposed on Subsuppliers

The supplier performing machining operations was considered specialized in these operations. The operations involved were simple and non-critical in nature. Also, some small parts were procured from suppliers as commercial items or standard products. Therefore, absence of Part 21 from purchase orders was considered justified.

4. ANSI N45.2 Requirements not Identified

Imposition of ANSI N45.2 requirements on material suppliers was determined to be not required based on the following: Material involved was a standard product. CMTR/C of C was requested for the material. NES performed the Receipt Inspection.

On the same lines, it was also determined that absence of ANSI N45.2 imposition on vendors performing machining was acceptable.

5. NCR Review

The verification team reviewed all NCRs associated with the defueling canisters, filters fuel, and knockouts. The review established the applicability to the filter canisters, and confirmed the closure on the NCRs applicable to filter canister Nos. F401, F402, F403, and F404.

Attachment No. 1 (Cont.)

Canister Checklist Verification Items
For Which No NES Action is Required

6. SDDR Review

The verification team reviewed supplier deviation disposition requests (SDDR) applicable to the filter canisters. For details of this review, see Comment No. 2.

7. Calibration of Incoming, Inprocess, and Final Inspection Equipment and Tools

A member of the Bechtel Canister Review Team performed an administrative review of NES calibration documents. The document review identified that inspection equipment and tools are within their required accuracy.

For details of this review, see Comment No. 3.

Comment No. 1

Resolution of NES receipt inspection(s) on Customer (Bechtel) Furnished Material (CFM)

Problem:

NES had not fully documented the receipt inspection of Customer Furnished Material as required by:

1. NES-POLICY & PROCEDURE MANUAL
   NES-Procedure Q-12, Titled Inspection and Acceptance Tags and Stamps dated 6-6-84. Para 3.2.10 "Customer Furnished Material." Para 3.2.10 states that; Customer Furnished Material is handled identical to material purchased by NES.

2. NES-QA MANUAL
   NES-Procedure-N-12 Titled "Inspection"
   Para. 4.3 unless otherwise provided for in customer contract, purchase order, or specification, a 100% inspection of all items manufactured by and/or for NES/SELANCO shall be imposed.

3. BECHTEL SPECIFICATION NO. 15737-2-M-101A(Q), Rev 2,6-18-85
   Titled "Technical specification for fabrication of DEFUELING CANISTERS."
   Para. 4.2.4 Materials Purchased by the Buyer (GPU)
   4.2.4.1.1 Buyer will provide seller with documents necessary for seller to receive, inspect, and control buyer-supplied material.
   Para. 5.5 Inspection
   5.5.3 The Buyers release of any materials and equipment being furnished by the Seller or his suppliers, shall not [illegible] strued to imply acceptance ... and will not in any [illegible] relieve the Seller of his responsibilities for inspection.

Resolution(s):

The following documents and actions are available and provide assurance of acceptability of the contractor furnished material.

1. All the Bechtel furnished materials were inspected at the source prior to shipment to NES. The Bechtel inspectors verified that the suppliers of the items meet the requirements of the purchasing documents.

2. NES performed receipt inspection (measurements) on the CFM. However, NES did not document all their receipt inspections.

3. There is documented evidence to support that NES and the Resident Bechtel Inspector have performed 100% documentation review of received material. Examples are: Certified Material Test Reports, Certificates of Compliance, etc.

4. NES Travelers also support inspection of CFM. When the CFM(s) were released for canister fabrication, via travelers, various inprocess and final dimensional inspections performed during the fabrication process support a conclusion that the dimensional CFM requirements were met.

FILTER CANISTER

COMMENT NO. 2
SDDRs

The following is a list of Supplier Deviation Disposition Requests (SDDRs), applicable to the Filter Canisters, that were reviewed by the Bechtel Verification Team. The scope of the review included SDDRs identified by design engineering as a critical verification item, and SDDRs relating to NCRs applicable to Filter Canisters F401, F402, F403 and F404.

