

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

DOCKETED
USNRC

'82 SEP 27 A10

In the Matter of)
COMMONWEALTH EDISON COMPANY) Docket Nos. 50-454
(Byron Station, Units 1 and 2)) 50-455

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

DAARE/SAFE'S MOTION TO RECONSIDER
SUMMARY DISPOSITION OF CONTENTION 1
WITH RESPECT TO QUALITY ASSURANCE AND QUALITY CONTROL

DAARE/SAFE, by its undersigned attorneys, hereby moves the Board to reconsider its ruling granting summary disposition against DAARE/SAFE's Contention 1, with respect to issues concerning quality assurance and quality control by Commonwealth Edison and Edison's contractors.*/

The grounds of this motion are as follows:

1. The Board's ruling overlooked the portion of DAARE/SAFE's Contention 1 relating to QA/QC. The ruling on Contention 1 (pp. 5-9) makes no reference to QA/QC. The Appendix to the Board's ruling, entitled "DAARE/SAFE ADMITTED CONTENTIONS," omits the portion of DAARE/SAFE's Contention 1 relating to QA/QC.

2. In relevant part, DAARE/SAFE's Contention 1 cites:

h. The history at all of Applicant's plants (whether now operating) of its failure (and that of its architects-engineers and contractors) to observe on a continuing and adequate basis the applicable quality control and quality assurance criteria and plans adopted pursuant thereto.

(Emphasis added)

*/ "Memorandum and Order Ruling on Motions for Summary Disposition of DAARE/SAFE Contentions," dated September 10, 1982, docketed in the NRC and served by mail on DAARE/SAFE, September 13, 1982.

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3. While the Board's ruling ignored the foregoing portion of DAARE/SAFE's Contention 1, Edison properly quoted it in full in Edison's motion for summary disposition (p. 1-3). Moreover, Edison's counsel stated at the August 18 prehearing conference,

If DAARE/SAFE ... has concerns with respect to quality assurance, perhaps felt with safety of the plant. [sic] Those concerns can be raised and the applicant is prepared to, and will, litigate the issues which pertain to the health and safety of the public, and the safe operation of the Byron plant.

Transcript at 50 (Emphasis added).

4. DAARE/SAFE attaches hereto four newly available exhibits, briefly described in paragraphs 5-8 below, in support of its QA/QC contention and this motion for reconsideration. Together these exhibits demonstrate genuine issues of material fact as to whether QA/QC at Byron has been and is sufficient to assure safe construction and operation of the plant.

5. The affidavit of Peter Stomfay-Stitz, dated September 20, 1982 (Exhibit A hereto), states that he was a QA/QC Inspector for a contractor at Byron from October 1978 to March 1979 and an ironworker apprentice at Byron from March to September 1979. As a QA/QC Inspector, he was responsible for inspection and documentation relating to structural steel erection and bolting in. As such, he found many nonconforming steel reinforcing tendons which were neither returned to the manufacturer nor completely repaired (Ex. A at 1-2), were improperly stored and handled (id. at 2-3), and had cracked buttonheads which were not properly

inspected (id. at 3). He also witnessed poor testing of the aggregate used for concrete, (id. at 3-5), such that "I am convinced that a good deal of bad aggregate was used to fabricate the cement which was used in the construction of the containment buildings." (Id. at 4-5.) He also testifies concerning: wet or dirty concrete blocks, supposed to be used only for Category II construction, but actually used for Category I (id. at 5); questionable alteration of design plans to conform to otherwise nonconforming construction (id.); inadequate inspection of bolts in the containment building (id. at 5-6); inadequate staffing and pay for QA/QC (id. at 6-7); and subordination of QA/QC personnel to production personnel (id. at 7). In sum, his experience was that, "The contractor and the utility were primarily concerned that the QA/QC staff completed the paper work. The general attitude was that as long as everything looked good on paper, then the QA/QC inspectors were doing their jobs properly." (Id. at 6.)

6. The affidavit of Michael A. Smith, dated September 21, 1982 (Exhibit B hereto), states that Smith was a quality assurance auditor for another Byron contractor from October 1978 to January 1980. He testifies that his QA training was inadequate (Ex. B at 1-2); that the contractor's QA program "had been thrown together in a matter of a few days" (id. at 1); that the QA manual was too vague (id. at 2); that his audit of pipe supports carrying Class 2 piping showed "100% non-compliance with the design drawings" (id. at 3); that his audit reports on this and other findings were edited "to downplay problem areas" (id. at 4);

that to his knowledge, "design engineers had not approved the altered locations of the supports" (id. at 6); that during his tenure with the contractor, "I was kept at a distance from NRC inspectors on site" and that it was "made clear to me by [his supervisor] that all dealings with Commonwealth Edison were to go through him" (id.), who also told Smith "that it would take too much time and research to get the QA program in shape" (id. at 6-7). Finally, he states, "We were so short of staff that I believe an effective QA program was not possible" (id. at 7).

7. The affidavit of Daniel W. Gallagher, dated September 6, 1982 (Exhibit C hereto), states that he was a batch plant operator for the concrete contractor at Byron from August 1975 to November 1977 and February 1978 to June 1979, when he was fired "when I refused to mix incompetent and unusable batches of concrete and approve their quality for safety-related use" (Ex. C at 1). He also testifies that the contractor "was under a great deal of pressure from CE supervisory personnel to produce concrete to keep up with the high-paced construction schedule" and that the contractor therefore "felt compelled" to take shortcuts (id. at 3); that "[f]or over two years, aggregate which had not met specifications was used to mix the concrete for the Unit One containment and turbine building" (id. at 4); that this problem was never adequately remedied by the NRC or by Edison (id. at 4-5); and that Edison stalled corrective action "because the poor quality of the aggregate was not reflected in any paper work, even though CE knew the aggregate did not meet safety specifications"

(id. at 5); that on one occasion the contractor's QC personnel "blatantly lied to NRC investigators" (id. at 5); that "it was apparent to me that the [contractor's] staff did not want the batch plant operators and the other workers talking to the NRC investigators" (id. at 6); that the contractor's "QC people stretched the truth on a variety of quality control practices" (id.); that excessive water was added to the concrete, weakening it (id. at 6-7); and that another worker told him that oil was also leaking into the concrete (id. at 7-8). In sum, Mr. Gallagher states:

All of the violations of safety specifications which I observed and in which I was asked to participate were overlooked or not discovered by CE inspectors. I believe that the CE supervisors were mainly worried about meeting safety specifications on paper. I further believe, from my experience at the Byron facility, that actual compliance with specified procedures for producing concrete for safety-related use was not nearly as important to CE as pushing Blount supervisors into increasing the speed of concrete fabrication to meet the daily quotas for the construction project.

(Id. at 8.)

8. In addition, a June 24, 1982 NRC Letter to Edison (Exhibit D hereto, which was not placed in the public document room nor made available to DAARE/SAFE until mid-August) reports the results of a special team inspection of QA/QC at Byron, conducted during March-May, 1982. While the letter states that, "[i]n general," Edison's QA/QC program "appeared good," it notes that "program implementation deficiencies were identified which

require corrective action." The accompanying notice of violation listed nine separate kinds of QA/QC violations and the letter expressed particular concern about inadequate QA/QC training, staffing and certification by Edison and its contractors at Byron. The inspection report itself is even more illuminating as to the adequacy of Edison's QA/QC program at Byron. After noting that Edison's QA program "should" be able to handle the job, it notes: "However, the execution of the program is not satisfactory, as evidenced by the many problems uncovered by the inspectors. One factor affecting the execution is the stability of service for the QA personnel." (Ex. D at 16.) It adds:

Since January 1976 there have been five QA superintendents at the Byron site: ... In addition to this undesirable condition, the QA Engineers and Inspectors have an average on-site service time of approximately fourteen months and have limited prior QA experience. Part of this on-site time was spent in training and qualifying for various QA duties.

In addition to this problem, manpower is currently being sent to other sites so that the QA effort is substantially weakened

The constant change over of personnel resulting in a minimum experience level and transfer of personnel could hinder the QA organization in meeting its obligation of effectively implementing a QA program.

Id.

The foregoing findings are not consistent with Edison's claims of a zealous commitment to vigorous QA/QC. What emerges from this report is a sketch of a low-priority, low-pay, low-power program, incapable of effectively handling its critical

responsibilities. Thus, Edison's own explanation for the rapid turnover and low experience level in QA/QC at Byron is, in part, a desire to offer QA/QC personnel "promotional opportunities" in other departments. (Id. at 17.) As the report noted, Edison's "inability ... to dedicate resources" to QA leads the inspectors to question both Edison's "effectiveness in staffing" its own QA Program, and its oversight of contractor QA/QC programs. Id. at 21, 22. The inspectors were also concerned about the lack of "assurance that upper management of CEC supported the Quality Assurance Program and its objectives." (Id. at 21.) It then comes as little surprise that, for example, Edison's response to the November 1981 GAO finding was still inadequate: "prompt training [of QA personnel] was still not being accomplished and ... the corrective action to prevent recurrence, stated in the audit response, was not being effectively implemented." (Id. at 17-18.)

9. Edison's failure to ensure effective QA/QC by its contractors at Byron is longstanding. (See Petition of DMARE/SAMP For Waiver Of Or Exception To Financial Qualifications Regulations, filed July 30, 1982, at pp. 9-13, and Exhibits Q through W thereto, which are incorporated by reference herein in their entirety. Indeed, Edison has knowingly tolerated QA/QC deficiencies at Byron, which are now the subject of a pending criminal investigation by the Department of Justice (id. at 10-11), and which have now led to an NRC Information Notice concerning "the potentially significant problem pertaining to welds in main

control panels", issued September 17, 1982 (Exhibit E hereto).

