

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
COMMONWEALTH EDISON COMPANY)
(Byron Station, Units 1 and 2))

Docket Nos. 50-454
50-455

NRC STAFF PROPOSED FINDINGS OF FACT AND CONCLUSIONS
OF LAW IN THE FORM OF A PARTIAL INITIAL DECISION
ON QUALITY ASSURANCE/QUALITY CONTROL ISSUES

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DESIGNATED ORIGINAL

Certified By

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The NRC Staff, in accordance with 10 CFR § 2.754 and a Licensing Board order dated June 21, 1983, proposes the following findings of fact and conclusions of law in the form of a partial initial decision.

I. INTRODUCTION AND BACKGROUND

Evidentiary hearings were held in the captioned proceeding on eight contested issues from March 1 through May 1983, with some adjournments. Proposed findings on seven contested issues^{1/} have already been filed by the parties. Findings on the quality assurance/quality control (QA/QC) contentions are filed herewith,^{2/} except for the issues to be heard

1/ The Staff has filed its proposed findings on seismology (A-1 through A-103), water hammer (B-1 through B-45), occupational radiation safety (C-1 through C-130), steam generator tube integrity (D-1 through D-243), emergency planning (E-1 through E-153), Class 9 accidents (F-1 through F-106 and RF-1 through RF-6), and liquid pathway (G-1 through G-138 and RG-1 through RG-4).

2/ QA/QC findings are designated H-1 through H-295.

during hearing on the reopened issues. See Memorandum and Order Reopening Evidentiary Record, dated June 21, 1983.

II. OPINION

H. Quality Assurance/Quality Control (Joint Interventors' Contention 1A)

Contention 1A asserts that Commonwealth Edison Company (hereinafter "Applicant" or CECO) does not have the ability or the willingness to maintain and implement a QA/QC program in accordance with 10 CFR Part 50, Appendix B, as evidenced by its past noncompliances, and that its QA program does not require sufficient independence of QA functions from other functions within the company.

The program for quality assurance at Byron must meet the requirements of the quality assurance criteria set forth in 10 CFR Part 50, Appendix B. That appendix defines quality assurance as comprising "all those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements."

In order to authorize issuance of an operating license for Byron, the Board must find that the Applicant has effectively implemented

during construction a QA/QC program which provides reasonable assurance that the facility can be operated without endangering the health and safety of the public. Consolidated Edison Company of New York, Inc. (Indian Point Station, Unit No. 2), LBP-73-33, 6 AEC 751, 755-56 (1973), aff'd, ALAB-188, 7 AEC 323, 336 (1974), remanded on other grounds, CLI-74-23, 7 AEC 947 (1974); Virginia Electric & Power Co. (North Anna Nuclear Power Station, Units 1 and 2), LBP-77-68, 6 NRC 1127, 1154-55 (1977), aff'd, ALAB-491, 8 NRC 245 (1978). However, as the Appeal Board observed in Indian Point:

Whether licensing can be authorized in light of existing deficiencies obviously depends on the significance of the deficiencies. For example, deficiencies may include non-compliance with regulatory criteria which have to be satisfied in order for the necessary findings for licensing authorization to be made But this is not translated into an overall requirement that there can be no licensing if there are any outstanding deficiencies even though the necessary licensing findings can be made.

7 AEC at 334. Moreover, as pointed out by the Licensing Board, and subsequently quoted with approval by the Appeal Board, "No quality assurance program, however thorough, can guarantee that there will be no errors in design or construction, or failures of equipment, or misoperation in a nuclear plant." Id.

I. Managerial Competence and Corporate Character

Section 182a. of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2242(a) (1976) (AEA), requires an applicant to submit sufficient information for the Commission to determine that the applicant has the

requisite character and technical qualifications to engage in the licensed activity.^{3/}

The requirement in Section 182a. of the AEA that an applicant provide sufficient information concerning its technical competence and character as the Commission may deem necessary to find there exists adequate protection for the health and safety of the public is consistent with general Commission practice which imposes the ultimate burden of proof on the applicant to show that it should receive a license. 10 C.F.R.

^{3/} No Commission rule or regulation sets forth further standards for determining whether an applicant has the character to receive a license. However, 10 C.F.R § 50.40 provides general guidance with respect to the standards a licensing board should apply in evaluating whether or not to issue a construction permit or operating license to an applicant. This section states:

In determining that a license will be issued to an applicant, the Commission will be guided by the following considerations:

(a) The processes to be performed, the operating procedures, the facility and equipment, the use of the facility, and other technical specifications, or the proposals, in regard to any of the foregoing collectively provide reasonable assurance that the applicant will comply with the regulations in this chapter, including the regulations in Part 20, and that the health and safety of the public will not be endangered.

(b) The applicant is technically and financially qualified to engage in the proposed activities in accordance with the regulations in this chapter.

(c) The issuance of a license to the applicant will not, in the opinion of the Commission, be inimical to the common defense and security or to the health and safety of the public.

In addition, after issuance, any license is continually subject to revocation, suspension, modification or amendment for cause as provided in the act and regulations. See 42 U.S.C. § 2236 and 10 C.F.R. § 50.54(e).

§ 2.732; Virginia Electric & Power Company (North Anna Power Station, Units 1, 2, 3 and 4), ALAB-256, 1 NRC 10, 17 n. 18 (1975).

The interdependence of competence and character is illustrated in Consumers Power Company, (Midland Plant, Units 1 and 2), ALAB-106, 6 AEC 182 (1973). There the Appeal Board held that a determination that the applicant had adopted a quality assurance and quality control QA/QC program which, if implemented in accordance with the representations of the application, would satisfy the requirements of Appendix B, 10 C.F.R. Part 50 was not sufficient. 6 AEC at 183. In addition to determining that an applicant has competence to carry out a quality assurance/quality control program, a Board must also determine an applicant has the character to meet its responsibilities and implement that program. 6 AEC at 184. The Appeal Board reasoned that regardless of the adequacy of the quality control program on paper (an indication of the applicant's managerial competence), the program would essentially be without value unless it is timely, continuously and properly implemented by the applicant (an indication of the applicant's corporate character or managerial attitude). The Appeal Board gave guidance to the Licensing Board stating:

The inquiry which the Board must make is not necessarily resolved by a determination of whether, in a broad sense, the applicant and its architect-engineer are "technically qualified." A demonstration that technical qualifications do exist does not necessarily provide reasonable assurance that the QA program described in the PSAR will be faithfully fulfilled. To the contrary, as important as qualifications may be, of no less significance is the fact of managerial attitude. Unless there is a willingness -- indeed, desire -- on the part of the responsible officials to carry it out to the letter, no program is likely to be successful. 6 AEC at 184.

Once the Board determines that the Applicant possesses the requisite technical and managerial competence, this Board must then determine

whether CECO possesses the managerial attitude or corporate character required to implement the various programs necessary to ensure the safe operation of Byron. As in Midland, the Applicant has the burden of showing that it possesses both the technical and managerial competence to develop adequate programs and the character or willingness to implement those programs following licensing. See 10 C.F.R. § 50.40(a).

In judging managerial competence, an applicant's management is reviewed for adequacy of organization and technical ability, prior performance as evidence by I&E Reports, management attitude, and the response to or plans for confronting technical problems. Each of these factors is then weighed in evaluating managerial competence. See generally Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), CLI-80-5, 11 NRC 408 (1980); Virginia Electric & Power Company (North Anna Nuclear Power Station, Units 1 & 2), LBP-77-68, 6 NRC 1127 (1977); Carolina Power and Light Company (Shearon Harris Nuclear Power Plant, Units 1, 2, 3 and 4), LBP-79-19, supra.

In Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1), CLI-80-05, 11 NRC 408 (1980), the Commission pointed to the areas of staffing, resources and past actions as germane to the issue of managerial competence. The Commission further stated, when looking at these broad areas, that the Licensing Board should examine more specific matters such as the appropriateness of plant and corporate organization; staff technical qualifications; quality of corporate and plant management; past infractions by the utility in contrast to industry-wide statistics; and, inter alia, the interaction of site staff and corporate management.

Not only are past failures of management evaluated, but the corrections of such past failures are given weight in considering whether an applicant has the requisite competence and character to receive a license. In Virginia Electric & Power Co. (North Anna Nuclear Power Station, Units 1 and 2), LBP-77-68, 6 NRC 1127 (1977), the utilities' management conceded that it erred in the past, but believed substantial improvement had been made. The North Anna Licensing Board concluded that in light of the current management responsiveness in correcting items of noncompliance and its commitment to safe operation of the facility in compliance with all applicable requirements, it had demonstrated its commitment and qualification to run the facility. 6 NRC at 1144.

Contrary to the Intervenors assertion, the Applicant's QA program meets the requirements of Appendix B and provides sufficient independence of QA functions. The QA organization is a separate entity from production. The CECO Manager of Quality Assurance reports on a level as high as the reporting levels of other elements of the company whose activities fall under the requirements of the QA program. The QA personnel have the authority to stop work in progress in the field and the Manager of QA the authority to stop the entire work of a contractor. (Findings H-19 through H-37).

The Applicant has also made improvements to its organization to enhance nuclear safety. Following the Three Mile Island accident, the Applicant used recommendations of a consultant and restructured its corporate nuclear organization to improve management effectiveness. Consultant recommendations were also used to develop the organizational structure for Byron. (Finding H-10 through H-16; H-38 through H-41).

Applicant corporate and Byron site management stated they possessed a strong commitment to nuclear safety. (Findings H-17, H-18, H-22 and H-39). The Applicant also participates in industrywide efforts to improve nuclear safety. (Finding H-17).

The Applicant employs technically qualified individuals who are instructed to maintain a commitment to nuclear safety. When Byron commences operation, the plant will be staffed with qualified individuals who are committed to the safe operation of the plant. (Findings H-39 through H-43).

While the Applicant has more years of reactor operation than the majority of utility licensees, the number of violations or items of noncompliance per unit at CECO facilities and their severity compared favorably with the plants in NRC Region III and for the period through December 1982, its facilities were below the national and regional averages for civil penalties. The past two Systematic Assessment of Licensee Performance Reports issued by the NRC, indicate that the Applicant's performance at its sites is in the average range. (Findings H-44 through H-49).

The Applicant has generally taken timely corrective action with respect to NRC identified noncompliances. Improvements have been made in the operation of CECO stations as the result of analyzing trends in deficiencies and by reviewing deficiencies at one construction site to determine their applicability to other construction sites. (Findings H-44 through H-93).

Three former construction workers at Byron testified about deficiencies they observed during the periods they were at the site. Mr. Stomfay-Stitz, a materials QA/QC controller for Blount Brothers,

made allegations which related to: nonconforming aggregate, tendons, buttonheads and concrete blocks; design alterations; structural steel bolting deficiencies; improper receipts of materials; pressure imposed on QA by production; and the inadequacy of his training. Throughout his testimony, Mr. Stomfay-Stitz was confused and had difficulty remembering facts surrounding the incidents which occurred over five years ago on his first full time job. (Findings H-94 through H-174).

Mr. Gallagher, a batch plant operator for Blount Brothers, made allegations which concerned the use of nonconforming aggregate in safety-related concrete, the inability of the manually operated batch plant to produce concrete for safety-related use, excessive amounts of water being added to concrete at the placement areas, oil leaks in concrete mixes, pressure from Applicant production to meet construction quotas, and quality control personnel lying to NRC inspectors. (Findings H-175 through H-221).

Mr. Smith, a QA inspector and auditor for Hunter Corporation, made allegations which concerned many of his findings during a 1979 audit of piping component supports or hangers and installation design tolerances and locations which were encompassed by a March 1980 NRC inspection report. In addition, Mr. Smith's allegation concerned Hunter QA policies and procedures, fraudulent inspector sign-offs and prevention of QA contacts with NRC inspectors. (Findings H-222 through H-295).

The Region III Staff performed special inspections to determine the validity of the allegations contained in the worker affidavits. Of the three sets of allegations, only allegations made by Mr. Smith were substantiated in large part. In each instance where the allegations were substantiated, we find the record shows that the substance of the

allegation was addressed by appropriate corrective action by the Applicant or the contractor. (Findings H-174; H-221; and H-295).

Thus, the record in this proceedings demonstrates that Applicant has the technical qualifications and commitment to safely operate the Byron plant and there is sufficient independence between the Applicant's QA organization and other functions within CECO. None of the substantiated allegations concern construction defects that will impair safe operation of Byron.

III. FINDINGS

H. Quality Assurance/Quality Control

1. Matter in Controversy

H-1. League Contention 1A states:

Intervenors contend that Edison does not have the ability or willingness to comply with 10 CFR Part 50, Appendix B, to maintain a quality assurance and quality control program, and to observe on a continuing and adequate basis the applicable quality control and quality assurance criteria and plans adopted pursuant thereto as is evidenced by Edison's and its architect-engineers' and its contractors' past history of noncompliance at all Edison plants (whether or not now operating). In addition, Applicant's quality assurance program does not require sufficient independence of the quality assurance functions from other functions within the Company.

2. Regulatory Background

H-2. The regulatory requirements for an Applicant's quality assurance program are set forth in the criteria of 10 CFR Part 50, Appendix B. (Spraul testimony, ff. Tr. 3564, at 2-3).

H-3. Criterion I of 10 CFR Part 50, Appendix B requires that persons and organizations performing QA functions have sufficient authority and organizational freedom to identify quality problems and

initiate solutions, including sufficient independence from cost and schedule when opposed to safety considerations. (Spraul testimony, ff. Tr. 3562, at 2).

H-4. In order to assure that persons and organizations performing QA functions have sufficient authority and organizational freedom to identify quality problems and initiate solutions in accordance with Appendix B, Criterion I, the Staff's Standard Review Plan (NUREG-0800) provides that the reporting level of the QA organization be as high as the reporting levels of other elements of the utility organization whose activities fall under the requirements of the QA program. (Spraul testimony, ff. Tr. 3562, at 2).

H-5. NRC Enforcement Policy is set forth in 10 CFR Part 2, Appendix C. When noncompliances are identified generally a Notice of Violation requiring a formal response describing corrective action is sent to an licensee from the Regional office. In cases involving more serious violations, elevated enforcement action is taken which may include (1) the imposition of civil penalties (2) the issuance of order modifying, suspending or revoking a license, or (3) the issuance of orders to cease and desist from designated actions. (Region III testimony, ff. Tr. 3586, at 7).

H-6. Prior to 1980, NRC used three categories of noncompliance which were, in order of increasing severity, deficiency, infraction and violation and imposed \$5,000 fines per violation not to exceed \$25,000 for any 30 day period. Currently, there are five categories of noncompliance which are in decreasing order of severity, Severity

Levels I, II, III, IV and V and the maximum fine that can be imposed varies with the severity level up to a maximum of \$100,000 per day. (Region III testimony, ff. Tr. 3586, at 7-8).

