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

REGION V

Report No. 50-508/81-08
50-509/81-08

Docket No. 50-508 & 50-509 License No. CPPR-154 & -155 Safeguards Group _____

Licensee: Washington Public Power Supply System

P. O. Box 1223

Elma, Washington 98541

Facility Name: Washington Nuclear Projects Nos. 3 and 5 (WNP-3/5)

Inspection at: WNP-3/5 Site, Elma, Washington

Inspection conducted: April 13-23, 1981

Inspectors: D. F. Kirsch
D. F. Kirsch, Team Leader — 6/29/81 Date Signed

T. W. Bishop
T. W. Bishop, Senior Resident Inspector — 6/29/81 Date Signed

P. P. Narbut
P. P. Narbut, Reactor Inspector — 6/29/81 Date Signed

G. Hernandez
G. Hernandez, Reactor Inspector — 6/29/81 Date Signed

W. J. Wagner
W. J. Wagner, Reactor Inspector — 6/30/81 Date Signed

Approved by: R. T. Dodds
R. T. Dodds, Chief, Reactor Projects Section 2
Reactor Construction Projects Branch — 7/1/81 Date Signed

Summary:

Inspection during the period of April 13-23, 1981 (Report No. 50-508/81-08) and 50-509/81-08)

Areas Inspected: Special construction assessment team inspection of quality assurance, design controls, procurement controls, construction controls, and project management of construction at the WNP-3/5 site. The inspection involved 421 inspector hours on-site by five NRC inspectors.

RV Form 219 (2)

Results: Of the five major areas inspected, no items of noncompliance were identified in two areas; five items of noncompliance were identified in three areas (control of design drawing modifications, paragraph 5.c.(3); failure to follow procedures/specifications for (1) bending reinforcing steel, paragraph 8.g; (2) quality control check of stud welding, paragraph 8.c; and (3) failure to provide cope holes in stiffener plates for structual steel beams paragraph 8.h; and (4) control of calibrated tools, gauges, measuring and test instruments, 3.b(5)).

DETAILS

1. Individuals Contacted

a. Washington Public Power Supply System (WPPSS)

**R. L. Ferguson, Managing Director
+R. S. Leddick, WNP-3/5 Program Director
**G. D. Bouchey, Director Nuclear Safety
**R. B. Glasscock, Director Quality Assurance
+D. E. Dobson, Project Manager
**N. C. Kaufman, Deputy Project Manager
+P. F. Ahern, Plant Manager
+O. E. Trapp, Project Engineering Manager
+J. C. Lockhart, Project QA Engineer
+J. Puzauskas, QA Engineering Supervisor
+D. A. Kerlee, QA Audit Supervisor
+C. H. Tewksbury, Senior Project Quality Engineer
*W. G. Dooley, Purchasing Manager
**M. M. Monopoli, Operations QA Supervisor
+E. L. Stephens, Senior QA Engineer
+R. Jurbala, QA Engineer
R. Madden, Senior QA Engineer
C. E. Love, Project Construction Manager
**W. G. Alexander, Director of Contracts & Materials Management

Various other engineering and QA personnel.

b. Ebasco Services, Inc.

**C. F. Whitehead, Senior Vice President
**M. K. Yates, Project Manager, Corporate Office
+D. L. Quamme, Project Manager, WNP-3/5 Site
**J. P. Sluka, Project Engineering Manager
*T. E. Cottrell, Senior Resident Engineer
*J. J. Mallanda, ESSE Project Engineer
+A. M. Cutrona, Project QA Manager
**J. C. Murphy, Construction Operations Manager
*J. F. Killian, ESSE Supervising Engineer, Mechanical/Nuclear
*L. Bast, QA Engineering Supervisor
M. Bagale, Lead Support/Restraint Engineer, ESSE
*T. Tully, Lead Project Quality Engineer
G. Ellis, Lead Civil Engineer, ESSE
D. L. Gowen, Document Control Supervisor
B. C. Bennett, Resident Engineer, Civil
K. L. Kinkela, Resident Engineer, Civil
C. M. McClaskey, Lead Project Quality Engineer
J. Kyle, Lead Project Quality Engineer
R. Baker, Senior Associate Engineer
**M. K. Yates, Project Manager (New York)

Various other engineering and QA personnel.

c. Morrison-Knudsen (M-K)

*D. E. Reed, Project Manager
*R. A. Davis, Project Quality Assurance Manager
*H. W. Holcombe, Quality Assurance Manager
M. C. Lentz, Project Construction Engineer
G. Hill, QC Manager
J. Davis, Engineering Manager

Various other craft and QC personnel.

d. J. A. Jones (JAJ)

*L. Andre', Project Manager
*T. M. McAllister, QA Manager
D. Jones, Document Control Supervisor
F. Slatter, General Superintendent
N. Donlick, QV Supervisor
L. Terry, Field Manager
E. Spurr, Area Superintendent

Various other craft and QC personnel.

e. Peter Kiewit Sons' Company (PKS)

*G. Nordlund, Project Manager
*D. W. Paulson, QA Manager
J. Wynne, Construction Manager
F. Wisner, QC Manager
H. Barton, Quality Engineer Supervisor
C. Honeycutt, Material Manager
J. Keene, District Manager
B. Cooksey, Engineering Supervisor
P. Lamberson, Document Control Supervisor
B. Flood, Fab Shop Superintendent

Various other craft, engineering, and quality control personnel.

f. Fischbach-Moore (F-M)

K. C. Bryden, Project Manager
D. L. Martin, Corporate Quality Assurance Manager
B. Morris, Document Control Supervisor
H. Jaillet, QA Manager
A. McLeod, Project Engineer

g. Other Personnel

**W. Fitch, State of Washington, EFSEC
**G. Hansen, State of Washington, EFSEC
**J. R. Lewis, BPA, Resident Manager
**D. Smithpeter, BPA. Project Engineer

*Attended Exit Meeting on April 17, 1981
**Attended Exit Meeting on April 23, 1981
+Attended both Exit Meetings

2. Background

In August 1978, the Washington Public Power Supply System announced the merger of Supply System and Ebasco construction management, project management, and project quality assurance responsibilities for WNP-3/5. As stated in PSAR Deviation Request No. 18-WP, this action was taken to permit better utilization of personnel resources resulting in improved efficiency and a more concentrated, better coordinated effort. The merger resulted in a three level quality program for the project. The first level performed by equipment manufacturers or site contractors; the second level by the merged Supply System/Ebasco Project Quality Assurance group; and the third level by WPPSS Corporate Quality Assurance office.

Following the appointment of Mr. R. L. Ferguson as Managing Director in June 1980 substantial Supply System and WNP-3/5 organizational changes were announced in October 1980. These changes included the establishment of a Program Director for WNP-3/5 who is responsible for the construction, startup, and initial power generation of the project. Other actions included a change in the reporting relationship of the WNP-3/5 project Quality Assurance Manager from the corporate Quality Assurance Manager to the WNP-3/5 Program Director, and the establishment of a new corporate Directorate of Nuclear Safety. At the same time, it was announced that the merged organization would be de-integrated, with Ebasco assigned full construction management responsibilities and the Supply System assuming an oversight role in project management for WNP-3/5.

The de-integration was accomplished in a sequenced manner with Supply System and Ebasco site engineering, construction management, and project management separated on February 1, 1981, and quality assurance de-integration on March 23, 1981. The current organizational structures are generally described in PSAR Deviation Request No. 26-WP, approved by the Supply System April 15, 1981. The Deviation Request describes the de-integrated quality assurance program as a three level quality program. The first level is performed by the equipment manufacturers, site contractors or Ebasco; the second level by Ebasco; and the third level by the Supply System. Third level quality is

provided in two ways: the site activities are monitored by the resident site surveillance and audit personnel, and a corporate audit program provides checks of Supply System quality affecting organizations both on and off the site.

The NRC team inspection addressed the new organizational relationships and revised Quality Assurance Program. The inspection included five major areas:

a. Quality Assurance Program
b. Project Management
c. Design Control
d. Procurement Control
e. Construction Control

Inspection of items a through d centered primarily on the Supply System and Ebasco organizations, while construction controls included examination of three major site contractors (Peter Kiewit Sons', Morrison & Knudsen, and J. A. Jones).

3. Quality Assurance

a. Quality Assurance Program and Program Adequacy

The Quality Assurance Program was reviewed to ascertain whether the establishment and execution of the program is consistent with the status of the nuclear project and regulatory requirements. The documents which establish the WNP-3/5 Quality Assurance Program include: the PSAR (supplemented by Deviation Request No. 26-WP, approved April 15, 1981); WPPSS Objectives, Policy, and Organization Manual; WPPSS Corporate Policy and Procedures Manual (which includes the corporate Quality Assurance Manual); WPPSS WNP-3/5 Project Site Procedures; WPPSS WNP-3/5 Department Instructions; Ebasco Nuclear Quality Assurance Program Manual (ETR1001); Ebasco ASME Quality Assurance Manual; Ebasco Administrative and Project Site Procedures; Ebasco Site Department Instructions; and the site contractor's quality assurance manuals, procedures, and instructions. The implementation of the quality program is discussed below.

(1) Management Commitment to Quality

Top management commitment to, and support of, the quality program is identified in several documents, including two recently issued management statements. The Supply System Objectives, Policy, and Organization Manual includes an Executive Directive, dated February 27, 1981, from the Managing Director stating that the Supply System is committed to meeting the high standards of excellence

for all its facilities in quality and nuclear safety. The management statement provided in the corporate Quality Assurance Manual, issued March 30, 1981, by the Managing Director, further supports the quality assurance program and mandates adherence to its requirements, criteria and guidance.

(2) Quality Program Documents

The current status of the Supply System's nuclear safety-related/quality affecting manuals, procedures, and instructions is of concern. These documents, which includes the PSAR, the Corporate Policy and Procedures Manual (which incorporates the QA Manual), the WNP-3/5 Project Site Procedures, and WNP-3/5 Department Instructions, were found to be in a less than complete condition with certain documents inconsistent with each other, and an excessive amount of time scheduled for resolution of this condition. The Supply System corporate reorganization and site de-integration were executed before the supporting quality documentation had been fully developed. Major efforts have been made in the last two months to issue updated documents. Some of the documents, such as the PSAR Deviation No. 26WP (which rewrites the Supply System and Ebasco QA section of the PSAR) and the QA manual, were developed in parallel, rather than in series, which may account for some of the inconsistencies between the documents. Examples of the document deficiencies identified from a selective review of the project quality documents are provided below:

(a) PSAR Deviation No. 26-WP (a complete rewrite of the Quality Assurance sections 17.0, 17.1, and 17.2; approved April 15, 1981).

((1)) Section 17.1.1 states that the Project Manager is responsible for the quality of the work. This responsibility is executed through the Project Engineering Manager and the Construction Manager. Yet the Deviation does not discuss the Construction Manager or his responsibilities.

((2)) No reference is made to the Supply System Nuclear Safety Directorate, which provides nuclear safety and licensing support to the projects and conducts Nuclear Safety Review Board activities.

((3)) Section 17.1.2 discusses system quality classification categories and associated quality requirements. This section, however, fails to identify the quality program requirements for Quality Class II - Augmented systems (such as fire protection and radioactive waste systems).

((4)) Section 17.1.18 discusses the Supply System audit program, but fails to identify the frequency at which 10 CFR 50, Appendix B criteria will be audited by WPPSS (e.g., annually, as committed in the original PSAR).

((5)) Section 17.2.1 (Ebasco Organization), appears to be a duplication of the original Ebasco PSAR section 17.2.1 (effective 1974), with minor modifications. The new section 17.2.1, however, does not fully reflect the current Ebasco structure on-site. Specifically, no reference is made to the QA Records Branch and QA Audits Supervisor, nor are the quality functions of the Construction Operations Manager, Site Manager, Materials Manager, or Resident Engineer identified.

(b) Supply System Quality Assurance Manual (a total rewrite approved March 30, 1981).

The QA Manual lacks consistency with the PSAR. A comparison of the first 20 pages of PSAR Deviation No. 26-WP with the QA Manual (which is to implement PSAR requirments) identified a large number of requirements not addressed in the QA Manual, for example:

((1)) PSAR Section 17.1.1 specifies that the Project Manager is resyonsible for the quality of the work. The QA Manual does not address the responsibilities of the Project Manager, nor does it identify who is responsible for the quality of the work.

((2)) PSAR Section 17.1.1 specifies that the Corporate QA Director is responsible for: providing standardization in procedures, management systems, and measurement techniques between projects; analyzing trends to preclude repetition of problems; and provide formal evaluations of additional quality commitments. These responsibilities do not appear to be addressed in the QA Manual.

((3)) PSAR section 17.1.3 requires: that design work be checked by individuals or groups other than those who did the original design; design verification; review of Quality Class I specifications for welding requirements; NRC Regulatory Guides; and review of Quality Class I specifications by "WPPSS Licensing" to assure conformance with PSAR and regulatory requirements. These aspects were not addressed in the QA Manual.

((4)) PSAR Section 17.1.1 requires Project Quality Assurance to conduct audits and surveillances on other project organizations (e.g., project engineering, project management). The QA Manual requires the Project QA Manager to audit the AE/CM, and contractors, but not the project organizations.

(c) Administrative Site Procedures (ASP's) and Project Site Procedures (PSP's) address interdepartment activities at the WNP-3/5 site. ASP's had been in use under the merged WPPSS/Ebasco project management organization. During the de-integration action was initiated to replace the ASP's with the two sets of PSP's (a "white" set for Ebasco activities, and a "blue" set for Supply System activities). Instructions had been issued by Supply System and Ebasco management addressing the use of ASP's until PSP's were fully developed. It was not clear, however, that firm dates had been established for the issuance of all PSP's.

(d) Department Instructions identify operating procedures and requirements within each Supply System and Ebasco project department (e.g., quality assurance, engineering, and construction management). While a large number of these instructions had been developed and issued, many department instructions had not been developed, and it was not clear that firm dates had been established for completing all department instructions.

