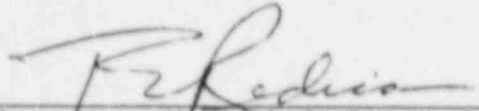
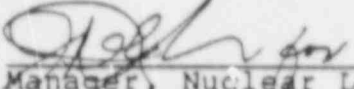
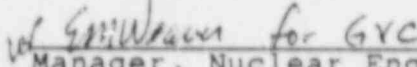
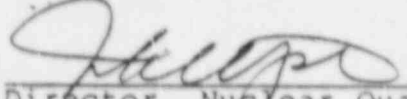



MATERIAL CONTROL DEPARTMENT ACTION PLAN
FOR
RANCHO SECO NUCLEAR GENERATING STATION
SACRAMENTO MUNICIPAL UTILITY DISTRICT
NUCLEAR REGULATORY COMMISSION BULLETIN 88-05
REVISION 0
JULY 15, 1988

 7/15/88
Manager, Material Control
T. E. Redican

 7/15/88
Manager, Nuclear Licensing
S. L. Crunk

 7/15/88
Manager, Nuclear Engineering
G. V. Cranston

 7/15/88
Director, Nuclear Quality
J. V. Vinquist

 7/15/88
Assistant General Manager
Technical and Administrative Services
R. G. Croley

DISTRIBUTION: CEO, Nuclear
Nuclear AGMs
Nuclear Directors
Nuclear Department Managers
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EXECUTIVE SUMMARY

The Nuclear Regulatory Commission issued NRC Bulletin No. 88-05 May 6, 1988 which presented all holders of operating licenses & construction permits for nuclear power reactors, with information that Piping Supplies, Incorporated (PSI) and West Jersey Manufacturing Company (WJM) had supplied material with certified material test reports (CMTRS) that contained false information.

Supplement 1 for NRC Bulletin 88-05 was issued June 15, 1988 providing additional information on PSI/ WJM supplied material, reduced the scope to fittings and flanges, delineated licensee required action, and clarified action required when material is found not complying to specifications.

This action plan defines the necessary action to satisfy the required action for the bulletin and supplement 1.

The action completed and in progress is listed below:

1. 619 purchase orders from suppliers identified on NRC Bulletin 88-05 were reviewed for PSI / WJM material.
2. 9 Heat Numbers were identified as being received from PSI for installation in the TDI Emergency Diesel Generators.
3. 7 of the 9 heat numbers were available and were sent to an independent laboratory for testing. 2 of the 7 samples failed the physical tests. All 7 passed the chemical test.
4. PDQ 88-1241 was written identifying the potentially deviation from quality. Interim disposition of the PDQ has provided analysis for Justification of Continued Operations (JCO).
5. Continuing investigation of heat numbers received from other entities have; approximately 185 to date, identified additional material from WJM purchased by contract with the TDI diesels systems as the intended placement. This was identified on PDQ 88-1315. This is an ongoing effort.
6. The Nuclear Management and Resources Council (NUMARC) is providing a industry representation to the NRC concerning the bulletin.

1.0 INTRODUCTION

- 1.1 NRC Bulletin 88-05 identifies potentially nonconforming materials supplied by Piping Supplies, Inc. (PSI) at Folsom, New Jersey and West Jersey Manufacturing (WJM) at Williamstown, New Jersey. Certified material test reports from PSI and WJM have been identified containing false information about material supplied to the nuclear industry.
- 1.2 This action plan defines necessary activities to satisfy the required action for this bulletin.
- 1.3 The Manager, Material Control is responsible for the administration of the NRC Bulletin 88-05 Action Plan.

2.0 ACTION PLAN

2.1 PURPOSE

- 2.1.1 Define Rancho Seco action/s required to control material found during the resolution of NRC Bulletin 88-05 with material identified which has been received from WJM and PSI.
- 2.1.2 Provide identification of internal Rancho Seco (RS) responsibility and interfaces for the required action in the resolution of NRC Bulletin 88-05.
- 2.1.3 Provide identification of responsibilities and interfaces with organizations external to RS during the resolution of NRC Bulletin 88-05.

2.2 SCOPE

- 2.2.1 This action plan applies to activities associated with NRC Bulletin 88-05.