10. Edison's Motion For Summary Disposition contains sixteen fact statements which it labels "Material Facts as to Which There is No Genuine Issue to be Heard," each allegedly supported by portions of the four affidavits also submitted.

However, the self-serving, conclusory affidavits submitted by Edison do not controvert Contention 1. The affidavit of Cordell Reed, Edison's Vice President for Nuclear Operations, contains no specific facts which speak to DAARE/SAFE's allegations, but rather generally describes Edison's corporate nuclear programs. Further, Exhibit F hereto, a published newspaper quotation of Edison spokesman James Toscas, states that Edison does not inspect at least some kinds of suppliers' equipment for use at Edison plants, but instead relies on the QA/QC programs of suppliers.

The similarly conclusory affidavit of Mr. Shewski carefully refrains from dealing with Edison's responsibility for the conduct of its contractors. Its allegations, particularly at pp. 5-6, are stated in the future tense, indicating that Edison intends a change in its programs. The affidavit does not, however, speak effectively to Edison's track record of QA/QC deficiencies.

Mr. Querio's affidavit merely alleges that all personnel who will eventually be employed at the Byron plant once it is operating will be qualified, but fails to discuss the qualifications of any person other than Mr. Querio. It contains only a table with the number of years of unspecified types of experience of unnamed persons.

Mr. Steide's affidavit addresses some of the specifics raised in Contention 1, but not more recent and serious infractions of NRC regulations by Edison. Both Mr. Steide and Mr. Forney (NRC resident inspector at Byron, whose affidavit is appended to the staff's response to Edison's motion) attempt to make much of the fact that each incident mentioned in the Contention occurred between 1974 and 1978. However, DAARE/SAFE's contentions were submitted in 1979; it is hardly surprising that only incidents up to that time were mentioned in the Contention.

Edison's more recent QA/QC failures at Byron and elsewhere are evidenced in Exhibits A-F hereto and in Exhibits Q through W to DAARE/SAFE's financial qualifications petition.

In sum, in no way can it be said that Edison's history of QA/QC breakdown and poor plant management has long since passed. Indeed, it appears to continue at an undiminished rate.

11. The affidavit of Edward W. Gogol, inadvertently omitted from DAARE/SAFE's reply and attached hereto as Exhibit G, reflects his study of Edison's infractions of NRC regulations which have resulted in fines. It supports DAARE/SAFE's Contention and controverts the assertions in Edison's and the staff's affidavits, thus giving rise to a genuine issue of material fact.

12. The Order, at p. 6, indicates that the affidavit of Michael D. Mollander has been accorded no weight by the Board. Mr. Mollander, however, does not purport to be a nuclear expert, but merely uses his technical background to aid the Board in reading the exhibits which he submits. The fact that "the data

he bases his opinions on was never detailed" (Order at p. 7) is equally true of the Edison and staff affidavits.

13. Finally, the subject of the Contention - quality assurance/quality control - is of paramount importance to fulfillment of the Commission's duty to protect the public health and safety. In response to a question concerning consideration of QA/QC issues in operating license proceedings, Chairman Palladino has stated,

"... I think the Commission as a whole is very strong on quality assurance and, if anything, I think leans over as far as it can to accommodate every aspect of quality assurance."

Quality Assurance in Nuclear Power Plant Construction, HR 97-26, 97th Cong. 1st Sess., at 30 (Nov. 19, 1981). In sum, DAARE/SAFE's QA/QC contention is too important to overlook, and its evidence of QA/QC deficiencies at Byron is too substantial to deny a full hearing and thorough Board consideration of the relevant facts. DAARE/SAFE therefore urges the Board to reconsider its earlier ruling and to deny summary disposition of Contention 1 with respect to QA/QC matters.

September 23, 1982

Respectfully submitted,

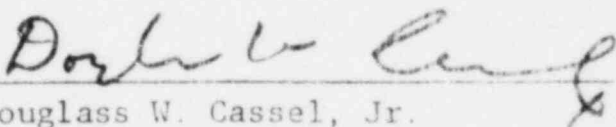
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Attorneys for DAARE/SAFE with
respect to issues concerning
quality assurance/quality control

By:


Douglass W. Cassel, Jr.

CERTIFICATE OF SERVICE

I hereby certify that I served copies of the foregoing DAARE/SAFE's Motion For Reconsideration on all parties by causing copies thereof to be placed in envelopes and deposited in the U.S. mail at 109 North Dearborn, Chicago, Illinois, first class postage prepaid, properly addressed as indicated on the attached service list, and by Federal Express to the Board members, this 23rd day of September, 1982.

Attorney

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TABLE OF EXHIBITS

TO

DAARE/SAFE's Motion To Reconsider Summary Disposition
Of Contention 1 With Respect To
Quality Assurance And Quality Control

EXHIBIT

- A. Affidavit of Peter Stomfay-Stitz.
- B. Affidavit of Michael A. Smith. ☺
- C. Affidavit of Daniel W. Gallagher.
- D. Letter from NRC Region III to Commonwealth Edison Co.,
June 24, 1982, with enclosures.
- E. NRC Office of Inspection and Enforcement Information
Notice No. 62-34, Rev 1, September 17, 1982.
- F. Illinois Times, Jan. 7-13, 1982, p. 3, "Nuclear Time
Bombs?"
- G. Affidavit of Edward M. Gogol.

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AFFIDAVIT OF PETER STOMFAY-STITZ

My name is Peter Stomfay-Stitz. I was employed as a Level I Quality Assurance/Quality Control Inspector for Blount Brothers Corporation (Blount) from October 1978 to March 1979 at the Byron Nuclear Power Plant being built by Commonwealth Edison Company (CE). From March 1979 to September 1979, I was an Ironworker Apprentice for Ironworkers Local 498 at the Byron facility.

As a QA/QC inspector I was responsible for required inspection and documentation of structural steel erection and bolting in. I was also responsible for receiving inspection for nuclear safety-related equipment and materials as Blount QA/QC Material Controller, establishing quality conformance to the procurement documents. I further participated in a program of planned and periodic audits to verify compliance with all aspects of the QA/QC program. All statements below refer to incidents and observations which occurred during my tenure as a Blount QA/QC inspector at the Byron site.

My primary responsibility at the beginning of my employment with Blount involved on-site inspection of steel reinforcing tendons which were used to strengthen the concrete placed in the containment buildings. I was told to examine the tendons visually to determine whether any nicks, wetness or other damage had occurred during shipping. Many times I found such nonconformances and authorized the return of the noncomplying tendons to the manufacturer as I had been instructed to do.

Even though I was merely following the instructions I had been given by Blount's QA/QC manager Rick Donica, I was told by

Exhibit A

both Blount and CE supervisory personnel that returning the non-complying tendons to the manufacturer presented an inconvenience to Blount and CE. I believe the inconvenience with shipping tendons back involved slow down of construction and great shipping cost.

The question of what should be done with the damaged tendons was finally resolved by a memo I received from my supervisors. I was informed through the memo that the tendons were to remain on site, because InRoyCo (also known as Inland Ryerson Steel Co.), the tendon manufacturer, would come to the Byron site and fix any damaged tendons. InRoyCo personnel did come on site later in 1978 or in 1979, but I believe that it is unlikely that the tendon manufacturer was able to completely repair the noncomplying tendons.

Many tendons, as I have described above, did not conform to specifications upon their receipt on site. In addition, many other nonconformances resulted from the mistreatment of the safety-related tendons during transfer and storage of the tendons at the Byron site. The tendons were packaged in pairs in large plastic bundles. Since it was extremely important that the tendons stayed clean and dry on the extremely dirty and dusty construction site, it was critical that the plastic bags remained sealed at all times. Many of these plastic coverings, however, were torn open as the tendons were loaded and unloaded for transportation to and from storage areas.

Also, the tendons were stored in tendon barns which did not adequately protect the tendons from dirt and dampness. The tendon barns were open at the bottom, and standing water and mud were consequently all over the ground upon which the stored

tendons rested.

In the Winter of 1978, several buttonheads, which hold the wires of the tendon in place, were found to have cracked. The ones with the greatest splits were supposedly sent back to InRoyCo. Because the cause of the cracks was not clearly determined, all the tendons stored in the tendon barns needed to be inspected. Blount organized a two day inspection of all the tendons on site. I participated in this inspection of the buttonheads. The temperature on the days of the inspection was around 10 degrees (F) below zero. We had to tear open the plastic coverings and attempt to maneuver the steel tendons which weighed thousands of pounds, to determine if the buttonheads had cracked. Many of the ends of the tendons were inaccessible due to the way they were coiled, making inspection of the cracks with a feeler gauge (to determine the width of the crack) impossible. Finally, I and the other inspectors had to reseal the plastic bags which held the tendons. However, the gray duct tape used to seal the bags would not stick at -10°F. The inspection of the buttonheads was technically completed, with no additional findings of cracked buttonheads. The rushed inspection, under terrible weather conditions, however, could not in any sense been accurate in inspecting the tendons. Buttonhead splits or cracks may have existed in the tendons, but because of the speed and difficulty of the inspection process these cracks went unnoticed.