3. Substantive Findings

H-7. The Applicant's direct case consisted of testimony by: Mr. Louis O. Del George (ff. Tr. 2344), a staff assistant to the Assistant Vice President for Nuclear Engineering, Nuclear Fuel Services and Nuclear Licensing for CECO; Mr. Walter J. Shewski (ff. Tr. 2364), Corporate Manager of Quality Assurance for CECO; Mr. Cordell Reed (ff. Tr. 2594), Vice President of Nuclear Operations for CECO; Mr. Michael A. Stanish (ff. Tr. 2619), CECO Construction Quality Assurance Superintendent at Byron; Mr. Robert E. Querio (ff. Tr. 2714), CECO Station Superintendent at Byron; Mr. John Mihovilovich (ff. Tr. 2750), lead structural engineer at Byron; Mr. Richard Barnhart (ff. Tr. 2797), project engineer for Blount Brothers Corporation at Byron; Mr. Donald Pope (ff. Tr. 2833), a concrete batch plant operator for Blount Brothers Corporation at Byron; and Mr. Malcolm L. Somsag (ff. Tr. 2883), the Site Quality Assurance Supervisor for Hunter Corporation at Byron Station. The Applicant also made available the panel of Marvin Tallent, Jr., a Pittsburgh Testing Laboratory (PTL) Site Manager at Byron, and Joseph Johnson, a PTL Civil Supervisor - Quality Control at Byron (Tr. 3960). In addition, the Board received four Applicant exhibits: a handwritten copy of Hunter Corporation QA Memo HC-QA-23, dated March 7, 1979 (Applicant Exhibit 5); a letter from Hardenbrook and Welborn, Hunter Corporation, dated October 11, 1979 (Applicant Exhibit 6), Hunter

Corporation Second Follow-up Report for Audit 059-3, Hanger Process Control, dated March 20, 1980 (Applicant Exhibit 7), and NRC Construction Assessment Team report on Byron, Inspection Report Nos. 50-454/82-05, 50-455/82-04, dated June 24, 1982. (Applicant Exhibit 8).

H-8. The Intervenors' direct case consisted of testimony by Mr. Peter Stomfay-Stitz (ff. Tr. 2939), a former QA/QC materials controller for Blount Brothers Corporation at Byron, Mr. Michael A. Smith (ff. Tr. 3243), a former QA inspector and Auditor for Hunter Corporation at Byron, and Daniel W. Gallagher (ff. Tr. 3459), a former concrete batch plant operator for Blount Brothers Corporation at Byron. In addition, the Board received 8 Joint Intervenor Exhibits (Tr. 2826)^{4/} which were used during cross examination of Applicant witnesses by Intervenors.

H-9. The Staff's direct case consisted of testimony by Mr. John G. Spraul (ff. Tr. 3561), a quality assurance engineer in the Office of Inspection and Enforcement and panel testimony by Mr. William L. Forney, the Senior Resident Inspector at Byron, and Messrs. D. W. Hayes, James E. Konklin, Cordell C. Williams and Isa T. Yin (ff. Tr. 3586), four other NRC Region III office personnel.^{5/}

^{4/} Inspection Report Nos. 50-456/80-12, 50-457/80-11 (Exhibit 1); Inspection Report Nos. 50-373/80-52, 50-374/80-33; 50-454/80-22, 50-455/80-21; 50-456/80-14, 50-457/80-13 (Exhibit 2); Inspection Report Nos. 50-454/78-07, 50-455/78-07 (Exhibit 3); Inspection Report Nos. 50-454/79-18, 50-455/79-18 (Exhibit 4); Inspection Report Nos. 50-454/80-25, 50-455/80-23 (Exhibit 5); Inspection Report Nos. 50-456/82-05, 50-457/82-05 and Notice of Violation and Proposed Imposition of Civil Penalties (Exhibit 6); Letter to J. O'Connor, CECO, from J. Keppler, NRC, dated February 16, 1983 and Notice of Violation and Proposed Imposition of Civil Penalties (Exhibit 7); and Investigation Report Nos. 50-454/80-04, 50-455/80-04 (Exhibit 8).

^{5/} The Board also received a presentation by the Staff and Applicant on the application of QA/QC to reactor trip breakers subsequent to the Salem event. (Tr. 3989-4099).

a. CECo QA Organization, Technical Qualifications and Commitment to Safety

H-10. Commonwealth Edison (CECo) evaluated the effectiveness of its nuclear operations in 1979, shortly after the Three Mile Island accident, and made changes in its organizational structure based on the results of the evaluation. As presently structured, the Vice President for Nuclear Operations is head of the Applicant's Nuclear Operations. The Division Vice President of Nuclear Stations and an Assistant Vice President for Nuclear engineering, Nuclear Fuel Services and Nuclear Licensing report to the Vice President for Nuclear Operations. (DeI George testimony, ff. Tr. 2344, at 5).

H-11. The Vice President for Nuclear Operations reports to an Executive Vice President of CECo who reports to the Chairman and President of the Company. The Manager of Quality Assurance reports to a Vice Chairman who reports to the President so as to assure separation of QA functions from responsibility for operation of Byron. (Reed testimony, ff, Tr. 2594, at 3).

H-12. The Division Vice President and General Manager of Nuclear Operations who reports to the Vice President for Nuclear Operations is responsible for the operation, maintenance modifications, and safety of the Station. The Division Vice President is also responsible for implementing QA program procedures and for development of station procedures that comprise the Station Procedures Manual. The Station Superintendent, is also responsible for implementing QA program procedures. (Spraul testimony, ff. Tr. 3562, at p. 17-5).

H-13. The corporate structure is capable of assuring safe operation of the Byron Station. (Del George testimony, ff. Tr. 2344 at 7). When noncompliances with NRC requirements are identified at an operating station, the station is responsible for taking the necessary corrective action and the Nuclear Licensing Group communicates the corrective action to the NRC. The Division Vice-President for Nuclear Stations or staff reviews the item of noncompliance to determine whether similar incidents could occur at other CECO stations. (Del George testimony, ff. Tr. 2344, at 8-9).

H-14. Independent review of nuclear operations are done by the Quality Assurance Department and the Nuclear Safety Department. Quality Assurance personnel, not directly responsible for the areas being audited, audit CECO stations using written checklists to assure that license conditions are being satisfied and to evaluate all aspects of the QA program including the effectiveness of its implementation to the 18 criteria of Appendix B. (Spraul testimony, ff. Tr. 3562, at 17-6; Del George testimony, ff. Tr. 2344, at 8; Shewski, Tr. 2830-A). Follow-up audits are performed to determine that noncompliances and deficiencies are effectively corrected and repeat occurrences prevented. (Spraul testimony, ff. Tr. 3562, at 17-6). The scope of CECO Quality Assurance audit procedures include areas not required by Commission regulations. (Del George testimony, ff. Tr. 2344, at 8-9).

H-15. The Nuclear Safety Department also monitors station activities. The Director of Nuclear Safety reports directly to the Chairman and President of CECO and works on a day-to-day basis with the Vice-President of Nuclear Operations. After Byron begins operating, a

on-site team composed of members of the Nuclear Safety department will be assigned to review Deviation Reports, Licensing Event Reports and Station Operations to determine if any long term trends adverse to safety are occurring at the plant. (Del George testimony, ff. Tr. 2344, at 9; Region III testimony, ff. 3586, at 14).

H-16. Other independent groups evaluate the Applicants' nuclear operations. Each operating unit has an N-Stamp granted by the American Society of Mechanical Engineers (ASME), the primary code setting body for nuclear vessels, piping systems and concrete. The Applicant has obtained an N-Stamp for Byron, which enables the Applicant to perform work on items subject to the ASME code. Each station is audited by the ASME every three years to ensure that the QA Program remains current and acceptable under ASME standards. (Del George testimony, ff. Tr. 2344, at 11).

H-17. The Applicant's corporate management has exhibited a commitment to nuclear safety. (Region III testimony, ff. Tr. 3586, at 13-14). Mr. Reed expressed a strong personal commitment to the operation of Byron and the corporate attitude of upper management towards the safe operation of its nuclear power stations. (Reed testimony, ff. Tr. 2594, at 3-4).

H-18. The Applicant's commitment to safe operation of its plants is reflected by its participation in industry-wide efforts to enhance nuclear safety. (Reed testimony, ff. Tr. 2594, at 3-5). The Applicant also employs individuals who are technically qualified and who are expected to share the commitment to safe operations and who have been formally instructed to do so. (Reed testimony, ff. Tr. 2594 at 4-5; Reed Exhibit 2).

H-19. The Applicant's description of its operational QA program set forth in Topical Report CE-IA, Revision 16, meets NRC quality assurance requirements in Appendix B to 10 CFR Part 50. (Spraul testimony, ff. Tr. 3562, at 2; Shewski testimony, ff. Tr. 2364, at 8-9).

H-20. The Manager of Quality Assurance reports to a Vice Chairman who reports to the President of CECO. Top management in procurement, engineering, operations and construction report to Vice Presidents who also report to the President. (Spraul testimony, ff. Tr. 3562, at 3). Thus, the Manager of QA reports level is as high in the organization as the Vice President for Nuclear Operations (Spraul, Tr. 3575) and remains independent of decisions on scheduling and costs (Del George testimony, ff. Tr. 2344, at 9).

H-21. The Applicant's Quality Control organization also has sufficient organizational independence and acceptable reporting levels. The QC Supervisor is a member of the plant staff and reports to the Administrative and Support Services Superintendent who reports to the Station Superintendent. Plant operations and maintenance personnel also report through a level of management that reports to the Station Superintendent. The QC personnel are not part of the QA organization but the Applicant has committed to meet the guidance in the Standard Review Plan that the inspection procedures, personnel, qualification criteria and independence from undue pressure such as cost and schedule be reviewed and found acceptable by the QA organization. (Spraul testimony, ff. Tr. 3562, at p. 17-4).

H-22. Mr. Shewski, the corporate Manager of Quality Assurance of the Applicant has held his position for nine years and has 30 years experience with the company in various technical and management

positions. (Shewski testimony, ff. Tr. 2364, at 1-2). As manager of Corporate QA, Mr. Shewski directs the quality assurance activities for operation, maintenance, design and modification activities of the Applicant's nuclear stations and has the authority to stop unsatisfactory work or plant operation and to stop further processing of unsatisfactory material during design, construction or operation of a plant. (Shewski testimony, ff. Tr. 2364, at 8).

H-23. The QA group located at Byron, under the direction of the Station QA Supervisor, primarily performs inspections, surveillances and audits of all safety-related and ASME Code related work performed by operating plant personnel, contractors and other Applicant personnel. (Shewski testimony, ff. Tr. 2364, at 5). The QA group is responsible for verifying that appropriate corrective action is taken to remedy identified at the plant. (Shewski tesitmony, ff. Tr. 2364, at 6).

H-24. All of the Applicants' QA personnel have the authority to stop work in the field. (Stanish, Tr. 2694).

H-25. QA personnel are assigned to specific quality activities and receive training in skills required to perform their work. The Applicant also controls purchased material, equipment and services by evaluating vendors, through surveillance of their operations, and through appropriate inspections. (Shewski testimony, ff. Tr. 2364, at 6).

H-26. Equipment and materials arriving on site are inspected by the Applicant, or its agents, to assure physical integrity and compliance with procurement document requirements. Final receipt inspections are performed by QC and QA personnel according to written procedures using checklists approved by QA. (Shewski testimony, ff. Tr. 2364, at 6-7).

H-27. The Station QC group which primarily performs inspection, reports to the Administration and Station Services Assistant Superintendent and functions independent of the Maintenance and Operating groups which are also headed by Assistant Superintendents who report to the Station Superintendent. (Shewski testimony, ff. Tr. 2364, at 7).

H-28. The Applicant's QA program for operations will be satisfactorily implemented at Byron. The operating program for Byron passed the ASME Survey in mid-1982. (Shewski testimony, at 8-9).

H-29. The Applicant's QA department has increased the frequency and intensity of its own audits. (Shewski testimony, ff. Tr. 2364, at 12). Deficiencies identified at the Applicant's construction sites are reviewed to determine their applicability to the other construction sites. (Shewski testimony, ff. Tr. 2364, at 21).

H-30. The Applicant performs trending analyses of its own and its contractors' activities. (Shewski, Tr. 2647). The trend analyses include those items identified by the Applicant and the contractors through the noncomformance reporting system, as well as the NRC, but does not include contractor audit findings. (Stanish, Tr. 2661).

H-31. QC control inspectors are responsible for the in-line acceptance of workmanship, materials and final installation of facilities at Byron. All contractors are required to have a QC group to perform inspections. (Shewski testimony, ff. Tr. 2364, at 23).

H-32. An independent testing agency, Pittsburgh Testing Laboratory (PTL), is under the direction of the Applicant's site QA group and is responsible for a large part of the QC inspection program. PTL performs

inspections in non-destructive testing disciplines and performs concrete, reinforcing steel and cadweld testing. (Shewski testimony, ff. Tr. 2364, at 23).

H-33. Personnel performing QC inspections at Byron must be trained and qualified to perform the activity. All contractors performing safety-related work are required to commit in their QA program to have trained and qualified QC inspectors (Shewski testimony, ff. Tr. 2364, at 23-24).

H-34. Initial responsibility for assuring QA rests with the contractors and vendors. (Shewski, Tr. 2370). The Applicant may delegate responsibility under a Appendix B, but the Applicant retains ultimate responsibility for the implementation of QA at Byron. (Forney, Tr. 3692-93; Shewski, Tr. 2526). The QA Program will be adequately staffed. (Forney, Tr. 3681).

H-35. Mr. Stanish, the Construction QA Superintendent at Byron, has been employed by the Applicant in various positions for over 9 years. (Stanish testimony, ff, Tr. 2619, at 1-2). His staff consists of 18 QA personnel including two supervisors -- one for mechanical and structural and one for electrical and documentation -- and subordinates, who are assigned contractors and certain activities. (Stanish, Tr. 2686-87).

H-36. Chapter 17 of the Staff Safety Evaluation Report related to the operation of Byron, dated February 1982 (NUREG-0876) (Staff Exhibit 1), listed seven areas in which the QA program description did not meet the guidance of the Standard Review Plan (SRP). (Spraul testimony, ff. Tr. 3562, at 17-2 to 17-3). The Staff did not consider the SRP items serious deficiencies, but rather fine tuning that could

be applied to an acceptable program. (Spraul, Tr. 3573). Future plants will be subject to the SRP criteria applied to Byron. (Spraul, Tr. 3567-69).

