UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CONTAINER SUPPLIER INSPECTION PROGRAM

Inspection Report

ORGANIZATION: Pacific Nuclear Systems, Inc.
ADDRESS: TRUPACT-II Assembly Facility
1010 South 336th Street
Federal Way, WA 98003

CONTACT: Dr. C. J. Temus TELEPHONE: 206-874-2235
TITLE: Technical Director

ACTIVITY: Fabricate radioactive material packages.

QUALITY ASSURANCE PROGRAM APPROVAL NO.: 0192

Report Number:	Inspection Dates:	Inspection On-Site
710192/89-06	9/26-28/89	Person-Hrs: 87

INSPECTION BASES AND SCOPE:

A. BASES: Title 10 CFR Parts 21 and 71, and Certificate of Compliance No. 9218.

B. SCOPE: To determine whether the organization has established, documented and executed procedures which fulfill the commitments made in the organization's NRC-approved quality assurance program.

To determine whether fabricated packages were manufactured in accordance with the design approved by the Commission.

CONTAINER SUPPLIER INSPECTION PROGRAM

Inspection Report

FINDINGS: Nonconformances with the requirements of 10 CFR Sections 71.111, 71.119, 71.123 and 71.135 were identified.

INSPECTION TEAM LEADER: John P Jankovich — John Jankovich, NMSS — DATE: 11/8/89

OTHER NRC INSPECTORS: John R. Cook — John R. Cook, NMSS — DATE: 11/8/89

Catherine Haney — Catherine Haney, NMSS — DATE: 11/8/89

NRC CONTRACTOR: John P Jankovich for — Boyd W. Brown, Idaho National Engineering Laboratory, EG&G — DATE: 11/8/89

REPORT APPROVED BY: Charles E. MacDonald — Charles E. MacDonald, Chief, Transportation Branch, NMSS — DATE: 11/9/89

1. INSPECTION SUMMARY

An announced inspection by the U.S. Nuclear Regulatory Commission (NRC) of container fabrication activities at Pacific Nuclear Systems, Inc., TRUPACT-II Assembly Facility (TAF) at Carlsbad, New Mexico was conducted on September 26-28, 1989. Inspection findings are based on data collected through observation of selected activities, review of implementation procedures and controls, review of selected documents and records, interviews with personnel, and examination of weld radiographs. The inspection team concluded that the implementation of the quality assurance (QA) program was satisfactory, in general. However, the team identified specific items of nonconformance in some aspects of the fabrication process (10 CFR Section 71.119), record control (10 CFR Section 71.135), test control (10 CFR Section 71.123), and QA management (10 CFR Section 71.111). The team discussed tentative findings with the organization's representatives, at the exit meeting.

2. CONTAINER SUPPLIER INSPECTION

The team conducted the inspection to evaluate TAF's implementation of its NRC-approved QA program, and to ensure that products are fabricated in compliance with NRC requirements. The team evaluated TAF's QA activities from the perspective of three functional elements: nondestructive examination (NDE), personnel qualifications, and quality discrepancy reports (QDRs).

2.1 Persons Contacted

The inspection team contacted the following persons.

*R. H. Smith, Director, Corporate Quality Assurance
*V. K. Cannon, Manager, Quality Assurance
*F. Humiston, Plant Superintendent
**W. B. Brown, Manufacturing Manager
*A. W. Work, Inspection Supervisor
***C. Carpenter, Quality Assurance Inspector
S. Garcia Busselman, Quality Assurance Inspector

This individual attended the entrance and exit meetings only:

C. R. McFarland, Senior Quality Assurance Engineer, Environmental Evaluation Group, State of New Mexico

2.2 Nondestructive Examination

Three certified Pacific Nuclear Systems, Inc. NDE examiners are engaged in radiographic (RT) and/or liquid penetrant (PT) examinations of TRUPACT-II containers. The Inspection Supervisor and a QA inspector are certified as

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*Attended Entrance and Exit Meeting
**Attended Entrance Meeting
***Attended Exit Meeting

Level II PT inspectors, and a second QA inspector is certified in both PT and RT as a Level II inspector. A consultant from Boeing Aircraft is retained as the Pacific Nuclear Systems, Inc. Level III radiograph examiner.

