

Washington Public Power Supply System  
A JOINT OPERATING AGENCY

AO/H

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

July 17, 1980

U. S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Washington, D.C. 20555

Attention: Victor Stello, Jr., Director

Subject: WPPSS NUCLEAR PROJECT NO. 2  
DOCKET NO. 50-397, EA-80-20,  
NOTICE OF VIOLATION AND ADDITIONAL INFORMATION - 10CFR50.54(f)

Dear Mr. Stello:

The purpose of this letter and its attachments is to respond to the 50.54(f) letter, your related instructions, and the requirements of NRC regulations. Our reply consists of the summary provided by this letter and the more detailed information provided in the attachments, which include plans and schedules which respond to the items of concern.

Due to the scope of the evaluations requested and the need to obtain meaningful results at the earliest time, it has been necessary to break down the actions into short term, intermediate and continuing phases. Programs and actions associated with each of these phases are described below:

Phase I - Short Term

- o Management resources have been allocated to three Task Forces to develop plans to a) expedite resolution of outstanding problem backlog at WNP-2, b) verify adequacy of prior work, and c) assure the management systems used to control continuing work are adequate.
- o Each Task Force has been directed to review standards of performance and detailed controls for work methods. Recommendations for improvements will be a principal output of the Task Force efforts.
- o A requirement for approval by the Assistant Director of Technology prior to resumption of installation activities was placed on the WNP-2 major mechanical contract on June 19 pending additional owner evaluation of work methods, controls, and establishment of standards of performance. Key personnel were assigned to perform the evaluation.

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- o A plan has been established to perform summary evaluations of other contractors current work controls at WNP-2 to reassure ourselves that quality controls are effective and that resumption of work following the current labor related work stoppage would have minimal risk of quality problems and would not preclude inspection of past work.

Accordingly, on July 17, we directed all contractors doing safety-significant installation work at the site to stop that work until these reviews are completed.

#### Phase II - Intermediate

This phase will last until January 1, 1981 and will include:

- o Completion of all reviews of safety-related hardware and records associated with those cases where past quality problems occurred and in those cases where timely review is essential to integrate with the startup sequence or is essential for timely evaluation of management controls. The overall review plan is given in Attachment 1.
- o The results from the above reviews will be applied to our evaluation of management controls, and any necessary changes will be made to WNP-2 in this phase.

#### Phase III - Continuing

- o The reviews of safety-related hardware and records will be completed in this phase and knowledge gained in reviewing past work at WNP-2 will be applied to evaluations of management control systems at all projects.
- o Further changes will be made in construction management systems which increase owner awareness of contractor and subcontractor activities. Where necessary, Owner personnel will be resident with contractors for a sufficient time to evaluate work methods and quality controls. Additionally, certain contractor procedures are being individually analyzed and necessary improvements will be made. These actions will improve working level communication with the Owner and will permit more timely action to resolve problems.
- o It is recognized that the resolution of outstanding concerns and problems at WNP-2 requires additional resources, more management involvement, improved performance standards, and improved tracking systems designed to inform project management of deviations from performance standards and require timely resolution and follow-up. Detailed recommendations will be made by the Task Forces.
- o The quality assurance program will be augmented by more project, construction and engineering management awareness and involvement in resolution of quality problems.

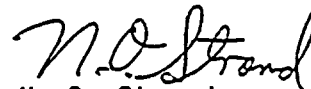
Mr. Stello  
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In both the intermediate and continuing phases, the following conditions will apply:

- o Reports on these contract-by-contract reviews will be prepared and given to the NRC Resident Inspector, and forwarded to Region V every two months until completion.
- o Repairs or further action on identified deficiencies will be reported in accordance with 10CFR50.55(e) and Part 21. Deficiencies not meeting these criteria will be in the periodic reporting and available for review by the Resident Inspector.
- o In addition to the contract-by-contract review presented in the schedule associated with the 50.54(f) response, we have provided a model of our strengthened system verification process, which provides further assurance of the acceptability of components and structures integrated into a system.

In conclusion, I reiterate that our corporate energy is dedicated to compliance with law, our public responsibility for nuclear safety and the need to resolve these issues on a rigorous schedule.

Very truly yours,

  
N. O. Strand  
Managing Director

Attachments:

- 1) Plan and Schedule
- 2) Example Application of Review Criteria to 216 Contract
- 3) Features and Scope of The Supply System's Management Task Forces
- 4) Model of System Verification Program
- 5) Preliminary Plan and Near-Term Actions, 215 Contract
- 6) Recent Actions To Strengthen Control of the Project

NOTICE OF VIOLATION AND ADDITIONAL INFORMATION -  
10 CFR 50.54(f)

STATE OF WASHINGTON

COUNTY OF BENTON

SS

NEIL O. STRAND, Being first duly sworn, deposes and says: That he is the Managing Director of the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the permit holder herein; that he is authorized to submit the foregoing on behalf of said permit holder; that he has read the foregoing and attachments listed therein and knows the contents thereof; and believes the same to be true to the best of his knowledge.

DATED: July 17, 1980

N. O. Strand  
N. O. STRAND

On this day personally appeared before me N. O. Strand to me known to be the individual who executed the foregoing instrument and acknowledged that he signed the same as his free act and deed for the uses and purposes therein mentioned.

GIVEN under my hand and seal this 17th day of July, 1980.

Reba B. Helgeson  
Notary Public in and for the State of  
Washington  
Residing at Richland



ATTACHMENT 1  
PLAN AND SCHEDULE  
FOR REVIEW OF COMPLETED SAFETY-RELATED WORK  
WNP-2

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A. SUMMARY

This program describes the plan the Supply System will implement for the review and/or reinspection of completed safety-related work to determine the adequacy of documentation, installation, and hardware. Also included, is a schedule for the review of contractors, subcontractors and pre-purchased equipment contractors.

B. OBJECTIVES

The objectives of this program are to:

- o Determine whether the quality assurance program was adequate in the past to assure completed safety-related work was properly performed.
- o Identify need for repairs or further action.
- o Apply knowledge gained to the review of QA programs at other Supply System Nuclear Projects.

C. POLICIES

The review and/or inspection of safety-related work at WNP-2 will be accomplished in accordance with the following policies;

- o Review of records, installation and hardware will be accomplished under Owner direction and control.
- o The review shall be integrated with on-going work plans and management systems to assure proper priority, feedback to on-going work, and to adjust the review in response to knowledge acquired.
- o This program will have priority over on-going work. The project construction work pace will be adjusted accordingly.
- o The basis for key decisions will be documented.

D. SCHEDULE

The schedule for this program will permit timely changes in control methods and will ensure thoroughness and validity of conclusions reached.