H-37. The Board finds that the Applicant's QA program for operation satisfies the requirements of Appendix B and will be staffed by persons who possess the technical qualifications and commitment to safely operate the plant.

H-38. The organizational structure for Byron was developed as a result of a consultant study performed in 1978 which was designed to develop a management organization and administrative controls at the Applicant's nuclear stations and corporate office to enhance operational safety. (Querio testimony, ff. Tr. 2714, at 4).

H-39. Robert Querio is the Station Superintendent for Byron and is responsible for the management of the station and its over 450 employees. He has 14 years of nuclear experience (Querio testimony, ff. Tr. 2714, at 1-2). As Station Superintendent, Mr. Querio, is responsible for carrying out the corporate commitment to ensure safe operation at Bryon and will assure that appropriate procedures for the safe operation and maintenance of Byron exist and are properly implemented. (Querio testimony, ff. Tr. 2714, at 3-4).

H-40. The plant operating staff will be organized into four main functional groups. The Operating Group, the Administrative and Support Services Group, and the Maintenance Group are headed by three Assistant Superintendents; and the Personnel Administration Group is headed by a Personnel Administrator. (Querio testimony, ff. Tr. 2714, at 5).

H-41. The Operating Group, under the direction of the Assistant Superintendent-Operating and the supervision of the Station Shift Engineer, is responsible for the day-to-day operations at Byron. The

Maintenance Group is responsible for maintaining and repairing equipment. The Administrative and Support Services Group has responsibilities which fall outside the areas of Operations and Maintenance and has five department supervisors: the Technical Staff Supervisor, Radiation Chemistry Supervisor, Station Quality Control Supervisor, Security Administrator and Office Supervisor. The Personnel Administrator is responsible for all personnel training and retraining activities. (Querio testimony, ff. Tr. 2714, at 6-12).

H-42. The Byron Station will be staffed by experienced personnel who possess the technical qualifications and commitment to safely operate the plant. (Querio testimony, ff. Tr. 2714, at 2, 12). The staffing for both Byron Units is currently in place and 75 candidates will take operator licensing exams. (Querio, Tr. 2730, 2732-33).

H-43. The Board finds that there is reasonable assurance that, after the completion of operator testing, the plant will be staffed with experienced personnel who possess the technical qualifications and commitment to nuclear safety at Byron.

b. CECo Noncompliance Record

H-44. The Staff compared the number of violations or items of noncompliance per nuclear unit at CECo facilities and their severity. While the Applicant has more years of reactor operation than the majority of utility licensees, its facilities were below the national and regional averages for civil penalties through December 1982. (Region III testimony, ff. Tr. 3586, at 12).

H-45. The Staff did not believe that the fines proposed or paid in 1983 demonstrated that the Applicant has poor corporate attitudes and

policies (Forney, Tr. 3860-61) and such fines do not change the Staff's conclusion regarding the Applicant's commitment to the safe operation of Byron. (Hayes, Forney, Tr. 3926-27; Williams, Tr. 3928).

H-46. Applicant does not condone any of the incidents which lead to the fines or any other incidents of noncompliance for which it was not fined. (DeI George testimony, ff. Tr. 2344, at 12).

H-47. For the period 1976-1982, the average number of noncompliances at the Applicant's facilities compare favorably with other Region III plants. Noncompliances at Byron Unit 1 are approximately three times the Region III average, but the number of noncompliances is not indicative of a systematic failure because a large number relate to inspection of preoperational testing activities which primarily occurred in 1982. (Region III testimony, ff. Tr. 3586, at 12).

H-48. The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC Staff effort to collect available observations on an annual basis and evaluate licensee performance based on those observations. (Region III testimony, ff. Tr. 3586, at 13).

H-49. The Applicant's operating plants and construction sites were rated as average as compared to those of other licensees both in Region III and nationwide in the SALP-1 rating period. (Region III testimony, ff. Tr. 3586, at 13 and Attachment C; Stanish testimony, ff. Tr. 2619, at 3). SALP-2 ratings were not intended as a means to compare utility performance, however, the Applicant's performance is in the average range of Region III sites. (Region III testimony, ff. Tr. 3586, at 13).

H-50. As the result of the identification of past noncompliances by the NRC, the Applicant has improved its rad-waste shipment performance by instituting an independent review by QC and QA, establishing the position of Radioactive Waste management Administrator in the Technical Services Department and revising rad-waste shipment procedures. (DeI George testimony, ff. Tr. 2344, at 24). These improvements, as well as advancements in radwaste technology and increased administrative controls, will be implemented at Byron. (Querio testimony, ff. Tr. 2714, at 12-16).

H-51. Many of the difficulties the Applicant experienced in developing security programs for its operating stations (e.g., Quad Cities) will not occur at Byron because the Station has been designed with the need for industrial security as one of the design criteria. The Applicant has a corporate level Security Administrator who will aid in the development of the Byron security program and the security system will be the most sophisticated of any installed at any of the Applicant's facilities. (DeI George testimony, ff. Tr. 2344, at 21).

H-52. The Applicant has issued stop work orders at Byron. Concrete placement by Blount Brothers was stopped in May 1977 due to improper installation and resumed after corrective action was completed. (Shewski testimony, ff. Tr. 2364, at 17).

H-53. The Applicant ordered work stopped in January 1981 on safety-related cable pulling activities by Hatfield Electric Company and NRC approved the corrective action taken in July 1981. (Shewski testimony, ff. Tr. 2364, at 18-19).

H-54. The Applicant issued a stop work order in September 1982 on all new installation of safety-related hearing, ventilation and air

conditioning (HVAC) systems, attachments and structures by Reliable Sheet Metal. The corrective action taken included a reorganization and expansion of the QA/QC organization of Reliable Sheet Metal and the revision of certain installation procedures. The stop work will be lifted when corrective actions have been completed to the satisfaction of the Applicant's QA department. (Shewski testimony, ff. Tr. 2364, at 19-20).

H-55. Reinspections are performed to provide added assurance that the inspection was done correctly. (Stanish, Tr. 2664).

H-56. The Applicant is performing a backfit inspection of Reliable Sheet Metals, the HVAC contractor, which includes some reinspection, because some of the inspections had not been performed. (Stanish, Tr. 2664-65). The Applicant's corrective action will be inspected and evaluated by Region III. (Region III testimony, ff. Tr. 3586, at 33).

H-57. The Applicant has issued stop work orders at Byron on six other occasions and the corrective action taken have been completed to the satisfaction of the NRC. (Shewski testimony, ff. Tr. 2364, at 20).

H-58. Three allegations regarding La Salle County Station resulted in extensive review and revisions to procedures at Byron. An accountability system was established for all concrete expansion anchor holes drilled in concrete, special audits of all contractors were conducted at Byron to discover whether records had been falsified, altered or duplicated, and the HVAC contractor's work was audited and that audit played a part in the decision to stop the work of Reliable Sheet Metal. (Shewski testimony, ff. Tr. 2364, at 21-22).

H-59. The La Salle HVAC system was fabricated and installed by a different vendor and contractor than at Byron. (Region III testimony, ff. Tr. 3586, at 33). The Staff concluded there was no relationship between problems with Zack Company at La Salle, and the HVAC problems at Byron. (Hayes, Tr. 3925).

H-60. The construction QA/QC assessment team inspection documented in Inspection Report Nos. 50-454/82-05, 50-455/82-04 (Applicant Exhibit 8) involved hundreds of inspector-hours to evaluate the Applicant's QA program, compliance history and corrective action, corrective action system, design control, material traceability, electrical work activities, in-process inspections, weld rod control, and QC inspector effectiveness. Within the areas inspected, the QA program for Byron generally appeared good. (Region III testimony, ff. Tr. 3586, at 28-29; Stanish testimony, ff. Tr. 2619, at 4).

H-61. Inspection Report 82-05 noted that there was a constant turnover in the QA superintendent position and other QA positions and was concerned that the experience of QA and production personnel remain comparable. (Forney, Tr. 3877-78). The turnover of QA personnel was due to promoting individuals to higher positions and has not affected implementation of the QA program at Byron. (Shewski testimony, ff. Tr. 2364, at 15-16). The Applicant did not receive an item of noncompliance and the QA staffing and management problems have been resolved to the satisfaction of the NRC. (Shewski, Tr. 2523).

H-62. The violations identified by the construction team inspection were Severity Level IV, more than minor significance, and Severity Level V, noncompliances of minor significance. (Region III testimony, ff. Tr. 3586, at 29; Stanish testimony, ff. Tr. 2619, at 4).

H-63. Eight of the 9 items of noncompliances identified by the NRC construction assessment team have been resolved to the satisfaction of the NRC. (Region III testimony, ff. Tr. 3586, at 28-29; Stanish testimony, ff. Tr. 2619, at 4-5). The resolution of the items included revisions in the structure of certain contractors' QA organizations, revised contractor procedures, revised descriptions in contractor QA manuals and the establishment of new Applicant policies to provide clarification of QA program implementation. The remaining item of noncompliance relates to QC inspector certification. (Stanish testimony, ff. Tr. 2619, at 5-19).

H-64. With respect to qualification of QC inspectors, the Staff found that the Applicant had not established minimum features and methodologies to be used in the training, qualification and certification of QA/QC personnel. (Shewski testimony, ff. Tr. 2364, at 32). As a result of the NRC finding that the Applicant should provide guidance on a minimum standard for qualifications to all of its contractors rather than allowing the contractors to apply varying interpretation, on June 9, 1982, the Applicant issued a directive to all site contractors setting forth the minimum requirement for certification. The QC inspectors on site have been certified to the new requirements of the June 9, 1982 directive. (Shewski testimony, ff. Tr. 2364, at 32-33).

H-65. The Applicant has reviewed certification records for QC inspectors no longer on site to determine compliance with the June 9, 1982 directive. In addition, a sample reinspection program has been developed in response to the noncompliance in Report 82-05 (Applicant Exhibit 8) which samples the first three months of an inspector's

activities. (Shewski testimony, ff. Tr. 2364, at 35). The results of the inspection will be reviewed by the Staff to determine whether the required actions are complete. (Forney, Tr. 3658).

H-66. Byron was 75 percent complete when the construction assessment team inspection occurred. (Forney, Tr. 3835).

H-67. The deficiency identified at Byron in Inspection Report No. 78-07 (Joint Intervenors' Exhibit 3) regarding the manner in which the Applicant intended to comply with requirements for personnel qualification and certification would constitute a Severity Level IV violation today. (Hayes, Tr. 3645). The noncompliance was closed in a subsequent report based on revised contractor procedures and audits by the Applicant and the contractors to assure that ANSI criteria are met. (Konklin, Tr. 3648).

H-68. Inspection Report No. 79-18 (Joint Intervenors' Exhibit 4) identified two infractions at Byron as to the use of controlled documents and failure to inspect concrete expansion anchors to inspection criteria. (Hayes, Tr. 3649). The noncompliances would probably be classified as Severity Level IV today and were satisfactorily closed out in subsequent inspection reports. (Hayes, Tr. 3650).

H-69. NRC Inspection Report No. 80-25 dated April 1981 (Joint Intervenors' Exhibit 5), led the Applicant to issue a stop work order with respect to Hatfield Electric until the items were corrected. (Williams, Tr. 3654). The NRC participated in the deliberations which led to the stop work order and would have stopped the work if the Applicant had not. (Williams, Tr. 3918). The NRC issued an immediate action letter to document Applicant commitments to take immediate corrective action. (Williams, Tr. 3697-98).

H-70. NRC Inspection Report Nos. 50-456/82-05, 50-457/82-05 (Joint Intervenors' Exhibit 6), a Braidwood report on steam generator bolting which formed the basis for a proposed fine, was referenced in two letters from the NRC to the Applicant. The second letter reflected the NRC's opinion that the noncompliance did not constitute a QA "breakdown," as originally stated, but a QA "problem." (Del George, Tr. 2454; Hayes, Tr. 3637-38; Forney, Tr. 3637).

H-71. Staff witness testified that the problem identified at Byron was not identical to the problem found later at Braidwood, but the fine was increased because after being made aware of steam generator support structure bolting and identifying it at Byron, the Applicant should have been alerted to the problem at Braidwood because the plants used the same engineering plans. (Hayes, Tr. 3639-43; Forney, Tr. 3642-43). In addition, the contractor installer at Braidwood was not the same as at Byron. (Hayes, Tr. 3917).

H-72. The item of noncompliance at Byron regarding the acceptability of anchor bolts was corrected by documenting the condition in a nonconformance report, replacing bent anchor bolts with an approved design change, revising the installation contractor's procedures to provide for a mandatory QC inspection prior to release of equipment for grouting, and reviewing a sample of other equipment installed before the procedures were revised. (Stanish testimony, ff. Tr. 2619, at 23-24).

H-73. Noncompliances associated with the inspection of piping system shock arresters (snubbers) were resolved to the satisfaction of the NRC by instructing personnel in the inspection, requiring inspection of all previous installations, and instructing engineering organizations

and contractors that design changes must be approved by engineering prior to implementation and that they were responsible for assuring that only approved design changes are used to perform work. (Stanish testimony, ff. Tr. 2619, at 25-26).

H-74. The Applicant took corrective action concerning an NRC identified noncompliance in implementation of revised cable separation procedures by instructing the contractor as to specific separation criteria for electrical cables. (Stanish testimony, ff. Tr. 2619, at 26-27).

H-75. Corrective action in response to a noncompliance relating to care and preservation of safety-related equipment included initiating a large scale surveillance program, instructing all contractor employees regarding the importance of equipment care and preservation and posting signs advising employees to report problems in equipment preservation to supervisory personnel. (Stanish testimony, ff. Tr. 2619, at 27-28; Querio, Tr. 2741; Forney Tr. 3708).

H-76. NRC Inspection Reports indicated that problems associated with the care and preservation of safety-related equipment recurred from 1979 to 1983. (Forney, Tr. 3868-65). Where noncompliances were identified, the noncompliances were Severity Levels IV and V. (Forney, Tr. 3928).

H-77. Corrective action taken by the Applicant in response to two items of noncompliances relative to controlled manual revisions, calibration of instruments and adherence to test procedures included: correcting a proof reading error in a Byron start-up manual used for the preoperational testing program and instituting a double layer review of

all revisions prior to distribution; instructing test engineers to ensure that all required instruments are calibrated and to identify all instruments that are unnecessary to perform the test; instructing test engineers authorized to modify test procedures to ensure that the changes are properly made; and establishing instrument calibration intervals. (Stanish testimony, ff. Tr. 2619, at 29-31).

