Washington Public Power Supply System
A JOINT OPERATING AGENCY

P. O. Box 968 3000 Geo. Washington Way Richland, Washington 99352 Phone (509) 375-5000

RECEIVED MAR 12 1980

March 5, 1980
G01-80-55

G. S. Spencer, Chief
Reactor Construction and Engineering Support Branch
Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 N. California Boulevard
Walnut Creek, California 94596

Subject: WPPSS NUCLEAR PROJECT NO. 2
DOCKET NO. 50-397, CPPR-93
NRC INSPECTION - MAY 17, MAY 29- JUNE 1, JUNE 11-14, SEPTEMBER 10-14, 1979
REPORT NO. 50-397/79-10

Reference: Letter G. S. Spencer to N. O. Strand, dated January 21, 1980

Dear Mr. Spencer:

This letter is in response to your letter of January 21, 1980 (referenced above) which documented the results of the NRC Inspections conducted on May 17, May 29 - June 1, June 11 - 14 and September 10 - 14, 1979, of the activities authorized by NRC Construction Permit No. CPPR-93. The referenced letter identified four (4) items of noncompliance.

The specific NRC findings, as stated in your letter of January 21, 1980, and the Supply Systems response are provided in the appendix to this letter.

If you have any questions or desire further information, please advise.

Very truly yours,

D L Renberger
D. L. RENBERGER
Assistant Director
Generation and Technology

DLR/RPS/im

Attachment: as stated

cc w/att: JM Blas - B&R, NY
HR Canter - B&R, NY
JR Lewis, BPA, Richland
V. Stello - Office of Inspection & Enforcement, WDC
JJ Verderber - B&R, NY

Dupe of
8003120517

APPENDIX A

Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Docket Number 50-397
Construction Permit Number CPPR-93

Notice of Violation

Based on the results of NRC inspections conducted between May 16 and September 14, 1979, it appears that certain of your activities were not conducted in full compliance with conditions of your NRC facility license No. CPPR-3 as indicated below.

A. 10CFR50, Appendix B, Criterion IX, states, in part, that "measures shall be established to assure that special processes, including ... heat treating .... are controlled and accomplished by ... using qualified procedures ...."

Paragraph D.2.5.9 of the WPPSS Quality Assurance Program documented in the PSAR states, in part, that "measures shall be established:.. to assure that special processes, including ... heat treating ... are accomplished ... using qualified .... procedures...."

Contrary to the above, on May 31, 1979, it was found that the piping post weld heat treating procedure No. PWHT-1, revision 4 (entitled "Post Weld Heat Treat Procedure No. 1:) was implemented using a unique method of heat application without the benefit of qualification. The method employed electric resistance heater blankets placed along each side of the weld (approximately 1½ inches from the weld center line) rather than directly over the weld. This procedure had been used to heat treat safety related pipe welds including welds 6, 7 and 8 of Burns & Roe isometric drawing No. RFW-419-4.

This is an infraction.

ACTION TO CORRECT DEFICIENCY

The Supply System has complied with the intent of 10CFR50, Appendix B, Criterion IX, which states, in part, that "measures shall be established to assure that special processes, including .... heat treatment .... are controlled and accomplished .... using qualified procedures ...." All ASME welding procedures which require PWHT are qualified with PWHT as an integral part of the qualification process. Placing the strip heaters 1½ inches away from the center of the weld is not considered unique and requiring special qualification.

Based upon an evaluation of the PWHT strip charts for the welds in question, it can be shown that all the requirements of ASME III, Section NB4620, Post Weld Heat Treatment, (e.g. heating and cooling rates, time at temperature) were complied with, the single exception being that the heating rate (220° F/hr.) for RFW-419-4 weld 6, was exceeded by 50° F during the first hour. The maximum weld temperature attained for the weld was 1150° F which occurred during hold time at temperature. The ΔT during the soak time was 50° F. The temperature directly under the heating coil would parallel the strip charts which showed no indication of any excessive temperature gradients. Since the heating coils were only 1½ inches from the center of the weld there is no reason to assume that the base material attained a temperature approaching the critical temperature of the material. This was substantiated by Report NO. IE-119, Hardness Testing and Metallurgical Examination on Feedwater Pipe Welds at Washington Nuclear Project No. 2, which stated "The maximum temperature reached at any point estimated to be in the range of 1270° F-1310° F."