The schedule is as follows:

1. Complete review plan details, mobilize forces, and initiate review of contractors, sub-contractors and prepurchased equipment contractors. 8/1/80
2. Establish priorities for review of work activities that are critical to the restart of work and Project completion milestones.
  - o Refine criteria for determining critical items and activities 8/1/80 to 8/15/80
  - o Test criteria and plan workability 8/1/80 to 8/15/80
  - o Complete priority reviews 8/15/80 to 1/1/81
3. Overall schedule:
  - o Completion date for documentation review, preliminary inspections, and establishment of plan and schedule for further inspections 3/31/81
  - o Notification to NRC of progress Bi-monthly (Beginning 10/1/80)

E. PROGRAM DESCRIPTION

The basic elements of the review and/or reinspection program are described below:

1. Identify all contractors, subcontractors, and prepurchased equipment contractors performing safety-related work, the status of their work and the status of final documentation review.
2. The review and/or reinspection program will be accomplished using the following process. The attached logic diagram depicts the program.
  - 2.1. Determine the criticality and priority of items for review and/or reinspection:

2.1.1 Evaluate the significance of the safety function, complexity of construction, time period of construction or fabrication activity, assessment and trending of deficiency documentation and discussions with selected craft and quality control personnel.

2.1.2 Identify all contractors with critical work remaining. These contractors will be the first priority for review under this program. All other contractors will be in the second priority group. Ranking within the groups will be based on criticality, past experience and the system turnover plan.

2.1.3 Identify and evaluate all contractors with any work remaining which could limit access for re-inspection of completed critical work.

2.2 Determine whether other inspection or evaluation program have satisfied or will satisfy the requirements of this program. (Examples are sacrificial shield wall evaluation and pre-service inspection program.)

These inspections or evaluations will be referred to Engineering for a documented evaluation of compliance with reinspection objectives. Quality Assurance and management will review and approve results.

## 2.3 Record Review

A review of a significant number of quality records for critical items shall be performed. This review shall include:

### 2.3.1 Quality and work procedures

- o Verify that procedures incorporate applicable requirements from the SAR, specification, code and standards.
- o Verify that procedures were approved by appropriate approval authorities.
- o Verify that welding and special process procedures were qualified.



- 2.3.2 Review personnel (welding/NDE/QC/Engineering) qualifications to determine whether they were qualified.
- 2.3.3 Review deficiency reports (NCRs, CARs, IRs, RFIs etc.) for the following.
  - o Significance of backlog on quality aspects.
  - o Quality of dispositions as written.
  - o Quality of dispositions as implemented.
- 2.3.4 Review selected sample of work packages for:
  - o Completion of all required inspections.
  - o Use of proper forms.
  - o Completeness of package.
  - o Adequacy of review by contractor personnel.
- 2.3.5 If significant problems are identified, escalation of records review will be applied as shown in the logic diagram.

#### 2.4 Receipt Inspection

Evaluation of site contractor receipt inspection programs will be conducted.

- 2.4.1 Critical items received by the contractors will be identified.
- 2.4.2 Contractors' documented receiving inspection programs will be reviewed for adequacy. This review shall include the following considerations:
  - o Inclusion of PSAR and Specification requirements.
  - o Receiving Inspection personnel qualifications.
  - o Use of drawings, vendor data and/or vendor specifications.

- o Review of deficiencies identified subsequent to receipt inspection to determine if they should have been documented at receipt.

2.4.3 If the receiving inspection program is judged to not be adequate, a significant sample of installed hardware shall be reinspected.

2.4.4 If the receipt inspection program is judged adequate, a smaller sample of reinspection shall be accomplished.

2.4.5 Significant problems identified during the reinspection program shall result in a progressively larger sample size.

## 2.5 Installation Reinspections

Installation reinspection not covered by the reviews performed in 2.2 shall be accomplished as follows:

2.5.1 Critical work activities within the contractors' scope of work shall be identified. Critical work activities are determined as identified in Section 2.1.

2.5.2 A significant sample of work activities will be selected for reinspection.

2.5.3 Reinspection shall independently verify adequacy of the activity, as well as the accuracy of the associated records.

2.5.4 If significant problems are found in the installation, a progressively larger sample will be reinspected.

## 2.6 Deficiencies

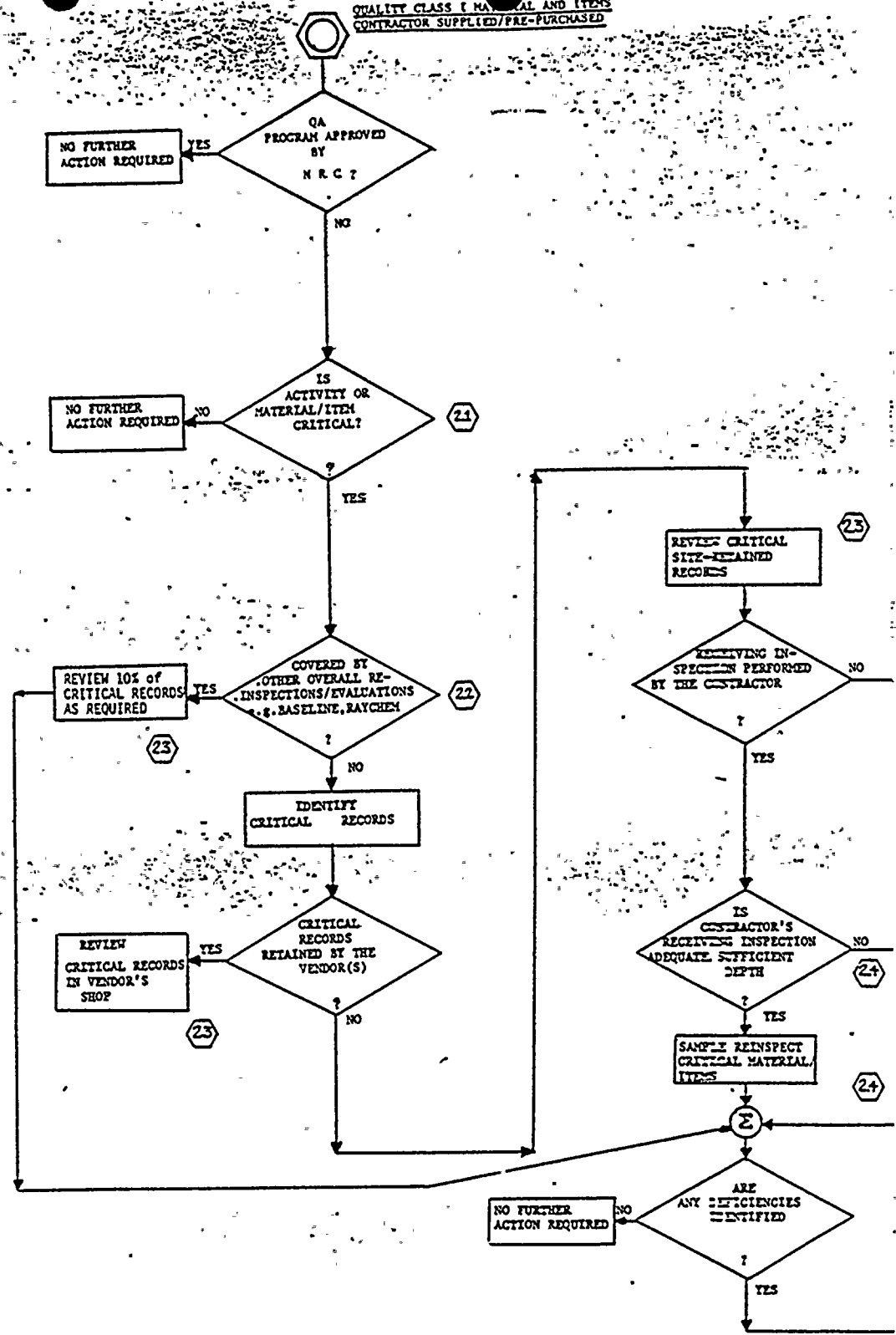
Deficiencies identified during the performance of record review, reinspection of installations and reinspection of received material shall be documented.