In the course of my other inspection duties, I witnessed a variety of questionable practices. The testing of the aggregate

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used in the fabrication of concrete for the containment buildings provides one such example. Pittsburgh Testing Laboratories would call Blount's QA/QC staff to inform us that a certain sample of aggregate had failed to comply with specifications. A Blount QA/QC inspector -- often myself -- would go out to the aggregate pile and inquire as to the exact location of the bad sample. The Pittsburgh Testing Laboratories inspector would point to a general area of about 50 to 60 feet of the six-or-seven-hundred-foot-long pile. The inspector would then suggest that another sample be taken from some other part of the same pile. Samples were taken until one was found that passed minimum specification requirements. The Blount inspector would then condemn a small portion of the pile where some of the bad samples had been found. This non-complying aggregate remained on site, but it was not supposed to be used in the production of concrete for safety-related purposes. I believe that at least some, if not most, of this condemned aggregate was used in fabricating safety-related concrete in spite of its temporary segregation from the pile.

The most significant problem with the aggregate testing procedure was the practice of testing sample after sample until a good one was found. It was evident to all the inspectors and testers that this process did not ensure that aggregate which did not meet specifications was prevented from being utilized in the production of cement for use in safety-related structures. I am convinced that a good deal of bad aggregate was used to fabricate the cement which was used in the construction

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of the containment buildings.

The same type of problem occurred with the receiving inspection of concrete blocks to be used in Category I construction. Many times the blocks would arrive wet or dirty and were placed in a separate building, often the turbine building, to dry, and supposedly were to be used only in Category II, not Category I, construction. I believe, however, that many of these blocks were used in Category I construction.

Another area of significant manipulation of specification regulations involved the repeated incidents of change in design. After the completion of construction, the design plans would be altered so that the structure which actually was constructed would appear to have met design specifications. This change of design occurred on a regular basis. The following scenario serves as an example of the manner in which the change of design procedure was regularly implemented. Blount would complete construction of an area of a structure and an engineer would realize that a support beam inadvertently had not been placed in the structure. Rather than rework the construction to meet the Sargent & Lundy design, Blount QA/QC persons would call Sargent & Lundy engineers and ask them to alter the design plans, leaving out the forgotten beam. Correcting the construction defect in this manner was considerably cheaper than physically placing the beam into the completed structure.

About three months before I left Blount, an increase in welding activity resulted in a need for extra QA/QC inspectors to check welds. Consequently, Blount shifted the QA/QC inspector

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who checked the structural steel "bolting in" (essentially making sure all bolts in the cement in the containment buildings were in place and properly tightened) to weld inspections. All the bolting in inspections became part of my duties. Tendon and other ad hoc inspections which had been occupying all my time were not supposed to be cut back in any respect. I was simply given more work than I could possibly complete.

The bolting in inspection duties included checking every bolt placed anywhere in the eight stories of either containment building. I never received proper training in this area, and essentially bumbled my way through the bolting in inspections. Because of the time pressures placed on me by my supervisors, I often simply did not inspect several bolts which required inspections.

Neither CE nor Blount supervisory personnel seemed concerned by the extreme overstretching of Blount's undersized QA/QC staff, which consisted of only five people. The contractor and the utility were primarily concerned that the QA/QC staff completed the paper work. The general attitude was that as long as everything looked good on paper, then the QA/QC inspectors were doing their jobs properly. This was accomplished by other members of the QA staff performing audits of others' paperwork.

The incredible pressure I was under in attempting to perform inspections without the necessary time to complete the tasks, or the training to understand the tasks, finally led to my decision to resign from Blount's QA/QC staff. Also, my job never paid

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more than \$4.00 per hour. Such pay was extremely low, especially in light of the tremendous pressure and responsibility which were involved in the job. The low salary in comparison with production-side employees also contributed to my decision to seek other employment. I understand that, according to NRC regulations, Blount's QA/QC staff was to be separate and independent from Blount's production staff. Such independence did not exist at the Byron job. For example, several times I tried to get an increase in my pay to be comparable with the other inspectors I worked with. Rick Donica, the QA/QC manager, would meet with Blount production chiefs Charles Smith and Bill Beesing regarding this. I also always had to go to production personnel for other matters such as time off.

I have read the above seven (7) page affidavit, and to the best of my knowledge, it is true, accurate and complete.

Peter Stomfay-Stitz
 PETER STOMFAY-STITZ

Subscribed and sworn to before me this 20 day of September, 1982.

James M. Smith
 NOTARY PUBLIC

My Commission Expires:

AFFIDAVIT OF MICHAEL A. SMITH

I, Michael A. Smith, being first duly sworn, hereby depose and say as follows:

I was employed by Hunter Corporation as a quality assurance ("QA") auditor at the Byron Nuclear Power Station, Byron, Illinois, from October, 1978 to January, 1980. Prior to that time, I had worked one and one half years as a production planner for Sunstrand Aviation, and two years as a service station manager for Martin Oil. I had no prior experience in the quality assurance field. I was hired by Butch Somsag, Hunter Corporation's QA supervisor. I was first hired as a QA inspector, but during my training a need developed for a QA auditor.

My training program for my job with Hunter Corporation consisted only of learning the site policy manual and taking a test on it. The manual was typewritten, covered approximately 24 areas and was 500-600 pages in length. Once I passed the test, I was certified and allowed to go out into the service area either as a QA inspector or a QA auditor.

As a QA auditor my job was to inspect what the QA inspectors had done. The QA inspectors were to inspect welds on pipes and supports and support locations.

At the time I was hired, Hunter Corporation had been at the Byron site for one or two years as the replacement for the Pope Company. Somsag told me that Hunter's QA program had been thrown together in a matter of a few days when Hunter took over the piping contract from Pope. It was the first time Hunter had

Exhibit B

been involved in nuclear construction. When they hired me, they had no definite plan of where to put me. They were trying to upgrade their QA program because it was too vague. My job was to fill in wherever needed and I assisted in the revision of the QA program.

The QA program consisted of 18 ANSI criteria and the site policy manual broke these criteria down so that the workers in the field could follow them.

Before I was hired the QA staff consisted of about six welding inspectors and one auditor. I was hired as a co-auditor. The staff then increased to about 12 welding inspectors, two auditors (including me) and a third auditor who was part time and also served as an inspector. My co-auditor and I reported directly to Somsag, and Somsag reported directly to the home office in Hammond, Indiana. Somsag also dealt with Commonwealth Edison personnel on the site.

We started digging up problem areas, or "gray areas." These were due to the fact that the QA manual contained no stringent guidelines and the workers were given too much freedom to put anything anywhere they wanted. For example, the policies regarding BEAS and piping supports inadequately defined installation and inspections as outlined by the working instructions of the most current ANSE codes.

In October and November of 1979, my co-auditor and I did a special audit of certain pipe supports. I had been told by production workers that they felt there was a need for it. They said that they had been rushed to put them in as quickly as possible and thought they were putting them in where piping was not supposed to be. One support had no documentation at all.

We looked at the support and its dimensional location was several feet off and the support faced the wrong direction. This prompted our more extensive audit, described below.

We drew out at random between 100 and 150 supports to audit. We went into the field to verify that the supports were where they were supposed to be. These hangers were in the auxiliary buildings at about the 364 level and the 400 level, just outside the reactor walls. The supports carried Class 2 piping. We picked these areas because there had been so many questions about the inspectors signing off without inspecting the supports. The inspectors would inspect only the welding process but not the location of any piping support. We found out that they could not verify the location of any piping supports because they had no tools to measure the locations. The most they would do was to verify the location by "eyeballing" the support in relation to some other object.

We found that some supports were off by as much as four feet, and that none of the 100 to 150 supports we audited was in the proper location indicated by the design drawings. In other words, we found 100% non-compliance with the design drawings.

No one had given the QA department any as-built data, i.e., something to say that this hanger had been moved to a location other than that designated in the line drawings. In other words, the "signed-off" drawings did not match the plans.

My co-auditor and I wrote up a handwritten report, consisting of approximately eight pages, and gave it to Somsag. Somsag

told us he felt we had opened a can of worms and wanted us to rewrite our audit. He re-edited it personally, and gave it back to us in typewritten form. The changes he made were quite extensive and resulted in the fact that our report made less of an impact that we felt the problem deserved. The report as we wrote it pointed to two areas of concern: production and QA inspection. Somsag changed the report so that it did not necessarily imply that these were problem areas. This is not the only time Somsag changed our reports to downplay problem areas; he did this quite often.

To the best of my knowledge, prior to our audit no inspector had ever verified piping locations on either Class 1 or Class 2 structures. Several of the supports could not be located at all even though there were "signed-off" documents that said the supports were in fact in place. Later, after confronting the production people, these were located. The production department went through the past paperwork and verified that they had moved some supports. The particular piping involved in our audit was class 2 piping from the reactor building into the auxiliary building. This is not as volatile as Class 1 piping but is as important because it carries contaminated waste.

Prior to our audit and the change in QA procedures stemming from our audit, I do not know how many supports were without proper inspection. Only in case of a weld to a support would there be anyone to verify or inspect it at all and even then they would only inspect the weld and not the location.

Because the supports are not in the exact locations the engineers had designed, it is questionable how much stress the joints and pipes can take in their present positions.

We were told to forget the audit but instead we called a meeting of the Hunter Corporation's project manager (Ben Krasawski), the four production superintendents, Somsag, myself and my co-auditor. This was in December of 1979 after Somsag had edited and returned our report so that the severity of the findings was not so noticeable. Even with Somsag's changes, the report did cause re-evaluation of the problem of inspection procedures.

What we were trying to get across to the production people was that we did not have as-built data included anywhere.