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Contrary to the above, on May 31, 1979, it was found that no written instructions had been developed for the operation or adjustment of pipe weld heat treating equipment designed and built for use on safety related piping systems, including welds 1A, 2 and 3 of Burns & Roe isometric drawing RFW-419-5.7.

This is an infraction.

Action To Correct Deficiency

On 8/6/79, Wright Schuchart Harbor/Boecon/General Energy Resources, Inc., (WBG) terminated their contract (2808-215-113) with Seattle Industrial and assumed direct responsibility for the PWHT operations.

Action To Prevent Recurrence

WBG has revised the PWHT procedure, purchased heat treating equipment from Cooperheat and developed and implemented a training program for the operators and inspectors. A packet containing the operating instructions and PWHT procedure are attached to the control panel of the equipment.

Date Of Full Compliance

Effective 9/12/79 WBG has been performing the PWHT operations. The PWHT has been witnessed by WBG Quality Control Inspectors and verified by a Quality Engineer to assure compliance to the revised PWHT procedure, PWHT No. 1, Revision No. 9.

C. 10CFR50, Appendix B, Criterion XVII, states, in part, that "sufficient records shall be maintained to furnish evidence of activites affecting quality ...."

Paragraph D.2.5 of the WPPSS Quality Assurance Program documented in the PSAR states, in part, that "sufficient records will be prepared as work is performed to furnish documentary evidence of the quality of items and of activities affecting quality..."

Contrary to the above, on May 31, 1979, it was found that sufficient records had not been obtained to furnish evidence of satisfactory heat treating of safety related pipe welding. For example, several heat treat record charts were illegible (e.g. welds 6, 7 and 8 of Burns & Roe isometric drawing No. RFW-419-4), thermocouple indications were not recorded on some portions of the recorder charts (e.g. welds 1A and 2 of Burns & Roe. isometric drawing RFW-419-5.7), no operator names had been recorded on heat treating data records (e.g. welds 6, 7 and 8 of Burns & Roe isometric drawing No. RFW-419-4, Welds 1A, 2 and 3 of isometric drawing No. RFW-419-5.7) different and conflicting thermocouple Nos. had been recorded for the heat treatment of the same weld (e.g. the recorder charts and certification sheets for weld 8 of Burns & Roe isometric drawing RFW-419-4, weld 1 of isometric FRW-418-7.8, welds 6, 7 and 8 of isometric RFW-418-4), different (and conflicting) dates of heat treatment had been listed on recorder charts and certification sheets (e.g. welds 4, 6, 7 and 8 of Burns & Roe isometric RFW-418-4, welds 1, 1A and 2 of isometric FRW-418-5.6).

This is a deficiency.

Action To Correct Deficiency

WBG has initiated a program to review all completed PWHT charts and records for the PWHT conducted by Seattle Industrial.. This review activity is overviewed by a Quality Engineer who evaluates the findings. Inspection Reports (IR's) are initiated as necessary to obtain resolution of the discrepancies found.

Action To Prevent Recurrence

As noted in B above, WBG has assumed direct responsibility for the PWHT operation and has initiated a program to assure compliance to the revised PWHT procedure.

Date Of Full Compliance

The review of all records initiated by Seattle Industrial and the initiation of IR's for discrepant conditions is estimated to be complete by 4/1/80.

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Paragraph 3.2.5 of the WPPSS Quality Assurance Program documented in the PSAR states, in part, that "... all project contractors for the nuclear related portions of the plant will be required to have a Quality Assurance Program ... the program shall include the following items as ... applicable to the ... construction for which the contractor is responsible." Paragraph D.2.5.5 states, in part, that "activity affecting quality... shall be accomplished in accordance with ... procedures."

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Contrary to the above, on May 31, 1979, it was found that recorder chart weld 1A of Burns & Roe isometric drawing No. RFW-419-5.7 and weld 6 and 7 (records are somewhat illegible) of isometric drawing No. RFW-419-4 indicate periods of time when the heating and cooling rates exceed 440° F per hour.