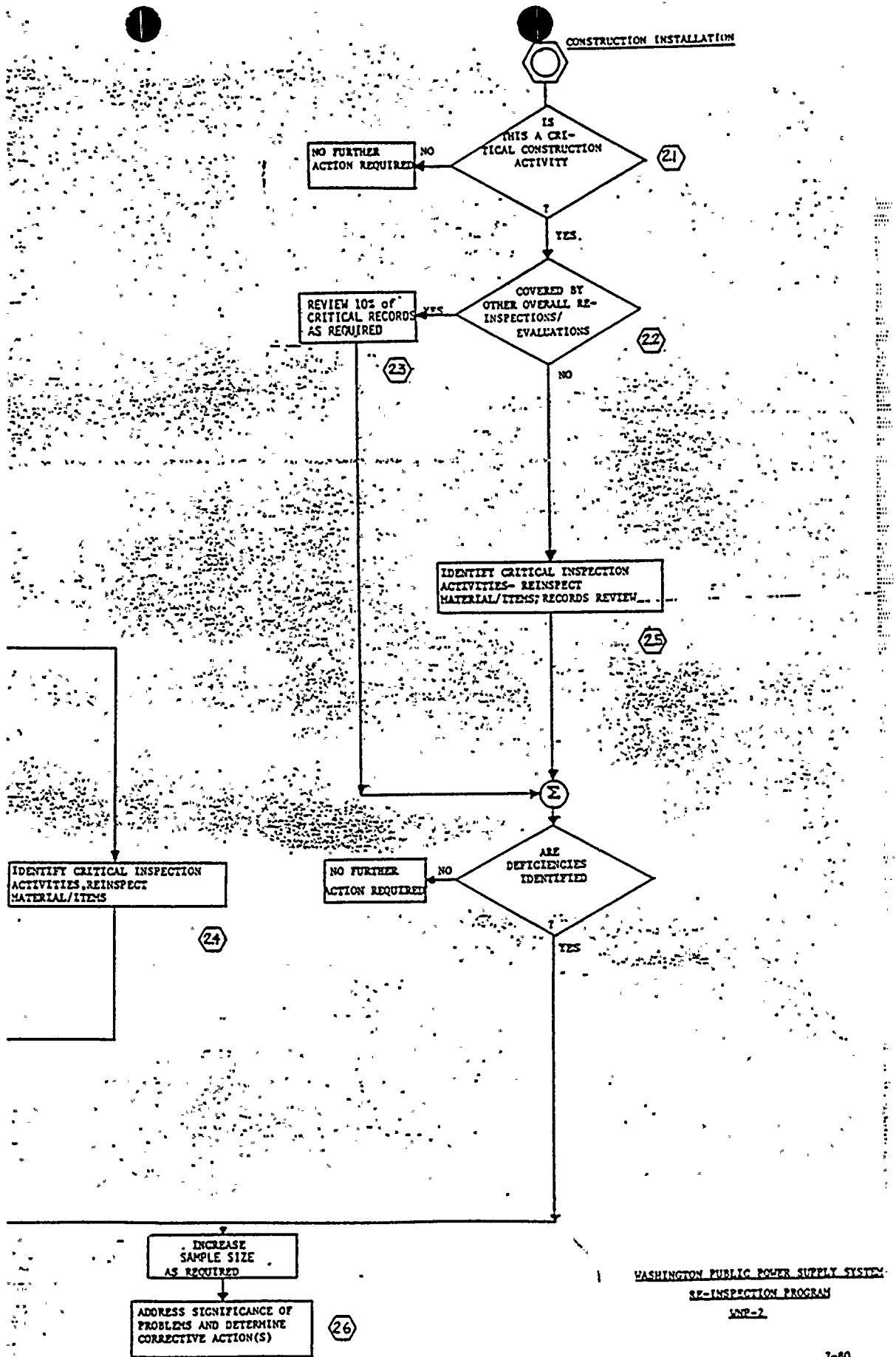
2.6.1 An analysis of the number and types of deficiencies identified shall be performed to determine the root cause of the problem and appropriate corrective action initiated. Relevant information will be communicated to all Projects.

2.6.2

Deficiencies meeting the requirements of 10CFR50.55(e) and/or Part 21 shall be reported to the NRC in accordance with approved procedures. Others shall be summarized in the bi-monthly report to the NRC Region V office.









ATTACHMENT 1  
PRELIMINARY  
PREPURCHASED CONTRACT SCHEDULE - QC I

Contractor/Subcontractor	Description of Contractors' Work	Contract Status (% Complete)	Status of Owner Final Documentation Review (% Complete)	Schedule	
				Review/Reinsp. Initiated	* Review Completed
2808-2 General Electric	HSSS	95%	61%	10/1/80	1/1/80
7 Science Systems & Technology	Seepage control from ponds	100%	85%	8/1/80	9/1/80
18 Farr Company	Standby Gas Treatment & HEPA Filters	85%	60%		
22A Joy Manufacturing	INAC Fans	100%	93% Note 1	9/1/80	9/15/80
23 Byron Jackson	Standby Service Water Pumps	100%	Note 3	9/30/80	12/8/80
24 Inlco, Inc.	Shop fabricated tanks	100%	Note 3	9/30/80	12/8/80
28 Buffalo Forge	INAC Fans	75%	88% Note 1	9/1/80	11/3/80
31A Whiting	Turbine Rm & Reactor Bldg Cranes	98%	95% Note 1	9/1/80	11/3/80
32CD Clayton	Jib Overhead Cranes	95%	90% Note 1	9/1/80	11/3/80
35A Crane Co.	Pumps & motors	95%	99% Note 1	9/15/80	11/19/80
36 ACME Concrete	Production & delivery of concrete	89%	75%	10/6/80	11/24/80
41A Valan Valve	Nuclear valves	96%	99% Note 1	9/15/80	11/28/80
41B Anchor/Darling	Nuclear valves	93%	80%	10/6/80	11/28/80
42A Fisher Controls	Control valves	95%	95% Note 1	9/15/80	10/27/80
42B Fisher Controls	Control valves	95%	Note 3	10/1/80	11/28/80
47A Westinghouse	Switchgear	94%	60%		
48 Westinghouse	480 Volt substation	94%	83% Note 1	9/15/80	11/17/80
49 I-T-E Imperial	Motor control centers	95%	92% Note 1	10/13/80	12/15/80
51A ESD Inc.	Batteries	66%	96% Note 1	1/13/80	12/15/80

Notes:

1. WNP-2 QA has completed a review of all available documentation and identified missing or incomplete documents.
2. All deficiencies resolved. Contract closed out.
3. Lack of record to substantiate known earlier reviews will require sampling for confirmatory overview.