At the meeting regarding the audit, there seemed to be a great deal of concern by the building superintendents that we were opening up a can of worms. They wanted to know where we got our ability to inspect pipe supports since we were not pipe fitters. We said that we had used a tape measure and anybody could do it.

The building superintendents were at odds with the QA department and said that the whole problem was the inspectors' fault because they should have caught it before our audit.

At the meeting, Krasawski acted as a mediator between the QA department and the production department. Everyone acknowledged that there was indeed a QA problem.

We did a follow-up audit to verify that the problems stated in my findings had been corrected or that as-built documentation was provided. That is, that the drawings and documentation for

each support were changed to show as-built data and properly signed. In all but a few instances, this was done. In the cases where it was not done, non-conformance reports were written up and the matter was then out of my hands. The QA supervisor kept a log on all non-conformance reports.

This follow-up audit did not satisfy my concerns, because the design engineers had not approved the altered locations of the supports. I talked with design engineer Bill Wellborn from Sargent & Lundy. He said that this would be handled at a later date and that he didn't think it was serious enough to be dealt with. To my knowledge, these altered supports have not been approved by any design engineers.

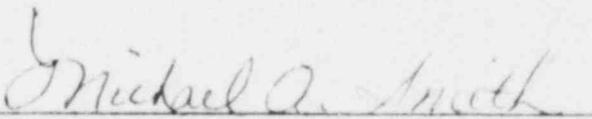
During my tenure at Hunter Corporation, I was kept at a distance from NRC inspectors on site. Every time they were on site I was given a specific task in the piping laydown area in the north end of the site which was many acres away from where my normal duties were. I believe this was done to make sure I did not talk to NRC personnel about the findings of my audits. It was made clear to me by Somsag that all dealings with Commonwealth Edison were to go through him. I believe this was so that he could control what Edison was told about the findings of my audits.

In doing other audits, I saw a need for revisions to the site policy manuals and made other suggestions for corrective action. My recommendations were generally ignored by Somsag, who told me that it would take too much time and research to

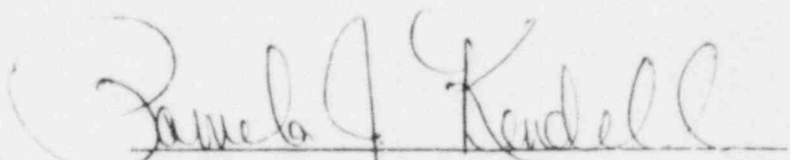
get the QA program in shape. We were so short of staff that I believe an effective QA program was not possible.

I feel that there were more placement problems than my co-auditor and I could possibly handle. The QA staff was so small because of the budget.

I have read the above affidavit consisting of 7 pages and it is true and correct to the best of my knowledge and belief.


MICHAEL A. SMITH

Subscribed and sworn to before me this 21st day of September, 1982.


NOTARY PUBLIC

My Commission Expires:

My Commission Expires Sept. 24, 1983

DWA

AFFIDAVIT

DANIEL W. GALLAGHER

My name is Daniel Gallagher. I have been a member of the Operating Engineers Local 150 since 1974 and have worked as a concrete mix operator since 1975. I am also active in local politics. I was Chairman of the Democratic Party of DeKalb County of Illinois from 1978 to 1980. I was alderman of the 2nd Ward in Genoa, from 1977 to 1981. Recently, I was defeated by a small margin in the Genoa mayoral race.

I was employed as a batch plant operator for the Blount Brothers Corporation (Blount) from August, 1975 to November, 1977 and from February, 1978 to June, 1979 at the Byron Nuclear Power Plant being built by Commonwealth Edison Company (CE). All statements below refer to events which occurred during my employment with Blount at the Byron plant site.

I was fired by Blount in June of 1979, when I refused to mix incompetent and unusable batches of concrete and approve their quality for safety-related use. The incident arose when the main computer-measured mixing apparatus was receiving a calibration inspection. While this mixer was shut down for inspection, my supervisor directed me to utilize the back-up mix system, which was a dry batch system. I had assisted in the construction of the back-up mixer and had operated it in 1977. The system only worked when mixer trucks were utilized in the process. At the time I was asked to employ the back-up system to fabricate the concrete, agitators, also known as transfer

Exhibit C

John A

trucks, were the only equipment available to mix the concrete. There were no mixer trucks available.

From my earlier experience with the dry batch system, I knew that dry batches of concrete would not mix properly in the agitators. We had tried to utilize agitators for two weeks in 1977 to fabricate concrete for non-safety related purposes. At that time laborers in the placement center where the concrete was formed for use in the plant told me that lumps of ice and solids were not mixing into the batch, rendering the batches virtually useless. Ice was used to keep the mixture at the proper temperature. The agitators simply were not able to integrate the ice. This failure properly to integrate the materials in the mixture resulted in the formation of the ice balls. To alleviate this problem, in 1977, Blount had temporarily rented mixer trucks which were adequately able to integrate the materials in the concrete mixture to use instead of the agitators.

The concrete which I had been mixing in the dry batch system in 1977 had not been used for safety-related purposes, and, therefore, I was not required to sign my name to verify the quality of the batches. In June of 1979 when I was asked to employ the back-up mixer to fabricate concrete for the cooling towers, I had to check a box marked "CHECK, IF SAFETY-RELATED CONCRETE" and sign my name. (See Blount Brothers Corp. form attached, and marked "Attachment A".)

I told my supervisors that I could not sign the audit form, since I knew from my past experience with the mixer that the concrete produced in the back-up unit would not meet the quality

NRK

standards in the safety specifications. My supervisors continued to insist that I mix the dry batches in spite of my explanation concerning the inadequacy of the concrete mixing process. I complained to union representatives about the situation. The union, however, was not able to help me, because I had refused to operate a machine. As a result, Blount supervisors terminated my employment. I later learned that my replacement attempted to mix the concrete in the back-up mixer, only to find that ice balls formed in the mixture, making the concrete unusable for safety purposes.

Blount was under a great deal of pressure from CE supervisory personnel to produce concrete to keep up with the high-paced construction schedule. I knew that CE plant superintendent Sorenson often reprimanded my Blount supervisors for failure to meet CE's desired production levels. CE construction supervisors would visit my Blount supervisors on a weekly basis to complain that the necessary concrete quotas were not being met. I believe Blount was under tremendous pressure from CE to increase the pace of its concrete production. Thus, when the computer-measured mix system was shut down for its calibration check, I think Blount supervisors felt compelled by CE's demand for concrete to try to operate the back-up system.

In my four years as batch plant operator at Byron, I observed other instances in which safety specifications were circumvented. In November of 1975, when I was trained as a batch plant operator, both my supervisor and the experienced batch plant operator who were conducting the training told me that the

WVA

aggregate being used in the fabrication of the concrete did not meet the specifications required for concrete utilized in safety-related areas. The concrete was being used in the construction of the containment and turbine buildings. The experienced batch plant operator complained to CE engineers about the poor condition of the aggregate being used. CE did nothing to remedy the problem.

Blount workers and CE personnel were not the only persons who recognized the non-complying condition of aggregate. Sometime in 1976, an Israeli engineer on tour of the Byron construction project questioned me about the pile of aggregate near the batch plant. When I informed him that it was being used to make the concrete used in the containment building, he expressed surprise, and explained that the stone was not clean enough to be used to mix concrete for safety-related purposes.

Finally, in 1978, NRC safety investigators and/or independent testing company inspectors condemned the aggregate pile, prohibiting the use of the stone until it was cleaned to specifications. Large quantities of the aggregate had already been used in the fabrication of safety-related concrete. Neither CE officials nor NRC staff investigators ever took any action that I knew of in regards to the concrete which had already been made with the condemned aggregate. For over two years, aggregate which had not met specifications was used to mix the concrete for the Unit One containment and turbine building. In my estimate, over 100,000 yards of concrete mixed with the non-complying

nWA

aggregate was fabricated, and used, with a great deal of the concrete being used in the lower level of the containment structure including the portions built below the ground.

In August, 1982, I was informed by a representative of BPI that NRC I & E reports indicate that a pile of aggregate at Commonwealth Edison's Byron nuclear power plant was condemned in December, 1975, for failure to meet specifications. I was not aware of this particular condemnation. I remain certain that later piles of aggregate used in mixing concrete for use in the Byron containment building failed to meet specifications. The conversation described above with the Israeli engineer concerning the poor quality of the aggregate occurred, to the best of my recollection, in the latter part of 1976, about one year after I had become batch plant operator in November, 1975. The problem of which I was aware with the aggregate, and which is described above in this Affidavit, was not rectified until NRC investigators or independent testing company inspectors condemned the pile sometime in 1978. In the meantime, during 1976, 1977 and part of 1978, aggregate not meeting specifications continued to be used in the fabrication of concrete utilized in safety-related areas at Byron.

I believe CE failed to take corrective action, prior to the NRC condemnation of the aggregate pile, because the poor quality of the aggregate was not reflected in any paper work, even though CE knew the aggregate did not meet safety specifications.

In another example of a failure to meet safety specifications, which I witnessed while sitting in my office, Blount Quality Control personnel blatantly lied to NRC investigators. On one

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occasion I heard a Blount QC employee tell the NRC that weekly and monthly maintenance checks were being performed. In fact, such inspections were only conducted when machinery happened to break down.

Also, in general, it was apparent to me that the Blount QC staff did not want the batch plant operators and the other workers talking to the NRC investigators. When NRC engineers spoke with Blount QC staff persons in my presence, I knew from the cold glares directed at me that I was not supposed to talk about safety topics being discussed, despite the fact that they often concerned matters about which I was quite familiar. I often sat quietly as the Blount QC people stretched the truth on a variety of quality control practices. I think that Blount supervisors, anxious to meet CE's daily demand quotas, did not feel that strict adherence to quality control procedures was necessary, and thought that strict adherence would interfere with the speed at which the concrete was produced.