This is an infraction.

Action To Correct Deficiencies

RFW-419-5.7 Weld 1A: The review conducted by WBG (see C above) has concluded that due to an excessive cooling rate (excess of 220° F per hour), the weld will be re-postweld heat treated.

RFW-419-4 Weld No. 6: Additional weld repair of this weld is required, therefore concurrent with the repair it will be re-postweld heat treated.

RFW-419-4 Weld No. 7: Final evaluation of Report IE-119 and the PWHT data from Seattle Industrial has not been made.

Action To Prevent Recurrence

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4/1/80.

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8003120517 DOC.DATE: 80/03/05 NOTARIZED: NO DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
RENBERGER,D.L. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
SPENCER,G.S. Region 5, San Francisco, Office of the Director

SUBJECT: Responds to NRC 800121 ltr documenting results per IE Insp Rept 50-397/79-10 on 790517,0529-0601,0611-14 & 0910-14. Specific NRC findings & supply sys response encl.

DISTRIBUTION CODE: B001B COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: PSAR/FSAR AMDTS and Related Correspondence

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INTERNAL:	01 REG FILE	1	1	02 NRC PDR	1	1
	06 I & E	3	3	08 OPERA LIC BR	1	1
	09 GEOSCIEN BR	4	4	10 QAB	1	1
	11 MECH ENG BR	1	1	12 STRUC ENG BR	1	1
	13 MATL ENG BR	2	2	15 REAC SYS BR	1	1
	16 ANALYSIS BR	1	1	17 CORE PERF BR	1	1
	18 AUX SYS BR	1	1	19 CONTAIN SYS	1	1
	20 I & C SYS BR	1	1	21 POWER SYS BR	1	1
	22 AD SITE TECH	1	0	26 ACCDNT ANLYS	1	1
	27 EFFL TRT SYS	1	1	28 RAD ASMT BR	1	1
	29 KIRKWOOD	1	1	AD FOR ENG	1	0
	AD PLANT SYS	1	0	AD REAC SAFETY	1	0
	AD SITE ANLYSIS	1	0	DIRECTOR NRR	1	0
	HYDRO-METEOR BR	2	2	MPA	1	0
	OELD	1	0			
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
	30 ACRS	10	10			

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MOORE
EPB #2 BC
S. KEBLUSEK
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Washington Public Power Supply System
A JOINT OPERATING AGENCY

P. O. BOX 968 3000 GEO. WASHINGTON WAY RICHLAND, WASHINGTON 99352 PHONE (509) 375-5000

March 5, 1980
G01-80-55

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DLR/RPS/im

Attachment: as stated

cc w/att: JM Blas - B&R, NY
HR Canter - B&R, NY
JR Lewis, BPA, Richland
V. Stello - Office of Inspection & Enforcement, WDC
JJ Verderber - B&R, NY

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SE
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APPENDIX A

Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Docket Number 50-397
Construction Permit Number CPPR-93

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This is an infraction.

ACTION TO CORRECT DEFICIENCY

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Date Of Full Compliance

4/1/80.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1990 N. CALIFORNIA BOULEVARD
SUITE 202, WALNUT CREEK PLAZA
WALNUT CREEK, CALIFORNIA 94596

JAN 21 1980

Docket No. 50-397

Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Attention: Mr. N. O. Strand
Managing Director

Gentlemen:

Subject: NRC Investigation of Post Weld Heat Treatment at Washington Nuclear Project No. 2 (WNP-2)

This refers to the investigation conducted by Messrs. T. W. Bishop, G. Hernandez, and W. G. Albert of this office and Mr. P. E. Baci of IE Headquarters of activities authorized by NRC Construction Permit No. CPPR-93. The investigation was conducted on May 17, May 29-June 1, June 11-14, and September 10-14, 1979, and concerned allegations of improper post weld heat treatment (PWHT) of welds at WNP-2. The findings of the investigation were discussed with Mr. A. D. Kohler and other members of your staff following each segment of the investigation.