Supply System representatives stated that the nuclear safety-related/quality affecting manuals and procedures were undergoing major revisions to reflect the operating structures established by the reorganization and project de-integration announced in October 1980. It was reported that the PSAR deviation and QA manual were previously scheduled for a "re-review" in the May-June 1981 time frame and that the Corporate Policy and Procedure Manual would be completed by July 31, 1981. It was further stated that consistency and uniformity of the total manual and procedure documents will not be assured until January 1982. 10 CFR 50, Appendix B, Criteria I and II require a documented quality assurance program be developed

consistent with the schedule for accomplishing quality activities. While the Supply System has established a quality program, the documented policies, procedures, and instructions do not appear to have been maintained current with changes in management policies and organizational structures. Further, the extended period of time allotted to achieve a program consistent with actual operations (October 1980 to January 1982) is considered to be a weakness in Supply System management performance (50-508/509-81-08-01).

(3) Organization Structures

Organization charts have been issued for the Supply System and Ebasco which clearly define lines of authority and responsibility and reflect adequate span of control for managers and supervisors. Two aspects of concern have been identified regarding the reporting relationship of the Supply System Project Quality Assurance Manager under the new corporate structure. Whereas the Project QA Manager previously reported to the Corporate QA Director, he now reports to the WNP-3/5 Program Director on site. The Program Director is the senior individual responsible and accountable to the Managing Director for completing the construction, startup, and initial power generation of WNP-3/5 within approved schedules and budgets and in accordance with quality, safety, and regulatory requirements. The Program Director is also responsible for setting the salary and tenure of the Project QA Manager. While there has been no indication that any Program Director has ever attempted to improperly influence quality decisions, the potential for abuse of the new reporting relationship is noted. Secondly, as stated in the PSAR (section 17.1.1), the Corporate Quality Assurance Director is responsible "to develop and administer the Corporate Quality Assurance Program for the Supply System...." In addition, the Corporate QA Director is required to "...provide standardization in procedures, management systems, and measurement techniques between projects to the extent practical...." It is not clear that these responsibilities can be effectively executed at the project site with the Project QA Manager reporting to the Program Director in lieu of the Corporate QA Director. The lack of a direct reporting relationship between site and corporate QA has the potential for nonuniform administration of the QA Program and policy at the various Supply System construction sites. The reporting

relationship of the Project QA Manager, the Program Director, and the Corporate QA Director is considered unresolved and will be further examined by the NRC staff (50-508/509-81-08-02).

The independence of the Ebasco QA organization from excessive design and construction pressures is clearly established with the Ebasco Quality Program Site Manager reporting off-site to Ebasco's Chief Quality Assurance Engineer.

(4) Contractor Quality Programs and Procedures

Thirteen major construction contractors are currently performing quality-class I, safety-related work on the WNP-3/5 project site. Each quality-class I contractor is required to develop a quality assurance program and implementing quality procedures. Previous NRC inspections have identified concerns with the adequacy of contractors' programs and procedures, as well as their implementation. These concerns have been attributed, in part, to the large number and diversity of quality programs at the construction site. This is not a new issue in that during the 1978 NRC Enforcement Conference with the Supply System, the licensee indicated that efforts would be made to standardize construction procedures to facilitate management of the large number of separate contractors and assure requisite quality in procedures which effect safety-related systems. Concerns with the adequacy of contractor procedures and their implementation were also expressed at the 1980 NRC Appraisal of the WNP-3/5 project (NRC report 50-508/509/80-11) and a more recent NRC/Supply System Meeting, in February 1981 (NRC report 50-508/509/81-03).

Supply System representatives indicated Ebasco engineering is developing a procedure for the review of contractor procedures (in response to a previous NRC finding) and that Ebasco has been tasked with developing a "procedure improvement program". The first draft of this program was submitted to the Supply System on April 16, 1981 but was returned to Ebasco for further work. Supply System representatives stated that the recent attempt to develop "generic" procedures for the reactor building contractor (Contract 3240-224) were not as successful as originally intended. During the team inspection, additional problems were identified in the quality of contractor procedures (see paragraphs 8.g and 8.i of this report). It appears that actions, taken to date, have not been fully effective

in assuring the required quality (i.e., technical adequacy, clarity, and completeness) is obtained in procedures effecting safety-related work. The continued ineffectiveness in this area is considered a significant weakness in the Supply System management program (50-508/509/81-08-03).

b. Quality Program Implementation

(1) Staffing

The quality organization staffing levels for the Supply System and Ebasco were examined. While Ebasco QA was found to be essentially at full staff (one vacancy in 90 positions), the Supply System is operating 25% below targeted staff level (six vacancies in 24 positions). The lower Supply System levels were reported to be due to the transfer of personnel to Ebasco (resulting from the recent de-integration), recent approval of new positions in QA (creating new vacancies), and attrition. Efforts are underway to staff the vacancies as soon as possible with qualified personnel. The impacts of the reduced staffing level were reported to have the most effect on the newer Supply System programs (e.g., improving trend analysis and vendor surveillance activities). Adequate QA coverage of site activities has been maintained through the use of overtime and support from corporate headquarters and other Supply System projects. Supply System management appears to be properly allocating quality resources during the lower manning period and is setting appropriate priorities to assure quality functions are properly performed. No immediate detrimental effects (with respect to nuclear safety) were identified from use of the reduced staffing level.

(2) Planning and Scheduling

The role of the quality organizations in the planning and scheduling of construction activities was reviewed with Supply System, Ebasco, and selected contractor representatives through interviews and examination of documents.

Of the topics examined, it appears that improvements are warranted in the area of routine planning and coordination between the Ebasco Construction Management and Quality Assurance organizations. Participation of the Quality

Assurance organization in construction planning meetings was reported to be infrequent. Based upon the interviews and field observations, there does not appear to be an established mechanism for QA to be advised of routine construction activities (and imminent changes) nor for construction management personnel to be routinely advised of weak quality areas. During the interviews, concerns were expressed that quality surveillance personnel have experienced difficulties in knowing when and where specific construction activities (which are due for surveillance) are being performed. Contract management team members stated that quality weaknesses are not always identified to them until after significant problems are evident. Related to this were expressions of concern that Construction Management has not always assumed the lead role in assuring contractor conformance to quality requirements and resolution of identified problems. This condition is reported to have put severe strains on QA resources in the past, although the condition is reportedly improving. Examples given include the major efforts required by QA to upgrade the mechanical contractor's procedures (Contract No. 251) in the summer of 1980, upgrading the HVAC contractor's procedures in the fall of 1980 (following a stop work order on that contractor), and the more recent problems with the electrical contractor's performance (contractor No. 225). Besides diluting the QA resources, the use of QA to perform the line function of correcting contractor performance has the potential for a loss of objectivity when QA is required to subsequently verify the effectiveness of corrective actions. The conditions identified above may be due, in part, to the lack of routine, formalized communications between the Construction Management and Quality Assurance organizations (e.g., joint participation in routine planning and problem discussion meetings). This situation detracts from the effectiveness of the overall quality program and is considered a weakness in the WNP-3/5 management system (50-508/509-81-08-04).

Preplanning of special and complex activities appears to be properly coordinated between the various departments. The inspector reviewed the preliminary plans for transport of the NSSS components from the barge slip to the site, and found them to include appropriate quality check points. In addition, on April 6, 1981, the Supply System established a "Heavy Lift Review Board", made up of Supply System and Ebasco construction, engineering, and quality managers who are to assure the proper planning and preparation for lifting of critical plant components.

The Supply System, Ebasco, and contractor quality assurance programs adequately provide for quality control hold and check points in the detailed work instruction, as exemplified by Supply System QAR-10; Ebasco ETR-1001, section III-11; J. A. Jones procedure POP-N-308; ASME QA Manual, section 10.0; and MK procedures CP-01 and CP-05.

The scheduling of Supply System and Ebasco quality assurance audits and surveillances was reviewed against the requirements of the PSAR and the Quality Assurance Manuals. It was found that the Supply System audit schedule for 1981 did not include any audits of the project organizations (Supply System Project Management, Construction Management, and Project Engineering) as required by the PSAR, section 17.1.1.B.4. This condition was corrected during the inspection, with a revised and comprehensive audit schedule issued on April 21, 1981. Audits of the Supply System site quality assurance program is provided for by the Supply System Corporate Quality Assurance Directorate. The Ebasco audit schedule for 1981 was in the process of being developed following the de-integration of the Supply System/Ebasco quality organizations March 23, 1981. The Ebasco audit schedule will be reviewed in conjunction with the routine NRC inspection program. The Ebasco surveillance schedule was reviewed for three contractors (Contracts 263, 265, and 251). The schedule appeared to be consistent with project activities and established requirements. No items of noncompliance or deviations were identified.

(3) Activity Review

The Supply System and Ebasco Quality Assurance reviews of changes to procurement documents, specifications, and nonconformance reports were examined for compliance to the requirements of the PSAR and implementing instructions, including ASP-RE-2-19 (Contract Waiver Request Control), ASP-RE-2-23 (Design Change Control), and ASP-QA-7-3/PSP-QA-7-3 (Site Nonconformance Reports) (refer to paragraph 5.c.(5) for discussion on the content of these documents). The inspector observed the QA function of document reviews (four nonconformance reports) and verified that the individuals performing the reviews were knowledgeable and qualified. The inspector also selected a sample of twenty Field Change Requests, ten Contract Waiver Requests, and forty nonconformance reports to verify that quality reviews had been performed at the appropriate time. No items of noncompliance or deviations were identified from this review.

Seven Supply System and Ebasco quality assurance audits were examined for adequacy of scope, depth, timeliness, and reporting. The qualifications of four site auditors was also examined. The audits were examined for compliance to the requirements of the PSAR, and implementing procedures in effect at the time of the audit (Supply System QAP-20, QAI-18-1; Supply System/Ebasco QAI-18-1 and -2). The audits examined included three audits of a site contractor (Audits 2515, -6, and -7) and four corporate audits of site activities (79-131, 80-141, 80-156, and 81-174). The audits examined were found to be appropriate in scope, depth, and handling of audit finding. It was noted, however, that audits of the mechanical contractor had been postponed resulting in important Appendix B criteria (IV - Procurement Document Control, VII - Control of Purchased Materials, VIII - Identification and Control of Parts, Materials, and Components, and XIV - Inspection, Test, and Operating Status) not having been audited in the past 12 months, as required. This condition had already been identified by the audit group and audits of these areas have been scheduled. Managers of the audit group stated that closer attention will be paid to postponement of audits to assure 10 CFR 50, Appendix B criteria are audited within the designated time frame. Refer to paragraph 5.c.4 for additional discussion of WPPSS/Ebasco audits. No items of noncompliance or deviations were identified.

Supply System and Ebasco quality surveillance reports for the civil contractor (Contract No. 263) and the mechnical contractor (Contract 251) were examined for compliance to the requirements of the PSAR and implementing procedure QAI-7-3. Approximately twenty surveillance reports for each contract were examined. The surveillances appeared to be appropriate in depth, documentation and handling of findings. No items of noncompliance or deviations were identified.

(4) Personnel

The training and qualification requirements for Supply System and Ebasco quality assurance personnel are provided in the PSAR; the Supply System Quality Assurance Manuals, sections QAR-2-3 and QAI-18-2; Ebasco's ETR 1001, section QA-III-11; and PSP-QA-7-10. The training and qualification criteria were reviewed and found to be consistent with industry standards (ANSI-N45.2.6, Regulatory Guide 1.58 and ANSI-N45.2.12). The qualification records of ten quality assurance personnel were examined for conformance to the required program. All records were found to reflect appropriate experience and training for the

positions occupied by the QA personnel. No items of noncompliance or deviations were identified.

(5) Quality Assurance Equipment Calibration Program

The calibration program for the equipment used in the performance of Supply System and Ebasco quality control inspections, QA audits, surveillances, and safety-related equipment maintenance was examined. This included a review of procedures which control the program, examination of the equipment storage area and selected tools, and review of equipment control and calibration records. The activities were examined for compliance to the requirements of the PSAR, the Supply System Quality Assurance Manual (section QAP-12), and the Ebasco Quality Assurance Manual (section QA-III-13).

The measuring and test equipment control program is administered on-site by the Ebasco Warehouse Supervisor with actual equipment calibrations being performed off-site by the Supply Systems Standards Laboratory. Two documents have been issued which control on-site activities. These are:

((a)) PSP-MM-11-9 (Interim); Care, Issue of Measuring and Test Equipment

((b)) CMI No. TOOLS-001, Rev. 0; Care and Maintenance Instruction

PSP-MM-11-9 was issued on March 3, 1981 replacing ASP-CM-4-17, Rev. 0. Examination of these documents disclosed that procedure PSP-MM-11-9 does not require a review of previous use of the equipment if it is damaged beyond further use or ability to check calibration, even though this is required by section QA-III-13 of the Ebasco Nuclear Quality Assurance Program Manual. Related to this, an examination of the storage area and records identified seven thermometers which had been broken. The validity of inspections which had been performed using this equipment prior to its breakage had not been evaluated. The thermometers serial Nos. are AT-7-03, AT-8-03, 33854, 33856, 33858, 33859 and 33861.

Examination of the equipment issue records identified that a calibrated torque wrench (serial No. 33741) was returned to the equipment issue station on December 22, 1980 with a written statement indicating

the instrument had been damaged. Contrary to the requirements of procedure ASP-CM-4-17 (in effect at that time), the equipment was not placed on hold or returned to the calibration laboratory. On March 6, 1981, the damaged torque wrench was issued for use and used to check the torque of bolts on a reactor coolant pump motor support on that day. This action appears contrary to the requirements of PSP-MM-11-9 (and ASP-CM-4-17) which states that, "At no time is measuring and test equipment to be issued when any damage is suspected." Inspection of the torque wrench on April 16, 1981 revealed a broken gage glass with a bent needle.

Care and Maintenance Instruction No. CMI-TOOLS-001 provides for monthly visual inspections of calibrated equipment and quarterly maintenance (oiling, cleaning, and adjusting). Discussions with cognizant personnel established that records of inspections and maintenance were not maintained.

The failure to include a requirement in the working procedures to investigate the prior use of broken equipment and to maintain a record of inspection and maintenance was considered a weakness in the program (50-508/81-08-30). The issuance of damaged test equipment for use is contrary to the requirements of 10 CFR 50, Appendix B, Criterion V. This is an apparent item of noncompliance (50-508/81-08-05).

c. Quality Assurance Management Involvement

Interviews were conducted and records examined to determine QA management involvement and understanding of QA functions and findings.