Another practice in which I was often involved provided a good illustration of Blount supervisors' lack of regard for safety specifications. Every 10-yard batch of concrete was supposed to be approved by a CE engineer or an independent testing company inspector. CE did not have enough engineers assigned to the project to watch every batch produced. Many times, when a batch was ready to be sent to the placement center, and when the CE engineer was not around, my supervisor would have me add water to the mixed concrete. I was told to add water to

NWA

the mixture, because the extra liquid made the concrete easier to work with. This practice was in violation of safety specifications. Also, my supervisor knew that by the time the batch with the added water reached the placement center, the form of the concrete mixture would appear to meet specifications, as the mixture would harden somewhat from the time it left the batch plant until its receipt at the placement center. Concrete workers at the placement center told me that after batches reached them, they were often directed to add even more water, in further violation of specifications.

The amounts of each material (including water) to be integrated into the concrete mixture utilized for safety purposes was specified in regulations. The addition of water by tampering with these amounts was a clear violation of the regulations. Also, from my experience with concrete mixing, I knew that when too much water was added to concrete the mixture loses its strength. My Blount supervisors knew that the process was in violation of regulations, but since it made the concrete easier to handle, the regulations were ignored.

I was told by a fellow worker, Glenn Garrison, about another significant violation of safety specifications relating to the production of concrete. Garrison, the cement tender (also referred in construction slang as the "pig operator"), informed me that oil was leaking into the concrete mixture from the large blower which he operated. The batches of cement being mixed with the oil were en route to the containment buildings. I shared Garrison's belief that the presence of oil in the mixture presented a safety hazard.

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Oil considerably weakens the strength of a concrete mixture, by preventing the concrete from reaching its normal levels of density and hardness. Garrison told me that he had reported the oil leakage to his supervisor, but to my knowledge no action was taken to remedy the matter. Garrison quit his job at Blount shortly after I was fired.

All of the violations of safety specifications which I observed and in which I was asked to participate were overlooked or not discovered by CE inspectors. I believe that the CE supervisors were mainly worried about meeting safety specifications on paper. I further believe, from my experience at the Byron facility, that actual compliance with specified procedures for producing concrete for safety-related use was not nearly as important to CE as pushing Blount supervisors into increasing the speed of concrete fabrication to meet the daily quotas for the construction project.

I have read the above eight (8) page affidavit, and to the best of my knowledge, it is true, accurate, and complete.

Daniel W. Gallagher
Daniel W. Gallagher

SUBSCRIBED AND SWORN TO before me
this _____ day of _____, 1982.

[Signature]
Notary Public

BLOUNT BROTHERS CORPORATION

New York Chicago



Boston Houston

31377

ATTACHMENT A

Montgomery, Ala.

BYRON STATION - UNITS 1 & 2
OWNER
Commonwealth Edison Company
Chicago, Illinois

DELIVER TO:

DATE OF PLACEMENT:

PRESS FIRMLY YOU ARE MAKING 5 COPIES

MONTH DAY YEAR	CONSECUTIVE BATCH NO.	DESIGN MIX CODE NO.	% MOISTURE	CU. YDS. THIS LOAD	CUBIC YARDS ORDERED	CUBIC YARDS DELIVERED INCLUDED THIS LOAD	TRUCK NO.

BATCH DATA

CHECK, IF SAFETY RELATED CONCRETE

X

BATCH PLANT OPERATOR'S SIGNATURE

IF REJECTED GIVE REASONS AND DISPOSITION OF LOAD

TIME EMPTIED _____

A.M.
P.M.

RECEIVED BY:

X

AUTHORIZED SIGNATURE B.B. CORP. FOREMAN

MATERIAL SYMBOLS

ST1 - 57 STONE
ST2 - 67 STONE
ST3 - 467 STONE
S4 - SAND

C1 - CEMENT, TYPE II

F1 - FLY ASH

A1 - AIR ENTR
W1 - WATER KE D

W2 - WATER

IC - ICE

WATER ADDED _____ GALS.

SLUMP _____ IN.

AIR CONTENT _____ %

TEMPERATURE _____ °F.

X

AUTHORIZED SIGNATURE, TESTING AGENT

RETURN TO PLANT



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

JUN 24 1982

Docket No. 50-454
Docket No. 50-455

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

This refers to the special safety inspection conducted by Mr. D. H. Danielson and other staff members of this office on March 29-31, April 1-2, 5-9, 12-14, and May 11, 1982, of activities at Byron Station, Units 1 & 2, authorized by NRC Construction Permits No. CPPR-130 and No. CPPR-131. This also refers to the discussion of our findings with Mr. W. Stiede and others of your staff during a meeting in our offices on May 7, 1982.

The purpose of this special team inspection was to assess the adequacy of certain aspects of the quality assurance/construction activities at the Byron Station. The scope of this assessment included audits of quality assurance program interfaces and overview, corrective action systems, design change control, material traceability of installed structures and components, electrical cable installation, inprocess inspections, and effectiveness of quality control inspectors. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel. In general, within the areas inspected, the quality assurance program for the Byron Station appeared good. However, examples of program implementation deficiencies were identified which require corrective action on your part. Please note that we expect Commonwealth Edison Company to review programs for its other facilities under construction to assure that similar problems do not exist at these facilities.

The activities that appeared to be in noncompliance with NRC requirements are specified in the enclosed Appendix. A written response is required. In responding to noncompliance Item #2, please describe the action taken or planned to assure that: (1) other quality control inspectors are properly

Exhibit D

JUN 24 1982

trained and certified, (2) quality control inspectors working for contractors that have completed safety-related work and no longer have personnel on site were properly trained and qualified to perform the inspection functions assigned, and (3) inspections performed by quality control inspectors that were improperly trained and qualified were valid.

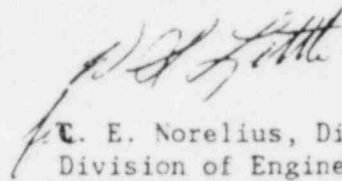
We are also concerned about your past performance concerning the staffing of the Byron QA Superintendent position and the on-the-job training of your Byron Site Quality Assurance personnel as discussed in the details of this report. Please provide us with a response explaining what action you will be taking to assure that your Quality Assurance Organization is staffed and trained to a level that will ensure effective oversight of quality activities.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter, the enclosures, and your response to this letter will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractors) believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within ten (10) days from the date of this letter of your intention to file a request for withholding; and (b) submit within twenty-five (25) days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than seven (7) days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons which are the bases for the claim that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, a copy of this letter, the enclosures, and your response to this letter will be placed in the Public Document Room.

JUN 24 1982

We will gladly discuss any questions you have concerning this inspection.

Sincerely,



U. E. Norelius, Director
Division of Engineering
and Technical Programs

Enclosures:

1. Appendix, Notice of Violation
2. Inspection Report No. 50-454/82-05 and No. 50-455/82-04

cc w/encls:

Louis O. DelGeorge, Director
of Nuclear Licensing
V. I. Schlosser, Project Manager
Gunner Sorensen, Site Project
Superintendent
R. E. Querio, Station
Superintendent
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII Byron
Resident Inspector, RIII
Braidwood
Karen Borgstadt, Office of
Assistant Attorney General
Myron M. Cherry

Appendix

NOTICE OF VIOLATION

Commonwealth Edison Company

Docket No. 50-454

Docket No. 50-455

As a result of the inspection conducted on March 29-31, April 1-2, 5-9, 12-4, and May 11, 1982, and in accordance with the NRC Enforcement Policy, 47 FR 9987 (March 9, 1982), the following violations were identified:

1. 10 CFR 50, Appendix B, Criterion I, states in part, "The authority and duties of persons and organizations performing activities affecting the safety-related functions of structures, systems, and components shall be clearly established and delineated in writing" and "Such persons and organizations performing quality assurance functions shall report to a management level such that this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided."

The licensee's Topical Report, CE-1-A, Revision 20, Section 1.A states "Edison has prime responsibility for controlling the quality of on-site work by field contractors,"... "The Commonwealth Edison Company Quality Assurance Program for Nuclear Generating Stations covers the organization arrangement whereby the Quality Assurance Department is a separate and independent organization."

Contrary to the above:

- a. On March 30, 1982, it was identified that the Quality Assurance Manager for Hatfield Electric Company, as shown in the Quality Assurance Manual, reports to the Vice-President, who is located on site and has direct responsibility for cost and schedule.
- b. On April 2, 1982, it was identified that the Quality Assurance Manager for Powers-Azco-Pope, as shown in the Quality Assurance Manual, reports to the Project Manager, who has direct responsibility for cost and schedule.
- c. On April 8, 1982, it was identified that the Project Construction Department of the licensee is part of the approval chain regarding the hiring and promoting of contractor's quality assurance personnel.
- d. On March 30, 1982, it was identified that the Hatfield Electric Company has been operating with a Quality Assurance Organization other than that described in their Quality Assurance Manual.

- e. On April 4, 1982, it was identified that Johnson Controls, Inc. has been operating with a Quality Assurance Organization other than that described in their Quality Assurance Manual.

○ This is a Severity Level IV violation (Supplement II).

2. 10 CFR 50, Appendix B, Criterion II - Quality Assurance Program states in part, "The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained."