The areas examined during the investigation are described in the enclosed investigation report. Within these areas, the investigation consisted of selective examination of procedures and representative records, interviews with personnel, observations by the inspectors, and independent metallographic testing of welds.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violations, enclosed herewith as Appendix A. These items of noncompliance have been categorized into a level as described in our correspondence to all NRC licensees dated December 31, 1974.

This notice is sent to you pursuant to the provisions of Section 2.201, of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within thirty (30) days of your receipt of this notice, a written statement or explanation in reply including (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be proprietary, it is necessary that you submit a written application to this office, within 30 days of the date of this letter, requesting that such information be withheld from public disclosure. The application must include a full statement of the reasons why it is claimed that the information is proprietary. The application should be prepared so that any proprietary information identified is contained in an enclosure to the application, since the application without the enclosure will also be placed in the Public Document Room. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,

G. S. Spencer, Chief
Reactor Construction and
Engineering Support Branch

Enclosures:
A. Notice of Violation
B. IE Inspection Report
No. 50-397/79-10

cc w/o enclosure B:
M. E. Witherspoon, Division Manager
Quality Assurance, WPPSS

W. C. Bibb, Manager
WNP-2 Project, WPPSS

APPENDIX A

Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Construction Permit No. CPPR-93

NOTICE OF VIOLATION

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This is an infraction.

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

REGION V

Report No. 50-397/79-10

Docket No. _____ License No. CPPR-93 Safeguards Group _____

Licensee: Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Facility Name: Washington Nuclear Project No. 2 (WNP-2)

Inspection at: WNP-2 Site, Benton County, Washington

Inspection conducted: May 17, May 29-June 1, June 11-14, September 10-14, 1979

Inspectors: T. W. Bishop for — 1/21/80
T. W. Bishop, Reactor Inspector — Date Signed

T. W. Bishop for — 1/21/80
G. Hernandez, Reactor Inspector — Date Signed

T. W. Bishop for Albert & Baci — 1/21/80
W. G. Albert, Reactor Inspector — Date Signed

P. E. Baci, Investigator — 1/21/80 Date Signed

Approved By: R. T. Dodds — 1/21/80
R. T. Dodds, Section Chief — Date Signed
Reactor Construction and Engineering Support Branch

Summary:

Investigation from May 17-September 14, 1979 (Report 50-397/79-10)

Areas Investigated: Investigation of allegations relating to post weld heat treatment of a pipe weld and a pipe whip restraint.

The investigation involved 220 manhours by three NRC inspectors, one investigator, and two NRC consultants.

Results: Four items of noncompliance were identified during the investigation (three infractions or: failure to qualify the post weld heat treatment procedure, failure to provide procedures for equipment operation, failure to accomplish heat treatment in accordance with requirements; one deficiency or: failure to provide adequate quality records).

DETAILS

1. Persons Contacted

a. Washington Public Power Supply System (WPPSS)

*A. D. Kohler, WNP-2 Project Manager
*M. E. Witherspoon, Division Manager - Quality Assurance
*A. M. Sastry, Project Quality Assurance Manager
*J. C. Janus, Construction Manager
*L. D. Noble, Mechanical Engineer
*J. D. Martin, Startup and Operations Manager

J. M. Steidl, Sr. Quality Assurance Engineer
D. K. Lawrence, Quality Assurance Engineer

b. Burns & Roe, Inc. (B/R)

*G. T. Harper, Technical Support Manager
*M. J. Parise, Deputy Project Quality Assurance Manager
L. F. Akers, Sr. Welding Engineer
H. R. Tuthill, Sr. Quality Assurance Engineer
J. A. Lauck, Quality Assurance Engineer

*Denotes those attending the exit interview on June 1, 1979.

c. WSH/Boecon/Bovee and Crail/GERI (WBG)

A. Larsen, Quality Assurance Manager
L. Buckner, Quality Assurance Supervisor
T. Bennington, Quality Control Supervisor
R. Lawton, Quality Assurance Engineer
L. Wulff, Quality Assurance Engineer

In addition, three PWHT operators and one former QC supervisor were interviewed.

d. Seattle Industrial Controlled Heat (SI)

Ted Giddens, Quality Control Manager

In addition, two previous SI employees were interviewed.