SDDR NO.	SDDR NO.	SDDR NO.
2-R200C-03	2-M101A-20	2-M101A-68
2-R200C-7	2-M101A-39	2-M101A-71
2-R200C-8	2-M101A-41	2-M101A-72
2-M101A-2	2-M101A-45	2-M101A-73
2-M101A-5	2-M101A-48	2-M101A-75
2-M101A-12	2-M101A-53	2-M101A-76
2-M101A-13	2-M101A-57	2-M101A-77
2-M101A-15	2-M101A-58	2-M101A-79
2-M101A-16	2-M101A-65	2-M101A-80
2-M101A-17		2-M101A-99

FILTER CANISTERS

Comment No. 3

Calibration of Incoming, Inprocess, and Final Inspection Equipment and Tools

A member of the Bechtel Canister Review Team performed an administrative review of the calibration documents. The type of NES documents reviewed and types of equipment and tools reviewed are listed below.

This review was performed to provide additional assurance that equipment and tools used by the inspection department are calibrated. The review included eighty-six (86) tools and twenty-six (26) welding machines.

The administrative data on the calibration documents were also physically compared to the calibration data on equipment and tools and no inconsistencies were noted.

The review also identified that the NES calibration records document that the previously calibrated tools and test equipment were still within usage tolerance when they were returned to the calibration department where they were remeasured and identified as "no adjustments required." One welding machine had to have one of its (two) voltmeters adjusted/repaired.

NES Documents Reviewed

- o Manufacturing Calibration Tool Record, Log

  (Listing of equipment and tools by Serial No./Description/Date Calibrated/ Due Date/Out of Calibration)

- o Calibration Record Card

  (Record Card is prepared for each piece of equipment and tool listing calibration dates, calibrated by, and if the item needed adjustment.)

- o Calibration Tags on Equipment and Tools

Types of equipment and tools reviewed included:

- o Surface plates, vernier calipers, dray tester, mic(s), hardness tester, I.D. calipers, bore gage, weight scale, and welding machines.

The Bechtel Resident Procurement Supplier Quality Representative has also performed random reviews for assurance(s) that inspection equipment used at incoming, inprocess an final inspection are within there calibration interval.

Filter Canisters

Comment No. 4

Upper Head Traceability

The upper heads supplied by Bechtel to NES contained the Heat numbers transcribed inside. The upper heads were inspected by a Bechtel supplier quality representative at the supplier shop, Gruyon Alloys, Inc.

The upper heads were receipt inspected by NES and accepted. The inspection also involved the review of CMTRs provided by Gruyon Alloys. The Heat nos. involved were HT # 33579, 20794, 33577, and 20840.

The upper heads were then sent for the weld-prep machining to Brown Bovery Corp., an outside vendor, by NES. The machined heads were receipt inspected by NES and released for further operations.

Further operations on the upper heads were carried out via NES Traveler Sr. No. 003778. The manufacturing department drew four (4) of the accepted upper heads from stores and assembled with other items. The Traveler instruction also required stamping of serial numbers F-401, F-402, F-403, and F-404 on the outside of the upper heads. After completion of the assembly, NES qualified inspector verified all requisites of the cognizant drawing including the serial numbers on the heads.

The serial numbers transcribed on the upper heads are the same serial numbers that are assigned for the filter canisters. The serial numbers on the heads are traceable to the Travelers.

It can be concluded that the aforementioned NES traveler operations assure the use of upper heads from the receipt inspected and accepted lot. Therefore, each head used is traceable to one of the four heat numbers for which CMTRs are available. This condition satisfies the applicable requirements including that of the ASME Code, Section VIII, Div. 1.

FILTER CANISTERS
COMMENT NO. 5
CATALYST INSPECTION

The following data outlines NES operations, manufacturing and inspection of the catalysts from the time the catalysts were individually weighed and bagged to the time the bagged catalysts were inserted into cavities in the cannister upper and lower heads.

The two (2) types of catalyst were provided to NES as Customer (Bechtel) furnished material (CFM). The two types of catalysts are:

Drawing No.	Drawing Title and Source
1150940	Recombiner Catalyst (1/8" dia.) Purchased from: Engelhard Speciality Chemicals Div. Union N.J.
1150972	Silicon-Coated Recombiner CAtalyst (1/4" Dia.) Purchased From: Atomic Energy of Canada Limited, Chalk River, Ontario.

The subject catalyst documents were receipt inspected and accepted by NES, the catalysts in bulk form were then forwarded to the storage area.

the chronology of events that occurred when the bulk catalysts were released from the storage area to be put into individual (Tare Containers) packages, weighed and inserted into the cannister upper and lower heads as follows:

<u>2-25-85 - Traveler No. 003734 is issued.</u>

This traveler (TVR) was issued to document the packaging and weighing of the two (2) bulk catalysts into 2000 individual packages. Each assembly has 5 grams of AECL in one package and 20 grams of ENGELHARD in another package. The two packages, a 5 gram & a 20 gram, were then tied together to form one assembly.