2.3 REFERENCES AND COMMITMENT DOCUMENTS

2.3.1 References

- 2.3.1.1 RSAP-0401 Preparation and Processing of Purchase Requisitions
- 2.3.1.2 RSAP-0601 Nuclear Records Management
- 2.3.1.3 RSAP-0803 Work Request

- 2.3.1.4 RSAP-1308 Potential Deviation From Quality
- 2.3.2 Commitment Documents
 - 2.3.2.1 NRC Bulletin 88-05
- 2.4 DEFINITIONS - Definitions are provided in the Referencing procedures or the text of this action plan.
- 2.5 ACTION TO BE TAKEN
 - 2.5.1 Responsibilities
 - 2.5.1.1 The Material Coding and Classification Unit (CCU) is responsible for:
 - 2.5.1.1.1 Providing a contact point for the Nuclear Management and Resources Council (NUMARC) inquiries including other member and participating utilities.
 - 2.5.1.1.2 Reviewing manufacturer, supplier, heat number, and other documentation to identify WJM or PSI material received at RS.
 - 2.5.1.1.3 For all PSI / WJM material found received at RS, perform a review of issue history to determine intended usage of the material in the unit.
 - 2.5.1.1.4 Initiating Purchase Requisition Worksheets (PRW) for testing of identified WJM / PSI material; as required for NRC Bulletin 88-05 and replacement of stock warehoused material removed for salvage per Ref 2.3.1.1.
 - 2.5.1.1.5 Initiating Potential Deviation From Quality (PDQ) per Ref 2.3.1.5 for WJM / PSI identified material received at RS.
 - 2.5.1.1.6 Quarantine any identified PSI / WJM material found pending NE disposition of PDQ's.
 - 2.5.1.1.7 Provide status reports as required by management or other associated organizations.
 - 2.5.1.2 The Manager, Nuclear Engineering is responsible for:
 - 2.5.1.2.1 Disposition of PDQ's per Ref. 2.3.1.4.
 - 2.5.1.2.2 Perform walkdown or identify walkdown and work requirements for installed material, per Ref 2.3.1.3.

- 2.5.1.2.3 Provide procedures and a standard work plan for the field in selection and obtaining samples of material for test and analyses.
- 2.5.1.2.4 Support Nuclear Licensing with justification for continued plant power operations when applicable.
- 2.5.1.3 The Director, Nuclear Quality is responsible for:
 - 2.5.1.3.1 Surveillance and audit activities to provide assurance of adherence to the action plan, and the site QA Program.
 - 2.5.1.3.2 Develop in place hardness testing procedure for NE review and approval.
 - 2.5.1.3.3 Supply NDE personnel to perform hardness testing.
- 2.5.1.4 The Manager, Nuclear Licensing is responsible for:
 - 2.5.1.4.1 Coordinating information between Rancho Seco Organizations to provide reports as required for NRC Bulletin 88-05.
 - 2.5.1.4.2 Coordinating information with outside agencies (e.g. NRC, NUMARC) to exchange information on NRC Bulletin 88-05.

3.0 SCHEDULE

- 3.1 Materials identify bulk of PSI / WJM material at RS by 9/30/88.
- 3.2 Quality have approved EquoTip Hardness Testing Procedure 7/22/88.
- 3.3 NE prepare technical requirements /procedure for associated work activity to support PDQ disposition's.
- 3.4 Licensing issue required responses as specified in NRC Bulletin 88-05.

4.0 RESOURCES

- 4.1 Manager, Material Control has contracted for 3 additional personnel to perform documentation review in support of NRC Bulletin 88-05.
- 4.2 Any additional personnel or resources required beyond the baseloading for the RS Organizations will be addressed by each department manager / director.

- 5.0 GENERIC GUIDELINES
- 5.1 PSI / WJM will be looked at without regard to date of manufacture.
- 5.2 Where available full chemical and physical analysis will be performed on all PSI / WJM material.
- 5.3 Inaccessable material will be addressed by NE on PDQ's when identified.
- 6.0 RECORDS -Records are controlled in accordance with Ref. 2.3.1.2.
- 7.0 APPENDIX
- 7.1 APPENDIX A: Purchaser of PSI / WJM material, Purchase Orders reviewed.
- 7.2 APPENDIX B: LATER (Testing Procedure for EquoTip Hardness Testing of Metallic Materials)

APPENDIX A
NRC BULLETIN 88-05 ACTION PLAN

619 TOTAL PURCHASE ORDERS REVIEWED.
7 TOTAL PSI/WJM CERTS FOUND.
134 TOTAL NON-Q PURCHASE ORDERS REVIEWED.
466 TOTAL PURCHASE ORDERS REVIEWED THAT ARE Q/C-1.