Commonwealth Edison Company (CECo) letter, L. O. DelGeorge to D. G. Eisenhut, U.S. NRC, Director, Division of Licensing, dated August 17, 1981, affirmed CECo commitment to Regulatory Guide 1.58, ANSI N45.2.6-1978 as required by Generic Letter 81-01.

ANSI N45.2.6-1978 - Paragraph 1.1 states in part, "This Standard delineates the requirements for the qualification of personnel who perform inspection, examination and testing to verify conformance to specified requirements of nuclear power plant items (structures, systems and components of nuclear power plants) where satisfactory performance is required to prevent postulated accidents which could cause undue risk to the health and safety of the public, or to mitigate the consequences of such accidents if they were to occur."

ANSI N45.2.6-1978 - Paragraph 1.2 states in part, "The requirements of this Standard apply to personnel who perform inspections, examinations, and tests during fabrication prior to and during receipt of items at the construction site, during construction, during peroperational and startup test...." The requirements apply to personnel of the owners..., plant designers and plant constructors...."

ANSI N45.2.6-1978 - Paragraph 2.2 states, "The capabilities of a candidate for certification shall be initially determined by a suitable evaluation of the candidate's education, experience, training, test results, or capability demonstration."

ANSI N45.2.6-1978 - Section 3.1 states, "The requirements contained within this section define the minimum capabilities that qualify personnel to perform inspections, examinations, and tests which are within the scope of this standard."

ANSI N45.2.6-1978 - Sections 3.2, 3.3, and 3.4 specify the personnel capabilities of Level I, II, and III inspectors respectively. Sections 3.5, 3.5.1, 3.5.2, 3.5.3 provide education and experience recommendations for Level I, II, and III inspectors.

ANSI N43.2.6-1978 - Section 4 states in part, "Personnel who are assigned the responsibility and authority to perform functions covered by this Standard shall have, as a minimum, the level of capability shown in Table 1...."

Contrary to the above, certain contractor QA/QC supervisors and inspectors were not adequately qualified and/or trained to perform safety-related inspection functions. Examples of apparent noncompliance are identified in paragraph h.(2) of the attached report.

This is a Severity Level IV violation (Supplement II).

10 CFR 50, Appendix B, Criterion V states in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances ..."

The licensee's Topical Report, CE-1-A, Revision 20, Section 5 states, "The quality assurance actions carried out for design, construction, testing, and operation activities will be described in documented instructions, procedures, drawings, specifications, or checklists." "Activities affecting quality are required by the Edison quality program to be prescribed by documented instructions, procedures or drawings."

Contrary to the above; the following activities were not controlled by procedures or instructions:

- a. On March 30, 1982, it was identified that Hatfield Electric Company was utilizing a Discrepancy Report System, which was not referenced or controlled by a procedure, to track and correct discrepancies and nonconforming conditions discovered during inspections of safety-related equipment.
- b. On April 2, 1982, it was identified that Powers-Azco-Pope was utilizing a Fabrication Installation Surveillance System, which was not controlled by a procedure, to track and correct discrepancies and nonconforming conditions discovered during inspections of safety-related equipment.

- c. On April 9, 1982, it was identified that Hatfield Electric Company procedures did not contain an electrical cable rework procedure nor the requirements to calculate electrical cable sidewall pressures prior to pulling cable.
- d. On April 7, 1982, it was identified that the Hatfield Electric Company's NCR form contained a section titled "Action to Prevent Recurrence" but there was no direction in the body of Procedure Number 6 for actions to be taken to satisfy this requirement nor does the procedure assign responsibility for this section of the NCR.

This is a Severity Level IV violation (Supplement II).

4. 10 CFR 50, Appendix B, Criterion XV, states in part, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation."

The licensee's Topical Report, CE-1-A, Revision 20, dated February 17, 1982, Section 15, states in part, "Items involving construction, maintenance, and modifications which are found nonconforming...will be controlled to prevent their inadvertent use or installation."

Contrary to the above:

- a. On March 31, 1982, it was identified that three (3) CECO nonconformance reports (F-634, F-645, and F-682) had been voided rather than closed, with reference to corrective action taken to resolve the nonconformance. By voiding the subject NCRs, the tracking system to verify that the approved disposition has been completed and corrective action to prevent recurrence is negated. Also, the voided NCRs are removed from the trend analysis system.
- b. On April 7, 1982, it was identified that three (3) nonconformance reports (98, 99, and 100) had been voided by the Hatfield Electric Company rather than closed, with reference to corrective action taken to resolve the nonconformance. The subject NCRs were voided because an ICR was or would be issued to accept the items as installed. At the time the NCRs were voided, there was no assurance that all the FCRs would be approved. By voiding the NCRs, the tracking system to verify that the proposed disposition was accepted, was negated and the NCRs were removed from the trend analysis system.

- c. On April 7, 1982, it was identified that the Hatfield Electric Company had improperly closed NCR 168, in that after CECO engineering dispositioned the subject NCR to replace the item, the Hatfield Electric Company closed the NCR without accomplishing the approved disposition. At the present time, there is a nonconforming cable installed, and the tracking system to replace the cable, has been negated.

This is a Severity Level IV violation (Supplement II).

10 CFR 50, Appendix B, Criterion V states, "Activities affecting quality shall be prescribed...and shall be accomplished in accordance with these instructions, procedures or drawings."

The licensee's Topical Report, CE-1-A, Revision 20, Section 2.2 commits to comply with the Regulatory Position of Regulatory Guide 1.38, Revision 2, which endorses ANSI N45.2.2-1972. Also Section 5 states, "The quality assurance actions carried out for design, construction, testing, and operation activities will be described in documented instructions, procedures, drawings, specifications, or checklists."... "Activities affecting quality are required by the Edison quality program to be prescribed by documented instructions, procedures or drawings."

Contrary to the above; the following activities were not accomplished according to procedures or instructions:

- a. On April 2, 1982, it was identified that Powers-Azco-Pope was storing rejected material among accepted material in Warehouse No. 4. This is contrary to their Procedure No. FP-3.
- b. On April 2, 1982, it was identified that Powers-Azco-Pope had not tagged a defective torque wrench with a Reject Tag. This is contrary to their Procedure No. FP-11.
- c. On March 30, 1982, it was identified that Hatfield Electric Company did not tag torque wrenches which were past their calibration due date. This is contrary to their Procedure No. 24.
- d. On April 5, 1982, of 13 reports reviewed it was identified that 12 nonconformance reports prepared by Powers-Azco-Pope did not address corrective action to prevent recurrence. This is contrary to their Quality Assurance Manual, Section B-8, paragraph B-8.8.2.
- e. On April 7, 1982, it was identified that the conditions maintained by the licensee in Warehouse No. 1 and No. 5 were contrary to CECO Quality Procedure 13-1 and to the requirements of ANSI N45.2.2-1972.

This is a Severity Level V violation (Supplement II).

6. 10 CFR 50, Appendix B, Criterion VI, states, "Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality."

The licensee's Topical Report, CE-1-A, Revision 20, Section 6 states, "A document control system will be used to assure that documents such as specifications, procedures, and drawings are reviewed for adequacy and approved for release by authorized personnel."... "Each receiving office or area shall have a controlled method for checking receipt of new or revised documents and assuring that the latest revised document is in use."

Contrary to the above:

- a. On April 4, 1982, of 12 drawings reviewed it was identified that one drawing located in the Johnson Controls Incorporated on-site office drawing file was not of the proper revision.
- b. On April 7, 1982, of 10 drawings reviewed it was identified that two drawings located in the Hunter Corporation document station 1-H were not of the proper revision.

This is a Severity Level V violation (Supplement II).

7. 10 CFR 50, Appendix B, Criterion IX, states in part, "Measures shall be established to assure that special processes, including welding..., are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes,...."

The licensee's Topical Report, CE-1-A, Revision 20, dated February 17, 1982, page 9-1, Revision 15, dated January 2, 1981, Section 9, "Control of Special Processes," third paragraph, states in part, that, "Process control procedures will be used as required by specifications, codes or standards, as applicable...."

The ASME B&PV Code Section III, 1974 Edition, Summer 1974 Addenda, Article NA-4000, Subarticle NA-4411, states in part, that "The program shall include measures to control the issuance and disposition of documents, such as..., instructions, procedures,...., including changes thereto, which prescribe the activities affecting quality. These measures shall assure that documents including changes..., and distributed to and used at the location where the prescribed activity is performed."

Contrary to the above, on April 13, 1982, it was identified that welding was not being accomplished in accordance with applicable codes, in that, controlled welding procedure specifications with the associated welding parameter sheets were not located at the prescribed activity (welding) in 3 out of 4 locations checked.

This is a Severity Level V violation (Supplement II).

8. 10 CFR 50, Appendix B, Criterion XVII states, "Sufficient records shall be maintained to furnish evidence of activities affecting quality. Consistent with applicable regulatory requirements, the applicant shall establish requirements concerning record retention, such as duration, location, and assigned responsibility."

The licensee's Topical Report, CE-1-A, Revision 20, Section 2.2, commits to the Regulatory Position of Regulatory Guide 1.88, Revision 2, which endorses ANSI N45.2.9-1974.

Contrary to the above, on April 7, 1982, it was identified that Midway Industrial Contractors did not provide the security standards established by ANSI N45.2.9-1974, to preclude the entry of unauthorized personnel into the storage area and to guard against larceny and vandalism.

This is a Severity Level V violation (Supplement II).

9. 10 CFR 50, Appendix B, Criterion XVIII states, "A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program."