<u>3-4-85 - Traveler 003697 is issued for the lower heads, Qty. 4</u>

A review of the Traveler indicated that: individual assemblies of weighed catalysts were withdrawn from stores and each assembly of catalysts, was verified by NES QC. NES QC verified that the correct material was withdrawn from stores. The contents of each assembly was then placed into basket(s) in the lower ahead. This function was witnessed by the Resident Bechtel Inspector.

Also, NES QC performed 100% inspection on the completed lower heads. This provides assurance that manufacturing inserted the catalysts into the header baskets.

<u>4-1-85 - Traveler 003778 is issued for the upper heads, Qty 4</u>

A review of the Traveler indicated that individual assemblies of weighed catalysts is withdrawn from stores verified by QC, for insertion in the upper heads. The contents of two assemblies were then placed into the

cavity in the upper head. This function was witnessed by the Bechtel resident inspector for four heads and the NES QA manager also witnessed placement of the contents of the assemblies in two of the heads.

Also, NES QC performed 100% inspection on the completed upper heads. This provides assurance that manufacturing inserted the catalysts into the cavities in the heads.

<u>6-17-85 NCR No. 245 is issued</u>

NCR No. 245 was issued reporting that several QC and material control items on Traveler No. 003734 were not stamped. (Traveler No. 003734 is outlined above).

NCR No. 245 reports that:

1. Materials on sheet 1 of the Traveler not verified by QC.

2. No MC stamp for verification of materials released from stores.

3. No QC stamp for verification of materials released from stores.

4. No QC "First Article" inspection of the catalysts weights.

5. No QC verification of the inspection of the catalysts weights.

6. The Traveler does not have a signature or data for the task titled "Notify Source Inspection".

7. Changes were made on the traveler w/o QA approval.

<u>7-10/31-85 - NCR 245 Mfg Review of the NCR for "Cause" and Corrective Action</u>

The review determined that for item No.'s: 1, 2, 3, & 6 - Manufacturing supervision has been notified of their errors.

4 "First Article" inspection was performed (2-25-85) and is documented on traveler No. 003734 for operation steps 30 & 40.

5 The packaging, operation is not completed.

Although not documented in the above NES manufacturing response Traveler 003734, does contain a QC stamp; on the back of sheet 3 of the traveler documenting that QC also witnessed and accepted on 5-15-85 production weights of the catalysts.

<u>7-31-85 - "Disposition Instructions"</u>

NCR 245 "Disposition Instructions," are "Use-As-Is based upon Quality Control verifying operations 30 & 40 in final inspection stage. Twenty (20) sample packages to be verified"

8-1-85 - M.R.B. Rework Traveler No. 004514 is issued.

The Traveler documents that Material Control is to withdraw 20 random samples of catalyst assembly packages in stores and have QC weigh each of the two types of catalysts and log the weights.

QC 8-2-85 QC verified and accepted the weights in 20 assembly packages. The 20 AECL packages and the 20 Englehard packages contained the proper weight of catalyst.

8-21-85 SDDR No. 68 Issued to Bechtel Engineering

NES issued SDDR No. 68 to Bechtel Engineering reporting that: when recombiner catalyst was weighted and bagged from bulk supply individual inspection verification of weights was not performed."

8-22-85 - SDDR No. 68 Dispositioned by Bechtel Engineering

Bechtel Engineering dispositioned SDDR No. 68 as; "This SDDR is rejected. The deviation stated above is not a design deviation requiring engineering disposition, it is a deviation in the NES implementation of their QA Program."

8-22-85 - Bechtel QA review of NCR 245 and SDDR No. 68

Bechtel canister verification team on a conference tele-con discussed status/resolution of NCR No. 245 an SDDR No. 68 with Bechtel QA Management and the Bechtel Resident inspector. The Bechtel resident inspector reported that he had witnessed and accepted on a periodic surveillance basis the weights of the catalyst packages, he further reported that he had also witnessed and accepted on a witness basis the inserting of the contents of the catalyst assemblies in the canister upper & lower heads. Based on the preceding data and SDDR #68 which indicated that the catalyst weights are correct, Bechtel concurred with NES disposition on the NCR "Use-As-Is".

8-22-85 - NES QA Closed NCR 245 & SDDR No. 68