\*Review completed denotes scheduled date for completion of documentation review and plans and schedules for any further inspections.



**ATTACHMENT 1  
PRELIMINARY  
PREPURCHASED CONTRACT SCHEDULE - QC 1**

Contractor/Subcontractor	Description of Contractors' Work	Contract Status (% Complete)	Status of Owner Final Documentation Review (% Complete)	Schedule	
				Review/Reinsp. Initiated	* Review Completed
2808-51B Power Conversion	Battery Chargers	76%	93% Note 1	10/13/80	12/15/80
52 Solid State Controls	Uninterruptible power supply	100%	No review Note 3	9/15/80	12/15/80
53 Stewart Stevenson	Diesel Generators	100%	94% Note 1	9/15/80	12/1/80
55 Westinghouse	Containment Electrical Penetrations	100%	No review Note 3	9/8/80	11/28/80
57 Kinometrics	Accelerometer	80%	No review Note 3	9/8/80	11/10/80
58 Jelco	Instrument racks	99%	100% Note 2	9/15/80	9/30/80
59 GE	Instrument & Control Brds.	100%	95%		
62A Okonite	Cable	95%	100% Note 2	9/15/80	9/30/80
62B Raychem	Cable	95%	80%		
62C Rockbestos	Cable	80%	No review Note 3		
67 H.K. Porter	Air handling units	95%	100% Note 2	9/15/80	9/30/80
68 BIF	Isolation valves	98%	96% Note 1	10/20/80	12/20/80
69 Velan	Check valves	79%	94%	11/10/80	1/1/80
71 Air Products & Chemicals	Hydrogen recombiner	94%	87% Note 1	10/20/80	12/22/80
73 Elger Corp.	15KVA Inverters	100%	No review Note 3	10/20/80	12/22/80
90 Leckenby	Pipe Whip Restraints	100%	** 100%		None
92A Ingersoll Rand	Sampling probes	---	No review	9/8/80	10/30/80
92B Kaman Sciences	Vacuum breaker valves	---	No review	9/8/80	10/30/80
93 GPE Controls	Vacuum breaker valves	95%	93% Note 2	9/15/80	9/30/80
94 B.F. Shaw	HSRV discharge	100%	92% Note 1	10/20/80	12/22/80

\*Review completed denotes scheduled date for completion of documentation review and plans and schedules for any further inspections.  
 \*\*Corrective Action Plan transmitted to HRC, approved and implemented.

ATTACHMENT 1  
PRELIMINARY  
SITE CONTRACTOR & SUB-CONTRACTOR SCHEDULE

Contractor/Subcontractor	Description of Contractors' Work	Construction Status (% Complete)	Status of Owner Final Documentation Review (% Complete)	Schedule	
				Review/Reinsp. Initiated	* Review Completed
<u>2808-205</u> Stewart Erikson	Reactor Bldg Substructure	100%	50%	8/1/80	10/1/80
<u>206</u> Rovee-Craig	General Const.	Defaulted	100%	8/1/80	12/30/80
Pybus Steel					
Livermore Rebar					
Brand Industries					
US Elevator					
Signal Hill					
HF Lampson					
Meta Fab					
Simes Const.					
OB Cannon					
<u>206A</u> Peter Kiewit	Architectural Construction	100%	70%	8/1/80	12/1/80
West Valley Steel					
Bostrom-Bergen					
HIX					
<u>207</u> PMH	Structural Steel	100%	70%	8/1/80	11/1/80
<u>209</u> Rigging Into	Rigging of Reactor	100%	50%	9/1/80	9/15/80
	Pressure Vessel				
<u>210</u> Peter Kiewit	Architectural Const.	90%	80%	9/1/80	10/15/80
Valley Sheet Mtl.					
Barclay Dean					
Inland Glass					
Rayproof Corp.					
EJ Bartells					
Fryer-Hoble					
Acoustical Design					
Kewaunee Scientific					
Alodon Co.					
Western Tile					
Swan-Storm					
Lyon Metal Inc.					
Chas. Fraser Inc					

\*Review completed denotes scheduled date for completion of documentation review and plans and schedules for any further inspections.

ATTACHMENT 1  
PRELIMINARY  
SITE CONTRACTOR & SUB-CONTRACTOR SCHEDULE

Contractor/Subcontractor	Description of Contractors' Work	Construction Status (% Complete)	Status of Owner Final Documentation Review (% Complete)	Schedule	
				Review/Reinsp. Initiated	* Review Completed
<u>213</u> PMH Clark Paint Co.	Primary containment vessel	100%	70%	8/4/80	10/1/80
<u>213A</u> PMH Continental Field Machining Peter Kiewit/Sons Brand Hanford	Containment Vessel Retrofit	85%	20%	8/4/80	11/1/80
<u>215</u> HDG H.H. Pope Co. Livermore Steel Brand Insulation GEI&SE Belmont Eng'g Sime Const. Co. Pybus Steel Leckenby HPS HIX Huico Seattle Industrial Pacific Testing CDI Corp. Concrete Coring Disco		78%	65%	7/28/80	1/1/81
				Mechanical Equipment Application of rationale to contractors' work scope will be applied by specific area:	
				Concrete	Start 7/28/80 Complete 9/1/80
				Structural	8/4/80 12/1/80
				Piping:	
				Sm. Bore	8/4/80 10/1/80
				Lg. Bore	8/18/80 12/12/80
				Materials/Component	
				Procurement	9/15/80 12/1/80
				Documentation	10/1/80 12/1/80
				Processing	
<u>216</u> Haldinger Industrial Pibg & Heating Powers Regulator Sime Const. Co. OD Cannon Peter Kiewit/Sons Able Balance	HVAC & Plumbing Installation.	85%	45%	9/8/80	12/1/80

\*Review completed denotes scheduled date for completion of documentation review and plans and schedules for any further inspections.