The licensee's Topical Report CE-1-A, Revision 20, Section 2.2 commits to comply with the Regulatory Position of Regulatory Guide 1.144, Revision 1, which endorses ANSI N45.1.12-1977.

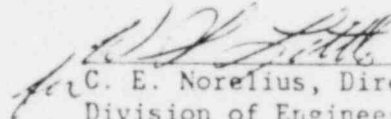
Contrary to the above, on March 29, 1982, it was identified that the audit reports of Commonwealth Edison Company, Powers-Azco-Pope, Pittsburgh Testing Laboratory, Johnson Controls, Incorporated, Hunter Corporation, and Hatfield Electric Company failed to include the criteria, established in ANSI N45.2.12-1977, regarding persons contacted in the audit and a summary of audit results including an evaluation statement regarding the effectiveness of the quality assurance program elements which were audited.

This is a Severity Level V violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, you are required to submit to this office within thirty days of the date of this Notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

Date

June 24, 1987


C. E. Norelius, Director
Division of Engineering and
Technical Programs

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-454/82-05(DETP); 50-455/82-04(DETP)

Docket Nos. 50-454; 50-455

License Nos. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, IL 60690

Facility Name: Byron Station, Unit 1 and 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: March 29-31, April 1-2, 5-9, 12-14, and May 11, 1982.

Inspectors: <i>D. H. Danielson</i> D. H. Danielson	<u>6/16/82</u>
<i>W. M. Peschel</i> W. M. Peschel	<u>6/16/82</u>
<i>R. S. Love</i> R. S. Love	<u>6/21/82</u>
<i>H. M. Wescott</i> H. M. Wescott	<u>6/16/82</u>
<i>E. H. Nightingale</i> E. H. Nightingale	<u>6/21/82</u>
<i>W. Forney</i> W. Forney (SRI Byron)	<u>6/16/82</u>
<i>P. Keshishian</i> P. Keshishian (IE Headquarters)	<u>6/16/82</u>
Approved By: <i>D. H. Danielson</i> D. H. Danielson, Chief Materials and Processes Section	<u>6/16/82</u>

Inspection Summary

Inspection on March 29-31, April 1-2, 5-9, 12-14, and May 11, 1982 (Reports No. 50-454/82-05(DETP); 50-455/82-04(DETP))

Areas Inspected: QA Program interfaces and overview; corrective action systems; design change control; material traceability of installed structures and components; electrical cable installation; inprocess inspections; QC inspector effectiveness. The inspection involved a total of 662 inspector-hours onsite by seven NRC inspectors.

Results: Of the areas inspected nine apparent violations were identified: failure to assure contractors are operating with a QA organization as described in their QA manual and to assure that QA is sufficiently independent from cost and schedule - paragraphs b.(6).(b), b.(8).(b), and b.(10).(b); failure of site contractors to control the issuance of documents - b.(10).(b); failure of site contractors to follow their procedures - paragraphs b.(10).(b), and c.(2),(d).2; failure of site contractors to accomplish activities in accordance with procedures - paragraphs b.(10).(b), c.(2).(e).1, and f.(2).(a); failure to include certain ANSI N45.2.12 criteria in CECo audit reports of contractors - paragraph b.(10).(b); failure of a site contractor to meet certain security standards established by ANSI N45.2.9 for storage of records - paragraph b.(10).(b); failure to meet ANSI N45.2.6 qualification, certification and training requirements for contractor QC inspectors - paragraph h.(2); failure to specify complete and adequate corrective actions on nonconformance reports - paragraph c.(2).(a).4; failure to accomplish welding in accordance with applicable codes - paragraph g.(2).(d).

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*W. Stiede, Assistant Vice President
*L. DelGeorge, Director of Nuclear Licensing
*V. I. Schlosser, Project Manager
*W. J. Shewski, Quality Assurance Manager
*G. Sorensen, Project Superintendent
*R. Tuetken, Assistant Project Superintendent
*M. A. Stanish, QA Superintendent, Byron
R. J. Farr, QA Supervisor
K. J. Hansing, QA Supervisor
T. E. Sommerfield, QA Superintendent, Braidwood
J. J. Mihovilovich, Structural Supervisor, PCD
R. B. Klingler, QA Supervisor, PCD
G. F. Marcus, Director of QA, Engineering/Construction
J. O. Binder, Electrical Supervisor, PCD
M. E. Lohmann, Mechanical Supervisor, PCD
C. J. Tomashak, Startup Coordinator
H. J. Kaczmarek, QA Engineer
A. A. Jaras, Project Operations Analysis Supervisor
*T. Tramm, Nuclear License Administrator
P. Donavin, Project Engineering Department
R. E. Querio, Startup Superintendent
*J. T. Westermeier, Project Engineer
R. Gruber, QA Engineer
J. Klink, QA Inspector
P. Nodzenski, QA Engineer
J. Toney, Engineering Assistant
P. Macruba, QA Engineer
K. Key, Senior Buyer
L. Channell, Material Coordinator
R. Schwartz, QA Engineer

Sargent and Lundy Engineers (S&L)

R. Sabin, Senior QA Coordinator
D. Demoss, Engineer, PMD
*T. B. Thorsell, Senior Electrical Project Engineer
V. Crisci, Project Leader
J. Kelnosky, Electrical Project Leader

Westinghouse (W)

D. K. Fraser, Manager, SAMU
S. Stahl, QA Engineer, NTD
Y. Kau, Associate Engineer, PIDG

Hatfield Electric Company (HECo)

G. Vanderhei, Project Manager
J. Buchanan, QA Manager
A. Koca, QC Supervisor
R. Barzeloski, QA Supervisor
D. Stoner, QC Foreman
L. Breege, QC Inspector
J. Mulrene, QC Inspector

Powers-Alco-Pope (PAP)

R. Larkin, QA Manager
M. Donahoe, Engineering Manager
C. Gremer, QC Supervisor
A. Linta, QC Inspector

Elcom Brothers Corporation (BBC)

R. H. Bay, QA/QC Manager
W. Wills, QC Inspector

Ebasco Services, Inc.

R. Detommaso, NDE Supervisor

Johnson Controls, Inc.

B. Shah, QA Manager
S. Pearson, QC Inspector

Pittsburgh Testing Laboratory (PTL)

J. Troutman, Site Manager
J. Chasm, Calibration Technician
G. Mohammad, Site Auditor

Midway Industries Contractor, Inc.

M. Windsor, Site Manager

Nuclear Installation Services Company (NISCo)

J. Pruitt, QA/QC Manager

Nuclear Power Services (NPS)

W. Whitaker, Project QA Engineer

Reliable Sheet Metal Works, Inc.

A. M. Schlegel, QA Supervisor

Hunter Corporation

M. Somsag, QA Supervisor
L. Haddick, QC Inspector
D. Cerasani, Piping Engineer
L. Hill, Auxiliary Building Superintendent
W. Evertt, Containment Building Superintendent
D. Askland, Warehouseman
J. Morrison, Project Engineer
J. Young, Hanger Engineer
A. Simon, Administrative Supervisor, QA
R. Irish, Administrative Assistant, QA
H. Lundquist, Material Control Supervisor

U. S. Nuclear Regulatory Commission (Region III)

*C. E. Norelius, Director, Division of Engineering & Technical Programs
W. S. Little, Chief, Engineering Inspection Branch
L. McGregor, Senior Resident Inspector, Braidwood
L. Cox, Secretary

*Denotes those personnel attending the exit meeting held at the USNRC Region III office on May 7, 1982. During the inspection at the Byron Station exit meetings were held on a daily basis in order to keep the licensee informed of any findings.

The inspectors also contacted and interviewed other licensee and contractor personnel during this inspection.

Function of Program Areas Inspected

a. General Background

The purpose of this special team inspection was to determine if there are indications of existing or potential construction problems similar to some of those identified at a number of other plants under construction. The scope of the assessments included quality assurance program interfaces and overviews, corrective action systems, design change control, material traceability of installed structures and components, electrical cable installation, inprocess inspections, and effectiveness of quality control inspectors.

Prepared By: J. M. Peschel

P. Keshishian

b. QA Program Interfaces and Overview

(1) Quality Assurance Manuals Reviewed

Pittsburgh Testing Laboratory Quality Assurance Manual
#QA-M-1, Revision 4, September 21, 1979

Powers-Azco-Pope Quality Assurance Manual, Revision 3,
December 7, 1981

Commonwealth Edison Topical Report, Revision 20,
February 17, 1982

Johnson Controls, Inc., SECD Quality Assurance Program,
Revision 0, June 29, 1978

Hatfield Electric Company Quality Assurance Manual,
Revision 9, August 13, 1979

Ebasco Nuclear Quality Assurance Program Manual, Revision 10,
September 30, 1981

Hunter Corporation Quality Assurance Manual, Revision 5,
August 1, 1981

Nuclear Power Services, Inc., Quality Assurance Manual,
Revision 1, January 13, 1981

Reliable Sheet Metal works, Inc., Quality Assurance Manual,
July 21, 1981

(2) Procedures Reviewed

(a) Commonwealth Edison Company

Byres Quality Instruction (BQI)

BQI-1, Revision 2, March 22, 1982
Generating On-Site Quality Instructions
BQI-7.1, Revision 2, March 22, 1982
On-Site Contractor Non-Conformance Reports
BQI-7.2, Revision 5, March 22, 1982
QA Handling of CECO Non-Conformances
BQI-9, Revision 4, March 22, 1982
QA Handling of Field Change Requests
BQI-10, Revision 4, February 25, 1982
Site QA Handling and Review of On-Site
Contractor Procedures