All welding procedures and personnel are to be qualified in accordance with ASME Code Section IX (TRUPACT-II, Safety Analysis Report). Radiography of the Trupact-II containers is to be performed in accordance with ASME Code Section III, Subsection NB. 10 CFR Section 71.119, "Control of special processes," specifies that special processes including welding must be accomplished using qualified procedures, in accordance with applicable codes, in this case, the aforementioned sections of the ASME Code.

The inspection team selected radiographs of TRUPACT-II Units 2, 3, and 5 for review. Each TRUPACT-II container requires approximately 310 radiographs, 80 radiographs of the Inner Containment Vessel (ICV) and 230 radiographs of the Outer Containment Vessel (OCV). The team reviewed all radiographs for Unit 5, approximately 30 percent of the radiographs for Unit 2, and approximately 10 percent of the radiographs for Unit 3.

A nonconformance was identified regarding 10 CFR Section 71.119 in that a weld on Unit 2 was found in nonconformance with the ASME Code. Drawing (Dwg.) 2077-042 Weld-10, (OCV) radiograph view 17-18, dated April 10, 1989, shows a crack indication and its attempted removal by grinding (a star-crack indication is noted adjacent to the grinding excavation). The repair radiograph (Weld-10R1), dated April 11, 1989, shows the same star-crack, yet was accepted by Pacific Nuclear Systems, Inc. This assessment was not acceptable to the NRC team.

A nonconformance was identified regarding 10 CFR Section 71.135, "Quality Assurance Records," which specifies that records must be maintained for three years after the QA holder last engages in the activity for which the program was developed. The initial radiograph of Weld-10 described above, which identified the unacceptable condition before grinding, was not located in the radiograph package and was not available to the inspection team. This radiograph should have been maintained on file at TAF.

A nonconformance was identified regarding 10 CFR Section 71.119 because a weld on Unit 5 was in nonconformance with the applicable ASME Code. Dwg. 2077-042, Weld-26 (OCV assembly lower body outer shell-to-bottom), radiograph views 10-11, 11-12, and 16-17 show significant cracking. These crack indications were identified and marked for repair. The repair radiographs dated June 7, 1989 show area 10-12 to be free from crack indications. However, repair area 16-17 still shows a crack indication that was accepted by Pacific Nuclear Systems, Inc.

The following day, the NRC inspection team requested to re-review the final acceptance radiograph of Weld-26 (view 16-17). The team noted that the radiograph showed significant smudges and scratches in the area of interest, which the team had not observed previously, and which made the crack indication more difficult to interpret. The team was advised that Pacific Nuclear Systems, Inc. personnel had reviewed the radiograph, using a contact magnifying glass, after the NRC inspection team had left the previous evening. As a general comment, the inspection team notes that Pacific Nuclear should consider using cotton gloves to handle radiographs and prohibit placing anything on the radiographs which may damage the emulsion in the area of interest on the radiographs, since these radiographs are permanent records. If the film had been permanently damaged, it would have been a nonconformance with 10 CFR Section 71.135, "Quality Assurance Records" which specifies that the records must be identifiable and retrievable, and must be retained for three years after the QA holder last engages in the activity for which the program was developed.

A nonconformance was identified regarding 10 CFR Section 71.119, because penetrameters were not used as required by ASME Code. On Unit 2, several OCV welds, having unacceptable indications and identified for repair by Pacific Nuclear, had their final acceptance radiographs taken after final assembly of the OCV and after the 10 inches of polyurethane foam had been installed (e.g., Weld 10 (Dwg. 2077-042), weld repair radiograph). Code-required penetrameters were not used during the final radiography to confirm the sensitivity of the radiographs. Polyurethane foam can cause significant degradation of the radiographs due to gamma ray scatter. These radiographs should not have been accepted without confirmation of radiograph sensitivity.