ATTACHMENT 1  
PRELIMINARY  
SITE CONTRACTOR & SUB-CONTRACTOR SCHEDULE

Contractor/Subcontractor	Description of Contractors' Work	Construction Status (% Complete)	Status of Owner Final Documentation Review (% Complete)	Schedule	
				Review/Reinsp. Initiated	* Review Completed
<u>2808-217</u> Sentry Automatic Lord Electric	Fire protection system	64%	0%	9/15/80	12/1/80
<u>218</u> Fischbach/Lord Sime Const. Bisco Peter Kiewit/Sons KPS PDH Chemtrol	Electrical installation	85%	40%	9/29/80	12/30/80
<u>219</u> OB Cannon	Special coatings	48%	40%	9/1/80	10/1/80
<u>220</u> Johnson Controls OB Cannon NIX Testing	Instrumentation Installation	65%	55%	10/6/80	12/30/80
<u>225</u> McMillin Bros. Signal Hill Coast Marine Lil Johnson AD Stanley & Assoc. Pittsburgh Testing Foster Sheet Metal Paving Inc.	Make-up Water Pumphouse	100%	50%	10/6/80	11/1/80
<u>226</u> Sime Const.	Reactor Bldg Excavation	100%	70%	8/25/80	10/6/80
<u>233</u> B.F. Shaw Livermore Steel ACHE Concrete Columbia Sand & Gravel	Spray Pond Alteration	100%	100%	10/20/80	10/30/80
<u>234</u> OB Cannon	Metwell Containment Painting	1%	0%	9/1/80	9/30/80
<u>235</u> GEI&SE	Instrument & Control Board Mod.	95%	55%	10/6/80	12/31/80

\*Review completed denotes scheduled date for completion of documentation review and plans and schedules for any further inspections.



## ATTACHMENT 2

### EXAMPLE APPLICATION OF REVIEW CRITERIA TO 216 CONTRACT

#### A. RATIONALE FOR THE SELECTION OF ITEMS TO BE EVALUATED

For each safety-related contractors' scope of work or portion thereof, the following criteria will be utilized to select items to be evaluated.

1. Physical work must be complete or close to completion.
2. Select the most safety-significant work or items.
3. Select work where record review status is lagging the physical completion.
4. Select known problem areas as defined in:
  - a) IE Bulletins/Circulars
  - b) 50.55(e)s/Part 21
  - c) Corrective Action Requests (CARs), Nonconformance Reports (NCRs) and audit findings
  - d) NRC Items of noncompliance and Items of Concern
5. Select work or items which are complex.
6. Do not select areas where significant corrective actions have occurred which corrected known deficiencies.

CONTRACT 216 THE WALDINGER CORPORATION

B. QUALITY CLASS 1 WORK SCOPE BY SPECIFICATION SECTION

Section 3A Cast-In-Place Concrete

1. Purchase of concrete
2. Furnish labor, material and equipment.
3. Installation including all items and accessories as specified by contract.
4. Furnish all data and information specified by contract (Documentation).
5. Perform all testing specified by contract.

Section 5A Reinforcing Steel

1. Furnish labor, material and equipment.
2. Detailing, fabrication, delivery, handling and storage.
3. Installation, including all items, supports and accessories.
4. Furnish all shop drawings and information specified by contract.
5. Perform all tests specified by contract.

Section 15B Essential Heating, Ventilation and Air Conditioning Systems

A. Area;

- (a) Primary Containment Cooling System.
- (b) Reactor Building Emergency System.
- (c) Standby Service Water Pump House.
- (d) Diesel Generator Building Heating & Ventilation Systems.
- (e) Control Room, Cable Spreading Room, and Critical Switchgear Rooms - Heating, Ventilation and Air Conditioning Systems.
- (f) Diesel Generator Building Cable Cooling System.

B. Work;

- (a) Furnish all HVAC System equipment specified.
- (b) Installation of HVAC equipment.
- (c) Furnish and install all HVAC System duct work and accessories as specified by contract.
- (d) Furnish and install all HVAC piping and accessories as specified by contract.
- (e) Furnish and install all controls, control panels, control tubing and accessories as specified by contract.
- (f) Test and balance all systems.
- (g) Furnish and install concrete, structural, foundation and anchor bolts for all pad mounted equipment.





Section 15C Balance of Plant Heating, Ventilating and Air Conditioning Systems

A. Area;

- (a) Reactor Building H & V System.
- (b) Office Area & Lab.
- (c) Water Treatment Area & Machine Shop H & V.
- (d) Turbine-Generator Building H & V.
- (e) Radwaste Building HVAC.
- (f) Radwaste Building Chilled Water System.
- (g) Plant Heating Steam System.
- (h) Circulating Water Pump House Area HVAC System.
- (i) Off-Gas Charcoal Absorber Vault Refrigeration System.

B. Work;

- (a) Furnish all equipment for the HVAC Systems specified by contract.
- (b) Install all equipment (furnished by owner) for the HVAC System as specified by contract.
- (c) Furnish and install all HVAC ductwork and accessories specified by contract.
- (d) Furnish and install all HVAC System piping and accessories specified by contract.
- (e) Furnish and install all instruments and control, control panels, including internal wiring and tubing specified by contract.
- (f) Testing and balancing of all systems specified by contract.
- (g) Furnish and install concrete pads or foundations including anchor bolts for pad mounted equipment installed by contractor.

Section 15E Piping and Tubing Supports

Including all necessary engineering, design, development, drawings, materials, services, fabrication, furnishing, delivery and erection of all piping and tubing supports, for all piping and tubing. The term, "piping and tubing supports" shall cover all required hardware as specified by contract. It also includes all necessary engineering, design, fabrication, furnishing, delivery, drawings and erection of all necessary supplementary steel for all piping supports.

Section 15F Essential Fan Coil Units

Includes the design, fabrication, shop testing, delivery and technical direction of installation and field testing of the fan coil units. These consist of the 5 reactor building MCC room and analyzer room fan coil units with all accessories, including piping, wiring, test, inspection and documentation.

Section 50A Panels & Racks (as described in Section 15B, C, E, & F)

Supply control boards, panels and local instrument racks completely fabricated, wired (internal), piped and mounted with all accessories. Provide accepted drawings, procedures, shop test reports and supporting installation and test documentation.

C. EXAMPLE OF APPLICATION OF RATIONALE FOR SELECTION OF COMPLETED ITEMS FOR REVIEW

Objective: Assess Contract scope of work 3A (Cast-In-Place Concrete) and 5A (Reinforcing Steel) against rationale for selection of items to be evaluated.

Rationale for the selection of completed items for review:

1. Is the work completed?

Answer: Contractor's concrete work, the installation of equipment pads (including grouting) is estimated to be 95% complete.

The following essential equipment pads are 100% complete.

<u>Pad No.</u>	<u>Equipment No.</u>	
18	WMA-AH-51A	Control Room
19	51B	Control Room
20	52A	Cable Spreading Room
21	52B	Cable Spreading Room
22	53A	Control Switchgear Room
23	53B	Control Switchgear Room

2. Is work safety significant and why?

Answer: Yes, support by the pads is essential for the safe shutdown and normal operation of the plant.

3. What is the status of record review?

Answer:

(a) Contractor review of applicable records is 80% complete.

(b) WNP-2 review of applicable records is 0% complete.

Problem:

With the equipment pad work 95% complete and only 80% of the records reviewed by the contractor, the potential for identifying deficiencies is large. Additionally, the WNP-2 record review must be expedited to assure timely record review completion.