(1) Reports Received by QA

Site QA management receives reports from Ebasco and Supply System vendor inspection programs, "Lessons Learned" from other Supply System nuclear projects, periodic problem reports from other utilities, as well as NRC Bulletins, Circulars, Information Notices and Inspection Reports. General project schedules and contractor staffing levels are also provided to the QA organizations. The reports appear to be properly reviewed and appropriate actions taken.

(2) Reports Prepared by QA

Supply System and Ebasco QA each issue monthly quality reports to their corporate QA office with distribution to appropriate site management. These reports typically summarize the amount of training, audit, surveillance, record activities, and QA/QC staffing levels (including class I contractors). The reports also address stop work orders, NRC inspection results, 50.55(e) items, and other significant quality related events. No reports, however, address trend information. Major efforts have been made over the past year to develop an automated nonconformance report trending system, but in recent months "manual" trend analysis of nonconformances has been informal and infrequent. It appears that there are no routine reports generated by either the Supply System or Ebasco which advise QA, construction management, or project management of each contractor's quality status or direction (i.e., improving, worsening, special problems). Senior site managers closely track contractor's performance to cost and schedule goals but no similar assessment systems have been implemented to monitor contractor's quality performance (e.g., number of nonconformances, audit findings, surveillance findings). In general, a contractor's quality performance is addressed to senior management only after significant quality problems have been identified. The use of an effective and routine trending system, which enables accurate assessment of contractor's quality performance, is particularly important at this project due to the large number of safety-related contractors and the inherent difficulty in managing the multitude of programs. The lack of such an assessment system, to enable implementation of corrective measures before significant quality problems develop, is considered a weakness in the Supply System management program (50-508/509/81-08-06).

(3) Regulatory Interfacing

The Supply System Project QA Manager is the designated individual who interfaces with the NRC inspection staff. In this role, the QA Manager keeps informed of inspection progress and is responsive to NRC concerns and findings. NRC inspection exit interviews are typically attended by the Supply System and Ebasco senior site management. Resolution of routine NRC inspection findings are coordinated by the QA organization. A documented system for this purpose is being developed by the Supply System following the deintegration of the merged QA organizations.

(4) Corrective Action

The effectiveness and influence of QA management in achieving corrective action was examined. This included senior management's recognition and support to QA in stopping work, when necessary. Interviews and documentation reviews indicate that senior management is supportive of QA in effecting stop work orders when appropriate, as well as offering corrective action support. Some individuals expressed the concern that, in the past, QA has had to assume the lead role in correcting weaknesses in contractor performance stating that Construction Management should take a more active role in this area. It was indicated that this condition has improved somewhat in recent months (see paragraph 3.b.(2) of this report for discussion on this subject).

An examination of fifteen Quality Finding Reports indicated that corrective actions are taken and verified in a timely manner, or that additional action is taken, as appropriate.

(5) Image

Based upon interviews with management, project personnel, QA personnel, and contractor representatives, it appears that both Supply System and Ebasco QA organizations are receptive to employee quality concerns and act aggressively to resolve quality problems. QA management was found to be very supportive of QA/QC personnel.

4. Project Management

The project management portion of the inspection was directed towards verification that management has been exercising control in a manner that will assure that systems and components are constructed in accordance with all quality requirements. The inspection included interviews with senior Supply System and Ebasco management representatives, line managers, selected field and office personnel, and review of records and reports.

a. Organization

Organization charts for the Supply System and Ebasco construction management organizations were current. The lines of authority and communications between the two organizations have been clearly defined following the de-integration and were understood by the individuals interviewed. Detailed department instructions either have been or are in the process of being developed (refer to section 3.a(2) of this report for discussion on this matter).

With the exception of the Ebasco General Program Manager, written position descriptions exist for both Supply System and Ebasco managerial and supervisory personnel. These descriptions are generally consistent with the defined responsibilities but do not, in all cases, reflect the new organizational reporting relationships. For example, the Supply System Project Engineering Manager now reports to the Project Manager, whereas the position description states that he reports to the Engineering Division Manager (a position which no longer exists, by name, in the Supply System). Similar inconsistencies were found for the Supply System Project QA Manager, "Project Division Manager" (now Project Manager), Ebasco's "Construction Manager" (now Construction Operations Manager), Ebasco's Site Manager, and Ebasco's Project Superintendent. The written position description for Ebasco's General Program Manager is being developed. It appears that additional licensee and Ebasco efforts are necessary to assure position descriptions are consistent with defined organization structures. Licensee representatives agreed to examine the area and take appropriate action.

b. Change Control

The Supply System and Ebasco program for affecting changes was reviewed. The purpose of the review was to determine if the results of site and industry experiences, changes in regulatory requirements, changes in codes and standards, and audit findings were appropriately handled.

The Supply System has established a "Lessons Learned" reporting system which transfers problem information between Supply System construction projects to avoid recurrence of those problems.

Changes resulting from audit findings are well controlled through the audit followup system. Changes resulting from site and industry experience are generally controlled through the nonconformance reporting and followup system or direct contract modification.

Changes resulting from regulatory requirements are initiated, if necessary, following engineering review. These reviews are performed both by Supply System and Ebasco engineering groups. The inspector selected seven NRC Inspection and Enforcement Bulletins, Circulars, and Information Notices to determine if the proper review cycle was performed and if designated actions were properly completed. The Bulletins, Circulars, and Information Notices examined were: IEB 80-11; IEB 80-19; IEB 81-01; IEC 80-12, IEC-80-22; IEC 81-01; and IEIN 80-40. With the exception of action taken on IEB 80-11, it appeared that both

Supply System and Ebasco reviews and subsequent actions were properly performed. IEB 80-11 concerned masonry walls and included a requirement to notify the NRC of the use of such walls in the plant. In this regard, Ebasco engineering identified several drawings to the Supply System which identified masonry walls. In responding to the NRC, Supply System engineering failed to include one of the Ebasco specified drawings. Supply System representatives agreed to review this area and initiate appropriate action to supplement the response to the NRC on this subject. This item will be verified in a future inspection (50-508/509-81-08-07). No items of noncompliance or deviations were identified.

c. Implementation

(1) Planning

Staffing levels of the engineering organizations were found to be below target levels, although interviews with cognizant managers indicated that temporary compensation is being made by use of overtime and postponement of some non-safety activities.

Planning and coordination of routine and special work activities within the engineering and construction management organization was generally well controlled through a system of daily and weekly meetings and schedules. As identified in paragraph 3.b(2) of this report, additional actions may be warranted in routine interfacing with the quality organizations.

The qualifications of fifteen engineers and managers were examined and found to be consistent with position description requirements. Interviews with four engineers indicated they had a good understanding of their responsibilities and activities.

(2) Activity Review

Processing of selected nonconformance reports, contract waiver requests, and field change requests were examined as stated in paragraph 3.b(3). In addition, the handling of document changes by the electrical contractor (Contract 3240-225/253) was examined. As identified in previous NRC inspections (see NRC Inspection Reports 50-508/509-81-04 and 81-07), this contractor had experienced problems in

properly developing electrical tray support construction drawings and a qualified structural fillet weld procedure. These areas were examined during the inspection.

Regarding the tray support drawings, discussions with contractor personnel revealed that as much as six hours per drawing have been expended by contractor QC personnel to assure that all design drawing requirements have been met. Contributing to this lengthy review time is complexity of Ebasco design drawings and changes and the lack of definity (e.g., the design drawings do not identify which typical joint details apply to which support structures; in some cases, there is no designated joint detail which would apply). Contractor managers stated that none of the support drawings reviewed to date have been totally free of problems. The QC review of drawings is performed prior to QC inspection of the support, but in some cases the support pieces may have already been fabricated and tack welded into position. For example, a support shown on drawing SS-113 was tack welded into position on April 20, 1981, and on April 21, 1981, after calling for a QC inspection, it was determined that the drawing had erroneously called out one piece to be made from material which was too thin (installed as 3/8" thick, whereas it should have been 1/2" thick). Besides contributing to unnecessary rework, the complex drawing situation is resulting in significant drains on contractor QC manpower (i.e., spending their time reviewing drawings instead of performing quality inspections) and contractor and Ebasco engineering. Ebasco management representatives stated that as many as 17 Requests for Information (RFI's) are received each day regarding the electrical tray support drawings, creating a work backlog in this area. This topic will be further examined in conjunction with the followup to the other aspects of design controls discussed in paragraph 5 of this report (50-508/509/81-08-29).

In reference to the problems encountered in developing a qualified fillet weld procedure, the inspector was advised that the contractor had begun to requalify the welding procedure using an improper material configuration. This condition, however, was detected by Ebasco surveillance personnel and direction given to again requalify the procedure on April 20, 1981. On April 21, 1981, the inspector interviewed contractor craftsman and supervisors to determine which welding procedures had been in use since the time the problem of procedure qualification was identified as a NRC Item of Noncompliance on March 26, 1981. From these interviews, and examination of recently welded supports, it was determined that the contractor's crafts

had not been told that their welding procedure was not qualified and that this type of welding (use of fillet welds smaller than specified in the AWS Code D1.1, Table 2.7, and use of multiple pass fillet welds for the smaller sizes) was not permitted. Tray supports Nos. SS-118, SS-11/A, and SS-124 showed evidence of multiple pass fillet welds, contrary to the specifications in AWS Code D1.1, Table 2.7. These welds had been made in the period of April 6-20, 1981, after it had been determined that the contractor did not have a qualified procedure for making these types of welds (March 26, 1981). Interviews with contractor management indicated that the QA/QC organization thought that the construction organization had been directed to suspend further small size multiple pass welding until qualification of a welding procedure, although no documentation to affect this action, had been issued. On April 22, 1981, a contractor interoffice memorandum was issued to cease further welding of this type.

The licensee's response to the original item of noncompliance has not been received by the NRC as of this inspection date. The failure to assure that conditions adverse to quality are promptly corrected or controlled to preclude repetition is an observed weakness in Supply System management systems (50-508/509/81-08-08).

(3) Inspection

Field inspection (or surveillance) by Ebasco and Supply System construction management personnel was in the process of being defined in the Project Site Procedures Manual (following the recent de-integration). In the interim, instructions for monitoring and surveillance of contractor work is addressed in procedure ASP-CM-4-0. Interviews with four construction management representatives indicated that the required monitoring and surveillance is being performed and findings appropriately handled. No items of noncompliance or deviations were identified.

d. Management Involvement

(1) Reports and Reviews

Management's utilization of various reports was reviewed with Supply System and Ebasco managers and supervisors. Items addressed included staffing, significant contractor quality problems, and general work status. Supervisors and managers reviewed the reports in a timely manner and provided examples which demonstrated their responsiveness

to the reports. Monthly program review meetings for the Managing Director provide an effective means of keeping corporate management aware of site progress and problems.

Corporate audits, Supply System Board of Director Audits, special "Swat Team" reviews, and routine on-site audits provide management with periodic reviews of performance in the different departments. These audits and followup actions are appropriately documented.

NRC Inspection Reports are reviewed by senior site management, and the Program Director usually attends NRC exit interviews. Following the de-integration, a formalized system for tracking NRC inspection findings is being developed by the Supply System (this was formerly handled by the joint Supply System/Ebasco QA group). Since January 1981, supplementary verification checks have been performed to assure responses to NRC findings are fully implemented.

(2) Other Information Channels

Workers and staff members interviewed believed that management had an "open door" policy and, in general, felt that their concerns would be attended to satisfactorily. Individuals have also been told, by management, that they are free to express their concerns to higher authority (including the NRC) if they do not feel their concerns were properly addressed. Staff members stated that management was supportive in both administrative and technical matters.

Allegations are usually handled by the Quality Assurance organizations, who formally document investigations and findings resulting from allegations. The allegers, if known, are notified of the results of the investigation. The Supply System has assigned a Corporate QA representative to the site full time to, among other things, conduct investigations of allegations. This offers an extra degree of independence in the investigations and is considered to be strength in the Supply System management system. An ombudsman program is being developed by the Supply System to provide a mechanism for allegers to express concerns. While not into effect yet, such a program will go far in providing a routine mechanism for accommodating complaints.

A Suggestion System has been recently implemented to further encourage employees to offer quality and cost beneficial ideas.

It was found that all levels of management periodically tour the work areas on a frequency of from several times a week to at least once a month. Personnel interviewed confirmed management visibility on the site aand at meetings. The overwhelming majority of staff members and field personnel perceived management to be genuinely interested in quality and felt that management had a good understanding of the job. All individuals felt that substandard work would not be accepted.

5. Design Controls - Site

a. Program

The organizations involved in the design of WNP-3/5 are as follows:

NSSS: Combustion Engineering, Inc. - Windsor, Connecticut
A/E & BOP: Ebasco Services, Inc. - New York Home Office
Ebasco Site Support Engineering (ESSE) - On site extension of New York Home Office Engineering Group

All Quality Class I design performed by Ebasco is accomplished at the New York Home Office Engineering Group. The Ebasco Site Support Engineering group on site performs design on non-Quality Class I small bore piping and supports. The ESSE group, however, is assigned responsibility for processing, evaluation, and approval of minor design changes through Field Change Requests (FCR's).

The Ebasco quality program requires that design changes be subjected to the same level of reviews, verification, and approvals as are applied to the original design. Design changes are governed, as in the original design, by formal Engineering Procedures contained in the Ebasco Company Procedures Manual. ESSE is authorized to accomplish design control, verification, and approval for minor changes while major changes must be reviewed and approved by the Ebasco Home Office Engineering Group.

b. Program Adequacy

The program employed by ESSE is contained in the Ebasco Company Procedures Manual, which is also the design program manual used by the New York Home Office. Selected portions, applicable to on-site design, were examined by the inspector. The procedures

were found to be of the latest revision and appropriately approved for use. The scope of procedural coverage satisfied regulatory requirements and SAR commitments. The procedures provided an adequate interface control system with the New York Home Office Engineering organization.

The PSAR, in Table 3.2.1, contains a listing of plant structures, systems and components, and their associated equipment classifications relating to seismic category and quality class. The licensee noted that an updated list was being developed by Ebasco Home Office Engineering and was scheduled for issue about June 1, 1981.