H-78. The proposed fine at Dresden and Quad cities (Joint Intervenor Exhibit 7) concerns certain valve guides that the NRC considered safety-related. (Shewski, Tr. 2489-90). The proposed fine was increased because of the duration of the problem and the missed management opportunities to take corrective action. (Shewski, Tr. 2491).

H-79. The noncompliance at Dresden and Quad Cities related to the failure of both plants to maintain and keep an updated safety classification list. (Hayes, Tr. 3855-57). After an engineering analysis of the two events indicated that the valve guides should be reclassified, the Applicant issued a letter to both stations, but did not take adequate measures to preclude reoccurrence of the problem. (Hayes, Tr. 3857-58).

H-80. In the opinion of the Staff, the circumstances of the fine was not indicative of Corporate attitudes. Dresden and Quad Cities are older plants that were built before the adoption of the 18 quality assurance criteria in Appendix B. By contrast, Byron is required to have and maintain a safety classification list. (Hayes, Tr. 3859).

H-81. The NRC investigated nonconforming welds in safety-related equipment supplied by Systems Control Corporation (SCC) to investigate allegations and documented the investigation in Investigation Report Nos. 50-454/80-04, 50-455/80-04 (Joint Intervenor Exhibit 8). (Region III testimony, ff. Tr. 3586, at 30).

H-82. In response to problems with weld size and quality for electrical cable pan stiffener plates supplied by SCC, the Applicant performed a sampling inspection and engineering evaluation of the length of the welds and a sampling inspection for weld quality based on acceptance criteria for a worst case seismic analysis. (Stanish testimony, ff. Tr. 2619, at 31-32). The results of the inspection found all the welds for cable pan stiffeners acceptable with a high factor of confidence and reliability. (Stanish testimony, ff. Tr. 2619, at 33).

H-83. In a May 1977 audit, Applicant found major deficiencies in the SCC QA program, issued a stop work order and made a 10 CFR § 50.55(e) report to the NRC in June 1977. (Shewski, Tr. 2504, Tr. 2521; Hayes, Tr. 3843-44). The corrective action taken with respect to the SCC welds has been resolved to the satisfaction of the NRC. (Shewski, Tr. 2521; Region III testimony, ff. Tr. 3586, at 30). Investigation Report 80-04 is being actively pursued by the Department of Justice. (Region III testimony, ff. Tr. 3586, at 32).

H-84. The NRC Human Factors engineering review modifications envelope the correction of welds on the main control panels at Byron. Westinghouse Corporation will re-evaluate the seismic analysis for the panels which was invalidated by the modification work. (Region III testimony, ff. Tr. 3586, at 30; Hayes, Tr. 3888-89). Due to the intervening reevaluation work and other interim events, the Staff did not believe problems with respect to SCC control panels are not indicative of poor corporate attitudes or policies. (Hayes, Tr. 3847, 3850).

H-85. Inspection Report 78-09 noted that the Applicant disagreed that cement was a safety-related component of concrete. (Konklin, Tr. 3824-26). When the item was resolved, the Applicant had to perform every test necessary for a safety-related component. (Konklin, Tr. 3827).

H-86. Inspection Report Nos. 50-456/80-12, 50-457/80-11 (Joint Intervenors Exhibit 1), which documented an inspection for Braidwood, found that nonconforming heating, ventilation and air-conditioning equipment had been inspected and accepted by the Applicant on site and that control bar panels were received with deficient welds, was also found at Byron. (Shewski, Tr. 2388). The report identified three infractions.

H-87. Inspection Report Nos. 50-454/80-22, 50-445/80-21 (Joint Intervenors Exhibit 2) was an inspection covering Braidwood, Byron and LaSalle. It found that the scope and timeliness of the Applicant's audits of its vendor facilities should be improved. (Shewski, Tr. 2394-96). The regulatory performance at all three sites, however, was rated as average. (Joint Intervenors' Exhibit 2, at 2).

H-88. The Staff and Applicant have identified instances of insufficient independence of contractor construction QA functions at Byron. The items were addressed and corrected and the contractors involved in the noncompliances will not be involved in plant operation. (Region III testimony, ff. Tr. 3586, at 15).

H-89. Deficiencies have been identified by the NRC, Applicant and contractors regarding instances where the Applicant's operating personnel, architect engineers or contractor personnel have failed to adhere to QA/QC criteria. (Shewski testimony, ff. Tr. 2364, at 3).

H-90. The mere existence of noncompliances does not in itself indicate a lack of dedication to safety or capability to achieve safe operations because an effective QA program can be expected to identify some deficiencies. (Shewski testimony, ff. Tr. 2364, at 11; Forney, Tr. 3860-61). The significance of individual deficiencies, the appropriateness of the corrective action taken and the overall trend in performance is important. (Shewski testimony, ff. Tr. 2364, at 11).

H-91. There has been a continuing reduction in the number of NRC deficiencies at the Applicant's operating plants. (Shewski testimony, ff. Tr. 2364, at 12).

H-92. The Staff concluded that although there had been instances of noncompliances, the Applicant had demonstrated a commitment to nuclear safety. (Region III testimony, ff. Tr. 3586, at 14). Each member of the Staff panel agreed that none of the noncompliances discussed during the hearing changed the Staff's conclusion. (Tr. 3930).

H-93. The Board finds that the Applicant has implemented an acceptable construction quality assurance program and has the ability and willingness to implement an acceptable operational quality assurance program at Byron. None of the QA noncompliances identified and corrected during construction or preoperational testing at Byron have resulted in a plant condition which poses a risk to the public health and safety from potential future operation.

c. Worker Allegations

H-94. Allegations were made by three former construction workers at the Byron facility. Messrs. Stomfay-Stitz and Gallagher worked for Blount Brothers Corporation, a general contractor primarily responsible for production and placement of concrete, tensioning work and erection of containment structural steel. Mr. Smith worked for Hunter Corporation, the principal piping contractor at Byron. (Region III testimony, ff. Tr. 3586, at 16).

H-95. The Staff conducted special inspections to determine the validity of allegations contained in the affidavits prepared by the three former workers, which were attached to the September 23, 1982 DAARE/SAFE motion to reconsider summary disposition. (Region III testimony, ff. Tr. 3586, at 16). The Staff read the affidavits carefully, classified the concerns and examined the record for the time frame in question (Hayes, Tr. 3921-22) and evaluated the effectiveness of the past and present QA program (Yin, Tr. 3922). The results of the inspections are documented in NRC Region III Inspection Report Nos. 50-454/82-25, 50-455/82-19; 50-454/82-28, 50-455/82-22, 50-454/82-26, 50-455/82-20; and 50-454/83-02, 50-455/83-02. (Attachment E, F, G and H to Region III testimony, ff. Tr. 3586).

(1) Stomfay-Stitz Allegations

H-96. Mr. Stomfay-Stitz was hired by Blount Brothers after he graduated high school in June 1978 as a timechecker and after several months he began training as a QA/QC inspector and ultimately became a materials controller. (Stomfay-Stitz testimony, ff. 2939, at 1-4).

Mr. Stomfay-Stitz was only 18 years old and working at Byron was his first full-time job. (Stomfay-Stitz, Tr. 3027). Mr. Stomfay-Stitz left Blount Brothers in April 1979 to take a job paying twice what he earned at Blount. (Tr. 3223).

H-97. Mr. Stomfay-Stitz alleged that his training to be a QA/QC materials controller was inadequate because he received less training than records indicated and Mr. Barnhart, project engineer for Blount Brothers at Byron only accompanied him on 5 percent of the inspections he performed as a trainee. (Stomfay-Stitz testimony, ff. Tr 2939, at 3-7).

H-98. The Staff determined that Mr. Stomfay-Stitz was properly certified as a QA/QC materials inspector on January 9, 1979. (Region III testimony, ff. Tr. 3586, at 22; Region III testimony, Attachment E at 5).

H-99. Mr. John Mihovilovich, an engineer with 30 years of experience at CECO, is the lead structural engineer for the Applicant at Byron and is responsible for assuring that structural contractors fulfill their contractual obligations. (Mihovilovich testimony, ff. Tr. 2750, at 1).

H-100. Mr. Mihovilovich testified that as a materials controller, Mr. Stomfay-Stitz was qualified to perform receiving inspections of materials which arrived at the site and inspections of the storage conditions of materials. (Mihovilovich testimony, ff. 2750, at 2).

H-101. Mr. Richard Barnhart testified that he was a Level I material receiving controller, and subsequently a Level II welding inspector, who trained and supervised Mr. Stomfay-Stitz in his duties as a QA/QC material receiving inspector from October to December 1978.

(Barnhart testimony, ff. Tr. 2797, at 1-2). When materials arrived on site, Mr. Stomfay-Stitz was told to look at the material himself and fill out the documents. (Barnhart, Tr. 2804-06). Mr. Barnhart testified he accompanied him on almost 25 percent of the inspections. (Tr. 2804).

H-102. The Receiving and Inspection (R&I) Reports in Blount Brothers' files that were prepared by Mr. Stomfay-Stitz were attached to Mr. Mihovilovich's testimony as Mihovilovich Exhibit 3. The majority of the reports prepared by Mr. Stomfay-Stitz were as a trainee, as indicated by the signature of Richard Barnhart, who instructed Mr. Stomfay-Stitz in receiving and inspection, on all but a few reports. (Mihovilovich testimony, ff. Tr 2750, at 5-6).

H-103. The Board finds that Mr. Stomfay-Stitz received adequate training and was properly certified as a QA/QC materials controller.

H-104. Mr. Stomfay-Stitz alleged that post-tensioning tendons were improperly protected during shipping, transfer and storage (Stomfay-Stitz testimony, ff. Tr. 2939, at 18-19; Region III testimony, ff. Tr. 3586, at 20).

H-105. The tendons were installed horizontally and vertically around each containment building, and across the dome of each unit to add strength to the structure of each containment building. (Mihovilovich testimony, ff. Tr. 2750, at 2).

H-106. Mr. Mihovilovich testified that the materials controller was required to complete a receiving and inspection report (R&I) and a receiving inspection checklist which contained seventeen items described in Blount Brother QA/QC Work Procedure No. Ten. (Mihovilovich testimony, ff. Tr. 2750, at 3-4). The procedure set forth four possible disposi-

tions of materials which were "Hold," "Accepted," "Rejected," and "Quarantined." (Mihovilovich testimony, ff. Tr. 2750, at 4).

H-107. A "hold" would be placed on materials that can neither be accepted or rejected due to partial documentation or the controller cannot verify what the proper documentation would be necessary. (Mihovilovich, Tr. 2765, 2789).

H-108. Materials were quarantined if they physically conformed to pertinent specifications, but documentation was not complete. (Mihovilovich testimony, ff. Tr. 2750, at 4). When subsequent documentation arrived for quarantined materials, a subsequent R&I designated by a postscript letter (e.g., R&I No. Q-6356-A) would be written indicating that the quarantine status was resolved. (Barnhart, Tr. 2818).

H-109. Under Blount Brothers Procedure Ten, deviation reports are issued if materials are rejected or if quarantined materials are used before the missing documentation could be delivered at the site. Mihovilovich. If quarantined materials are stored and are not required for immediate use, no deviation report would be required. (Mihovilovich testimony, ff. Tr. 2750, at 4-5).

H-110. Mr. Stomfay-Stitz was confused about whether under Blount Brothers procedures a deviation report would be written when materials were released from quarantine after receiving the proper documentation (Stomfay-Stitz, Tr. 2955-2978, 2984-86), but he remembered that deviation reports were prepared with respect to tendons. (Stomfay-Stitz, Tr. 2969). Mr. Stomfay-Stitz believed that when materials were supposed to be quarantined, a second R&I report and letter explaining the quarantine and release was written. (Stomfay-Stitz testimony, ff. Tr.

2939, at 14). After reading the Blount Brothers procedure, Mr. Stomfay-Stitz admitted that no deviation reports were written for materials that were cleared when documents arrived (Tr. 2974), Mr. Stomfay-Stitz testified that he wrote deviations because he was instructed to do so (Tr. 2984, 2990) Mr. Stomfay-Stitz could not recall any instance where a deviation report was issued for tendons placed in quarantine. (Stomfay-Stitz, Tr. 3005).

H-111. Mr. Stomfay-Stitz could not recall the meaning of the Blount Brother procedure reference to a postscript letter being added to R&Is even after reading two R&Is (Nos. 2693 and 2693-A) which he had prepared that were included in Mihovilovich Exhibit 3. (Stomfay-Stitz, Tr. 3000).

H-112. The R&I reports prepared by Mr. Stomfay-Stitz for tendons received at the site (Mihovilovich Exhibit 3) indicated that the large majority of the tendons received by Blount Brothers conformed to inspection criteria. Some tendons were rejected and others were quarantined until proper documentation arrived. (Mihovilovich testimony, ff. Tr. 2750, at 6-7).

H-113. R&I Reports prepared by Mr. Stomfay-Stitz (Mihovilovich Exhibit 3) showed that tendons were quarantined on two occasions due to lack of documentation. (Stomfay-Stitz, Tr. 2996).

H-114. The Staff could not substantiate the allegation that tendons were improperly protected during shipping, transfer and storage. Some tendons were damaged or had the potential to be damaged during shipping and transfer, however, the Staff found no evidence to show that any damaged tendons had not been identified, the problem documented and the

tendons returned to the manufacturer for re-inspection. (Region III testimony, ff. Tr. 3586, at 20).

H-115. Mr. Stomfay-Stitz testified he was not aware of any instances where tendons were accepted but should have been rejected. (Tr. 3015). He explained that some tendons had small frays and rips, which could be easily corrected, were received on the site. He later understood that the tendons were not nonconforming and were properly accepted. (Tr. 3015-17).

H-116. The Applicant and the Staff investigated the adequacy of tendon storage and found that no adverse storage conditions were documented in any of the storage inspection reports issued by Mr. Stomfay-Stitz. (Region III testimony, ff. Tr. 3586, at 20; Mihovilovich testimony, ff. Tr. 2750, at 8 and Mihovilovich Exhibit 4). The tendons were covered in layers of plastic and grease and stacked on wooden pallets that were ten inches off the ground. (Mihovilovich testimony, ff. Tr. 2750, at 8-9).