4. Are there known deficiencies?

Answer:

Yes (see below)

<u>Categorization</u>		<u>Significance</u>
NCR 05791	Disposition Control	No inspection documentation for anchor bolting.
NCR 05792	Lack of passing on contract requirements.	Known grouting problem. (Pads must also be grouted).

Previous NRC Findings:

Vendor/sub-contractor control	Previous NRC findings relating to inadequate sub-contractor control. All concrete work sub-contracted.
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Resolution of the NCRs and CARs must be expedited to determine the impact on completed work.

5. Is completed work a known problem area?

Answer: Yes, WNP-2 has not reviewed the records for the equipment pad and there are known problems associated with grouting and anchor bolting.

6. Is work simple or complex?

Answer: Repairs, if required, may be complex because the repair may require the removal of the equipment from the pads.

7. Any substantial corrective action which may have reduced the problem?

Answer: Resolution of the NRC Findings relating to sub-contractor control should have reduced the potential of further vendor/subcontractor work being inadequate.

Conclusion:

1. Expedite resolution of NCRs and CARs to determine if rework is required.
2. Perform sample review of completed installations and backlog of documentation to determine adequacy of completed work using review checklist.

CHECKLIST FOR THE REVIEW OF ESSENTIAL  
EQUIPMENT PADS

1. Drawings of the pads and equipment placement will be reviewed for approval.
2. Documentation Review
  - a) Review material acceptability/traceability for rebar, splicing, embedded items, concrete grout. Check Purchase Orders and receiving inspections for adequacy.
  - b) Check for approval by AE of concrete or grout mixes.
  - c) Check for contractor approval of vendors.
  - d) Review Inspection Reports, Nonconformance Reports, Requests for Information for adequate disposition. Identify any documents not dispositioned. Determine impact on completed work.
  - e) Review inspection documents for pre-placement, placement and post-placement activities for sign-off. Determine that inspection activities were completed as required by procedures.
  - f) Review inspector qualifications for adequacy.
3. Reinspection Activity

Inspect six (6) completed equipment pads for the following:

  - a) Using drawings and previous inspection checksheets, verify that pad size, shape and location is accurate and correlates with previous inspection.
  - b) Inspect anchor bolting for appropriate number, size and location.
4. Review and reinspection actions shall be documented.
5. Findings shall be analyzed and a determination made as to whether concrete and grouting work is satisfactory.
6. Sample size will be increased if deficiencies are identified.
7. Required corrective actions, if any, will be identified.



### ATTACHMENT 3

#### FEATURES AND SCOPE OF THE SUPPLY SYSTEM'S MANAGEMENT TASK FORCES

The Supply System has organized three interrelated task forces to respond to the NRC's requests of June 17, 1980. These task forces functions are as follows:

1. Expedite resolution of outstanding WNP-2 concerns/problems.
2. Verify that previously completed WNP-2 work is adequate.
3. Assure the management systems used to control continuing work are adequate.

Task Forces Two and Three are in direct response to the 50.54(f) request for information; Task Force One provides necessary information to Task Force Two and deals directly with an area of NRC comment.

#### MAJOR FEATURES OF TASK FORCES:

- o They are programmed to give results in immediate, interim and completion time phases on prioritized bases to meet overall program requirements.
- o Program definition and implementation will be performed under close senior management review.
- o All significant evaluations will be performed under Supply System management and control.
- o Program implementation and results will be subject to independent review.
- o Program implementation and results will be reported and reviewed periodically by senior management and applied to other projects as appropriate.

#### SCOPE OF TASK FORCES:

- o Task Force One performs initial review of outstanding problems such as nonconformance report closeout, outstanding requests from contractors for information, etc. The backlog of such problems and the associated management systems to control or closeout the problems are to be reviewed. Recommendations from this task force will be used to improve certain controls over backlog and establish short term goals for reduction of backlog. More engineering support may be indicated to accomplish the proposed goals.



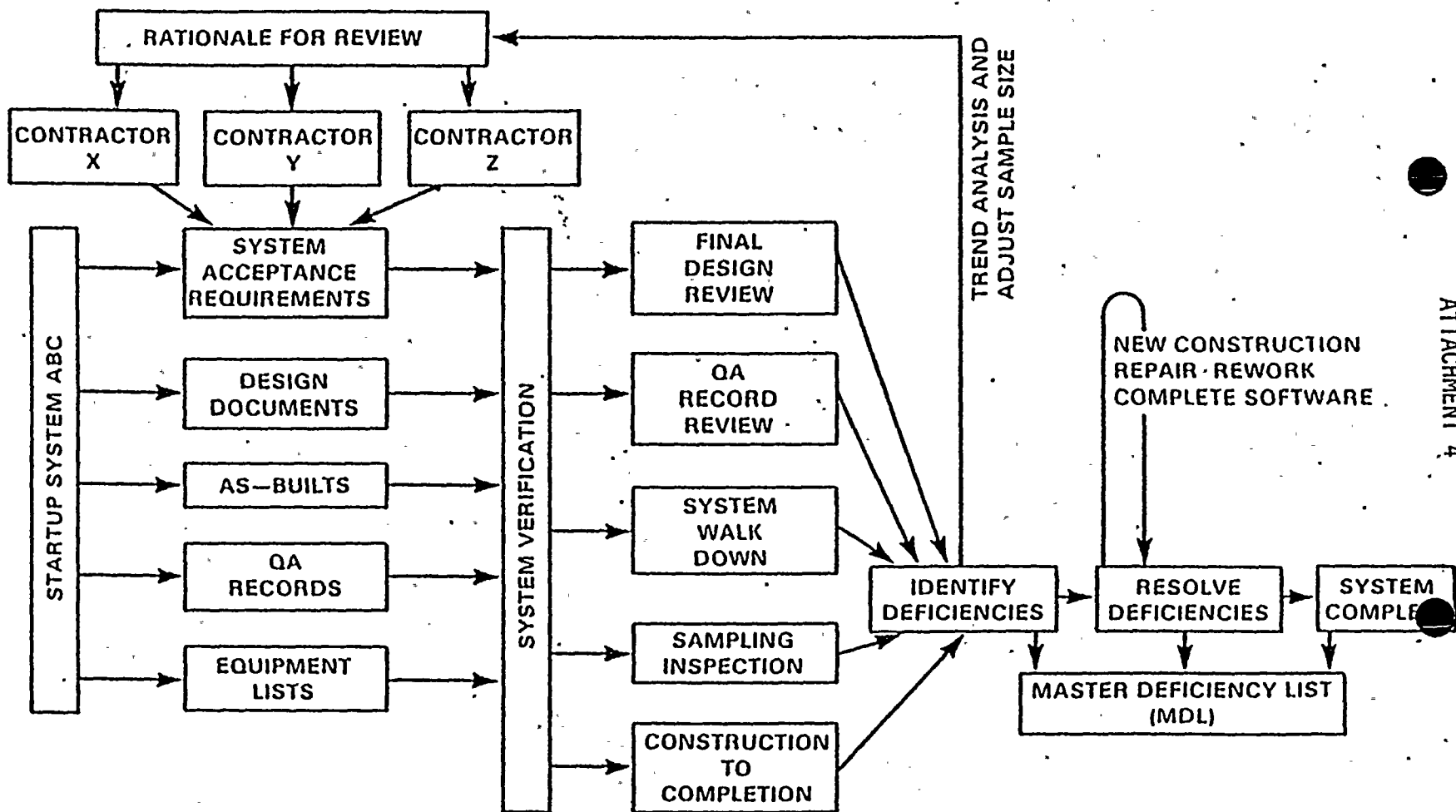
Knowledge gained from this review feeds into Task Two for evaluation of prior work and Task Three for review of management systems.