N.R.C. BULLETIN 88-05 SUMMARY

VENDOR NAME	# P/O LKD AT	# P/O FOUND PSI/WJM	# P/O NON-Q	COMMENTS
=====	=====	=====	=====	=====
o AMERICAN STANDARD	2	0	2	PLUMBING FITTINGS
o BELLOWS	0	0	0	NON SMUD VENDOR
o CAPITOL PIPE STL	20	0	0	
o CHICAGO TUBE/IRON	0	0	0	NON SMUD VENDOR
o CONAX	28	0	3	
o CONSOL POWER	7	0	1	
o DRAVO INC	0	0	0	NON SMUD VENDOR
o DUBOSE	31	6	0	
o GULFALLOY	1	0	0	
o GUYON ALLOYS INC	65	0	3	
o HUB INC	165	0	8	
o ITT GRINNELL	288	0	117	
o JOLIET VALVE INC	0	0	0	NON SMUD VENDOR
o LOUIS P. CANUSO	0	0	0	NON SMUD VENDOR
o MCJUNKIN	11	0	0	
o OSBORNE BROS.WLD	0	0	0	NON SMUD VENDOR
o P.S.E/G	0	0	0	NON SMUD VENDOR
o PULLMAN POWER PRODUCTS	0	0	0	NON SMUD VENDOR
o RADNOR ALLOYS	0	0	0	NON SMUD VENDOR
o TYLER DAVISON	0	0	0	NON SMUD VENDOR
o TRANSAMER DELAVAL	1	1	0	

Attachment IV
Justification for Continued Operation

A. Purpose

Four flanges were installed in the "A" TDI diesel generator fuel oil system which do not meet specification requirements. Engineering determined that operation of "A" TDI diesel generator may continue with these flanges in the fuel oil system.

The flanges were identified as part of an investigation being performed in response to NRC Bulletin 88-05. This Bulletin deals with nonconforming materials supplied by West Jersey Manufacturing and Piping Supplies Incorporated.

B. Affected System/Safety Function of Affected System

This Justification for Continued Operation affects the Emergency Generator System (USAR Section 8.2.3.1.2), specifically TDI diesel generator GEA2.

The safety function of the Emergency Diesel Generators is to automatically supply the associated 4160V AC Nuclear Service buses upon loss of voltage or SFAS actuation. The Emergency Diesel Generators supply all AC loads necessary to ensure continued operation of essential reactor and station auxiliary equipment.

The District installed the TDI diesel generators to support the additional electrical loads resulting from "TMI Modifications". The Emergency Diesel Generator System consists of two independent and redundant trains with a Bruce-GM diesel (GEA/GEB) and a TDI diesel (GEA2/GEB2) in each train. In Train A, GEA supports bus 4A and GEA2 supports bus 4A2. Similarly, in Train B, GEB supports bus 4B and GEB2 supports bus 4B2. Each train alone is sufficient to accomplish the safety function.

C. Effects on Safety Function/Analysis of Effects

The heat number of the material in question is CFY. This material consists of 2-inch, 150# carbon steel flanges. These flanges are ASME III ND (C13), SA-105 material. A total of eight flanges with heat number CFY were received on site, three are in stock, one was scrapped, and the remaining four were installed in the "A" TDI diesel generator fuel oil system (two in each of two lines).

The maximum calculated combined pipe stress level for code compliance for the "A" TDI diesel fuel oil lines is less than 6000 psi. This figure results in a stress ratio on the fuel oil lines of less than 0.25 (Actual Stress/Allowable Stress). The maximum allowable pressure for a 150#-rated flange at a design temperature of 125°F is approximately 255 psig, whereas the design pressure of the system is only 100 psig. Hence, there exists a conservative margin of safety of over 50%.

The actual tensile strength of the sample was 66,400 psi (see test results, Attachment V). The required tensile strength is 70,000 psi. This results in a reduction of tensile strength of 5.14%. Based on this slight reduction in strength of the flange, when compared to the conservative margin of safety which remains, Engineering has determined that an adequate margin of safety exists to assure the integrity of the fuel oil system and justify the interim use of the flanges. The final disposition is to replace the degraded flanges with materials having proper certification at the next available outage.

D. Summary

Four flanges were installed in the "A" TDI diesel generator fuel oil system which do not meet specification requirements. The District identified these flanges as part of the investigation required by NRC Bulletin 88-05.

This Justification for Continued Operation affects the Emergency Generator System TDI diesel generator GEA2. The TDI diesel generators support the additional electrical loads resulting from "TMI Modifications."