e. Pybus Steel Company

D. Barnes, Quality Assurance Manager

2. Allegations and Summary of Investigation Results

On May 4, 1979 the NRC Region V office received an allegation regarding the application of excessive and nonuniform temperatures in the postweld

heat treatment of a pipe weld at WNP-2. The alleger stated that recording equipment had been manipulated so that the recording chart indicated that the heat treatment had been properly performed. The individual was interviewed by two NRC inspectors on May 17, 1979, at which time he provided two specific allegations:

Allegation no. 1: One large pipe or penetration weld on a mainsteam or feedwater line was subjected to a temperature of approximately 2000°F on the lower 180° of the weld, while the upper 180° of the weld was held at the normal heat treating temperatures (approximately 1150°F). The thermocouple leads to the temperature recorder were manipulated so that the recorder chart indicated proper post weld heat temperatures for both the bottom and top of the weld. This was accomplished by disconnecting the thermocouple from the bottom of the weld and splitting the signal from the, properly reading, top thermocouple.

Finding:

The allegation was not substantiated.

The alleger was interviewed on two later occasions when he furnished additional information regarding the location of the welds and the alleged techniques used in manipulating equipment. The pipe weld in question was determined to be a 24 inch feedwater pipe weld no. 7 on Burns & Roe isometric drawing RFW-418-4 or weld no. 7 on Burns & Roe isometric drawing RFW-419-4. Interviews with cognizant equipment operators, current and former Seattle Industrial personnel, and contractor quality surveillance personnel failed to substantiate the allegation. An examination of heat treatment records associated with the two welds in question did not substantiate the allegation, but did reveal some irregularities including: illegible post weld heat treat recorder charts; temporary loss of one thermocouple indication on one chart; record inconsistencies regarding thermocouple identification numbers; inconsistent dating of one PWHT certification sheet. Due to the nature and scope of the record irregularities identified it was concluded that independent NRC metallographic testing of the two welds was warranted. The testing included in situ hardness tests and microscopic examination for grain size irregularities. This testing was accomplished in September 1979 by a NRC contractor. The final contractors report (NRC no. IE-119) was received in Region V in December 1979. Based on the results of these tests it was concluded that there was no evidence of radically excessive or non-uniform post weld heat treatment. The maximum temperature reached at any point was estimated to be in the range of 1270°-1310°F. Some non-uniformity was noted but the maximum temperature differential around the perimeter of the weld zone and pipe is estimated to be less than 100°F. As indicated the metallographic testing did not substantiate the allegation.

Allegation no. 2: While performing post weld heat treatment on a large WNP-2 steel structure at Pybus Steel Company, the temperature was allowed to vary between 650°F and 1650°F during the soak period. A section of the recorder chart which showed the excessively high temperature was cut out before the chart was presented to the customer.

Finding

The allegation was not substantiated.

Additional interviews with the alleger enabled identification of the structure in question, which was determined to be a large pipe whip restraint (mark no. 316P1) for the mainsteam piping system. Personnel interviews and examination of quality records (including heat treat charts) failed to substantiate the allegation. The investigating team was unable to identify any charts which showed evidence of cut out sections.

While the two allegations were not substantiated, several significant concerns were identified with the post weld heat treatment program. These concerns are identified in paragraph 3 and were first reported to licensee representatives on June 1, 1979. A stop-work order, preventing further quality class 1 heat treatment by the subcontractor, was issued by the licensee on that date. As of December 1979, the subcontractor involved (SI)had not been allowed to resume heat treatment of safety related components.

3. Investigation of the Allegations

Post weld heat treatment of large piping at the WNP-2 site is included in the prime mechanical and piping contract (contract 215). This contractor had subcontracted piping heat treatment to Seattle Industrial Controlled Heat, Inc., of Seattle, Washington. The investigation was initiated at the WNP-2 site on May 29, 1979. It was determined that, as of that date, the post weld heat treatment subcontractor had heat treated approximately 20 safety related pipe welds (all of these welds were in the mainsteam and feedwater piping systems). It was also determined that the subcontractor had completed heat treatment of large pipe whip restraints for the WNP-2 project at Pybus Steel Company. The investigation included an examination of the procedures applied to post weld heat treating by the subcontractor, interviews with personnel, examination of quality records associated with heat treatment, and independent metallographic examinations of suspect pipe welds. The results were as indicated below.