- o Task Force Two is described in Attachment I to this letter. Knowledge gained from the evaluation of completed work will be utilized in trend analysis and will also input to task three for evaluation of overall management systems.
- o Task Force Three, will review and strengthen management systems, will take the knowledge gained from the first two tasks, consider the management system changes made over the past two years, and determine the need for additional improvements.

Included in this task is a review of various consultant comments regarding Quality Assurance improvements.

We will be focusing on improving methods throughout the organization to systematically identify and correct underlying causes of problems and to do so in a timely manner.

# SYSTEM VERIFICATION MODEL





## ATTACHMENT 5

### PRELIMINARY PLANS AND NEAR TERM ACTIONS ON CONTRACT 215

#### 1. Personnel Qualifications

A review of personnel qualifications of contractor welding, QC, NDE and Engineering personnel will be performed.

#### 2. Inspection Reports (IRs)

2.1 A substantial sample of contractor IRs that were dispositioned internally, i.e., did not result in NCRs submitted for Owner/Engineer disposition, will be reviewed. The review will verify the quality of dispositions as written and as implemented. A trend analysis will be performed and required corrective action will be initiated. Backlogs will be reviewed for significance on quality.

2.2 The contractor's internal procedures will be revised to require feedback to the originator of the IR.

#### 3. Audit and CAR History

Internal and external audit findings and Corrective Action Reports will be reviewed. Closure of open items will be expedited. A trend analysis will be performed and corrective action initiated. A review will be made of the quality of dispositions as written and as implemented. Backlogs will be reviewed for significance on quality.

#### 4. Nonconformance Reports (NCRs)

All NCRs issued since July 1979 will be reviewed for trends. All open NCRs will be prioritized and an expedited schedule developed for their disposition. A review will be made of the quality of dispositions as written and as implemented. Backlogs will be evaluated for significance on quality.

#### 5. Training

The adequacy of the contractor training program will be reviewed by an independent team and upgraded as necessary.



6. Procedure Adequacy

A review will be made of existing studies of discrepancies between contractor's procedures, specification requirements and the SAR. An expedited schedule will be established to reconcile discrepancies.

7. QA Record Controls

Current controls for custody of quality-affecting records will be reviewed and enhanced, as necessary.

8. Critical Work Activities

A study of critical work activities has begun and will be pursued. The study will be aimed at procedure simplification, increased accountability, and establishment of performance indicators to enable timely monitoring of adverse quality trends including high reject rates.

The following work activities have been selected for review at this time:

- (a) Large bore hanger installation
- (b) Small bore pipe and hanger installation

9. Verification of Past Work

A QA record review and sampling reinspection will be performed of critical past installation to gain confidence in the quality of previous work. Appropriate rationale will be developed for these reviews, and will take into account any recent work done by the Supply System in this area.

The following are examples of past activities that will be covered by such reviews:

- (a) Sacrificial Shield Wall (SSW) Set
- (b) Reactor Pressure Vessel (RPV) Set
- (c) RPV Safe-end Modification
- (d) Large bore pipe welding and heat treatment
- (e) Fabrication of Pipe Whip Restraints and associated brackets
- (f) Large bore hanger installation, including drilled inserts
- (g) Small bore pipe design and installation
- (h) Control rod drive unit installation
- (i) Equipment storage and maintenance
- (j) Structural steel installation

Particular attention will be given during the reviews to the elements of the contractor's QA Program which have had a history of previous problems. Examples of such elements are:

- (a) Material control and traceability

- (b) Cleanliness
- (c) Authenticity, completeness and accuracy of QA records,  
including radiographs
- (d) Subcontractor/supplier QA Program controls
- (e) Design control
- (f) Personnel qualification
- (g) Conformance of hardware to QA records
- (h) Receiving inspection





## ATTACHMENT 6

### RECENT ACTIONS TO STRENGTHEN MANAGEMENT CONTROL OF THE PROJECT

Sixteen of the twenty items of noncompliance cited by the NRC on June 17, 1980 relate to work performed in 1976-1978. The WNP-2 project was experiencing the effects of earlier policy that included fixed price contracts, construction management delegated to a contractor (Burns & Roe), some key engineering delegated to contractors, and a multi-layered management and Quality Assurance system that left the owner remote from the work details.

Fundamental changes in policy have been made and implemented over the past few years that have streamlined the working system, focused accountability, and revealed quality problems such as those associated with the sacrificial shield wall and pipe whip restraints.

We believe that further improvements can be made, and our task force evaluations described in Attachment 3 are identifying issues and recommending actions for improvements.

The key decision that led to recent actions was to increase owner involvement. The following list summarizes some of the key results from that policy change.

#### 1. Staffing

Supply System Staffing has increased from 455 in 1975 to over 1,900 in 1980. Quality Assurance staffing has increased from 50 to 80 in the past 24 months. Burns & Roe site staffing has increased from 184 in 1975 to 441 in 1980.

#### 2. Changes in State Law

State Law has been changed to allow contract reformulation without new public bidding. This permitted a Supply System initiated change in corporate partners in the major mechanical contract at WNP-2, as well as other changes discussed below:

#### 3. Restructuring of Contracts and Contract Enforcement

To allow the opportunity for more owner involvement, several contracts were restructured or are in the process of being restructured:

##### WNP-2

Wetwell Retrofit (213)	- October 1979
Mechanical (215)	- November 1979
HVAC (216)	- August 1979



Electrical (218)	- January 1979
Painting (219)	- July 1979
Instrumentation (22)	- August 1979

Similar restructuring of contracts is being done at the other sites, and even further revisions in contract conditions are now being developed.

Contract enforcement actions have included default of a major contractor, termination of a subcontractor, and numerous owner directed changes in personnel.

The Supply System has established direct owner involvement in the containment retrofit contract and the major mechanical contract on the WNP-2 project.

The following actions were also taken on specific contracts:

- o Major Mechanical (215) - See separate summary at the end of this attachment.
- o Seattle-Industrial - Contract terminated
- o Industrial Heating and Plumbing - Changed QA management and revised QA/QC systems.
- o Johnson Controls - Two stop works to force corrective action. Numerous management meetings.
- o Pittsburg-Des Moines - Changed management and tightened Owner/CM control. Contractor instituted formal corrective action program. Supply System initiated stop work.