A nonconformance was identified regarding 10 CFR Section 71.119, because incorrect penetrameters were used on the radiographs taken between January and August 1989. Radiography of the TRUPACT-II container should be performed per the requirements of ASME Code Section III, Subsection NB, Table NB-5111-1. Instead, Pacific Nuclear Systems, Inc., Radiographic Procedure (RT-G1) incorrectly specified ASME Code Section V, Article 2, Table T-276 for penetrameter selection. Using the incorrect Section/Table resulted in the use of the incorrect penetrameter, i.e., a 15 penetrameter with the 2T hole imaged on the radiograph was used, rather than a 7 penetrameter with the 4T hole imaged on the radiograph; the latter ensures a more sensitive radiograph. When questioned about the discrepancy, the TAF level II Radiographer provided QDR No. 1254, dated July 31, 1989, identifying misidentification of the reference table. The disposition on the QDR states: "Accept as is: Sensitivity achieved for the 2T hole in a 15 penetrameter is greater than that required for a 4T hole in a 7 penetrameter." This QDR also stated that, as of August 23, 1989, Table NB-5111-1 will be used for penetrameter selection. Although the disposition statement in the QDR is incorrect, the QDR specifies the appropriate corrective action and, therefore, the inspection team accepted the correction as proposed by Pacific Nuclear Systems, Inc.

Nonconformances were identified regarding 10 CFR Section 71.123, "Test Control," which requires that a test program, e.g., inspection program, be established, demonstrating that the package components will perform satisfactorily in service.

(a) In nonconformance with 10 CFR Section 71.123, the team found discrepancies for Unit 2 between the date showing on the radiographs of Weld-2 (Dwg. 2077-054) and the date on the radiograph reader sheets. The acceptance date on the radiograph reader sheet for Weld-2 is January 23, 1989. The date on the radiographs of Weld-2 is January 26, 1989 (3 days after final acceptance).

(b) In nonconformance with 10 CFR Section 71.123, radiographs were found for Unit 5, Dwg. 2077-042, Welds-43 and -44; however, these welds could not be located on Dwg. 2077-042. Discussions with TAF personnel confirmed that these welds are not on the fabrication drawings because they were additional

welds, added to extend the overall length of the OCV. The radiograph package did not contain any documentation about the acceptability of Weld-44.

2.3 Personnel Qualifications

The inspection team reviewed the "Certificates of Personnel Qualification" on file for the TAF inspectors. The education, training, and testing records for these individuals were on file at Pacific Nuclear Systems, Inc., Federal Way, Washington and were promptly telecopied for the inspection team. The records were found satisfactory.

Midland Inspection, Inc. of Midland, Texas, is contracted to perform radiographic examination of the TRUPACT-II containers at TAF. Certification documentation for three Midland Inspection Level II and one Level III examination personnel was on file at TAF. Education, training, and testing records for these personnel were reported to be on file at Midland Inspection and, therefore, were unavailable for review. From the information that was available at the site the team found no nonconformances.

A nonconformance was identified regarding 10 CFR Section 71.111, "Instructions, Procedures, and Drawings," which specifies that instructions, procedures, and drawings affecting quality must be prescribed and must be followed. The team noted a nonconformance with regard to Quality Assurance Instruction Q1-16.4, Rev. 0, "Certification of NDE Personnel." The procedure requires annual eye examinations of NDE personnel. During review of the NDE certification records, the team noted that the required annual visual acuity examination for a QA inspector, certified as Level II inspector, had expired on September 6, 1989. The team subsequently noted that the inspector had performed PT examinations after the September 6, 1989 expiration date.

2.4 Quality Discrepancy Report

A system of QDRs is used for disposition of discrepancies pertaining to material, components, hardware and products. The inspection team reviewed a large number of QDRs and found them in conformance with regulatory requirements.

3. DOCUMENTS REVIEWED

Traveler 2077-248-1 OCV Upper Body Inner
Traveler 2077-245-1 OCV Upper Body Outer

Welder or Welding Operator Qualification Tests (WPQ) For
Welder A 5/5/89 Procedure W-0003-WP
Welder B 5/10/89 Procedure W-0007-NP

QA Data Package Unit S/N 102
QA Data Package Unit S/N 101 (Section A only)
P.O. 6832-2077, 5/27/88, Pacific Nuclear Systems, Inc. to
Joseph T. Ryerson & Sons, Inc.
P.O. CB092, 10/10/88, Pacific Nuclear Systems, Inc. to Great Western
P.O. CB260, 2/13/89

Calibration certificates:

Varian leak standard SN 71J-132, 71J-328
Starrett dial caliper SN QA-CB-88-25

Certificate of Personnel Qualifications:

Inspection Supervisor Level 2, Helium Mass Spectrometer Leak Test
Liquid Penetrant Testing
QA Inspector 10, Liquid Penetrant Testing
QA Inspector 11, Radiographic Testing, Gamma Ray

Technical Examination:

Inspection Supervisor 9, Liquid Penetrant Testing
QA Inspector 10, Liquid Penetrant Testing
QA Inspector 11, Radiographic Testing-Gamma Ray

Technical Procedures:

Procedure	Revision No.	Date	Title
QI-5.1	1	7/18/89	Manufacturing/Inspection Plan-NUPAC TAF
QI-5.2	0	8/21/89	Material/Components Traceability Plan - NUPAC TAF
QI-5.3	0	8/22/89	Material Overcheck/Verification Plan - NUPAC TAF
QI-16.4	0	1/17/89	Certification of NDE Personnel
QI-16.5	0	7/17/89	Welder/Welding Operator Qualifications Continuations

Technical Procedures (continued):

Procedure	Revision No.	Date	Title
NDE-001			Certification of Nondestructive Testing Personnel
NDE-003	0	3/1/88	Nondestructive Test Procedure, Liquid Penetrant Testing (Solvent Removable),
RT-G1	4	8/29/88	Midland Inspection, "Radiographic Procedure," approved by NUPAC 9/12/88

Quality Discrepancy Reports:

No. 1213 dated 6/27/89 through 1255, dated 9/25/89

Travelers:

Travelers for Unit 7, Nos. 2077-205, 248, 261, 269, 320
Travelers for Unit 9, Nos. 2077-204, 205, 243, 253, 259, 261, 262, 264.

4. NONCONFORMANCES

The following nonconformances were identified:

Nonconformances 1, 2, 3 and 4

10 CFR Section 71.119, requires special processes, including welding, to be accomplished using qualified procedures in accordance with applicable codes.

In nonconformance with 10 CFR Section 71.119:

1. Welds on Unit 2 were found to be in nonconformance with ASME Code. (Reference Sec. 2.2, Page 5).

2. Welds on Unit 5 were found to be in nonconformance with ASME Code. (Reference Sec. 2.2, Page 6).

3. Penetrameters were not used on radiographs taken after the repair of welds on Unit 2. (Reference Sec. 2.2, Page 6).

4. The incorrect penetrameter was used on radiographs taken prior to August 23, 1989 (Reference Sec. 2.2, Page 7).

Nonconformance 5

10 CFR Section 71.135, requires that records must be maintained for three years after the QA holder last engages in the activity for which the program was developed.

In nonconformance with 10 CFR Section 71.135:

5. The original radiograph for Dwg. 2077-042, Weld-10, radiograph view 17-18, was not available. (Reference Sec. 2.2, Page 5)

Nonconformances 6, 7

10 CFR Section 71.123, requires that a test program be established that demonstrates that the package components will perform satisfactorily in service.

In nonconformance with 10 CFR Section 71.123:

6. The date indicated on one reader sheet for Unit 2 was three days before the date on the radiograph. (Reference Sec. 2.2, Page 7)

7. Welds-43 and -44, on Unit 5, could not be located on Dwg. 2077-042, and there was no documentation of the acceptability of Weld-44. (Reference Sec. 2.2, Page 7).

Nonconformance 8

10 CFR Section 71.111, requires that instructions, procedures, and drawings affecting quality must be prescribed and must be followed. The instructions, procedures and drawings must include quantitative or qualitative acceptance criteria.

In nonconformance with 10 CFR Section 71.111:

8. The annual visual acuity examination, required by Procedure QI-16.4, for a QA Inspector certified as Level II PT inspector, expired on September 6, 1989. This inspector had performed PT examinations after the September 6, 1989 expiration date. (Reference Section 2.3, Page 8).

5. EXIT MEETING

In the exit meeting, held on September 28, 1989, the team members summarized the preliminary results of the inspection. The following personnel attended the meeting:

R. H. Smith, Director, Corporate Quality Assurance
V. K. Cannon, Manager, Quality Assurance
F. Humiston, Plant Superintendent
A. Work, Inspection Supervisor
C. R. McFarland, Senior Quality Assurance Engineer, Environmental Evaluation Group, State of New Mexico
C. Carpenter, Quality Assurance Inspector
A. Atchenson, Quality Assurance Manager, Westinghouse