The licensee has a program in effect for reviewing, analyzing, and reporting construction deficiencies and defects pursuant to the requirements of 10 CFR 50.55(e) and 10 CFR 21, respectively.

The licensee had recently approved PSAR Deviation No. WP-25, describing the Ebasco Services Quality Assurance System. During Design and Construction, the old Section 17.2 of the PSAR will be replaced with the QA system to be utilized by Ebasco following abolition of the integrated WPPSS/Ebasco organizational structure. Paragraph 17.2.3 of the PSAR defines major changes as "those changes to engineering documents which will affect safety-related structures, systems, and components" and, by inference, defines a minor change as a change which will not affect safety-related structures, systems, and components. The Construction Operations Manager is charged with the responsibility to determine if a field requested change is major or minor in nature, subject to concurrence of the Lead Discipline Engineer. The PSAR definitions are effectively implemented in procedure QA-I-4 (Design Control) in the Ebasco Nuclear Quality Assurance Program Manual (QA Topical Report No. ETR-1001). The inspector observed that the above definitions of major and minor changes were not consistently applied throughout the Ebasco Company Procedures Manual (e.g., Company Procedure Nos. E-7 (Processing Drawings for Review and Approval), E-11 ("As-Built" Drawings), and E-69 (Design Change Notice/Field Change Request)). The licensee stated the the procedures would be modified to achieve definition consistency. This item will be examined during a future inspection (50-508/509/81-08-26).

The licensee had recently modified the M-K contract specification No. 3240-263 to permit more direct licensee and Ebasco construction management participation in the control of M-K work activities. Section 1B, paragraph 14.1.1, of the contract provides for the issuance of technical direction consisting of instructions,

guidance, and advice on matters or requirements for design, engineering, erection, and testing. Ebasco construction management uses "serial letters" as the vehicle for issuing such technical direction. The inspector found that neither Quality Assurance nor ESSE were included in the standard distribution of the serial letters. It further appeared that the specification revision allowed Construction Management to revise or establish procedures and design requirements without the necessary involvement of engineering or quality assurance in the review process.

The inspector examined the serial letter file and those letters issued since February 1981. While no instance was found where a serial letter had modified design requirements or established procedures without the required reviews, the inspector expressed the concern to licensee management that significant potential for this existed. The licensee stated that the specification section would be revised appropriately to preclude bypassing the engineering and quality assurance review process (50-508/509/81-08-27).

The licensee had established a task plan for system reviews, defined review procedures, established a deficiency reporting and resolution system, and provided for documentation of review completion. The inspector examined the review system and observed that reviews conducted to date appeared to be comprehensive and of substance. Although the system reviews were behind schedule, the inspector observed the program to be a demonstration of significant licensee engineering involvement in the design review process.

c. Implementation

The ESSE program for site design control is effected by the Ebasco Company Procedures Manual with the guidelines for the establishment and implementation of the ESSE group defined in Company Procedure No. E-82 (Ebasco Site Support Engineering Group). The inspector examined all procedures in the Company Procedures manual at ESSE for incorporation of proper revision status and found that status acceptable.

(1) Ebasco Site Support Engineering Group

The inspector examined the controls established for the on-site ESSE group for conformance with selected portions of the Company Procedures Manual and made the following observations:

(a) The Ebasco site organization chart shows ESSE administered by the Manager of Engineering. Discussions with Ebasco personnel indicate that this is implemented in practice. Company Procedure E-82, paragraph 5.1.1, states that "The ESSE group will be administered at the site by the Senior Resident Engineer...".

(b) Discussions with the ESSE Project Engineer indicate that his supervision of the ESSE engineering disciplines is administrative in nature and not technical as implied by Company Procedure E-82, paragraph 5.1.1, which states "Engineering personnel assigned to the ESSE group will be directly supervised by the ESSE Project Engineer...". The inspector found, through discussions with the ESSE Project Engineer, that each discipline operates as a semi-autonomous group and that no project specific instructions were available to define the ESSE group responsibilities in implementation of the general Company Procedures Manual requirements.

(c) The Delegation of Authority Letters for ESSE civil, instrumentation and control, and electrical engineers appeared to deviate, in minor ways, from Company Procedures Manual requirements. For example:

- A clear indication of responsibilities was not established for each item on the Open Engineering Items (OEI) list as required by Company Procedure E-82, paragraph 5.1.5.3.

- The OEI lists established in the letters were very general in nature and not formulated in a clear manner as required by Company Procedure E-82, paragraph 5.1.5.3 and Attachment 6.

- The definitions of major and minor changes specified by the letters were not consistent with those contained in the PSAR and Ebasco Nuclear Quality Assurance Manual, procedure QA-I-4 (Design Control).

(d) ESSE had established a listing of ESSE instructions and reference company procedures with identification, for each, as to whether or not the instruction or procedure was quality affecting. The inspector observed that several procedures were incorrectly identified as not quality affecting. For example, Company Procedure E-1 (Review of Vendor's Drawings), E-7 (Processing Drawings for Review and Approval),

E-8 (Approval Signatures Required on Ebasco Drawings), E-10 (Identification of Information Required for Completion of Design Drawings), E-11 (As-Built Drawings), E-69 (Design Change Notice/Field Change Request), E-76 (Guidelines for Design Verification), E-77 (Selection, Identification, and Documentation Design Inputs), and E-82 (Ebasco Site Support Engineering Group) were listed as not quality affecting.

(e) The Field Change Request form being utilized on-site did not contain a block for identifying if the requested change was major or minor as required by Company Procedure E-69.

(f) Company Procedure No. E-82, in paragraphs 5.1.7 and 6.2, references a superseded procedure (E-50) for design verification guidelines instead of the current procedure No. E-76.

The inspector did not identify any instances where the above considerations had any adverse effect on the quality of work performed by ESSE. However, the above examples of inconsistency in procedural application and implementation were brought to the attention of the licensee. Pursuant to the licensee's corrective action, Ebasco Home Office and site management conducted a review of the ESSE on-site organization and documented the results by letter No. EBWP-81-5246, to the WPPSS Program Director, dated April 22, 1981. The review corroborated the inspector's findings and detailed certain corrective actions which were being evaluated by the licensee. The licensee agreed to evaluate and resolve the inspector's findings and the Ebasco review team action items. This item will be examined during a future inspection (50-508/509/81-09).

(2) Design Changes - Field Change Requests

The inspector sampled and examined nine Field Change Requests (FCR's) to ascertain the degree of compliance with Ebasco Company procedures for processing and approving FCR's (Procedure No. E-69) and verified that calculations, as necessary, justified approval of the FCR's. No items of noncompliance or deviations were identified.

(3) Design Changes - Document Control

The inspector sampled the following contract drawings, each with several field change requests modifying the drawing, and examined those drawings in the master file

at each of the listed contractors and at ESSE for inclusion of the proper revision and the applicable changes.

Contractor	Drawing No.		No. of Drawing Modifications Applicable
Fischbach & Moore	3240-G-3477-S5	Rev. 3	16
	3240-G-5358	Rev. 4	11
	3240-G-5390	Rev. 3	12
	3240-G-5443-01	Rev. 3	9
	3240-G-5443-02	Rev. 4	5
Peter Kiewit & Sons	3240-04 App. A	Rev. 0	8
	3240-G-1300-4	Rev. 3	5
	3240-G-1325	Rev. 1	15
J. A. Jones	3240-G-1325	Rev. 1	15
	3240-G-2520-S1	Rev. 5	14
	3240-G-2521	Rev. 4	26
	3240-G-2539	Rev. 1	5
	3240-G-2550	Rev. 4	8

Examination of the above contract drawings at each of the contractor's document control areas identified that J. A. Jones had no discrepancies while Peter Kiewit and Fischbach & Moore each had one minor discrepancy, of no safety significance, each of which was immediately corrected.

The inspector examined the above drawings on controlled stick file No. R15 at ESSE and made the following observations:

- None of the document control required drawing modifications had been identified on drawings 3240-G-2520-S1, 2520-S2, 2521, 2539, 2550.

- Four of five drawing modifications were not identified on drawing 3240-G-1300-4.

- Drawing 3240-G-1300-4 had been annotated by an engineer's hand indicating a change in fuel transfer tube material, as specified by FCR-AS-845 applicable to drawing 3240-G-3580, but no formal change to drawing G-1300-4 had been implemented.

- Three of fifteen drawing modifications applicable to drawing 3240-G-1325 were not identified on this drawing.

- Drawings 3240-G-3477, sheets 1 through 7, were not in file R15. Ebasco personnel stated that these drawings had been misplaced and were replaced in the file.

Drawing File R-15 is employed by engineering/design personnel for the performance of design related activities, a quality related activity. The inspector found that ESSE had no procedure or instruction established which prescribed the controls necessary to assure that design drawing modifications (FCR's, Design Change Notice (DCNs) and Contract Waiver Requests (CWRs)) were adequately posted to the basic design document. This is an apparent item of noncompliance with 10 CFR 50, Appendix B, Criterion VI (50-508/509/81-08-10).

The inspector did not find any evidence where the failure to prescribe controls of drawing modifications at ESSE resulted in a safety significant deficiency.

It was subsequently determined that ESSE was not included on the Controlled Document Distribution List used by Ebasco Document Control to distribute modification documents such as FCRs, DCNs, and CWRs. While it was established that Document Control issues those modification documents to ESSE as a matter of courtesy, specific requirements to do so had not been established. The licensee stated that document distribution requirements for ESSE would be evaluated and necessary corrective actions taken. This item will be examined during a future inspection (50-508/509/810-81-1).

The inspector expressed concern that, while numerous drawings had several modifications (FCR, DCN & CWR) applicable to each, no system appeared to be established to require interim "as-building" of design drawings to incorporate changes. This concern was further highlighted by complaints expressed by contractors that an excessive amount of time was necessary to screen drawing modification documents, during process planning and QC inspection planning phases, to establish whether or not a particular drawing change affected that particular activity (refer

to paragraph 4.c.2 for additional example). The licensee observed that this concern had been addressed in audits of design control activities.

(4) Design Control - Audits

The inspector examined several audits performed by WPPSS/Ebasco in the area of design control. Audit findings appeared to have been adequately addressed and resolved with the exception of one recurring finding.

Audit No. 3/5-45 identified that several drawings had a number of FCRs/DCNs outstanding against the design drawings. The proposed resolution was to incorporate changes for site developed documents within six months and incorporate changes for New York developed documents in accordance with ESSE Procedures. Audit No. 3/5-51 identified that Ebasco failed to implement and continue corrective action related to the audit finding of Audit 3/5-45. ESSE personnel were instructed through letter No. WPPSS-PE-1641, dated July 27, 1979, that a drawing shall be reissued when any combination of five changes are issued against the drawing. Ebasco issued procedure No. ESSE-P-002 (ESSE Procedure for Scheduling of As-Building Documents) on July 1, 1980, and specified that, for minor DCNs and FCRs, "Generally, upon accumulation of five (5) changes, the changes to date shall be incorporated onto the original". However, this document also set such loose criteria for interim as-building (by modifying the five-change criteria), that no firm requirements existed for incorporation of changes.

The licensee's concern in this area was further expressed to Ebasco by letter No. WPEB-80-214, dated August 15, 1980, requesting a reply and corrective action by August 25, 1980. On October 22, 1980, Ebasco responded by letter No. EBWP-80-427 without acknowledging that corrective action was necessary and, therefore, did not provide any criteria other than those previously defined in Procedure No. ESSE-P-002. The Ebasco reply did not appear responsive to the licensee's requests.

Pursuant to the inspector's expression of concern in this area, the review of the ESSE site organization conducted by Ebasco home office and site management concluded that a more effective method was needed for incorporating FCRs

into drawings. Resolution of this issue is to be completed by August 1, 1981.

This item will be examined during a future inspection to ascertain the degree of Ebasco responsiveness to the licensee's concerns and verify the effectiveness of the Ebasco corrective actions (50-508/509/81-08-12).

The inspector observed that the quality of audits was very good in that they appeared well planned and performed. However, the resolution of findings, as evidenced by finding repetition, appeared weak.

(5) Design Control - Nonconformances

The nonconformance report (NCR) is used for dispositioning nonconforming items, materials, and components consistent with the definitions contained in the PSAR, Chapter 17. The inspector found that subtier implementing documents did not consistently implement the PSAR definitions which addresses nonconforming materials, parts, or components. For example:

- The Ebasco Nuclear Quality Assurance Program, (QA Topical Report No. ETR-1001) Section QA-III-6 (Nonconformances) defines nonconformances to include items or services.

- The Ebasco Project Site Procedure (PSP) No. PSP-QA-7-3 defines a nonconformance to include physical defects, test failures, incorrect or inadequate documentation in addition to services such as deviation from prescribed processing, inspection, or test procedures.

- The licensee's home office Quality Assurance instruction QAI-15-1 (QA Processing and Review of Nonconformance Reports) defines a nonconformance to include deficiencies in material, documentation, components, items, or services and provides such examples as deviation from prescribed processing, inspection or test procedures.

The inspector observed that the above definitions of nonconforming conditions were not consistently applied throughout the implementing documents. The licensee agreed to evaluate the situation and establish consistency of definition. This item will be examined during a future inspection (50-508/509/81-08-13).

The practice currently employed on-site is to document hardware-related deficiencies by NCRs and those deficiencies related to quality systems, audit findings, or deviations from procedures by Quality Finding Reports (QFRs) or Corrective Action Requests (CARs). The inspector observed that use of the definitions contained in the above subtier documents implies that most QFR documented problems would generally be classified nonconforming conditions.

(6) Posting of Design Changes

At some unknown point in time, prior to November 1980, a situation evolved at Morrison-Knudsen document control wherein changes to design drawings had not been properly posted as required by the change document (FCR or DCN). M-Ks Document Control personnel had been posting design changes as specified by Ebasco transmitted letter and not as directed by the actual FCR or DCN. Cases are identified where: design document numbers had been transposed on the transmittal document causing changes to be posted to incorrect drawings; the transmitted document did not list all of the affected drawings resulting in some of the FCR required documents not being posted with the change; and some changes voided by others but, with the failure to list all voided documents on the transmittal, voiding as specified by the change document did not take place. In summary, work may have been accomplished in the field in a manner not in accordance with A/E direction.