H-117. After Mr. Stomfay-Stitz left the Byron site, rusting was identified on a significant number of Unit 1 tendons but the findings was documented in a deviation report and properly resolved by CECO and the tendon manufacturer, INRYCO. (Region III testimony, ff. Tr. 3586, at 20; Mihovilovich testimony, ff. Tr. 2750, at 9-10). The rust that formed was not due to improper storage conditions but was caused by natural humidity in the air after the tendons rubbed against the post and through the layers of grease and plastic covering the tendons. (Konklin, Tr. 3734, 3735; Hayes, Tr. 3734). Staff and Applicant witness agreed that the rust would not have been visible unless the tendon package, weighing several

hundred pounds, was removed from the pallet, completely dismantled and the plastic removed. (Konklin, Tr. 3735; Mihovilovich, Tr. 2779-80; Hayes, Tr. 3732).

H-118. After rust was identified on the tendons, every tendon was removed from storage, recoated with grease and returned to the storage racks. In addition, each tendon was inspected as it was installed. (Mihovilovich, Tr. 2780).

H-119. The Board finds there is no evidence that any tendons during shipping transfer and storage were not properly documented and returned to the manufacturer for re-inspection.

H-120. Mr. Stomfay-Stitz testified that he performed weekly tendon storage inspections (Stomfay-Stitz testimony, ff. Tr. 2939, at 18), but he was not aware of the Sargent & Lundy letter authorizing weekly inspections (Stomfay-Stitz, Tr. 3028).

H-121. A November 1977 letter from Sargent & Lundy, the Architect Engineer, indicated that storage surveillance could be performed weekly, rather than daily, if circulating fans are installed and operating. (Mihovilovich, Tr. 2786-87). The letter was not included in the Blount Brothers procedure. (Barnhart, Tr. 2810).

H-122. The Board finds that weekly inspection of the tendon storage area was appropriate under the Blount Brothers procedure.

H-123. Mr. Stomfay-Stitz alleged that buttonhead cracks existed on tendons which had some inaccessible buttonheads and thus, nonconforming tendons may not have been completely repaired. (Stomfay-Stitz testimony, ff. Tr. 2939, at 21-23).

H-124. Buttonheads are cold-formed head on the end of the wire that engages the anchor head and holds the tendon in place as it is being tensioned. (Mihovilovich, Tr. 2767; Konklin, Tr. 3737). The buttonheads were formed both at the INRYCO shop and at the site by Blount Brothers, but the problems occurred with shop-formed buttonheads. (Hayes, Tr. 3738-39).

H-125. Tendon shop buttonhead cracks exceeding initial criteria were documented in an INRYCO nonconformance report and was reported to the NRC pursuant to 10 CFR 50.55(g). (Region III testimony, ff. Tr. 3586, at 20). The tendons were placed in hold status, the problem was resolved by the manufacturer, the Applicant implemented a test program which established revised criteria for buttonheads, and the Applicant conducted a 100 percent re-inspection of the buttonheads to ensure compliance. (Mihovilovich testimony, ff. Tr. 2750, at 10-11; Region III testimony, ff. Tr. 3586, at 21). The 100% inspection identified slits or splits in excess of original design criteria and some buttonheads were subsequently replaced as a result of the new acceptance criteria. (Mihovilovich, Tr. 2767-69).

H-126. Mr. Stomfay-Stitz testified that it was his speculation that INRYCO was unable to repair the buttonhead problem (Tr. 3038) and he could not identify any instance where tendon problems were unresolved (Tr. 3045-48).

H-127. The Board finds there is no evidence to suggest that nonconforming tendons were not completely repaired.

H-128. Mr. Stomfay-Stitz alleged that testing practices for concrete aggregate were improper and some, if not all, condemned

aggregate was used in safety-related concrete, including concrete for the containment building. (Stomfay-Stitz testimony, ff. Tr. 2439, at 24-29). Mr. Stomfay-Stitz testified that the segregation of the aggregate pile was not always adequate because the signs and tape marking the pile would be blown over or fall as the pile shifted. (Tr. 3238-39). Mr. Stomfay-Stitz believed PTL inspectors would repeat to tests on the pile until they found a passing sample. (Tr. 3108).

H-129. The Sargent & Lundy procedure for testing aggregate (Mihovilovich Exhibit 8) provided that if aggregate fails any of the specified tests, two additional samples were required to be subjected to the same test the aggregate failed. (Mihovilovich testimony, ff. Tr. 2570, at 11; Johnson, Tr. 3692). If either of the additional samples failed the test, production involving the aggregate is halted pending resolution of the problem. (Mihovilovich testimony, ff. Tr. 2570, at 12; Johnson, Tr. 3964).

H-130. Aggregate samples are taken from five different areas along the face of the pile being worked. Because the aggregate has to dry before testing, the test results would take a few hours. If resampling is necessary and the pile has shifted, the technician tries to obtain additional samples from the same vicinity in which the failing samples were located. (Johnson, Tr. 3971-75).

H-131. PTL performs slump tests, air entrainment tests, unit weight test, gradation and sieve analysis. (Mihovilovich, Tr. 2783). PTL performs daily, monthly and 6-month tests to ensure that materials used in concrete are within specifications and it performs slump tests at either every 100 or 150 yards depending on specifications.

(Mihovilovich, Tr. 2776; Johnson, Tr. 3895). Sargent & Lundy performs a statistical analysis of the strength of concrete cylinders and recommends to the Applicant's QA organization any modifications in the mix design to bring it within all requirements. (Mihovilovich, Tr. 2777-78).

H-132. A sieve test was run daily to determine the percentage of "fines," small particles of materials produced by the process by which the stone comprising the aggregate is crushed, in the coarse aggregate. (Mihovilovich testimony, ff. Tr. 2570, at 12; Pope testimony, ff. Tr. 2833, at 10).

H-133. In March 1979, the coarse aggregate pile at the concrete batch plant was condemned for failing the sieve test and was documented by Blount Brothers memoranda. (Mihovilovich Exhibit 9). A Blount Brothers Deviation Report was issued and the problem was resolved by washing the condemned aggregate. (Mihovilovich testimony, ff. Tr. 2570, at 12).

H-134. Mr. Stomfay-Stitz testified that he was responsible for segregating condemned aggregate from good aggregate. (Tr. 3102). It was not part of his job to view written test results on aggregate, rather, PTL would call his supervisor, Mr. Donica, when aggregate failed a test. (Tr. 3014).

H-135. Mr. Stomfay-Stitz admitted he was unfamiliar with procedures for testing aggregate (Tr. 3105), but maintained that retesting of additional samples was done to generate documentation (Tr. 3110). He did not believe that PTL falsified test results but he "believed" that PTL inspectors would fail to report aggregate test results. (Tr. 3115-16). Mr. Stomfay-Stitz also admitted that PTL only contacted Blount QA when

aggregate failed, and, consequently, he would not hear when aggregate passed testing. (Tr. 3118).

H-136. After examining the aggregate memoranda attached to his testimony (Stomfay-Stitz Exhibit H), Mr. Stomfay-Stitz could not point out any respect in which the documents did not reflect actual facts. (Tr. 3122-35).

H-137. Mr. Stomfay-Stitz also claimed that paperwork was manipulated, but he could not identify any specific errors in the aggregate memoranda. (Tr. 3136-38). He had no personal knowledge that Category I concrete was made from the pile condemned in March 1979 nor did he actually know that condemned concrete was used in the Containment II auxiliary building and the fuel handling building as implied in his prefiled testimony. (Tr. 3138-39, 3141-44; Region III testimony, ff. Tr. 3586, at 21).

H-138. The NRC Staff concluded that the aggregate memos showed that no condemned aggregate was used for safety-related concrete and that Mr. Stomfay-Stitz took appropriate steps to verify it was not improperly used. (Region III testimony, ff. Tr. 3586, Attachment E at 16).

H-139. The Board finds no evidence that unacceptable aggregate was used in concrete for safety-related structure as Mr. Stomfay-Stitz alleged.

H-140. Mr. Stomfay-Stitz alleged that often masonry blocks would arrive wet or dirty and were supposed to be used only in Category II construction but may have been used in Category I construction. (Stomfay-Stitz testimony, ff. Tr. 2939, at 14-16). This concern was

primarily based on his distrust of workers at Byron (Tr. 3020) and not on specific observed instances. (Tr. 3024).

H-141. All receiving and inspection reports signed by Mr. Stomfay-Stitz indicated that the concrete blocks met all applicable inspection requirements and no entries were made concerning wet or dirty blocks. (Region III testimony, ff. Tr. 3586, at 21).

H-142. The Staff concluded that Mr. Stomfay-Stitz had no direct knowledge that Category II blocks were used in Category I construction but had only assumed it would be easier for workers to take Category II blocks from their storage area than the Category I blocks which were marked with yellow tape. (Region III testimony, ff. Tr. 3586, at 22).

H-143. The Board finds no evidence to suggest that wet or dirty masonry blocks arrived on site or that Category II construction blocks were used in Category I construction.

H-144. Mr. Stomfay-Stitz alleged that design plans were altered so that structures, as constructed, would appear to meet design specifications. (Stomfay-Stitz testimony, ff. Tr. 2939, at 40-41, 43).

H-145. The only specific example Mr. Stomfay-Stitz could recall was that support beams were omitted and the design plans were altered rather than correcting the omission. (Region III testimony, ff. Tr. 3586, at 22; Stomfay-Stitz testimony, ff. Tr. 2939, at 40-41). Mr. Stomfay-Stitz alleged that on several occasions he personally contacted an engineer in Sargent & Lundy's Chicago office, and was told to delete it and that written confirmation would be forthcoming. (Tr. 3198-99). Mr. Stomfay-Stitz was unable to remember the name of the engineer who told him to disregard the design plans. (Tr. 3225).

H-146. The Staff could not locate any evidence that indicated design changes were not properly controlled, reviewed and approved. Region III testimony, ff. Tr. 3586, at 22).

H-147. Mr. Stomfay-Stitz testified that he did not know whether the missing beam was due to a design change or omitted inadvertently. (Tr. 3197, 3199). He believed that it was undesirable for missing beams to be approved by a simple phone call. (Tr. 3198-99). Mr. Stomfay-Stitz testified that the problem with the missing beam was resolved. (Tr. 3222).

H-148. The Applicant's lead structural engineer testified that it would be unusual for a field inspector to contact the Sargent & Lundy directly. (Mihovilovich, Tr. 2763-65). According to procedures in use at the site, a field change request form was to be used by anyone to document changes that are necessary and the reason for the change. (Mihovilovich, Tr. 2763-64). A QA/QC inspector would normally generate a deviation report and Blount or the Applicant's engineering personnel would contact Sargent & Lundy. (Mihovilovich, Tr. 2764).

H-149. The Applicant is not aware of any beams that are missing without appropriate documentation and analysis by Sargent & Lundy. (Mihovilovich, Tr. 2792). Field design changes may be verbally approved over the phone, but are reduced to written approval and final concurrence by identifying on the form the drawing affected and the form would be resubmitted to the field for final review. (Mihovilovich, Tr. 2771).

H-150. The Board finds no evidence to suggest that design plans were not properly controlled, reviewed or approved.

H-151. Mr. Stomfay-Stitz alleged that his training to perform structural steel bolting inspections was inadequate and that bolts which required inspection often were not inspected. (Stomfay-Stitz testimony, ff. Tr. 2939, at 30-36).

H-152. Mr. Stomfay-Stitz believed he was performing final acceptance inspections, rather than surveillance, of slotted connections, but he admitted he did not fully understand the scope of inspection responsibilities. (Tr. 3210, 3216). Mr. Stomfay-Stitz admitted that he believed his training to perform inspections of slotted connections was adequate because his duties were relatively simple, but he was confused about his duties regarding fixed connections. (Tr. 3215-17).

H-153. Mr. Barnhart testified that he trained Mr. Stomfay-Stitz to perform spot review of ongoing work in structural steel, and that Stomfay-Stitz remained a trainee until he left Blount Brothers in April 1979. The spotchecking bolting-in inspections were to determine that all structural steel connection holes had nuts and bolts as per drawings and in addition, with respect to slotted connections, to see if each nut was finger tight and each bolt burred. (Barnhart testimony, ff. Tr 2797, at 2-5).

H-154. The NRC inspection (Region III testimony, Attachment E) substantiated Mr. Stomfay-Stitz's allegation that his training to perform structural steel bolting inspections was inadequate. Mr. Stomfay-Stitz's training was provided by Mr. Barnhart, a Level I inspector who was not certified to conduct inspections of structural steel bolting. (Region III testimony, ff. Tr. 3586, at 22-23). The inspector could not determine from the records whether the inspections were surveillance inspections or

official inspections, but neither Mr. Barnhart nor Mr. Stomfay-Stitz were qualified. (Hayes, Tr. 3727). An acceptance inspection was conducted on all connections Mr. Stomfay-Stitz reviewed during the time he performed bolting-in inspections (Hayes, Tr. 3727; Barnhart, Tr. 2819-20).

H-155. The Applicant has initiated a 100 percent re-inspection program for all structural steel bolting in the containment building as well as other areas, because of questionable qualifications of some quality control inspectors discovered in Inspection Report 82-05 and changes in acceptance criteria. (Region III testimony, ff. Tr. 3586, at 23; Hayes, Tr. 3728-29; Barnhart testimony, ff. Tr. 2797, at 5).

H-156. The Board finds that Mr. Stomfay-Stitz was not qualified to perform structural steel inspections, however, any problems which may not have been discovered because of his questionable qualifications or of certain quality control inspectors and changes in acceptance criteria were corrected by the 100% re-inspection program.

H-157. Mr. Stomfay-Stitz alleged that there was not sufficient independence between Blount Brothers QA/QC Staff and production and he alleged that decisions regarding his pay raises and the amount of overtime he worked were made by production. (Stomfay-Stitz testimony, ff. Tr. 2939, at 8-10, 41-42).

H-158. Mr. Stomfay-Stitz could not identify any instance in which Blount's Production Department prevented QA from implementing or recommending corrective action other than when Blount Engineering suggested he call Sargent & Lundy about the missing beam. (Tr. 3222).

H-159. Mr. Stanish testified that the Applicant's Project Construction Department is the point where requests for payments are

processed, but the department is not responsible for approving raises and similar items. (Stanish, Tr. 2695-96). The Project Construction Department is independent of the site Construction QA department. (Stanish, Tr. 2696).

H-160. NRC witnesses testified that it is not unusual for production personnel to determine QA/QC work schedules or whether overtime was necessary. (Forney, Tr. 3749-50; Hayes, Tr. 3750-51). Mr. Hayes testified that production personnel would not have to approve a QC inspector's raise because the two organizations are separate. (Tr. 3750-51).

H-161. The Board finds that it is not improper for QA to consult production regarding work schedules and that there is no reliable evidence that Blount Brothers QA/QC staff did not have sufficient authority and organizational freedom to identify quality problems and correct them.