a. Quality Assurance Implementing Procedures

It was found that the heat treat subcontractors quality assurance manual had not yet been approved by the Construction Manager (Burns & Roe) and the subcontractor had been directed to work under the requirements of the previously approved prime contractors Quality Assurance Manual. The inspectors examined the procedures invoked for post weld heat treatment for compliance to the requirements of the pertinent QA manual, the contract specification, the AWS structural welding code, AWS D.1.1 and the ASME Section III code (as applicable), and the PSAR.

The procedures examined were: "Post Weld Heat-Treat Procedure No. 1", PWHT-1, revision 4; "Preheat and Post-Weld Heat Treat Procedure no. 7891", PPWHT-7891, revision 0; and "Welding and Sequence Procedure no. 1", WSP-1, revision 1.

Procedure PWHT-1, above, applies to pipe heat treatment. This procedure was supplemented with a one page training document describing how heaters, thermocouples, insulation, and connections are to be made. This supplemental document was not numbered, dated, nor did it have any approving signatures. PPWHT-7891 and WSP-1 apply to pipe whip restraints fabricated by Pybus Steel Company. The examination disclosed the following concerns:

(1) Procedure PWHT-1 was not qualified.

PWHT-1 employs a unique method of post weld heat treatment wherein the resistence heater blankets are not placed directly over the weld to be heat treated. The resistance blankets are placed on each side of the weld (at a distance of approximately 1½ inches from the weld). Heat conduction through the pipe wall heats the welds to the PWHT temperatures. Contrary to the requirements of 10CFR50 appendix B, criterion IX, which requires the qualification of special processes such as heat treating, no qualification tests were conducted to assure that this process properly heat treated the pipe welds. The lack of qualification testing does not enable assessment that the entire weld, especially the root, receives adequate time at temperature nor is it possible to determine if the area of the pipe directly under the heaters is subjected to excessive temperatures. The failure to properly qualify the heat treatment procedure is an apparent item of noncompliance (50-397/79-10/01).

(2) Procedures for operating PWHT equipment were not developed.

The equipment had been designed and built by the subcontractor and no specific instructions for adjustment or operation had been written and provided to the equipment operators. Such procedures were necessary to identify how to control the rate of heating and cooling. The failure to provide implementing instructions or procedures is contrary to 10CFR50, Appendix B, criterion V and is an apparent item of noncompliance (50-397/79-10/02).

b. Interviews with Personnel

Personnel involved with the conduct and surveillance of post weld heat treatment operations were interviewed. This included the on-site Seattle Industrial representative, former Seattle Industrial personnel, heat treatment equipment operators, and current and former QA surveillance personnel. The individuals were questioned regarding the alleged practice of manipulating equipment or record charts, record irregularities, and any other improper actions. None of the individuals provided any information which would substantiate the allegations.

No other items of noncompliance or deviations were identified.

c. Observations of Heat Treating Operations, Piping, and Structural Steel

While no post weld heat treatment of safety related components was in progress during the investigation several non safety related pipe welds were being heat treated. The procedures, and techniques for PWHT were the same for safety related and non-safety related components. The in-process heat treatment for two non safety related pipe welds were observed. The heat treatment activities appeared to be in compliance with the requirements of procedure PWHT-1. The inspectors also visually examined the pipe welds no. 7 of RFW-418-4 and RFW-419-4, and pipe whip restraint no. 316P1 for any visual evidence of excessive or radical post weld heat treatment. The visual examination of the two pipe welds and restraint 316P1 did not identify any defects.

No items of noncompliance or deviations were identified.

d. Review of Quality Records

The inspectors reviewed the quality records associated with the post weld heat treatment of safety related pipe welds and selected pipe whip restraints performed by the subcontractor. This included an examination of weld history records (NF-6 form), PWHT certificates, PWHT Log, PWHT Inspection Checklists, PWHT Data Sheets, PWHT Time/Temperature Recorder Charts, and pertinent nonconformance reports and surveillance reports. The records of heat treatment of pipe welds were examined at the WNP-2 site while the records for heat treatment of the pipe whip restraints were examined at the Pybus Steel Company, in Wanatchee, Washington. The examination revealed two areas of concern as indicated below:

(1) Sufficient records were not maintained to furnish evidence of proper post weld heat treatment.