The above situation was identified to Ebasco personnel on November 12, 1980, and to M-K home office personnel on November 17, 1980. The system was resolved for future changes by an Ebasco letter instructing that the transmittal form was merely a receipt acknowledgement statement and that the document affected list contained in the change notice was to be used as engineering approved document modification information. An M-K audit verified the correct posting of changes after initial identification of the problem for that work taking place after November 20, 1980.

On November 24, 1930, by letter No. 8263-80-400, Ebasco stated that "Future evaluations of the documents will be required to establish whether or not any nonconforming conditions were generated by past conditions." The inspector determined that as of April 23, 1981, the

specified future evaluations had not been accomplished either by Ebasco or M-K. Further examination of the situation identified that (a) Ebasco had not specified details for the performance of the evaluations of past conditions (such as: who was to perform, criteria for performance and when the evaluation was to be completed) and (b) Ebasco apparently had not adequately appraised the licensee and quality assurance of the significance of the situation and the proposed corrective action.

On April 23, 1981 in response to the inspector's questions and concerns, Ebasco issued a memorandum specifying the actions necessary to determine whether or not any nonconforming conditions were generated by past conditions. The results of these evaluations and corrective actions will be examined during a future inspection (50-508/509/81-08-14).

d. Management Involvement

The inspector discussed the topic of management involvement and staffing with several members of Ebasco and licensee middle management personnel. The inspector observed that management had a positive attitude toward quality assurance. Licensee management observed that QA has had significant involvement in major milestone planning. Quality Assurance is invited to engineering and planning meetings; however, management observed that QA attendance is sporadic mainly due to the press of other business (refer to paragraph 3.b.2 for additional discussion on this subject). Quality Assurance involvement in engineering activities comprises review of quality affecting field changes, review of contracts and specifications, auditing construction engineering, and contractor work implementation and auditing ESSE.

Ebasco Home Office QA has responsibility for auditing ESSE. The inspector reviewed two of those audits and observed that the WPPSS/Ebasco site audits of ESSE were at least equivalent to the New York audits in scope and substance.

Ebasco management observed that coordinated site management reviews of ESSE had not been performed and that New York Home Office engineering conducts management reviews of ESSE. However, Ebasco site management stated that the Home Office has not provided the results of those reviews to site management for evaluation. Failure to provide results of the reviews to site management was considered a weakness in the Ebasco management system (50-508/509/81-08-28).

Ebasco QA personnel observed that efforts have recently been made to hire five additional QA engineers. Staffing requirements were also reviewed with the ESSE Project Manager. ESSE has

prepared a request for additional personnel which indicates the need for additional personnel to more than double ESSE's current manning level. Efforts are currently underway to provide additional staffing. ESSE turnover rates are very low. It appeared that ESSE personnel had been properly assigned according to discipline and experience level.

The licensee is in the process of instituting a computerized nonconformance report tracking system with capability to perform nonconformance trend analysis. Current trending practice has been costly in terms of required personnel effort.

6. Procurement Controls - Site

a. Program Implementation

The inspector examined the only two procurement documents issued by the licensee on-site for purchase of quality Class 1 materials and services. The procurements were relatively minor in nature. Major procurements are processed through the licensee's Home Office or through Ebasco, acting as agent for the licensee. The procurement documents examined appeared to comply with applicable requirements of the QA program and material documentation appeared to comply with specified requirements. No items of noncompliance or deviations were identified.

b. Receiving Inspection

The licensee has delegated receiving inspection responsibility to Ebasco who maintains the necessary staff and facilities to accomplish inspections as required. Where source inspection is not performed, a detailed receiving inspection is performed on-site. When source inspection had been performed by Ebasco at the vendor's facility, the site receiving inspection group performs only over/short/damage inspections on hardware and documentation examinations to assure that necessary documentation was received. When material is released to contractors by Ebasco, the contractors merely perform, for the most part, inspections for over/short/damage.

The inspector examined receiving inspection documentation for four Limitorque motor operated gate valves, one control board and cabinet and the new fuel elevator, used in the transfer canal. Records were available indicating compliance with procurement document requirements, on indicating appropriate identification of discrepancies, and had been signed authorized

members of the supplier, Ebasco source inspection and on-site Ebasco receiving inspection organization. No items of noncompliance or deviations were identified.

c. Storage

The inspector examined the licensee's warehouse storage areas on-site and observed that work and QA/QC procedures were established to appropriately store safety related items in Class A, B, C, and D levels.

The Class A storage area was environmentally controlled and adequate safeguards were in effect to preclude entry of foreign material. Facilities for storage of Class A, B, C, and D level items appeared to comply with ANSI N45.2.2 requirements. Records of storage for quality Class 1 material were maintained as required by procedure.

The inspector observed that the Ebasco Receiving and Handling Instructions did not address the Limitorque valve operator manufacturer instructions for orientation of the limit switch assembly during storage. While no instances were observed where actual orientations did not comply with the manufacturer's recommendations, the licensee took immediate action to specify orientation requirements in the instructions.

No items of noncompliance or deviations were identified.

7. Peter Kiewit Sons' Installation of Safety Related Piping and Supports (Construction Management)

a. Quality Assurance Organization

The PKS Quality Assurance organization is divided into two functioning groups; Quality Assurance Administration and Quality Control. Both of these groups report to the QA Manager. The main QA office is located near the Unit 5 reactor building. In addition, there are three field offices located near the work activities. The work areas, supplies and records maintenance facilities in these areas were examined and found to be adequate by the inspector. The quality assurance program appeared to be implemented as described in the PKS Quality Assurance Manual for ASME B&PV Code Section III, Division 1 fabrication and installation activities.

b. Manpower Resources

Work projections indicate QA/QC manpower requirements over the course of construction will reach a maximum of approximately 60

people. The present level of QA/QC personnel is 25 and appears adequate since less than 10% Quality Class I work has been completed.

c. Personnel Qualifications

The inspector examined the PKS system for indoctrination and training of inspection personnel. The system was found to conform to the requirements of Regulatory Guide 1.58 and ANSI N45.2.6, "Qualification of Inspection, Examination and Testing Personnel for the Construction Phase of Nuclear Power Plants". Quality Engineers (QE's) are given training courses in all aspects of the quality program. In addition, QE's are given 40 hours of welding experience prior to performing their inspection functions. The education, experience, and training of these inspectors appeared satisfactory for their assigned quality control functions.

All new employees receive an indoctrination session on quality and safety requirements before being assigned to a specific work area. The inspector was present during one of these sessions which included two training films. The first film presented all the quality requirements PKS is committed to comply with during construction at WNP-3/5 (e.g., 10 CFR 50, Appendix B, ASME B&PV Code, ANSI standards and PKS QA Program, procedures and work instructions for performing construction activities). The second film was a safety film where emphasis on safety is stressed by the Project Manager. The indoctrination and training program appeared satisfactory.

d. Employee Morale

PKS construction management projected a strong positive attitude toward safety and quality. Interviews with QA, QC, and craft personnel indicated this attitude was felt in all levels of the PKS organization.

The lines of communication between engineering, construction, QA, and QC appeared to be very effective. Interface between QA and construction management is made on a daily basis. All personnel interviewed felt free to identify quality problems and receive feedback on dispositions taken to resolve their concern. Employee morale appeared to be very high throughout the PKS organization, from craftsmen to management.

e. Document Control

A central document control facility had been established by PKS. The inspector examined this area to determine if documents are being issued, revised, handled, stored, and discarded in accordance with the PKS quality assurance program.

From the master document control cards, seven drawings were selected for inspection. This included distribution from the document control facility to the engineering department and to the field office located in the reactor auxiliary building (RAB). The stick files in these areas were examined for proper distribution and correct revisions of the drawings, DCN's, and FCR's. All documents were readily located, properly marked, and found to be of the correct revision. Discussions with document control personnel at various field locations indicated that the document control system was operating satisfactorily. No items of noncompliance or deviations were identified.

f. Audits

The PKS audit program was examined for compliance with their QA manual and procedures. Audit plans and schedules had been established to audit all applicable requirements of 10 CFR 50, Appendix B on a yearly basis. The audit program had been implemented since approval of the PKS QA Program in April 1980.

The inspector reviewed ten completed audit reports to ascertain that the reports contained the following items in accordance with PKS-QP-17: audit plan, checklists, pre-audit and post-audit summaries, audit finding report, and a statement as to effectiveness of the audited operation. All audits were initiated and completed within the required time period. The audit scope and findings were clearly documented. Discrepant conditions were properly recorded, and followup and corrective actions taken were appropriate. No items of noncompliance or deviations were identified.

g. Surveillance

The PKS surveillance program requires that surveillances be performed at predetermined intervals on protective services such as housekeeping, care and maintenance, cleanliness control, and storage. The 1981 surveillance schedule also includes surveillance in the areas of welding and pipe cleanliness control. The inspector reviewed a number of quality assurance

surveillance reports for compliance to PKS-QP-12 and to ascertain that proper corrective measures were taken by the responsible supervisor. The surveillance logs, checklists and reports all appeared satisfactory.

h. Records System

The PKS quality assurance records system had been established, defined and was being implemented in accordance with PKS-QP-10. All quality records are stored and safeguarded in a fire protected vault. All QA/QC personnel receive training regarding the PKS records system.

The ease of identification and retrievability of quality records was amply demonstrated. The inspection provided the identity of three pipe spools containing unidentified weld joints, previously examined by the inspector, to the Project QA Manager. The Project QA Manager was able to identify the weld joints and retrieve the records packages within five minutes. N items of noncompliance or deviations were identified.

i. Nonconformance Control and Trending

Nonconformance reports (NCR's) are initiated by project quality assurance. Nonconformances are normally identified from inspection and surveillance activities. No other categories of nonconformance documentation, such as Inspection or Deviation Reports, are used. The inspector examined several NCR's for appropriate and timely corrective actions and evidence of PKS management review.

During the time from PKS QA program approval, April 1, 1980, to January 1981, a number of NCR's were generated. This period was used to establish a baseline from which meaningful trend analysis could begin. Two trend analysis work sheets have been generated for the months of January and February 1981. Now that construction is well underway, trending will be performed on a monthly basis. Trending and nonconformance documentation appeared satisfactory and appeared to be in compliance with PKS QA procedures. No items of noncompliance or deviations were identified.

j. Review of Quality Assurance Implementing Procedures

The following procedures and work instructions were examined for compliance with 10 CFR 50, Appendix B; the ASME B&PV Code, Section III; Ebasco Contract Specifications; the PSAR and applicable ANSI Standards:

- Specification 860-W: Supplementary Quality Assurance Requirements for Quality Class I Activities
- Specification 884-WA: Supplementary Requirements for Welding of Nuclear Pressure Components
- PKS Quality Assurance Manual for ASME B&PV Code, Section III, Division 1
- PKS-WI-302: Pipe Cleanness Control
- PKS-WI-305. Cold Bending of Pipe
- PKS-WI-701: Filler Metal Control
- PKS-WI-704: Weld Rework Instruction
- PKS-EP-1: Document Control
- PKS-EP-2: PKS Drawing Format
- PKS-EP-3: Configuration Control
- PKS-EP-5: Engineering Modifications
- PKS-EP-7: Cleaning Instruction Preparation
- PKS-EP-8: Procurement
- PKS-EP-9: Packaging, Shipping, and Storage of Nuclear Plant Items
- PKS-EP-10: Warehousing
- PKS-EP-11: Reporting Defects and Non-compliance (10 CFR 21)
- PKS-EP-12: Engineering Drawing and Document Identification
- PKS-EP-13: Work Release Preparation
- PKS-EP-14: Material and Item Marking and Identification
- PKS-CP-7: General Welding Procedure
- PKS-CP-9: General Housekeeping
- PKS-QP-1: QA Personnel Qualification
- PKS-QP-2: Auditor Qualification

- PKS-QP-4: Stop Work Authority
- PKS-QP-5: Receiving Inspection
- PKS-QP-7: Inspection and Examination
- PKS-QP-8: Inspection Status
- PKS-QP-9: Control of Nonconformances
- PKS-QP-10: Quality Assurance Records
- PKS-QP-11: Audit
- PKS-QP-12: Surveillance
- PKS-QP-13: Vendor Qualification and Source Surveillance
- PKS-QP-14: Cleanness Examination
- PKS-QP-15: Visual Weld Examination
- Ebasco Specification: Fabrication Requirements for 2" and Smaller Nuclear Piping

Pursuant to review and evaluation of the above listed documents, the inspector identified the following concern regarding PKS-WI-305.

PKS Work Instruction 305, Revision 4, does not specify a minimum temperature for cold bending carbon and low alloy steel pipe. The concern here is the possibility of brittle fracture if the bending temperature is too low. Also, the specified upper temperature limits, 1500° F for carbon and low alloy steel and 800° F for stainless steel, for pipe bending appear excessively high. Bending carbon steel or low alloy steel above 1300° F may result in a change in the mechanical properties of the material. The 800° F upper limit on stainless steel may cause sensitization, making the material susceptable to intergranular stress corrosion cracking. No cold bending by PKS has been performed to date using the temperatures of concern. In response to the inspector's concern, the PKS procedure was being revised and the Ebasco specification, addressing fabrication requirements for cold bending 2" and smaller pipe, was being evaluated for possible revision to reflect proper technical information. This item will be examined during a future inspection (50-508/509/81-08-15).

b. Welding Activities

(1) Weld Procedure Review

The following welding procedure specifications (WPS) and procedure qualification records (PQR) were examined for compliance with ASME Section IX requirements:

- PKS-WPS-1s, Revision 6 of 9/5/80, Carbon Steel (P-1 to P-1), PQR No. 3, Revision 1
- PKS-WPS-2s, Revision 4 of 6/18/80, Stainless Steel (P-8 to P-8), PQR's No. 1, Revision 2 and No. 2 Revision 2
- PKS-WPS-3s, Revision 4 of 12/16/80, Alloy Steel (P-4 to P-4), PQR's No. 12 Revision 1 and No. 13, Revision 1
- PKS-WPS-8s, Revision 4 of 9/29/80, Carbon Steel (P-1 to P-1), PQR's No. 8 Revision 0, No. 3, Revision 1 and No. 16, Revision 0
- PKS-WPS-9s, Revision 3 of 9/3/80, Stainless Steel (P-8 to P-8), PQR's No. 2, Revision 2 and No. 9, Revision 1

The procedure qualification records supported the essential variables listed in the welding procedure specification. No items of noncompliance or deviations were identified.