The heat number of the material in question is CFY. This material consists of 2-inch, 150# carbon steel flanges. These flanges are ASME III ND (C13), SA-105 material. Based on the minimal reduction in measured strength of the flange when compared to the conservative margin of safety which remains, the Engineering evaluation concludes that an adequate margin of safety exists to justify the interim use of the flanges.

Attachment V
Anamet Laboratories Test Results

LABORATORY CERTIFICATE

Anamet Laboratories, Inc.

3400 INVESTMENT BOULEVARD • HAYWARD, CALIFORNIA 94546-3811 • (415) 887-8511

Laboratory Number: 688.138
 Purchase Order: RQ-88-08-26278
 S/N: 48961
 Date Submitted: June 13, 1988
 Date Reported: June 21, 1988

Sacramento Municipal Utility Dist.
 Rancho Seco Nuclear Generator Station
 Attn: Jim Holbrook
 14440 Twin Cities Road
 Herald, CA 95638-9799

SUBJECT

Seven fittings were submitted for chemical analysis, tensile and hardness testing. The samples are identified in Appendix 1.

SPECTROCHEMICAL ANALYSIS
 (reported in wt. %)

Requirements
 ASTM A 182-84,
 F304
Min. Max.

Mark:		Heat #104839	Heat #A1040		
Carbon	(C)	0.06	0.01	=	0.08
Chromium	(Cr)	18.95	18.81	18.00	20.00
Manganese	(Mn)	1.64	1.57	=	2.00
Molybdenum	(Mo)	0.24	0.37	Information	
Nickel	(Ni)	10.51	10.45	8.00	11.00
Phosphorus	(P)	0.025	0.022	=	0.040
Silicon	(Si)	0.59	0.30	=	1.00
Sulfur	(S)	0.018	0.024	=	0.030

Requirements
 ASTM A 309-84,
 WP304
Min. Max.

Mark:		Heat #7611		
Carbon	(C)	0.006	=	0.08
Chromium	(Cr)	19.63	18.0	20.0
Manganese	(Mn)	1.03	=	2.00
Molybdenum	(Mo)	0.13	Information	
Nickel	(Ni)	9.96	8.00	11.0
Phosphorus	(P)	0.024	=	0.045
Silicon	(Si)	0.30	=	1.00
Sulfur	(S)	<0.005	=	0.030

LABORATORY CERTIFICATE

Anamet Laboratories, Inc.

HAYWARD, CALIFORNIA

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Lab. No. 688.138

TENSILE TEST

Requirements
ASTM A 182-80,
F304

Mark:	Heat <u>#104839</u>	Heat <u>#A1040</u>	
Diameter of Specimen:	0.357 In.	0.354 In.	
Area:	0.100 Sq.In.	0.0984 Sq.In.	
Tensile Strength:	84500 Psi	76700 Psi	75000 Psi Min.
Yield Strength @ 0.2% Offset:	38800 Psi	34300 Psi	30000 Psi Min.
Elongation in 4D Gage:	61 1/2%	65%	30% Min.
Reduction of Area:	70.4%	74.7%	50% Min.

Requirements
ASTM A 403-84,
WP304

Mark:	Heat <u>#7511</u>	
Diameter of Specimen:	0.249 Inches	
Area:	0.0487 Square Inches	
Tensile Strength:	79600 Psi	75000 Psi Min.
Yield Strength @ 0.2% Offset:	28500 Psi	30000 Psi Min.
Elongation in 4D Gage:	69%	28% Min.
Reduction of Area:	85.2%	35% Min.

Requirements
ASME SA-105,
'77 Ed.,
'78 Add.

Mark:	Heat <u>#CFY</u>	
Diameter of Specimen:	0.349 Inches	
Area:	0.0957 Square Inches	
Tensile Strength:	66400 Psi	70000 Psi Min.
Yield Strength @ 0.2% Offset or 0.5% E.U.L:	41800 Psi	36000 Psi Min.
Elongation in 4D Gage:	36 1/2%	22% Min.
Reduction of Area:	59.6%	30% Min.

LABORATORY CERTIFICATE

Anamet Laboratories, Inc.

HAYWARD, CALIFORNIA

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Lab. No. 688.138

SPECTROCHEMICAL ANALYSIS (continued)

Requirements
ASTM A 105-83,
-84
Min. Max.