H-162. Mr. Stomfay-Stitz testified that he was told not to document nonconforming conditions in Mid-City shipments, tendon storage, and structural steel bolting because it would generate more paper work. (Stomfay-Stitz testimony, ff. Tr. 2939, at 14, 18, 37, 41-42).

H-163. The Staff could not substantiate Stomfay-Stitz's allegation that he was told when to write deviation reports by his supervisors Mr. Donica and Mr. Barnhart. (Hayes, Tr. 3731).

H-164. Mr. Barnhart testified that he did not instruct Mr. Stomfay-Stitz not to write deviation reports or not to document nonconforming conditions. (Barnhart, Tr. 2804, 2805).

H-165. Mr. Stomfay-Stitz admitted that Mr. Donica would tell him not to document nonconformances because as Mr. Stomfay-Stitz later understood that tendons which were frayed, weathered or had rips in plastic which could be easily corrected were not considered nonconforming. (Tr. 3015-17).

H-166. The Board finds that Mr. Stomfay-Stitz's allegation that he was told not to document nonconforming conditions is without merit.

H-167. Mr. Stomfay-Stitz alleged that Blount Brothers frequently failed to properly receive materials from Mid-City Architectural Iron Company because paperwork would arrive 2-3 days later than the initial shipment, (Stomfay-Stitz testimony, ff. Tr. 2939, at 13; Tr. 3148-51).

H-168. Mr. Barnhart admitted that it was his practice, contrary to Blount Brothers procedures, not to fill out a quarantine tag when Mid-City embeds arrived, but to segregate the materials until the necessary documentation arrived later. (Barnhart, Tr. 2808-09).

H-169. The R&I reports for Mid-City Architectural Iron Company completed by Mr. Stomfay-Stitz, as a trainee (Mihovilovich Exhibit 11) indicate that appropriate steps were taken when Mid-City materials arrived at Byron without proper documentation. (Mihovilovich testimony, ff. Tr. 2570, at 13). Mid-City supplied miscellaneous steel such as frames and embedments. (Mihovilovich, Tr. 2754).

H-170. Mr. Stomfay-Stitz testified that he was not aware of any embeds which were installed before all the documentation arrived at the site (Tr. 3148-51) and there were no physical problems with any of the embeds. (Tr. 3152).

H-171. The Board finds no reliable evidence that Mid-City materials were installed before appropriate documentation arrived.

H-172. Mr. Stomfay-Stitz testified that when shipments arrived while he was performing bolting-in inspections, his supervisors would instruct him to write the report as if he had received the shipment personally. (Stomfay-Stitz testimony, ff Tr. 2939, at 38-39). He believed his supervisors actually performed the inspections (Tr. 3055) until he became disillusioned (Tr. 3236-37). Mr. Stomfay-Stitz admitted to having examined most of the materials himself. (Stomfay-Stitz, Tr. 3057-58).

H-173. Mr. Stomfay-Stitz stated that he was testifying because he was concerned that work performed by Blount Brothers was not done adequately. (Stomfay-Stitz testimony, ff. Tr. 2939, at 43). Under cross-examination by the Applicant, he admitted that he never contacted the NRC, the Applicant, or Blount Brother to express his concerns regarding the safety of the plant even though he believed the importance of his concerns has remained the same. (Stomfay-Stitz, Tr. 2941-44). Mr. Stomfay-Stitz was not aware of the tests and inspections performed after he left the site in 1979. (Tr. 3223). Mr. Stomfay-Stitz also admitted that his five year old memory made it difficult for him to testify about problems he observed at Byron. (Tr. 3144).

H-174. The Board finds that most of the allegations made by Mr. Stomfay-Stitz are unsubstantiated. Where the allegations have been substantiated, appropriate corrective action was taken.

(2) Gallagher Allegations

H-175. Mr. Gallagher worked for Blount Brothers from August 1975 to November 1977 and from February 1978 to June 1979. (Gallagher testimony, ff. Tr. 3459, at 1).

H-176. Mr. Donald Pope, a concrete batch plant operator with 16 years experience, testified that he was Blount Brothers first batch plant operator at Byron and he trained and worked with Mr. Gallagher. (Pope testimony, ff Tr. 2833, at 1-2). Mr. Gallagher worked as Pope's oiler, an apprentice position in which he learned how to maintain equipment and how to mix concrete, and later became a batch plant operator. (Pope testimony, ff. Tr. 2833, at 2; Gallagher testimony, ff. Tr. 3459, at 3-4).

H-177. The two batch plants in operation at Byron when Mr. Gallagher was employed were the Erie-Strayer plant, a computerized "wet batch" or "central mix" plant which had its own mixing drum from which finished concrete was poured into trucks for delivery to placement sites, and the Ross plant, a manually operated "dry batch" plant which pours the ingredients unmixed into trucks that mix the concrete and transport it to placement sites. (Pope testimony, ff. Tr. 2833, at 3-6). The Ross batch plant could produce four to five yard batches and the Erie-Strayer plant had a ten yard capacity. (Pope, Tr. 2839).

H-178. The batch plant operator would receive a pour slip for every batch of concrete ordered from the batch plant, which indicated the destination of the concrete, the mix type and the amount to be batched. The batch plant operator would then complete a batch ticket describing the concrete mixed (i.e., the mix design, the water trim, the number of

cubic yards ordered and delivered, the truck that received the concrete, the aggregate weight, and the cement type and weight, the admixtures, the amount of water, and the time and date the concrete was batched). (Pope testimony, ff. Tr. 2833, at 7-8).

H-179. Mr. Gallagher alleged concrete batched at the Ross plant was used in safety-related structures was not uniformly mixed. Mr. Gallagher alleged that the CMC trucks provided by Blount to transport concrete were not designed to mix concrete from a dry batch plant. (Gallagher testimony, ff. Tr. 3459, at 5).

H-180. Mr. Gallagher could not recall whether uniformity tests were conducted on the Ross plant. (Gallagher testimony, ff. Tr. 3459, at 5). He believed that uniformity tests were conducted only twice at the Erie-Stayer plant. (Gallagher testimony, ff. Tr. 3459, at 6).

H-181. The Staff inspection conducted in December 1982 (Region III testimony, Attachment F) concluded that no safety-related concrete batched in the Ross plant was transported in trucks without tested ASTM C-94 uniform mixing capability. (Region III testimony, ff. Tr. 3586, at 23; Hayes, Tr. 3884). The report noted that rented trucks which had not been properly tested were onsite but no inadequately trucks were tested used at the Ross plant. (Hayes, Tr. 3886-87).

H-182. Mr. Gallagher alleged that nonconforming aggregate was used in the production of safety-related concrete. (Gallagher testimony, ff. Tr. 3459, at 11-14). He testified that there was a recurrent problem with nonconforming aggregate at the site from 1975 until the pile was condemned in 1978. (Gallagher testimony, ff. Tr. 3459, at 12; Tr. 3477).

In 1976, an Israeli engineer told Pope and Gallagher that the aggregate was not clean enough for safety-related concrete. (Gallagher testimony, ff. 3459, at 14). During that time the below ground portions of both containments and the turbine building was being placed. (Gallagher testimony ff. Tr. 3459, at 14-15). In 1978, the aggregate pile was washed because of excessive fines. (Gallagher testimony, ff. Tr. 3459, at 12).

H-183. Mr. Pope expressed concern to Blount Brothers QA that the aggregate that he and Mr. Gallagher looked at in November 1975 had too many fines, but the results of the next cylinder test, which he witnessed, assured Mr. Pope that the pile was acceptable. (Pope testimony, ff. Tr. 2833, at 17-18; Pope, Tr. 2871-72).

H-184. Excessive fine material in the No. 57 coarse aggregate was identified during December 1975 and March 1979 and documented in deviation reports. (Region III testimony, ff. Tr. 3586, at 23; Mihovilovich testimony, ff. Tr. 2750, at 12).

H-185. The aggregate identified as nonconforming in March 1979 was segregated and eventually used as backfill. (Region III testimony, ff. Tr. 3586, at 24). Actions to prevent the use of nonconforming aggregate were engineered by Sargent and Lundy and implemented by the Applicant and the contractor. (Region III testimony, ff. Tr. 3586, at 24).

H-186. Blount Brothers issued a deviation report in December 1975 that coarse aggregate had excessive fines. Sargent & Lundy, performed an engineering evaluation, which determined that the excessive fines were due predominantly to limestone, and approved the use of the aggregate for safety-related concrete. (Hayes, Tr. 3932-33, 3913; Konklin,

Tr. 3909-10). Subsequently, the supplier of the coarse aggregate changed its washing procedures to remedy the problems. (Hayes, Tr. 3934).

H-187. Mr. Pope testified that the Israeli engineer who visited the site did not tell him that he believed the aggregate was inadequate. (Pope testimony, ff. Tr. 2833, at 18). Mr. Pope testified that you cannot determine whether aggregate is bad only by its appearance. Tr. 2871). Mr. Pope also testified that the aggregate pile was condemned in 1978 or 1979 because of equipment traffic running on part of the pile. (Pope testimony, ff. Tr. 2833, at 19).

H-188. Mr. Gallagher admitted that the Israeli engineer never looked at aggregate tests, but only looked the pile. (Tr. 3480). Mr. Gallagher believed that someone could tell whether aggregate by its appearance. (Tr. 3479). Mr. Gallagher testified that he trusted Mr. Pope's judgment regarding concrete (Tr. 3461) and believed Mr. Pope was a conscientious worker. (Gallagher testimony, ff. Tr. 3459 at 17-18).

H-189. Mr. Gallagher testified that he believes the excessive fines could have resulted from inadequate washing of the aggregate, but would not attribute the fines to traffic running over the pile. (Tr. 3529-30). He knew of no specific instance in which bad aggregate was used for Category I placement (Tr. 3484) and assumed that the bad aggregate problem was solved after he left the site. (Tr. 3516).

H-190. The Board finds no reliable evidence that unacceptable aggregate was used for safety-related structures while Mr. Gallagher was on site.

H-191. Mr. Gallagher alleged that water in excess of specification limits was often added to concrete batches. The allegation was based on conversation with truck drivers who were present at placement areas and

not based on his own direct observation of the alleged practice.

(Gallagher testimony, ff. Tr. 3459, at 21-22).

H-192. Tests for slump, air content, and temperature are performed at the placement site where the concrete is poured and documented on the bottom of the batch ticket by the authorized testing agent. (Pope testimony, ff. Tr. 2833, at 8-9). A copy of the completed batch ticket was returned to the batch plant operator in order to determine if any adjustments had to be made in future batches, however, the operator generally would be informed of problems by radio before the batch ticket arrived back at the plant. (Pope testimony, ff. Tr. 2833, at 9-10).

H-193. Slump tests were performed at the placement site indicating the amount of water in concrete, by placing a concrete sample in a cone on the top, placing the cone on a flat surface, lifting the cone from the wet concrete, and measuring the distance in inches that the released concrete slumps down. (Pope testimony, ff. Tr. 2833, at 10). Slump tests were performed for the first ten yards, or first truckload, of each new pour and then for every 50 yards of the pour. (Pope testimony, ff. Tr. 2833, at 11).

H-194. Cylinder tests are performed by filling a cylinder with concrete and breaking then 7, 14, 28 and 91 days after the pour by compression to determine the strength of the concrete. (Pope testimony, ff. Tr. 2833, at 12). Mr. Johnson estimated that less than one-half percent of the cylinder tests have failed. (Tr. 3968).

H-195. Cylinder samples are not taken from every truckload. (Hayes, Tr. 3828). Cylinders tests are performed for every 100 yards of concrete for containment and every 150 yards for other safety-related

areas (Johnson, Tr. 3895). Mr. Gallagher testified that he agreed with Mr. Pope that cylinder tests are the ultimate test of concrete strength. (Tr. 3469).

H-196. Tests were conducted before a batch was poured into the placement area. A small amount would be tested for slump and a cylinder sample taken as the concrete was being pumped from the truck. If the slump was too low, water would be added from the water tank in each truck as the concrete was pumped out of the truck and a new cylinder sample would be taken. (Johnson, Tr. 3965-67; Gallagher, Tr. 3540-41).

H-197. The slump specification was usually between 3.5 and 4.5. (Gallagher testimony, ff. Tr. 3459, at 19). Mr. Gallagher admitted that due to a chemical reaction in the concrete which caused heat to evaporate the water while it was in the truck, the personnel at the placement center may have had to add water to raise the slump. (Gallagher testimony, ff. Tr. 3459, at 19).

H-198. When PTL found that a batch failed one of the tests performed, corrective measures would be taken at the batch plant and the failed concrete would be rejected or used as backfill if it had not been placed or, if placed, Sargent & Lundy would analyze further tests on the concrete to determine whether it should be rejected and a deviation report issued. (Pope testimony, ff. Tr. 2833, at 13).

H-199. Quality Control inspectors were present at all placement areas and if the slump was too high the batch would be rejected. (Pope testimony, ff. Tr. 2833, at 21-22; Johnson, Tr. 3978). Blount Brothers QA controlled the addition of water to the concrete at the placement area. (Pope, Tr. 2842; Tallent, Tr. 3978; Gallagher, Tr. 3472). The

amount of water that could be added within specifications was indicated by a water trim figure on the batch ticket. (Pope testimony, ff. Tr. 2833, at 21-22; Gallagher, Tr. 3488). For example, a trim value of negative two would mean 12 gallons of water could be added to a six yard load. (Pope, Tr. 2857-59).

H-200. Mr. Pope testified that he knew of no instances where water added to concrete at the placement center was not recorded on the batch ticket. (Pope, Tr. 2843-44). Mr. Pope admitted that the batch plant located over 200 yards away from the placement area and the batch plant operator could not see what happened at the placement center. (Pope, Tr. 2840).

H-201. The PTL Civil Supervisor for Quality Control at Byron testified that water could not have been added secretly because PTL technicians who perform concrete testing within 25 feet of the trucks would hear the engine rev at the speed necessary to mix water into the concrete or would see the increased revolutions of the drum on the truck. (Johnson, Tr. 7677).

H-202. The Board finds no evidence that water in excess of specifications was added to concrete batches.

H-203. Mr. Gallagher alleged that oil from the blower used by the concrete tender leaked into concrete mixes. (Gallagher testimony, ff. Tr. 3459, at 23-24).

H-204. The NRC Staff determined that small amounts of oil could have leaked into the cement from the blower used to blow the cement from the mobile storage tank into the site storage silo. The Staff concluded that due to the small amount of concrete in each batch and the quantity

of oil which could be involved, the contamination would be extremely low. (Region III testimony, ff. Tr. 3586, at 24). In addition, concrete strength test data did not reflect any concrete below design values. (Region III testimony, ff. Tr. 3586, at 24; Pope testimony, ff. Tr. 2833, at 24; Hayes, Tr. 3779).