(2) Welder Qualification

The inspector examined PKS Work Instruction 702, "Welder Qualification and Administrative Controls", for compliance with ASME Section IX requirements. WI-702 does not describe in detail the PKS system for welder qualification. Instead it states that the welder's test assembles shall be tested in accordance with the applicable code, ASME Section IX or AWS D1.1. However, ASME Section IX and AWS D1.1 are silent on requirements for having a procedure detailing qualification methods.

The inspector determined that the Welding Engineer supervising welder qualification was knowledgeable in code requirements and appeared capable of appropriately qualifying welders. However, there is a weakness perceived in this approach in that the PKS method of qualifying welders appears dependent on the knowledge level of the welding engineer responsible for welder qualification.

This concern and the impact of a significant increase in welder manning levels will be examined during a future inspection (50-508/509/81-04-16).

The interview with the welding engineer identified that PKS had been qualifying welders to the 1977 Edition Summer 1978 Addenda of ASME Section IX instead of the current edition of Section IX.

The Section IX Preamble specifies that any requalifications or new qualifications shall be made to requirements of the current edition. A comparison of the two Code Editions and Addendas did not identify any inconsistency in the area of weld or performance qualifications. The inspector considers this matter to be satisfactorily resolved.

(3) Observation of Welding Activities

In-process welding on safety-related components was examined for compliance with applicable procedures and standards. Welding was observed on containment penetration No. 24, Frame 64 pipe chase in the fuel handling building (FHB) and on hanger installation 3G-CH-209. These examinations identified that filler material, base metal, weld identification, cleanliness, preheat, weld rod use, inspector qualification, weld joint geometry, and use of a "traveler", were in accordance with contractor's quality assurance procedures and work instructions. In addition, the inspector interviewed the welders performing these welds during which it was determined that the welders received adequate instructions about the weld joint and welding procedure to be used. No items of noncompliance or deviations were identified.

(4) Visual Examination of Welds

The inspector visually examined ten completed welds in the Unit 3 RAB (Reactor Auxiliary Building) and FHB (Fuel Handling Building) areas. Characteristics examined included weld location, size, shape, finish, weld reinforcement height and freedom from surface defects exceeding requirements. No items of noncompliance or deviations were identified.

(5) Weld Filler Material Control

The inspector examined the activities of control, issue return and storage of weld filler materials. These activities were performed in the three established PKS rod rooms, located in the Fab Shop, RAB and FHB. Holding

ovens and portable rod containers were being properly maintained, and contained only one electrode classification. Filler material was issued only to qualified welders as determined from the qualified welder roster located in each rod room. The inspector examined the records from four separate heats of stainless weld rod and verified that the delta ferrite measurements were in compliance with contract specifications. No items of noncompliance or deviations were identified.

(6) Piping Laydown Area

The inspector examined the pipe rack storage area for conformance to ANSI N45.2.2 and contract specifications. The laydown area was orderly, the pipe was on racks, and the pipe ends were capped. The inspector reviewed the material contract (MC-251-4) for three different size stainless steel pipes located in the pipe rack storage area. Code and contract requirements were specified in the contract material certification and Certificates of Conformance were supplied with each shipment or lot. The supplier was on the PKS approved vendor list. No items of noncompliance or deviations were identified.

8. Morrison-Knudsen (Construction Management)

a. Scope of Work

Morrison-Knudsen is the civil contractor charged with the responsibility for the construction of the Reactor Auxiliary and Fuel Handling Building substructures, walls, elevated slabs, and performance of related work for the Washington Public Power Supply System's Nuclear Projects Numbers 3 and 5.

b. Construction/Fabrication/Installation Adequacy

The inspector selected two of Morrison-Knudsen field activities to establish confidence that field activities were being adequately controlled and that these activities conform to the requirements of the contractor's specifications, procedures, and applicable codes. The two activities examined and the findings are detailed below:

c. Stud Welding

During the examination of stud welding activities on the southside of Unit 3 at the 417' elevation, the inspector

observed that a stud welding operator welding on a member (No. D133B) had welded twenty-four studs without bending the first two studs of the series as required by Morrison-Knudsen Administrative Instruction Number 15 (A.I.15), "Stud Welding Inspection Procedure".

A.I.15 in paragraph 6.3 states that, "Each operator shall bend the first two studs on each day's production to 30° and the first two studs on each member to 30°", and in paragraph 6.8 that, "The operator shall circle with a paint stick, or paint a line up the shank of the first two studs bent on each new member."

The failure to accomplish work in accordance with approved procedures is considered an apparent item of noncompliance with 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" (50-508/810817).

This is an apparent repeat of an item of noncompliance that was identified in IE Inspection Report No. 81-01. It is apparent that the licensee's corrective measures instituted since that time have not prevented recurrence of this item.

d. Field Welding

The inspector examined completed and in-process field welding of form plates to structural steel beams at the 417' elevation of Unit 3. The plate welds located between columns numbers CA5 and CA6 did not conform to the requirements of AWS A2.4-1979 in that the intermittent welds were not terminated at the end of the plate length. Specifically, AWS A2.4, "Symbols for Welding and Nondestructive Testing", states in paragraph 4.6.1 that, "When intermittent fillet welding is used by itself, the symbol indicates that the increments shall be located at the ends of the dimension length."

These welds had been accepted by Morrison-Knudsen's Quality Control on or before April 15, 1981.

Contract Drawing Number 3240-3306 in the weld detail specifies three inch welds on nine inch centers and a different contract drawing specifies the length of the form plates as varying from three to seven feet in length.

These form plates are welded around and between the containment shield wall and the steel deck at the 417' elevation. Discussion with the licensee indicated that the form plates have no structural safety significance other than to serve as a steel concrete form. The welding to the structural steel beams is designated as Quality Class I and is being performed in accordance with the contractor's Quality Program. Therefore, this is not considered an item of noncompliance because it is recognized that there is no safety significance involved and that the form plates do not perform a structural safety function.

e. Document Control

(1) Program

Morrison-Knudsen does not perform any design activity; all design is performed by the Architect/Engineer, Ebasco Services, either on-site by the Ebasco Site Support Engineering (ESSE) group, or by the Ebasco New York office. To provide the Owner/Engineer with reports of discrepancies, interferences, conflicts between drawings and/or specifications, construction procedures, contract documents, and other routine construction interface problems, Morrison-Knudsen utilizes what is termed the Field Problem Memo (FPM). Field Problem Memos are originated by M-K Engineering or other organizations and are forwarded to the M-K Engineering Section for review and serial number assignment. The Field Problem Memos are then sent to Ebasco engineering and if the resolution of the FPM results in a design change/modification, the Engineer can issue a preliminary design change. The preliminary design change allows the contractor to continue work up to an assigned hold point or until the formally approved and controlled design change has been received from the Engineer.

(2) Program Adequacy

The document control system as instituted by Morrison-Knudsen was examined by the inspector to verify that design documents were revised, handled, stored, and discarded in accordance with the contractor's procedures. The inspector found that because modifications (design change notices, field change requests, contract waiver requests) are not incorporated into design documents on a periodic basis, the contractor has evolved a system of litt drawings to incorporate modifications. During the month of March 1981, Morrison-Knudsen received, tracked, and incorporated 392 modifications.

Lift drawings are used for construction purposes only and Quality Control cannot use lift drawings for inspecting and accepting work, although lift drawings are subject to the same controls as the original design documents. This constriction has caused the contractor to evolve another system wherein Morrison-Knudsen develops a "document directory". The directory lists modifications that are applicable to contract drawings that Quality Control will use in inspecting and accepting work. If it were not for the document directory, the Quality Control inspector would be required to go through the volumes of modifications to verify which were applicable. For example, a single seven yard concrete placement was found to have four applicable drawings with 131 applicable modifications. Not all the modifications applied to the concrete placement, but all of the modifications had to be reviewed to determine their status.

The performance of Morrison-Knudsen's document control is seen by the inspector as a perceived strength in the contractor's program, specifically with regard to the handling of the influx of design modifications, the incorporation of modifications into lift drawings, the evolution of the document directory, and the attitude and motivation of the document control personnel to provide a quality product.

f. Implementation

The inspector examined five of the Morrison-Knudsen field drawing stations to assure that drawings in the field were of the most current revision and that the modifications books were up to date. The inspector found that while all drawings examined were of the most current revision, some drawings had not been updated since 1979. A review of the modification books indicated that some FCR's did not stipulate whether the FCR applied to Unit 3 or Unit 5 or both. In some cases, FCR's were found to indicate applicability to a drawing, even though the drawing had since been revised to incorporate the FCR. Because modifications are not continually revised, each of the drawing stations inspected each had approximately two bookcases of modifications that applied to contract drawings.

Morrison-Knudsen's document control has twenty such drawing stations and fifteen lift drawing stations to continually update.

The revision or issuance of contract drawings or modifications is the responsibility of the Engineer (Ebasco). Morrison-Knudsen has no control over this area.

During the aforementioned inspection of the drawing control stations, the inspector also examined drawings used by the Field Fabrication Shack (behind Unit 5) to perform field bending of reinforcing steel. The inspector found that an iron worker foreman had been working with a portion of a contract drawing and an unofficial sketch of the Reinforcing Bar Bending Schedule for the past two weeks. The contractor took action to stop the further use of these unofficial documents. The contractor was able to show that the Reinforcing Bar Bending Schedule (for the first five types) does not change and work performed for the past two weeks involved only the first two types of the bar bending schedule. A review of the MorrisonKnudsen field fabrication rebar log confirmed the contractor's contention. The inspector found no other instances of uncontrolled drawings being used to perform work.

g. Bending of Reinforcing Steel

The inspector examined the controls instituted by M-K to control bending of reinforcing steel for compliance with Specification No. 3240-412 (Formed Concrete Construction) and ACI-318 (Building Code Requirements for Reinforced Concrete). M-K Construction Procedure No. 15 (Field Fabrication of Reinforcing Steel) details the system employed to control this activity. In addition, the actual bending pin diameters employed in the field to effect compliance with bend radius requirements were examined. The inspector found on April 22, 1981, that the M-K procedure did not implement specification requirements and actual pin sizes used by M-K in the field for bending rebar did not conform to the requirements of either CP-15 or Specification 3240-412. The licensee stated that sizes 3, 7, and 9 reinforcing steel were not used or bent at the WNP-3/5 site. The following tabulation details the minimum bend radius, for various size reinforcing steel used on-site, specified by Specification 3240 (paragraph 5.02), M-K Construction Procedure CP-15 (Table 1) and the actual pin diameters used by M-K in the field for bending rebar.

Bar Size	Spec. 3240-412 Requirement Bar Diameter (inches)	M-K CP-15 Requirement Bar Diameter (inches)	Approximate Pin Diameter Used In Field
4	6 (3")	4 (2")	2.35"
5	6 (3.75")	4 (2.5")	2.35"
6	6 (4.5")	5 (3.75")	3.075"
8	6 (6")	6 (6")	4.75"
10	8 (10")	8 (10")	6.25"
11	8 (11")	8 (11")	6.75"

M-K personnel stated that the above field apparatus had been used in the past to bend rebar for use in safety-related applications. The licensee took immediate action to stop work on rebar bending. The licensee initiated action to evaluate the effects of bending reinforcing steel to a smaller inside diameter than required by specification. This is an apparent item of noncompliance with the requirements of 10 CFR 50, Appendix B, Criterion V (50-508/509/81-08-18).

h. Handling and Storage of Materials

The inspector toured all of Morrison-Knudsen's storage areas in order to evaluate the adequacy of storage. housekeeping conditions, control of nonconforming material, measures to preclude use of nonconforming material, and the type, frequency, and comprehensiveness of QA/QC inspections. The following areas were examined:

- Cooley laydown area
- A-Yard (next to main office)
- Main Warehouse (Warehouse No. 1)
- Warehouse No. 3
- Weld Rod Issue Stations:
  - Main issue station (next to Warehouse No. 1)
  - Rod issue station for Unit No. 5
  - Rod issue station for Unit No. 5

(1) Cooley Laydown Area

On April 20, 1981, the inspector examined ten structural steel beams at the Cooley laydown area for compliance to the Morrison-Knudsen storage and handling requirements. The inspector noted that pursuant to direction from the Owner/Engineer, Morrison-Knudsen's responsibilities for receipt inspection is limited to performing an over, short, or damage receiving inspection, with the owner responsible for the "quality-related" inspection (reference: Serial letter EB263-80-259). The structural steel beams fabricated by Isaacson Steel and Fought and Company were also examined for compliance with the fabrication and design drawings. The findings and the beams examined are listed below:

Isaacson Steel	Fought and Company
(1) Mark No. D119D	(1) Mark No. 318A
(2) Mark No. D35A	(2) Mark No. 308B
(3) Mark No. D63A	
(4) Mark No. D64B	
(5) Mark No. F18B	
(6) Mark No. F69F	
(7) Mark No. F11B	
(8) Mark No. A25B	

The inspector observed that generic design drawing number 3240-G3357 for structural steel fabrication depicts, in the "Beam Bearing Plate Schedule", stiffener plates that are coped or clipped at the beam web and flange intersection with fillet welding terminating at the coped edge of the stiffener plate and not continuing to the beam web and flange intersection.

The structural steel beams examined did not conform to the drawing specified requirements in that the majority of the stiffener plates were welded through the cope area to the beam web and flange intersection. All of the discrepant structural steel beams had been shop inspected and accepted by Ebasco Vendor Quality Assurance Representatives.