Mark:		Heat #AXSX	Heat #41971	Heat #CFW	
Aluminum	(Al)	<0.005	<0.005	0.03	Information
Carbon	(C)	0.28	0.18	0.34	- 0.35
Chromium	(Cr)	0.04	0.12	0.11	Information
Copper	(Cu)	0.04	0.18	0.20	Information
Manganese	(Mn)	0.99	1.23*	0.88	0.60 1.05
Molybdenum	(Mo)	<0.005	0.02	0.05	Information
Nickel	(Ni)	0.03	0.09	0.13	Information
Phosphorus	(P)	0.007	0.013	0.009	- 0.040
Silicon	(Si)	0.12	0.23	0.21	- 0.35
Sulfur	(S)	0.010	0.019	0.013	- 0.050
Vanadium	(V)	<0.005	0.06	<0.005	Information

* Product Analysis - Requirements: Manganese - 0.50% Minimum and 1.35% Maximum.

Requirements
ASME SA-105,
'77 Ed.,
78 Add.
Min. Max.

Mark:		Heat #CFY	
Aluminum	(Al)	0.04	Information
Carbon	(C)	0.20	- 0.35
Chromium	(Cr)	0.04	Information
Copper	(Cu)	0.02	Information
Manganese	(Mn)	0.93	0.60 1.05
Molybdenum	(Mo)	<0.005	Information
Nickel	(Ni)	0.02	Information
Phosphorus	(P)	0.019	- 0.040
Silicon	(Si)	0.21	- 0.35
Sulfur	(S)	0.019	- 0.050

LABORATORY CERTIFICATE

Anamet Laboratories, Inc.

HAYWARD CALIFORNIA

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Lab. No. 688.138

TENSILE TEST (continued)

Mark:	Heat #ASXS	Heat #41971	Heat #CFW
Diameter of Specimen:	0.251 In.	0.349 In.	0.356 In.
Area:	0.0495 Sq.In.	0.0957 Sq.In.	0.0995 Sq.In.
Tensile Strength:	79800 Psi	84100 Psi	94200 Psi
Yield Strength @ 0.2% Offset:	42900 Psi	55400 Psi	51000 Psi
Elongation in 4D Gage:	32%	27%	23%
Reduction of Area:	64.2%	65.9%	50.7%

Requirements: Ultimate Tensile Strength - 70000 Psi Minimum, Yield Strength @ 0.2% Offset - 36000 Psi Minimum, Elongation in 4D Gage - 22% Minimum and Reduction of Area - 30% Minimum per ASTM A 105-33, -84.

BRINELL HARDNESS TEST

(3000 Kg. load; 10mm ball)

<u>Specimen</u>	<u>Result</u>
Ht. #AXSX	152 HB
Ht. #41971	183 HB
Ht. #CFW	183 HB
Ht. #CFY	137 HB

Requirement: 187 HB Max. per ASTM A 105-83, -84 and ASME SA-105, '77 Ed. with '78 Addenda.

This testing was performed in accordance with the purchase order and, with the exception of the tensile results on Ht. #7511 and #CFY, the results meet the listed requirements.

Submitted by:

E. A. Foreman

E. A. Foreman
Manager, Quality Control

3c/bn6:788

LABORATORY CERTIFICATE

Anamet Laboratories, Inc.

HAYWARD, CALIFORNIA

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Lab. No. 688.138

APPENDIX 1

Item No. 1, Distribution/Stock Code #472501, 1 each Flange, Slip-On, RF, 6" 150# S.S. ASTM A 182, F304, Heat #1Q4839 (1984), SMUD Stock Code #702495.

Item No. 2, Distribution/Stock Code #472501, 1 each Pipe Cap, 12" Sch. 40 S.S. ASTM A 403, WP304 Buttweld, Heat #7611 (1984), SMUD Stock Code #702501.

Item No. 3, Distribution/Stock Code #472501, 1 each Flange, Slip-On, 3" 150# RF, S.S., ASTM A 182, F304, Heat #A1040 (1984), SMUD Stock Code 702512.

Item No. 4, Distribution/Stock Code #472501, 1 each Cap, Pipe, 8" Sch. 80 BW CS, ASTM A 105-84, Heat #AXSX, SMUD Stock Code #036926.

Item No. 5, Distribution/Stock Code #472501, 1 each, Flange, Slip-On, 3" 150# RF, ASTM A 105-83, Sch. 80, Heat #CFW Carbon Steel, SMUD Stock Code 701279.

Item No. 6, Distribution/Stock Code #472501, 1 each, Flange, 2" - 150#, SW RF, ASME III ND (C13) SA-105, Heat #CFY, Carbon steel, 77 edition - 78 Addenda, SMUD Stock Code #113345.

Item No. 7, Distribution/Stock Code #472501, 1 each Flange, Slip-On, 5" - 150# RF, CS, ASTM A 105, Heat #41971 (1984), SMUD stock code #702395.