H-205. The Board finds that quantities of oil that may have leaked into the concrete mix did not affect the strength of the concrete.

H-206. Mr. Gallagher alleged that quality control personnel lied to NRC investigators about concrete batch plant maintenance checks and a variety of quality control practices. (Gallagher testimony, ff. Tr. 3459 at 15-16).

H-207. The batch plant operators were responsible for maintenance of the batch plant equipment and that instruments, the scales, the admixtures, the dispensers at both plants and the water meter at the Erie-Strayer plant, were calibrated every 90 days. (Pope testimony, ff. Tr. 2833, at 20; Gallagher testimony, ff. Tr. 3459, at 16).

H-208. Mr. Gallagher admitted that he never asked the employee what he meant by "maintenance." He believed that he and Mr. Pope kept the plant properly maintained. (Tr. 3486). He also testified that calibration tests were performed periodically. (Gallagher testimony, ff. Tr. 3459, at 5-6).

H-209. The NRC inspector who investigated the allegation opined that Mr. Gallagher did not understand that the NRC inspector's questions were in regard to QC required equipment calibration or inspections and not routine maintenance and servicing checks which would involve running the

machinery. (Region III testimony, ff. Tr. 3586, at 25; Hayes, Tr. 3781-82; Konklin, Tr. 3782).

H-210. Due to the apparent misunderstanding by Mr. Gallagher, the Board finds that there is no evidence to substantiate the allegation that Blount Brothers personnel lied to NRC inspectors.

H-211. Mr. Gallagher alleged he was fired in June 1979 for refusing to operate the Ross plant to mix safety-related concrete for the cooling towers which he believed the plant was not equipped to mix and to avoid waste. (Gallagher testimony, ff. Tr. 3459, at 25-26; Gallagher, Tr. 350509; Pope, Tr. 2863).

H-212. The batch ticket would indicate whether the batch was safety-related. (Gallagher testimony, ff. Tr. 3459, at 8; Pope, Tr. 2855). If the concrete was for safety-related placement, the batch operator had to sign the batch ticket to verify the proportion of ingredients met design specifications. (Gallagher testimony, ff. Tr. 3459 at 9; Pope, Tr. 2855).

H-213. Mr. Gallagher asserted that he would not sign a batch ticket for safety-related concrete unless he was certain it was a "quality product." (Gallagher testimony, ff. Tr. 3459, at 10).

H-214. Mr. Pope testified that whether the batch ticket indicated that the concrete was for safety-related or nonsafety-related placement, he made the concrete with the same mix and exercised same amount of care. (Pope, Tr. 2870-71, 2878). The concrete Mr. Gallagher refused to mix was nonsafety-related, Category II concrete for the cooling towers. (Pope testimony, ff. Tr. 2833, at 14-15). If problems such as ice balls existed with the concrete, it would be rejected. (Pope testimony, ff.

Tr. 2833, at 15). Mr. Pope did not question Mr. Gallagher's sincerity, but disagreed that the Ross plant could not produce safety-related concrete because he was using the Ross plant to produce safety-related concrete at the time of the hearings. (Pope, Tr. 2865-66).

H-215. When Gallagher was employed at Byron, the Ross batch plant was primarily used to produce mud slab and backfill concrete. (Pope, Tr. 2868, Gallagher testimony, ff. Tr. 3459, at 7; Tr. 2874). Mr. Pope recalled that both plants were used together only once. (Pope, Tr. 2839-40). The Erie-Strayer plant was run the day Mr. Gallagher was fired. (Pope, Tr. 2852). The Erie-Strayer plant was dismantled in 1980 because Blount Brothers does not place enough concrete to use the Plant. (Pope, Tr. 2867).

H-216. Mr. Pope testified that Mr. Gallagher preferred to work in the Erie-Strayer plant and could have filed a grievance with the union if he felt his firing was unjustified. (Pope testimony, ff. Tr. 2833, at 15-16). The operator of the Ross plant sits in front of the scales in the same building as the concrete ingredients. The operator of the Erie-Strayer plant sat in an air-conditioned and heated trailer which was more comfortable to work in than the Ross plant. (Pope testimony, ff. Tr. 2833, at 6).

H-217. The Board finds that Ross plant was equipped to mix safety-related concrete and that the concrete Mr. Gallagher refused to batch was for nonsafety-related placement.

H-218. Mr. Gallagher alleged he heard Applicant Production supervisors complaining to Blount to meet production quotas. (Gallagher testimony,

ff. Tr. 3459, at 10-11). Mr. Gallagher admitted that he did not feel the pressure affected the quality of the concrete. (Tr. 3476).

H-219. Mr. Pope testified that he was not aware of any instances in which the Applicant's construction supervisors visited Blount Brothers to complain that concrete production quotas were not being met. (Pope testimony, ff. Tr. 2833 at 17).

H-220. The Board finds no evidence that such alleged pressure affected the quality of concrete.

H-221. The Board finds that the majority of Mr. Gallagher's allegations are not substantiated. Where substantiated, all of the allegations have been addressed by appropriate corrective action and have not resulted in unsafe conditions at the plant.

(3) Smith Allegations

H-222. Mr. Smith was a QA inspector and auditor for Hunter Corporation, the principal piping contractor at Byron, from November 1978 to January 1980 and supervised by Mr. Somsag. (Smith testimony, ff. Tr. 3243, at 1-2).

H-223. Mr. Smith was certified as a Level I QA inspector and as an auditor and his immediate supervisor was Michael Zeise, the lead auditor for Hunter QA. (Somsag testimony, ff. Tr. 2883, at 4).

H-224. Mr. Smith was fired from Hunter Corporation in January 1980 for an excessive absenteeism rate of approximately 20 percent (Smith, Tr. 3244) and inefficiency and his requests to be rehired were denied. (Somsag testimony, ff. Tr. 2883, at 24).

H-225. When two DAARE/SAFE members contacted Mr. Smith and asked him to sign an affidavit (Tr. 3248), Mr. Smith prepared an affidavit from memory in September 1982 (Joint Intervenors' Exhibit 21, Tr. 7000), which was modified by his oral testimony, to inform the public about problems he observed in Hunter's QA program. (Smith testimony, ff. Tr. 3243, at 2-3). After reviewing documents provided by the NRC and the Applicant he revised many of his statements concerning Audit 059-3. (Smith testimony, ff. Tr. 3243, at 4-5).

H-226. Malcolm L. Somsag, the Site Quality Assurance Supervisor for Hunter Corporation with 10 years of experience in quality assurance and six years in his position at Byron, testified that he was responsible for both QA and QC at Byron, he reports to the corporate QA manager for Hunter Corporation, and was Mr. Smith's supervisor. (Somsag testimony, ff. Tr. 2883, at 1-4).

H-227. Hunter QA performs surveillances, or informal audits, and audits. An audit is a formal review and evaluation of work performed by production and inspection personnel to determine whether work is in accordance with relevant requirements. (Somsag testimony, ff. Tr. 2883, at 7). Audits are scheduled at the beginning of the year. (Smith, testimony ff. Tr. 3243, at 15; Somsag testimony, ff. Tr. 2883, at 7). Auditors read instructions that inform them of the work activities and familiarize themselves with the procedural and technical requirements which pertain to the work. Auditors composed checklists from the QA Manual and the Site Implementation Manual (Smith testimony, ff. Tr. 3243, at 13). After an entrance and exit meeting are held between the auditors and the pertinent inspection personnel, the audit findings are written in

final and a follow-up audit performed to determine whether problems or nonconformances identified in the initial audit have been corrected. (Somsag testimony, ff, Tr. 2883, at 7-8).

H-228. Mr. Smith alleged that policies regarding concrete expansion anchors (CEA) and piping supports were inadequately defined in the areas of installation and inspection, but he could not state specifically how the CEA policies were inadequate (Tr. 3252-53).

H-229. The Staff determined that the allegation was substantiated in part. When Mr. Smith was on site the QC inspection program for CEA and piping supports was inadequate. NRC could not substantiate that the CEA installation procedure was insufficient. (Region III testimony, ff. Tr. 3586, at 25).

H-230. Mr. Smith alleged that QC inspection only covered welding process of component supports and not the locations of pipe supports. (Smith testimony, ff. Tr. 3243 at 9). Mr. Smith also alleged that inspector did not have tools to measure locations. (Smith testimony, ff. Tr. 3243, at 37).

H-231. Component supports are installed in accordance with design drawings or, if installation cannot be achieved in strict accordance with design drawings, in accordance with design tolerances. Each component support has a job traveler package which includes all documentation pertaining to the physical installation of the support. (Somsag testimony, ff. Tr. 2883, at 9-10).

H-232. Audit 059-3, performed by Mr. Zeise and Mr. Smith from July to August 1979, was a regularly scheduled audit conducted to determine whether documentation indicated that component supports or hangers which

suspend piping and equipment were being installed within design tolerances and whether support locations were acceptable. (Somsag testimony, ff. 2883, at 9, 13; Smith testimony, ff. Tr. 3243, at 6).

H-233. Audit 059-3 found that quality control welding inspectors (QCWI) were not inspecting location of supports, (Somsag, Tr. 2897).

H-234. At the time of Audit 059-3, Hunter's procedure was to postpone location inspection until an entire system of component supports was stabilized in its final configuration because of frequent design changes. (Somsag testimony, ff. 2883, at 12). Hunter Corporation Inter-Company Correspondence Letter, HC-QA-23 (Exhibit 2), which was made known to production supervisors and QA/QC personnel, established the procedures to be followed regarding the location of component supports. (Somsag testimony, ff. Tr. 2883, at 11). The letter references Sargent & Lundy's Mechanical Drawing M-916 established the various dimensional changes that could be made to individual parts that comprise the overall component support assembly and the degree of allowable variation from the design drawing. (Somsag testimony, ff. Tr. 2883 at 11; Smith testimony, ff. Tr. 3243, at 8).

H-235. Mr. Zeise and Mr. Smith used HC-QA-23, which was attached to a Hunter site implementation procedure, to develop some of the items for the Audit 059-3 check list. (Smith, Tr. 3361).

H-236. Mr. Smith prepared a handwritten draft of HC-QA-23 (Applicant Exhibit 5) before it was typed and was aware of M-916 as of March 1979. (Tr. 3366-68). Smith asked questions about M-916 during Audit 059-3, but he never read it thoroughly. (Tr. 3370-71).

H-237. To correct the problems identified in Audit 059-3, the report recommended that QC take action to accept or reject as-built documentation of component supports in accordance with the procedures set forth in HC-QA-23 (Somsag testimony, ff. Tr. 2883, at 15; Smith Exhibit C, at 12).

H-238. Audit 059-3 reviewed five component support job traveler packages and found that only one had quality control welding inspector (QCWI) acceptance of as-built data noted in the job traveler package as required by HC-QA-23. (Somsag testimony, ff. Tr. 2883, at 15; Smith testimony, ff. Tr. 3243, at 37).

H-239. Mr. Smith testified that Audit 059-3 disclosed that two of the five supports examined had properly generated as-built data per M-916 (Tr. 3272-73) and four supports referenced M-916 (Tr. 3274).

H-240. The production department was not adequately detailing as-built data and data contained in the traveler package was not reproduced or photocopied adequately. (Somsag testimony, ff. Tr. 2883, at 14; Smith, Tr. 3388).

H-241. The Staff had identified similar problems as to the inspection of pipe support locations in March 1980, two months after Mr. Smith's employment ended at the site. (Region III testimony, ff. Tr. 3586, at 25).

H-242. NRC Inspection Report No. 80-05 (Smith Exhibit H) documented a March 25-26, 1980, inspection of safety-related piping component supports. The report found noncompliances due to inadequate design drawing review by Sargent & Lundy, the Architect-Engineer, inadequate installation procedures, inadequate QC inspection program, inadequate document revision control, failure to protect installed snubbers, and

inadequate QA audits on hanger restraint installations. (Smith Exhibit H at 1).

H-243. The Staff considered the performance of support location inspections after an entire system was finalized as untimely and reached agreement with the Applicant that required such inspections be performed at a specified period. (Somsag testimony, ff. Tr. 2883, at 20-21, Tr. 2928; Yin, Tr. 3674). The Staff also criticized the absence of specific requirements pertaining to component support and the use of inter-company correspondence such as HC-QA-23 to set forth inspection procedures. (Yin, Tr. 3676-77). Hunter's procedures were revised to include timely inspection of component support locations and to provide for ongoing trend analysis of installation work underway. (Somsag testimony, ff. Tr. 2883, at 21-22). The Applicant's action was verified to be effective. (Yin, Tr. 3677).

H-244. Mr. Somsag admitted that timely QC inspections of piping suspension system component installation, including verification of correct location and configuration, is important because NRC regulations require licensees to promptly identify deficiencies and nonconformances and to initiate corrective actions. (Somsag, Tr. 2910). The timeliness of inspections is also important in evaluating program adequacy. (Somsag, Tr. 2911).

H-245. A formal inspection program which included M-916 design tolerances and documentation of as-built support configurations and locations began about one month following Audit 059-3. (Region III testimony, ff. Tr. 3586 at 25-26).

H-246. Mr. Smith agreed that approximately a month following the Audit 059-3 exit meeting, Hunter's Hanger Engineer issued an inter-company letter dated October 11, 1979 (Applicant Exhibit 7), setting forth the procedure for generating and providing as-built data per M-916. (Smith, Tr. 3393).

H-247. In response to Inspection Report No. 80-05, an inspection checklist (Somsag Exhibit 7) was developed to document that support locations as-built drawings are generated as production installs the component supports and use of design tolerances is appropriately accepted by the QC welding inspectors. (Somsag testimony, ff. Tr. 2883 at 21-22). Components installed prior to March 1980 were subjected to a 100% reinspection program to provide current documentation of support locations. (Somsag testimony, ff. Tr. 2883, at 22-23, Tr. 2903; Smith Tr. 3402).

H-248. Mr. Smith alleged that Mr. Somsag instructed him not to report findings related to hanger field problems because they would be caught later during the walk down when the construction of the system is complete. (Smith testimony, ff. Tr. 3243, at 22-24).

H-249. Mr. Smith alleged that no one had given the QA department any as-built data. (Joint Intervenors' Exhibit 21, at 3).

H-250. Audit 059-3 also criticized the methodology used to forward as-built data from the Hunter Hanger Department to Sargent & Lundy and subsequently the reporting methodology was changed to reflect the comments of the auditors. (Somsag testimony, ff. Tr. 2883, at 16).