The failure to fabricate structural steel beams in accordance with prescribed drawings is considered an apparent item of noncompliance with 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings. (50-508/509/81-08-19)

i. Weld Rod Control Stations

Examination of the three weld rod issue stations for compliance with Morrison-Knudsen's Administrative Instruction Number 7, "Welding Material Control Procedure", Contract Specification Number 884-WC-80, "Structure Welding", and the requirements of the AWS Code revealed the following inconsistencies with the welding material control procedure and the contract specification not reflecting code requirements:

(1) Contract Specification Number 884-WC-80 in paragraph 5.1.2 states, in part, that,

"All low hydrogen electrodes and submerged arc fluxes after removal from sealed containers shall be stored in holding ovens maintained at 250-350° F unless immediately issued for use."

"Unused covered electrodes which have been exposed outside of the holding ovens or portable electrode ovens shall be returned to the holding ovens for an eight hour re-dry before the following exposure limits are exceeded:

E70XX	4 hours
E80XX	2 hours
E90XX	1 hour

Unused, covered electrodes which have been exposed for periods in excess of the above limits shall be re-baked (one time only) in accordance with a procedure acceptable to the Engineer or discarded."

AWS D1.1-1979 in paragraph 4.5.2 states in part that, "All electrodes having low-hydrogen coverings conforming

to AWS A5.1 shall be purchased in hermetically sealed containers or shall be dried for at least two hours between 450° F (230° C) and 500° F (260° C) before they are used. Electrodes having a low-hydrogen covering conforming to AWS A5.5 shall be purchased in hermetically sealed containers or shall be dried at least one hour at temperatures between 700° F (370° C) and 800° F (430° C) before being used. Immediately after opening of the hermetically sealed container or removal of the electrodes from drying ovens, electrodes shall be stored in ovens held at a temperature of at least 250° F (120° C). After the opening of hermetically sealed containers or removal from drying or storage ovens, electrode exposure to the atmosphere shall not exceed the requirements of either 4.5.2.1 or 4.5.2.2."

Paragraph 4.5.2.1 states that, "After hermetically sealed containers are opened or after electrodes are removed from drying or storage ovens, the electrode exposure to the atmosphere shall not exceed the values shown in Column A, Table 4.5.2, for the specific electrode classification."

Table 4.5.2, "Permissible atmospheric exposure of low hydrogen electrodes", Column A, shows a maximum atmospheric exposure time of four hours for E70XX electrodes. Note 1 of Column A states that, "Electrodes exposed to atmosphere for longer periods than shown shall be redried before use."

Morrison-Knudsen Administrative Instruction Number 7 states in paragraph 7.6, that, "Covered low hydrogen electrodes which are exposed to the atmosphere for more than four (4) hours shall be returned to ovens for eight (8) hours minimum redrying at the holding temperature (250° F - 350° F). These redrying ovens shall be so identified "redrying". Electrodes shall be redried only one time."

It is apparent that the welding material control procedure and the contract specification conflict with the requirements of the AWS Code regarding welding electrode atmospheric exposure limits, redrying temperatures, and duration of redrying. Also, the contract specification prescribes three types of ovens, a holding or storage oven, an eight hour redry oven, and a rebake oven. Only the holding and redrying ovens are addressed in the Morrison-Knudsen procedure or the AWS Code.

Morrison-Knudsen procedure AI-07, in paragraph 6.5.2, requires that a welder withdraw only a maximum of ten electrodes from his portable oven at one time. At the end of a shift, all unused electrodes are required to be bent and placed in the welder's stub bucket.

It appears that this procedural practice has precluded Morrison-Knudsen from inadvertently using weld filler material which might not comply with the requirements of the AWS Code.

Discussions with licensee representatives indicated that these procedural/specification/code concerns would be evaluated and resolved. This item will be examined during a future inspection (50-508/509/81-08-20).

(2) Paragraph 6.8 of Morrison-Knudsen Procedure AI-07, states in part that the "Quality Control person will verify the weld rod returned by counting the rod returned in the portable oven and adding the amount of stubs returned." The rod returned shall equal the rod issued."

Examination of the weld filler metal withdrawal slips at the two field weld rod issue stations indicated that the Quality Control inspectors were not documenting the number of weld rod stubs returned. The Quality Control inspectors were only documenting the number of weld rod issued and the number of weld rod returned. Therefore, the inspector could not verify compliance with paragraph 6.8 of the procedures.

The inspector toured the Morrison-Knudsen work areas and found no instances of loose or uncontrolled weld rod. The inspector does not attach any safety significance to this finding and this is not considered an item of noncompliance.

However, the inspector noted that this practice is not consistent with the procedure and that procedure practice compliance cannot be verified since no record exists to confirm the Quality Control inspector's findings.

The licensee indicated that they would evaluate and resolve this matter. This item will be examined during a future inspection. (50-508/509/81-08-21)

The failure of the contractor's procedures to adequately incorporate specification and/or code requirements is regarded as a perceived weakness in the licensee's management system and has been the subject of repeated inspection findings, an item of noncompliance (Reference: IE Inspection Report No. 50-508/509/80-15/01) and has been discussed with WPPSS management during the presentation of the NRC Regional Evaluation of Licensee Performance at WNP-3/5 for the appraisal period of August 1979 through August 1980.

j. Audits

The inspector reviewed the results of five internal and two management corporate audits. The audits reviewed were found to be comprehensive and applicable to the activity being audited. The audits were performed in accordance with the audit schedule and, except for one audit, all findings were found to be answered adequately and in a timely manner. This exception is discussed in paragraph 5.c.(6).

9. J. A. Jones, Contract 265 (Construction Management)

The inspector examined a portion of the safety related activities of J. A. Jones Inc. and a portion of the WPPSS and Ebasco activities that related to the J. A. Jones work. J. A. Jones performs civil and structural work inside containment as defined in Contract 265. The specific areas examined and the inspector's findings are detailed below.

a. WPPSS/Ebasco De-integrated Organization

The inspector examined to what degree the de-integrated WPPSS/Ebasco QA organization was functioning in its overview of the JAJ contract. The inspector determined that de-integration was initiated but not complete. In that regard, it was observed that:

(1) Some WPPSS QA personnel were performing Ebasco work.

(2) The Ebasco and WPPSS QA personnel were physically comingled in the same office space.

(3) WPPSS QA personnel have not evolved their methodology of monitoring quality performance. For example, the WPPSS QA Engineer responsible to monitor the J. A. Jones contract does not receive information copies of J. A. Jones' related nonconformance reports or procedure changes.

(4) Ebasco QA manning is about half of that intended.

Because the de-integrated organization was in the early stages of development in regards to overviewing JAJ, no assessment of adequacy was possible.

b. J. A. Jones Training

The inspector examined the area of J. A. Jones craft and QV training. Jones procedure POP-N-605 prescribes training for craft personnel. POP-N-702 prescribes training for QV personnel.

POP-N-605 for craft personnel is very general. It states all personnel shall receive basic indoctrination in Quality Assurance Requirements by their immediate supervisor.

POP-N-702 for QV personnel is more specific and requires formal training, qualification, examination, certification, and records.

The inspector examined the training records of one QV inspector. The records were orderly, retrievable, and appeared up to date. The written examinations had meaningful questions and appeared to adequately test the scope of the applicants knowledge.

Through discussion with the general superintendent, the inspector established that although the craft training procedure does not require it, craft personnel from the foreman level up are intended to be trained. The method used is that the superintendent marks up a reading list for the craft foreman and above. The craft are to read the procedures and initial the list. The inspector examined records of one ironworker general foreman. Although the man had been employed for approximately one year, approximately half of his reading assignment had not been initialed off as complete.

The general superintendent also pointed out that special short training sessions were given for problem areas and these sessions were documented on an attendence record. There appeared to be no orderly method of determining mandatory attendence by craft discipline; attendence records were on an as-attended basis only.

The Ebasco audits of J. A. Jones had previously identified problems with training documentation. This is discussed further in paragraph 9.h of this report.

The perceived weakness of the craft training, both the procedure and the practice were discussed with licensee management at the exit interview. An example of how this perceived weakness

may have resulted in a problem in the field is given in paragraph 9.d of this report. This area will be inspected further in the normal course of future inspections.

c. Procedures

(1) Procedure Review

The inspector examined a sample of J. A. Jones work and inspection procedures and the related Ebasco specifications for general compliance to applicable codes and standards.

The procedures and related specifications reviewed were:

(a) Project Specification No. 3240-265, Section 2A, Revision 10 of 12-22-80, Concrete Construction of Reactor Building

(b) Project Specification No. 3240-412, Revision 5 of 9/30/80, Technical Specification for Formed Concrete Construction

(c) Ebasco Specification No. 884-WC-77, Revision 2 of January 1977, Structural Welding

(d) J. A. Jones Procedure WE WP-1, Revision 2 of 7/17/80, Qualification of Welders.

(e) J. A. Jones Procedure WE WP-2, Revision 4 of 6/27/80, Handling, Storing, and Modification of Reinforcing Steel

(f) J. A. Jones Procedure WE WP-5, Revision 5 of 11/25/80, Concrete Placing, Curing, Finishing, and Inspection

(g) J. A. Jones Procedure WE WP-11, Revision 3 of 3/11/80. Weld Filler Metal Control

(h) J. A. Jones Procedure WE SP-102, Revision 2 of 4/03/80, Structural Welding Procedure

(i) J. A. Jones Procedure WE SP-107, Revision 2 of 2/27/81, Stud Welding

(j) J. A. Jones Procedure WE SITP-102, Revision 1 of 6/18/80, Welding Inspection

(k) J. A. Jones Procedure POP-N-605, Revision 2 of 11/12/80, Indoctrination and Training

(l) J. A. Jones Procedure POP-N-702, Revision 2, of 1/27/81, Personnel Training, Qualification, and Certification

(m) J. A. Jones Procedure POP-N-709, Revision 1 of 8/25/80, Project Quality Assurance Records

(2) Procedures do not implement specifications

The inspector determined that the J. A. Jones implementing work and inspection procedures did not contain all Ebasco specification requirements by inclusion or reference. Examples are: (a) Concrete Procedure WP-5 does not specify or invoke the requirements for curing compounds for finished surfaces given in specification 265-2A, and (b) Welding Procedure SP-113 permits thermal cutting of stainless steel. Specification 265-2A, FCR-972 had the additional requirement of grinding 1/8" inc of material following thermal cutting if carbon arc was used. Specification 265-2A was not referenced by the weld procedure.

Weld Filler Control Procedure WP-11 does not contain electrode redrying temperatures or reference specification 265-2A, FCR-F-912.

J. A. Jones procedures not implementing specification requirements has been the subject of a previous item of noncompliance (50-508/509/80-15-01) and two unresolved items (50-508/509/80-01-01 and 50-508/509/81-01-04). In the case of the procedure discrepancies discussed above, the inspector determined that inspection personnel were familiar with the specification requirements. Proper field implementation of requirements was not verified.

The fact that implementing procedure do not consistently include or invoke specification requirements is perceived as a weakness.

(3) Procedures issued with unresolved comments

The inspector observed that the stud welding procedure WE-SP-107, Revision 2 of 2/27/81, had been issued for field use with unresolved comments regarding records and inspection reports. The transmittal sheet which issued the procedure for field use contained the signatures of the Ebasco discipline engineer, QA engineer, ESSE engineer, and the construction superintendent. A review of other

documents indicated this was not an isolated case; however, the transmittal sheets indicated that although released for construction, the documents were to be revised and resubmitted.

At the exit interview, licensee management committed to review all contractor safety Class 1 documents for similar unresolved comments. This item will be inspected further during a future inspection (50-508/81-08-22).

(4) Structural Welding Procedure

The inspector examined the J. A. Jones structural welding procedure WE-SP-102, Revision 2 of 4/3/80, for compliance to AWS D1.1-1-79 and Ebasco Specification 884-WC-77.

The J. A. Jones procedure has a single "Prequalified Joint Welding Procedure - Procedure Specification" sheet (Form E-1 of AWS D1.1) for all AWS prequalified joints. The entry on this single specification sheet under "material" references all the material listed in AWS suitable for E-7018 weld rod. The entry on this single specification sheet under joint detail references 17 sheets of joint details - all the prequalified joints of AWS D1.1. As discussed at the exit interview with licensee management, the J. A. Jones welding procedure was not considered normal practice. Usual practice is to write a specification sheet for joining specific base metals and specifying a particular joint detail for an AWS prequalified joint. Other AWS required details are usually included on the specification sheet such as minimum and maximum root and pass sizes and whether single pass fillet welding is required. The J. A. Jones procedure as written depends heavily on the knowledge of the intricacies of the AWS Code requirements by the welder and the weld surveillance inspector.

No welding was in progress at the time of inspection; therefore, implementation of welding activities was not examined.

The Jones welding procedure was discussed at the exit interview and is a perceived weakness. Additionally, an idiosyncracy was noted in the Jones procedure. Paragraph 12, material specifications, lists ASTM A 537, Cl 2 material.

AWS D.1.1 Table 4.1.1 shows ASTM A537 CL 2 material to require welding with E 8018 filler metal whereas the Jones procedure requires E 7018 filler metal.

This item will be inspected further on a future inspection (50-508/81-08-23).

d. Concrete Preplacement Activities

The inspector examined concrete preplacement activities for Unit 3 concrete placement 3 RBI-044-372.

It was observed that that quality verification personnel had an adequate work station in the immediate vicinity of the work, that they had controlled copies of necessary documents, and that they utilized design documents versus placement drawings for inspection verification.

Through discussion with the quality verification personnel, it was determined that the preplacement verification of reinforcing steel and embed items was performed in a systematic orderly manner. Since several quality verification personnel were involved in verifying the installation of reinforcing steel and embed items, the individuals involved used a color coding method to mark the drawing areas they had personally inspected.

The inspector sampled five embed plates and several reinforcing steel areas. The inspector verified embed plate locations per the design drawing and reinforcing steel bar size, spacing and bar count.

The inspector observed one area where there was missing rebar and improper bar spacing. The area is the column number CR-11 base at elevation 372 as shown on drawing G-2526 Revision 3 as modified by field change request No. FCR-CH-1064. Specifically, six of the eighteen "U" type bars shown on FCR-CH 1064 were not installed and the minimum spacing of 3/4 inch between bars was not achieved as required by Specification 3240-412; the bars were in contact with each other. The quality verification inspector was notified of the condition.