Several of the heat treatment charts were illegible to the degree that the thermocouple numbers could not be identified (e.g. welds 6, 7, and 8 of isometric no. RFW-419-4, and welds 1, 1A, and 2 of isometric no. RFW-418-5.6). Thermocouple indications were not recorded on some portions of the recorder charts (e.g. welds 1A and 2 of isometric no. RFW-419-5.7). There were inconsistencies on charts and certification sheets for thermocouple identification numbers (e.g. weld 8 of isometric no. RFW-418-4, weld 1 of isometric no. RFW-418-7.8, welds 6, 7, 8 of isometric RFW-418-4). No operators names had been recorded on data records (e.g. weld 6, 7, 8 of isometric RFW-419-4, welds 1A, 2, 3 of isometric RFW-419-5.7). There were inconsistencies in the date of heat treating as shown on certification sheets and the recorder charts (e.g. welds 6, 7, 8 of isometric no. RFW-418-4, welds 1, 1A, 2 of isometric no. RFW-418-5.6, weld 4 of isometric RFW-418-4). The failure to maintain sufficient quality records to furnish evidence of proper post weld heat treatment is contrary to the requirements of 10CFR50 Appendix B. This is an apparent item of noncompliance (50-397/79-10/03).

(2) Records indicate heating and cooling rates exceeded procedure and ASME code limitations (no more than 400°F/hr).

Recorder charts for weld 6 or 7 (Note: Records were somewhat illegible) of isometric no. RFW-419-4 and weld 1A of isometric no. RFW-419-5.7 indicate that for short periods of time the heating and cooling rates exceeded 400°F/hr. The failure to accomplish heat treatment in accordance with procedures is contrary to the requirements of 10CFR50 Appendix B. This is an apparent item of noncompliance (50-397/79-10/04).

It was also found from the records examination that the subcontractor representative on site would function as the job supervisor and sign certifications as the quality control representative. Contractor representatives stated that although the subcontractors representative signed certificates using the title "QC" he did not perform quality control functions. This responsibility had been retained by the prime contractor.

e. Independent Metallographic Testing

Because of the nature and scope of the record irregularities, it was concluded that independent NRC metallographic testing of the two pipe welds allegedly improperly heat treated was warranted. The NRC contracted the services of Parameter, Inc., of Elm Grove, Wisconsin to perform in situ hardness tests and microscopic examination of welds 7 of isometric drawings nos. RFW-418-4 and RFW-419-4. These welds join the feedwater line to the isolation check valve inside the containment vessel. Hardness tests were conducted on the weld, heat effected zones of the pipe and valve, and uneffected areas of the pipe and valve. Approximately 75 locations were examined for hardness with 15 tests at each location. Microscopic examination of the welds, heat effected zones, and unaffected pipe and valve were made in 17 locations. As stated in paragraph 2, above, there was no evidence from the testing which would substantiate the allegation of radically excessive or non-uniform heat treatment. During the examination, however, one area was located on valve RFW-V-10A which appears to have a different temperature history than other portions of the valve body examined. The area is located approximated 60 counter clockwise from the top of weld no. 7 on the valve body a distance of approximately 8 inches from the weld centerline. The area appears to be a weld repair. It was concluded from microscopic examination that the repair was made after the valve was quenched and tempered and that the area was never subsequently heated to above the lower critical temperature of the material (approximately 1330°F). The significance of this condition will be examined during subsequent inspections. This item is unresolved (50-397/79-10/05).

4. Management Interviews

The inspectors and investigator met with licensee and Burns and Roe representatives on June 1, 1979, June 13, 1979, and September 13, 1979 and summarized the scope and findings of the investigation. Licensee representatives were advised of the results of metallographic testing on October 26, 1979 following receipt of the draft report by the NRC contractor. Licensee representatives were responsive and stated that immediate action would be taken to resolve the concerns identified.