H-251. The NRC substantiated the allegation. The first formal site procedure requiring QC inspectors to document their observations in the

as-built drawings was issued in March 1980, after Mr. Smith's employment at Byron was terminated. The present as-built documentation requirements are being implemented effectively by Hunter Corporation. (Region III testimony, ff. Tr. 3586, at 26).

H-252. Mr Smith alleged that the follow-up Audit of 059-3 did not resolve deviations in support locations because Sargent & Lundy had not approved altered locations of pipe supports that a Sargent & Lundy engineer did not think it was important enough to be addressed. (Joint Intervenors' Exhibit 21, at 6).

H-253. In October 1979, a follow-up audit for Audit 059-3 (Somsag Exhibit 4) which examined a total of 50 component supports, including the five identified in the initial audit, was performed by Mr. Zeise and Mr. Smith to verify that corrective action was taken in response to the initial audit. (Somsag testimony, ff. Tr. 2883, at 18-19; Smith, Tr. 3387). The follow-up audit determined that appropriate corrective action had been taken and the findings and observations of the initial audit pertaining to component support location were closed. (Somsag testimony, ff. Tr. 2883, at 19).

H-254. Mr. Smith admitted that the first follow-up audit closed the substantive findings of audit-0593 and the second follow-up report (Applicant Exhibit 7) only indicated that the remaining item in Audit 059-3 was closed because under revised procedures, audit findings were no longer considered open pending site implementation procedure revisions. (Tr. 3398-3401).

H-255. The NRC Staff could not substantiate the allegation. The Sargent & Lundy design engineer identified by Mr. Smith was not assigned

any design related responsibilities. The altered locations would not have required engineering approval if they were within the design installation tolerances. (Region III testimony, ff. Tr. 3586, at 26-27). If the altered support locations are not within design tolerances engineering concurrence is required prior to actual installation.

H-256. Mr. Smith assisted in revising the QA manual. (Smith testimony, ff. Tr. 3243, at 6). When Hunter auditors discovered problems, Hunter QA would add additional procedures instead of clarifying the initial procedure which resulted in the procedures being ambiguous and subject to interpretation. (Smith testimony, ff. Tr. 3243, at 11). The Site Implementation Procedure manual was updated by adding inter-company correspondence. (Smith testimony, ff. Tr. 3243 at 36, 38-39).

H-257. Hunter Corporation QA manual used at Byron was reviewed and approved by the Applicant and Sargent & Lundy. (Somsag testimony, ff. Tr. 2883, at 5).

H-258. Mr. Smith admitted that HC-QA-23 was not added to the manual as a result of an audit. (Tr. 3283).

H-259. The manual was ultimately revised as a result of the component supports audit and the NRC inspection after Mr. Smith left. (Smith, Tr. 3281).

H-260. Audit 059-3 disclosed that quality control welding inspectors (QCWI) were not formally trained to M-916. (Smith testimony, ff. Tr. 3243, at 8). There were no training records, some welders stated that they did not know about M-916, and QCWIs had no tools to measure locations. (Smith testimony, ff. Tr. 3243, at 8-9; Somsag, Tr. 2987).

Only the hanger foreman and the superintendent used M916. (Smith testimony, ff. Tr. 3245, at 32-33).

H-261. Audit 059-3 disclosed that QC welding inspectors did not know what M-916 was. (Somsag, Tr. 2897).

H-262. Mr. Somsag wrote in Audit 059-3 that he committed to train QCWIs to M-916 (Smith testimony at 25). Mr. Smith believed it was an inappropriate way of closing the audit finding. (Smith testimony, at 34-36).

H-263. While discussing the follow-up audit to Audit 059-3 the QA supervisor committed to train QC welding Hunter inspectors to M-916 tolerances (Somsag, Tr. 2917). The training of QCWIs to M-916 began about a month after the follow-up audit was conducted (Somsag, Tr. 2918-19; Smith, Tr. 3395). Mr. Smith admitted such training was timely. (Tr., 3395).

H-264. Mr. Smith alleged that the QA supervisor would change audit reports such that the report would have less of an impact. (Smith testimony, ff. Tr. 3243 at 18-20).

H-265. Handwritten drafts of audits were reviewed by the QA Supervisor to verify that the necessary language was included in the reports to make the conclusions clear and substantiated. (Somsag testimony, ff. Tr. 2883, at 17). Applicant and Staff witnesses testified that the QA supervisor made editorial changes on inspector write-ups but did not delete any of the facts on which the reports were based. (Region III testimony at 26-27; Somsag testimony, ff. Tr. 2883, at 18).

H-266. Mr. Somsag did not recall making any changes to Audit 059-3, but he could not locate the handwritten draft. (Somsag, Tr 2891). The

Hunter site implementation procedure in effect at the time required the retention of original copies of audit checklists, audit reports, pencil notes and draft audit summary reports. (Somsag, Tr. 2894).

H-267. Mr. Smith could not identify any findings or observations that Somsag ordered deleted (Tr. 3409), but he believed Mr. Somsag made extensive changes to the handwritten draft of Audit 059-3. (Tr. 3406). Mr. Smith also admitted that Mr. Somsag would expand some drafts. (Tr. 3420).

H-268. The Board finds that the changes in inspection report drafts were editorial and did not affect the factual bases of the audit reports.

H-269. Mr. Smith alleged that supports are not in the exact design locations and the amount of stress the joints and pipes can take as constructed is questionable. (Joint Intervenors' Exhibit 21, at 5).

H-270. Audit 059-3 only looked at documentation of support installation and not whether actual installation was performed in accordance with either design drawings or within the tolerances of Sargent & Lundy Mechanical Drawing M-916. (Somsag testimony, ff. Tr. 2883, at 16).

H-271. Mr. Smith admitted that his statements as to stress placed on joints and pipes was speculation and that he did not have any engineering training. (Smith, Tr. 3275-76).

H-272. The NRC Staff substantiated the allegation that pipe supports are not in exact design locations and will verify and evaluate installation deviations from design locations as part of the Region III inspection program. (Region III testimony, ff. Tr. 3586, at 27).

H-273. Mr. Smith alleged that Hunter Corporation was under pressure by the Applicant to increase production. Workers told Mr. Smith repeatedly that they were urged to install supports quickly to meet production and the quality of their work was adversely affected. (Smith testimony, ff. Tr. 3243, at 20-22).

H-274. The Audit 059-3 noted that measurements of component support locations are never made by QC inspectors due to lack of time. (Smith Exhibit C at 10).

H-275. Mr. Somsag testified that he did not feel any financial pressure to limit the number or the activities of persons in his department and his staff grew from 20 to 31 during the time Mr. Smith was employed. (Somsag testimony, ff. Tr. 2883, at 6-7).

H-276. The Board finds that each of the concerns raised by Audit 059-3 have been addressed by subsequent corrective action both in response to the audit and the NRC inspection of component support installations.

H-277. Mr. Smith believed his audit activities related to the inspection of the Authorized Nuclear Inspector (ANI) were restricted. (Smith testimony, ff. Tr. 3243, at 16-17).

H-278. Even though Mr. Smith was not certain what the ANI's duties were (Tr. 3301, 3305) and was unsatisfied with the explanation he got from Mr. Zeise (Tr. 3311), Mr. Smith never asked the ANI himself what he did. (Tr. 3312).

H-279. Mr. Smith participated in an audit of the ANI, an individual trained and certified by the National Board of Boiler and Pressure Vessel Inspectors and a third-party inspector to monitor implementation

of Hunter's program, by providing the ANI with the required information and documentation. (Somsag, Tr. 2905; Smith, Tr. 3304). The purpose of the audit was not to evaluate the effectiveness of the ANI because his work is audited by his own organization. (Somsag, Tr. 2912).

H-280. Mr. Smith alleged he was discouraged or kept away from NRC inspectors by his supervisor Mr. Somsag and Art Simon, his assistant (Smith testimony, ff. Tr. 3243, at 39-40). Mr. Smith testified that he did not know what the NRC's function was. (Smith, Tr. 3245). He also testified that even though he believed the problems were serious, did not tell the NRC because he did not know where to contact the NRC and still did not know at the time of the hearing. (Smith, Tr. 3247).

H-281. While the Applicant does not have a formal written policy which provides that no disciplinary action will be taken against workers who report problems to the NRC (Stanish, Tr. 2703), neither CECO nor Hunter discourage contact with the NRC (Forney, Tr. 3662; Somsag, Tr. 2906). Under the Applicant's QA program, any employee may identify a deficiency. (Stanish, Tr. 2711).

H-282. The Staff testified that it spoke to workers at Byron and was unable to identify any policies that discouraged contact with the NRC. (Hayes, Tr. 5798). Mr. Forney also testified that some workers who have made allegations are still present at the site and he knew of no firing because of NRC contacts. (Tr. 3662).

H-283. Mr. Stanish testified that if the allegations made by any of the Intervenor witnesses had come to his attention, his QA group would have investigated the validity of the allegations and the individuals would not have been disciplined. (Stanish, Tr. 2702-03). Problems that

are reported immediately are easier to correct. (Stanish, Tr. 2711). In the opinion of Mr. Stanish, the utility would not benefit from discouraging worker employees from identifying potential problems. (Stanish, Tr. 2711).

H-284. Mr. Hayes testified that beginning in 1977, the NRC took actions to meet with workers at nuclear power plants to inform them of the role of the NRC and NRC inspectors wore hats that were labelled "NRC Inspector" on both sides. (Tr. 3894). When Mr. Forney, the Senior Resident Inspector at Byron, arrived on site in October 1981, NRC form 3 was posted on bulletin boards, but Mr. Forney increased the number of posting. (Forney, Tr. 3662; Hayes, Tr. 3896).

H-285. Currently, signs as large as 4' x 6" are posted all over the site informing workers how they may contact the NRC and the Applicant. (Forney, Tr. 3708; Stanish, Tr. 2703).

H-286. The Board finds there is uncorroborated evidence that Mr. Smith was kept away from NRC inspectors and adequate information is currently available at the site to enable workers to contact the NRC anonymously.

H-287. Mr. Smith believed Mr. McGhee would sign off on process sheets and weld record for other inspectors (Tr. 3423; Smith testimony, ff. Tr. 3243, at 15) and did so on ten occasions (Tr. 3429).

H-288. Mr. McGhee was the QC inspector supervisor and was generally responsible for directing the activities of the QC group and verifying that documentation was complete. (Somsag, Tr. 3953). Mr. McGhee is retired and no longer at Hunter. (Somsag, Tr. 3954).

H-289. Mr. Somsag knew of no instance where Mr. McGhee had fraudulently signed-off on inspection reports. (Tr. 3954). Mr. Somsag testified that Mr. Zeise told him that the issue had been addressed and adequately resolved. (Tr. 3955).

H-290. Mr. Somsag testified that if it became apparent that inspectors had not signed-off on documentation of inspections, Hunter QA would review the daily inspection reports by the inspectors and if there was no evidence that the inspection was performed, a nonconformance report would be issued if the hardware was inaccessible or, if accessible, direct that an inspection be done. (Somsag, Tr. 3951). There were instances when Hunter QA discovered underlying inspections had not been done and nonconformance issued. (Somsag, Tr. 3954).

H-291. Stipulated testimony of Mr. Zeise indicates that the problems with weld sign-offs was resolved. (Board Exhibit 4, Tr. 7025). If called to testify, Mr. Zeise would state that he was aware of three instances in which Mr. McGhee, Hunter's QC inspection superintendent, initialed an inspection report with the initials of another inspector when there was no evidence that the inspector had inspected a weld point. Each of the three instances involved three-inch diameter piping in the river screenhouse. Each weld was a Class 3 weld, due to their distance from the reactor units. (Board Exhibit 4, at 1-2).

H-292. Mr. Zeise would also testify that in each of the instances subsequent tests were run on the piping before the welds were embedded in concrete, which would have indicated any deficient welds. Mr. Zeise was not informed that the welds failed to pass the tests. Mr. Zeise believes it is unlikely that Mr. Smith observed other instances when Mr. McGhee

initialed for inspections for which there was no record that inspection had been performed because Mr. Zeise was in a position to observe such actions and Mr. McGhee changes job positions soon after the three instances observed by Mr. Zeise. (Board Exhibit 4, at 2).

H-293. Mr. Smith alleged that Mr. Zeise told him he heard PTL was fraudently producing weld radiograph records. (Smith testimony, ff. Tr. 3243, at 40). Mr. Smith had no personal knowledge of bad welding. (Tr. 3275).

H-294. The Board finds because Mr. Smith did not observe the ten allegedly fraudulent sign-offs and there is no corroboration of Mr. Smith's statements regarding weld radiograph records, on this record to suggest that problems were not resolved.

H-295. The Board finds that the problems Mr. Smith observed while he worked at Hunter Corporation, including Audit 059-3 findings, have been encompassed by subsequent NRC inspections and effective Applicant corrective action.

IV. CONCLUSIONS OF LAW

Based on the entire evidentiary record of this proceeding, and upon the foregoing findings of fact, the Board concludes the following:

1. Contrary to the claim of Contention 1A, despite a history of some past nonconformances, the weight of the evidence indicates that the Applicant has the willingness and the ability to maintain and implement a QC program in accordance with 10 C.F.R. Part 50, Appendix B, and that the QA program requires sufficient independence of QA functions from other functions within the company.

V. ORDER

WHEREFORE, in accordance with the Atomic Energy Act of 1954, as amended, and the Rules of Practice of the Commission, and based on the foregoing findings of fact and conclusions of law, IT IS ORDERED THAT this Partial Initial Decision shall constitute a portion of the ultimate initial decision to be issued upon resolution of the remaining contested issues in this proceeding.

IT IS FURTHER ORDERED, in accordance with 10 C.F.R. §§ 2.760, 2.762, 2.764, 2.785, and 2.786 that this Partial Initial Decision shall become effective and shall constitute, with respect to the matters addressed herein, the final decision of the Commission 30 days after the date of issuance hereof, subject to any review pursuant to the above cited rules of practice. Exceptions to this Decision may be filed within ten (10) days after service of this Partial Initial Decision. A brief in support of such exceptions may be filed within thirty (30) days after service of the brief of Appellant, forty (40) days in the case of the

Staff, any other party may file a brief in support of, or in opposition, to such exceptions.

THE ATOMIC SAFETY AND LICENSING BOARD

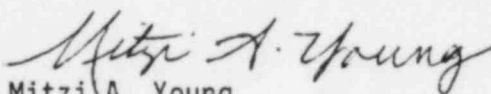
Ivan W. Smith, Chairman

Dr. Richard F. Cole, Member

A. Dixon Callihan, Member

Dated at Bethesda, Maryland
this day of , 1983

Respectfully submitted,


Mitzi A. Young
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 8th day of August, 1983