4. Integration of Owner/Construction Management Forces

In order to simplify and make more effective the communications and controls associated with project work, a decision was made in late 1977 to integrate the Construction Manager and Supply System project management. Integration at WNP-2 occurred in February, 1978; at WNP-1/4 in July, 1978; at WNP-3/5 in August, 1978.

5. Management of Work at WNP-2

A project organization that is more effective has been developed using the input from several consultants. This development started in September, 1979 with the establishment of:

- o Area managers and area engineers to effectively coordinate work of several contractors within an area.
- o A construction quality organization to focus responsibility for quality in the organization directing the contractors' work.

- o An action to produce a single Master Deficiency List (MDL) for controlling and dispositioning all discrepancies.
- o A System Completion Group for control of the turnover process from contractor to owner.
- o An improved pre-planning program (Work Smart Program) based on strong teamwork. This program has been tested at WNP-2 and has resulted in installation of large bore pipe hangers in one area with 27% of the man-hours forecast by historical experience without re-work. The essence of this concept is that work of a complex quality-related nature will not be initiated in an area until a constructability or work-smart review group has developed a detailed plan which ensures:
  - a) Interferences have been identified and eliminated.
  - b) Quality requirements are clear.
  - c) Engineering is complete and reviewed for constructability by the group.
  - d) Work methods are efficient.

#### 6. Improved Engineering Support

Engineering work formerly assigned to a contractor for large bore pipe hangers was re-assigned to the Architect Engineer.

An additional engineering firm was engaged to validate the small bore piping system design.

Consultant services were obtained for TMI followup and review of Burns & Roe's updated pipe hanger design criteria.

The Owner assumed management of the technical evaluation of the adequacy of the sacrificial shield wall in February, 1980.

Burns & Roe has been directed to improve technical decision authority in the field.

A position of Project Change Manager has been established to exercise increased control over engineering changes.

#### 7. Improved Quality Assurance Programs

The level of Quality Assurance was elevated within the organization, and the Owner's personnel were merged with the Construction Manager's QA group, with Supply System leadership. Significant increases in staffing levels have been implemented for



the Corporate and Project facilities. Particular emphasis has been directed to recruit experienced senior level personnel with specific expertise in records, surveillance and audit areas.

Escalated enforcement actions in the form of Stop Work Orders and Corrective Action Requests indicate that more direct control of construction activities are in place but further improvements will be made.

The records management area has been greatly enhanced through changes in records policy relative to turnover of records on an as-completed basis, rather than the system completion approach. Standard review guidelines will provide an "early warning system" to preclude latent record deficiencies. A more effective preliminary review of records has been implemented by the surveillance group to ensure correlation and compatibility of hardware and associated software.

We have recently completed a comprehensive review of contractor inspection personnel to ensure that levels of responsibility are commensurate with education and experience. In addition, we have established a system to review inspection personnel qualifications prior to assignment of inspection activities by the contractor.

Increased emphasis on training has been implemented at all Supply System Projects. Specific areas of attention have been directed to craft supervision and contractor inspection personnel. Particular attention has been placed in welding inspection for contractor, Owner, and AE/CM personnel. During the last two years the Supply System has instigated four AWS QCI welding examinations. Approximately one-hundred (100) individuals have participated in the program, and more than sixty (60) Supply System, AE and contractor personnel have been certified.

We have revised and expanded the Supply System Vendor Surveillance Program. Supply System Surveillances have increased from 15 in 1975 to 167 in the last twelve months.

Results of the revised Supply System Vendor Surveillance Program are as follows:

- a. Established a formal Vendor Surveillance Report format for each Supply System Vendor Surveillance visit. Reports written since August, 1979: 155

- b. Initiated use of QFRs for documenting suppliers' deficiencies. Since August of 1979 335 QFRs have been documented for all projects and more than 100 have been resolved, preventing many of the kinds of problems that have occurred on WNP-2.
- c. A file has been established for all Supply System evaluated suppliers.
- d. Quarterly and annual Vendor Surveillance Program trend analyses have been performed for the past year. Based on the data, adjustments have been made to improve efficiency.

8. Inspections

Special actions were required to correct problems identified by the QA program. For example, a 100% review of pipe hanger records was instituted and is still in effect. A hanger hardware reinspection program was also established.

9. Welding

The Supply System developed a welder qualification program to qualify contractors' welders to uniform standards. This program is in the process of being implemented.

10. ASME N-Stamp

The Supply System has initiated actions to obtain an ASME N-Stamp, and recently recieved recommendation by the survey team for acceptance of our Quality Assurance Program.

11. Other actions initiated in followup to previous NRC and Supply System findings include:

- o Developed contract interpretations to clarify stop work activity.
- o Strengthened policy on Stop Work Orders.
- o Ensured ability to default contractor on QA grounds.
- o Formalized contractor payment policy to withhold payment based on quality performance.
- o Reinforced the contracts to establish owner authority to remove personnel.
- o Revised Contract Evaluation Procedures to emphasize evaluation of bidders' ability to have an effective QA program.

In summary, the actions taken have been beneficial in identifying and eliminating problems at WNP-2. The application of the same policies to the other projects in an earlier phase of design and construction has resulted in improved quality performance.





SIGNIFICANT ACTIONS TAKEN ON 215 CONTRACT  
WITHIN LAST TWO YEARS

1. A 215 Contract QA Task Force was established within Project QA June 78-August 79 to focus on and resolve major QA problems on this contract.
2. Improved training program by procedure revisions requiring training of all personnel and providing training material through WPPSS Q-Tips Program.
3. Established second level inspection group (EQA) for hanger installation within the contractor's organization to verify and upgrade the effectiveness of QC inspectors.
4. Established new equipment preventive maintenance program under WPPSS overall direction and support.
5. Increased effectiveness of WNP-2 audits of 215 Contractor by increasing audit personnel & restructuring audit program to review hardware as well as systems.
6. Removed Post-Weld Heat Treatment Sub-Contractor for lack of performance.
7. Removal of responsibility for Small-Bore Design from 215 Contractor for inadequate performance.
8. Emphasis on QA records review has been significantly increased. Review backlogs have been substantially reduced, and focus is being directed to timely review of records following installation activities.
9. On June 19, 1980, the Supply System took action to assert greater control over the mechanical installation work at the WNP-2 site. The contractor replaced three key managers and WPPSS assigned four of its own senior staff members to work directly with their counterparts in the contractor organization so as to provide a management "window" into that organization. This change is intended to shorten the communications loops for the flow of information regarding activities affecting quality to Supply System headquarters staffs and the feedback to the contractor of review and approval requirements for corrective action or other appropriate input. These actions will also enable the Supply System management to have a direct input into day-to-day contractor activities affecting quality by providing advice and consultation through experienced Supply System personnel without eliminating the contractor's accountability to the Supply System as required by good management practice and state law.