The inspector observed that the column 11 detail on the quality verification copy of drawing G 2526 Revision 3 had a colored mark on column 11, apparently indicating it had been inspected

by quality verification personnel. Subsequent discussion with involved personnel indicated that the quality verification person who made the colored mark was no longer on site, and that the mark was not applied in the normal manner. Discussion with the quality verification supervisor indicated that the departed inspector had a habit of "ticking off" in his color, the items he would inspect versus the items he had inspected.

Since the final preplacement inspection for reinforcing steel had not been completed, this was not considered an item of noncompliance.

Subsequent to the identification of the missing bar and the spacing problem, the bars were reworked by the craft (since work was officially still "in progress") and a field change request (FCR CH-1148) was written to request a specification change to allow engineering approval of deviations from the spacing requirement of the specification.

After the missing bars were placed, the inspector reexamined the area and observed that although the bar count had been corrected, the bars were not in the space envelope defined on the drawings (due to the congested nature of the bar in the area of the column). The inspector questioned the quality verification inspector as to whether he was aware of the problem. The quality verification inspector stated he had not been informed of a problem by craft personnel but had not yet performed his inspection of the reworked area.

As a result of this second spacing problem, a red tag was hung on the area and the problems identified on Field Change Request FCR-CH-1153. This FCR was approved and authorized the as-installed spacing between bars and bar locations.

In summary, it appeared that although this item was not an item of noncompliance, it demonstrated a weakness in the craft compliance with drawing and specification requirements and a lack of craft coordination with quality verification personnel when requirements could not be met. This weakness is covered in this report in paragraph 9.b. regarding craft training.

At the exit interview, licensee management committed to review the circumstances leading to the missing and misspaced reinforcing steel and to take appropriate corrective actions. This item will be inspected further in a future inspection (Item 50-508/81-08-24).

e. Concrete Placement

The inspector examined the placement of concrete in Unit 3 containment, concrete placement 3RBI-44-372, for compliance to applicable codes and standards. The inspector observed adequate numbers of quality verification and crafts personnel and proper placement and consolidation techniques. The placement in and around the congested reinforcing steel under column CR-11 appeared to be adequate.

No items of noncompliance or deviations were observed.

f. Curing Compounds

The inspector examined the use of concrete curing compounds by J. A. Jones.

(1) Verification of Curing Compound Application

Through discussion, the inspector determined that Ebasco surveillance personnel had previously identified a problem with the verification of application of curing compound. The problem was identified on quality finding report QFR No. 265-014 and dealt with the fact that although quality verification personnel were required to verify the proper cure of concrete, they were not necessarily present for the application of curing compound and depended on heresay information from the laborer foreman to verify application. At the time of the inspection, the QFR remained outstanding and procedure changes had not been issued. Discussion with the quality verification supervisor disclosed that by verbal instruction, the quality verification inspector was to verify application of curing compound by observing its application. Additionally, another change was being implemented which required the addition of red dye to the curing compound which would allow post application verification.

The inspector subsequently interviewed the swing shift quality verification inspector and verified he was aware of the requirement to observe curing compound application. The following morning the inspector examined the surface where curing compound had been applied and noted that the red dye was almost gone; apparently due to a bleaching reaction with the fresh concrete.

Although the problem identified on the QFR appeared to be corrected for the placement observed, the resolution was

implemented informally. This failure to resolve the QFR formally by procedure change prior to performing additional safety-related work is considered an additional example of a procedure weakness described in paragraph 9.c. of this report.

(2) Compatability of Curing Compounds With Final Coatings

The inspector attempted to determine whether the concrete curing compounds were compatible with the final concrete coatings (which are required to be qualified for DBA environmental conditions). Through discussion with the responsible engineer, it was determined that a contract change was in progress which would require the coatings contractor to first remove all curing compounds by sand or water blast prior to applying final coatings.

(3) Control of Curing Compound Removal

In the discussion with the engineer, the two curing compounds in use were discussed. One is an epoxylike compound which must be sandblasted to be removed; the other is a water soluble compound which can be water blast removed. The engineer stated red dye had been added to the water soluble compound so that the required removal technique could be determined visually. The inspector informed the engineer of the bleaching problem with the red dye. The engineer indicated that the method of determining which curing compound was applied and controlling the proper removal technique would be reevaluated. This item will be inspected further on a future inspection (Item 50-508/509/81-08-25).

g. Records

The inspector examined the status of contractor quality records review. Through interviews with responsible licensee records personnel, the inspector determined that there is a large backlog of contractor records in the licensee vault. The J. A. Jones contract had six months of quality documents submitted to the licensee but not yet reviewed and accepted. Some contracts are currently written to require the contractor to submit all quality documents at the end of the contract. At

the time of inspection, basically none of the contractor generated quality records had been reviewed. The licensee personnel interviewed were aware of the problem and stated that plans for action were being formulated which included record review procedure changes, manpower increases, and contract changes to require records submittal as they are generated rather than at the end of the contract.

At the exit interview, the inspector included the backlog of records as a perceived weakness in the licensee's program.

h. Audits

The inspector examined quality assurance audits of the J. A. Jones contract. At the time of the inspection, the licensee's audit group was not fully in place as previously discussed in paragraph 2.a. of this report. The licensee representatives interviewed stated that the primary function of the WPPSS audit group was to audit Ebasco performance but that plans were being formulated to periodically audit contractors as well.

The inspector examined the Ebasco audits of J. A. Jones. In the approximately one year that J. A. Jones has been performing work on the site, Ebasco has performed five audits on the Jones contract. The inspector examined the five audits. The depth and scope of the audit, the nature of the findings, and the followup actions by the auditors appeared satisfactory.

The inspector observed that the first two audits of J. A. Jones had findings regarding J. A. Jones not documenting training of personnel. Both findings were closed. The sampling performed and rationale for closing the items appeared sound. However, as discussed in paragraph 9.b. of this report the inspector found that problems in training documentation still exist.

In several of the Ebasco audits, the adequacy of the Jones QA self-audit program was the subject of findings in the areas of improperly qualified auditors and improper conduct of audits. At the time of inspection, these findings had not been resolved.

At the exit interview with licensee management, the inspector discussed the above observations regarding the lack of timely or lasting resolutions to audit findings as a perceived weakness in the Ebasco audit program.

i. Defective Stud Welding on Embedded Plates

The inspector examined the licensee's action pursuant to the February 26, 1981 potential 50.55(e) report regarding defective

stud welding on embedded plates supplied by Chicago Bridge and Iron's (CB&I) Salt Lake City Facility.

The problem was discovered by visual observation that studs (welded by the stud gun method), which did not exhibit a 360° flash, had not been bent 15 degrees as required by AWS D.1.1.

The licensee's program to assure that no additional defective embeds were installed was comprehensive. All CB&I embeds already installed were identified will be evaluated for acceptability as part of the licensee's 50.55(e) evaluation. As part of the action required of CB&I, all new plates were subject to stud tension testing. All plates in the CB&I yard ready for shipment were similarly tested.

At the site, a 20% sample of plates in the warehouse and the laydown areas were tested by a 30° bend test of the studs on the sampled plates.

The inspector examined CB&I embed plates which had been released to Jones for construction. No examples of lack of flash were observed in the sample.

The licensee's action in investigating the potential 50.55(e) report appeared satisfactory.

j. Personnel Interviews

In the course of the inspection, the inspector privately interviewed several members of J. A. Jones site management, craft and quality verification personnel. In addition, several WPPSS and Ebasco quality assurance and engineering personnel were interviewed. None of the personnel interviewed voiced any serious concerns regarding the achieving of a quality product.

The inspector perceived an undercurrent in the discussions that the J. A. Jones organization is not committed to a well defined system of checks and balances. Although all the required quality assurance systems are in place, the J.A. Jones organization depends heavily on the performance of the craft personnel as monitored by the quality verification personnel. Should there be a breakdown in performance of certain key quality verification personnel, it is not apparent that the procedural controls or quality assurance overview functions of J. A. Jones would prevent a breakdown. The Ebasco surveillance and audit groups add some strength to this perceived weakness in the J. A. Jones QA System.

10. Perceived Strengths

a. Attitude Toward Quality

The inspectors observed that strong positive attitudes toward quality existed in the ranks of the Supply System, Ebasco, and site contractors. These attitudes reflected a positive and supportive management attitude toward quality.

b. Audits

The quality of audits conducted by the quality assurance organizations of the Supply System, Ebasco, and site contractors appeared to be very good. The audits were well planned, comprehensive in nature, and well performed. However, the inspectors observed that actions to resolve findings warrant improvement based on the observation that some findings were repetitive.

c. Document Control

Document control and records management systems employed by the site contractors appeared to be well ordered and implemented, in spite of the large numbers of design document changes imposed on these systems by Ebasco.

d. Licensee Involvement in Engineering

The inspector observed a substantial commitment, on the part of the licensee's onsite engineering organization, to quality and technical evaluation. This conclusion is based on evaluation of the licensee's established task plan for system reviews.

e. Peter Kiewit Sons appeared to have a (1) strong QA/QC program, (2) good interface between QA and construction management, (3) well coordinated and managed records management system, (4) strong effective construction management, and (5) high level of morale. Personnel feel that safety and quality are being emphasized by management.

11. Perceived Weaknesses

a. Procedures

Site contractor's quality implementing procedures require improvement. Actions to assure complete and workable contractor's procedures have not been fully effective.

This observation is reinforced by the following:

(1) The Morrison-Knudsen procedure for field fabrication of reinforcing steel does not implement the technical requirements for minimum bend diameter (paragraph 8.g).

(2) A recently approved revision to the Morrison-Knudsen contract allows Ebasco Construction Management to provide the contractor technical direction in quality affecting activities without appropriate controls to assure compliance with the quality program (paragraph 5.b).

(3) Implementing procedures used by J. A. Jones do not consistently include or invoke specification requirements (paragraph 9.c(2)).

(4) The J. A. Jones structural welding procedure is not in accordance with normal weld procedure practice and depends heavily on the welder's and inspector's intimate knowledge of the welding code (paragraph 9.c(4)).

(5) The J. A. Jones procedure for verification of concrete curing has not been amended to reflect construction/inspection practices (paragraph 9.f.(1)).

(6) The definition of a nonconforming condition is not consistent in quality implementing documents (paragraph 5.c(5)).

(7) The definitions of major and minor design changes, as provided in the PSAR, Section 17.2, and the Ebasco Nuclear Quality Assurance Program, are not consistently applied throughout the Ebasco Company Procedures Manual, the design control implementing system, and the letters delegating authority to design engineers assigned to the Ebasco Site Support Engineering Group (paragraph 5.b).

(8) The form utilized on-site for Field Change Requests did not contain any identifier for indicating if the change requested was major or minor as required by Ebasco Company Procedure No. E-69 (paragraph 5.c(1)(e)).

(9) The Ebasco site procedures for care and maintenance of test equipment do not require a review of previous use of equipment if it is damaged beyond further use nor were records being maintained of periodic inspection and maintenance of test equipment (paragraph 3.b.(5)).

b. Receiving Inspection

The system utilized by the licensee and Ebasco for on-site receipt inspection of safety-related items and components does not include conformance to engineering specifications (paragraph 8.i).

c. Organization and Quality Assurance Program

Significant changes have been made in the Licensee's corporate and site organizational structures. These changes were not reflected in the PSAR and implementing corporate quality assurance program manuals in a timely manner. While interim documents have now been issued, the time allotted to finalize all the documents appears excessive (paragraph 3.a.(2)).

d. Records

There is a large backlog of quality records which have been submitted by contractors for review by the Construction Manager (paragraph 9.g).

e. Corrective Actions

Corrective actions on identified problems are not always prompt nor fully effective.

This observation is based on the following:

(1) Field Change Request and Design Change Notices are not incorporated into design drawings in a timely manner. This issue was identified in two previous WPPSS/Ebasco audits but has not been corrected by Ebasco engineering organizations.

(2) There is a lack of timely and lasting resolutions to Ebasco audit findings pertaining to J. A. Jones (paragraph 9.h).

(3) Use of an improperly qualified welding procedure for cable tray supports was cited as an item of noncompliance by the NRC on March 27, 1981 (Report No. 50-508/81-07). Corrective action has not yet been taken (paragraph 4.c(2)).

f. Trend Analysis

An effective system for detecting and reporting adverse trends in contractor performance has not been implemented. Formal trend analysis of nonconformance reports, audit findings, surveillance findings, etc. has not been performed on a routine basis (paragraph 3.c.(2)).

g. Craft Training

The craft training procedure for J. A. Jones Company is general and does not provide specific training requirements for craft personnel, and the training documentation is incomplete (paragraphs 9.b and 9.d).

h. Interfaces

The interfaces between Ebasco site organization construction management, quality assurance and Ebasco Site Support Engineering (ESSE) are not always defined or implemented.

This observation is based on the following:

(1) The Ebasco site organization chart shows ESSE administratively reporting to the Ebasco Manager of Engineering instead of the Senior Resident Engineer, as required by Ebasco Company Procedure No. 82 (paragraph 5.c(1)(a) and (b)).

(2) Ebasco site management indicated that they had not been provided with the results of Corporate Office reviews of the ESSE organizations (paragraph 5.d).

(3) Ebasco had not taken positive action to include ESSE on distribution lists for design change documents issued by Ebasco Document Control (paragraph 5.c(3)).

(4) The Ebasco quality assurance organization does not routinely participate in work activity planning meetings nor is there an effective written communication system for this purpose (paragraph 3.b.(2)).

(5) The Ebasco quality assurance organization was not put on distribution of a letter modifying a contractor's practice (paragraph 5.c(6)).

12. Unresolved Items

Unresolved items are matters which more information is required to ascertain whether they are acceptable items, items of noncompliance, or deviations. An unresolved item identified during the inspection is discussed in paragraph 3.a(3).

13. Management Interviews

The inspectors met with representatives of Ebasco and Supply System site management on April 13, 1981, to summarize the scope and purpose of the Construction Assessment Team Inspection. At this meeting, site management presented an overview of the Ebasco and Supply System's organizations, including general discussions of position function, duties and responsibilities.

The inspectors met with licensee representatives on April 17 and 23, 1981, to discuss the inspection activities and findings. The licensee acknowledged the findings of apparent noncompliance and weakness.