- BQI-11.1, Revision 4, March 22, 1982
Byron Site QA Audits
- BQI-12.1, Revision 1, March 22, 1982
Installed Equipment Surveillance Instructions
- BQI-24, Revision 1, March 22, 1982
Byron QA Training Program

Byron Site Instruction (BSI)

- BSI-5, Revision 5, October 20, 1980
 - ⊙ Material and Equipment Receiving, Receiving Inspection Storage, and Removal from Storage Instruction

Quality Procedure (QP)

- QP, 2-1, Procedure for the Revision of the Quality Assurance Manual - Engineering, Construction and Operation, Revision 63, February 24, 1982
- QP, 2-2, Training of Personnel to meet Quality Assurance Requirements, Revision 63, February 24, 1982
- QP, 3-3, Classification of System, Components, Parts and Materials, Revision 63, February 24, 1982
- QP, 4-2, Evaluation of Contractor's Quality Assurance Program, Revision 63, February 24, 1982
- QP, 5-1, Quality Instruction and Procedures, Revision 63, February 24, 1982
- QP, 7-1, Control of Procured Material and Equipment, Receiving and Inspection, Revision 63, February 24, 1982
- QP, 12-1, Calibration Control of Commonwealth Edison Test and Measurement Equipment, Revision 63, February 24, 1982
- QP, 15-1, Reporting Quality Nonconformance during Construction and Test, Revision 63, February 24, 1982
- QP, 15-2, Reporting Incidents and Deficiencies that occur during Construction and Test, Revision 63, February 24, 1982
- QP, 16-1, Corrective action for Reportable Deficiencies and Quality Nonconformances that occur during Construction and Tests, Revision 63, February 24, 1982
- QP, 17-1, Quality Assurance Records, Revision 63, February 24, 1982
- QP, 4-1, Request for Bid, Proposed Evaluation, and Recommendation, Revision 63, February 24, 1982
- QP, 18-1, Quality Program Audits, Revision 63, February 24, 1982
- QP, 18-2, Surveillance of Contractor Quality Assurance Control Activities, Revision 63, February 24, 1982

General Procedure

General Procedure No. 738, Site Buying, February 2, 1981

(b) Hatfield Electric Company Procedures

- Procedure #6, Revision 6, January 15, 1982
Reporting of Damaged or Nonconforming
Material or Equipment
- Procedure #8, Revision 2, Issue 1, July 6, 1981
Audits
- Procedure #9E, Revision 6, Issue 1, January 23, 1981
Class I Cable Pan Identification
- Procedure #11, Revision 12, February 2, 1982
Class I Cable Termination and Splicing
- Procedure #17, Revision 2, October 10, 1981
Qualification of Inspection and Audit
Personnel
- Procedure #19, Revision 4, Issue 1, January 24, 1981
Equipment Turnover Reporting
- Procedure #20, Revision 8, November 20, 1981
Class I Exposed Conduit System
Identification
- Procedure #23, Revision 8, Issue 1, January 22, 1981
Concrete Expansion Anchor Installation
- Procedure #24, Revision 1, Issue 2, January 28, 1980
Control and Calibration of Meters and
Instruments
- Procedure #29, Revision 5, November 20, 1981
Field Initiated Request for Design
Changes

(c) Hunter Corporation Site Implementation Procedures

- 4.201 Revision 4, January 19, 1982
Installation Verification
- 7.502 Revision 7, August 20, 1981
Control of Measuring and Testing Equipment
- 11.101 Revision 4, April 28, 1981
Nonconformance Processing
- 12.301 Revision 5, March 19, 1981
Internal and External Site Quality Assurance
Audits
- 20.513 Revision 9, June 8, 1981
Installation of Concrete Expansion Anchors

(d) Powers-Azco-Pope Procedures

- QC-4 Revision 7, September 30, 1981
Nonconformance Control
- QC-5 Revision 5, December 17, 1981
Site Audit

FP-3 Revision 9, December 22, 1981
Material Receiving Inspection Controls
FP-4 Revision 5, September 30, 1981
Material Storage
FP-11 Revision 7, January 21, 1982
Calibration and Control of Measuring and Test
Equipment (M&TE)

(e) Pittsburgh Testing Laboratory Procedure

Resident Internal Quality Assurance Audit Plan,
Revision 4, November 17, 1981

(f) Johnson Controls Inc., Procedures

QAS-210-EY Revision 2, January 28, 1980
Auditor Training and Qualification
QAS-211-EY Revision 2, February 5, 1980
Training and Indoctrination Procedure
QAS-710-EY Revision 1, September 19, 1979
On-Site Document Control Procedure
QAS-1011-BY Revision 3, January 10, 1980
Weld Rod Control
QAS-1310-BY Revision 1, October 30, 1979
Calibration Control of Measuring and Test
Equipment
QAS-1510-BY Revision 0, April 17, 1979
Status Tag Usage Procedure
QAS-1610-BY Revision 0, February 13, 1979
Nonconformance Control Procedure
QAS-1710-BY Revision 0, September 18, 1979
Corrective Action
QAS-1910-BY Revision 1, November 8, 1979
Audit Procedure
SP-611-BY Revision 1, April 3, 1981
Field Change Control Procedure

(g) Audits and Miscellaneous Documentation Reviewed

(a) Commonwealth Edison Company

Audit Reports

#6-82-4
#6-82-08
#6-81-300
#6-81-308
#6-81-309
#6-81-330
#6-81-331
#6-81-336
#6-81-340

#6-81-344
#6-81-354
#6-81-357
#6-81-360

General Office Audit of Byron Construction Site,
April 30, 1981.
General Office Audit of Byron Construction Site,
November 8, 1981.
General Office Quality Assurance Audit of Byron
Station, April 30, 1981.
General Office Quality Assurance Audit of Byron
Station, November 8, 1981.
Management Audit at LaSalle, Byron, and Braidwood
Construction Sites and the LaSalle Operating Station,
April, 1981, by Energy Incorporated.

Miscellaneous Documentation

Site Mechanical Organization Chart, March 16, 1982.
Site Electrical Organization Chart, March 16, 1982.
Site Structural Organization Chart, March 16, 1982.
Site Project Construction Organization Chart, March 16,
1982.
1981 Byron Site QA Audit Schedule, Revision 0 and
Revision 9.
1981 Byron Site QA Surveillance Schedule.
Byron Quality Assurance Organization Chart, March 22,
1982.
Byron Quality Assurance Status Reports, January 5, 1982
and February 4, 1982.
Byron Site Quality Assurance Semi-Monthly Report for
December 1981.
1982 Byron Site Quality Assurance QP Training Schedule.

(b) Hatfield Electric Company

Audit Reports

#81-02
#81-18
#81-19
#81-20
#82-04

Audit Report of Byron Site Procedure 5, 6 and 22 by
Energy Incorporated, September 21, 1981.

Follow-up Management Audit Report by Energy Incorporated,
September 21, 1981.

Trend Analysis Reports

#2, July 24, 1981, 2nd Quarter of 1981
#3, November 6, 1981, 3rd Quarter of 1981
#4, 4th Quarter of 1981
#1, March 25, 1982, 1st Quarter of 1982

Miscellaneous Documentation

Discrepancy Reports, "Trouble Letters" No.'s 640 - 670,
680 - 720.
1981 Audit Schedule
1982 Audit Schedule
Quality Assurance Audit Log
Memorandum from C. Van Lyssel to W. Brock concerning
Quality Assurance Organization, March 17, 1982.

(c) Hunter Corporation

Audit Report

No. 084-4

Miscellaneous Documentation

Audit Summary
Fourth Quarter Audit Report
Follow-up Audit #1
Hunter Audit Summary Report for Fourth Quarter, 1981.
Hunter Corporation, Byron Site Quality Assurance Audit,
June 3, 1981.
Hunter Corporation Quarterly Nonconformance Report (NR)
Summary and Trend Analysis, December 29, 1981.

(d) Powers-Azco-Pope

Audit Reports

#52 September 29, 1981
#53 October 1, 1981
#54 November 12, 1981
#55 November 12, 1981
#56 November 16, 1981
#57 November 15, 1981
#58 November 25, 1981
#59 December 3, 1981
#60 December 29, 1981
#61 January 27, 1982
Management Review Audit, Byron, March 17, 1982

Miscellaneous Documentation

Weekly Storage Surveillance Report, March 10, 1982
Weekly Storage Surveillance Report, March 17, 1982
Weekly Storage Surveillance Report, March 24, 1982
Weekly Storage Surveillance Report, March 30, 1982

(e) Pittsburgh Testing Laboratory

Audit Reports

#81-21
#81-22
#81-23
#81-24
#81-25
#81-26
#81-27
#81-28
#81-29
Internal QA Audit #BY-3
Internal QA Audit #BY-4

Miscellaneous Documentation

Pittsburgh Testing Laboratory Organization Chart
Pittsburgh Testing Laboratory Inspectors Eye Examination
Records

(f) Johnson Controls, Incorporated

Audit Reports

Yearly QA Program Audit No. 00501, May 16, 1980
Yearly QA Program Audit No. 10801, August 5, 1981
Audit Report, Bensenville Office, September 15, 1981

Nonconformance Reports

#001BY November 14, 1980
#002BY November 14, 1980
#003BY December 4, 1980
#004BY August 19, 1981
#005BY February 23, 1982
#006BY March 25, 1982
#007BY April 2, 1982

(4) Interviews with Site Personnel

Interviews were conducted with sixteen personnel from Commonwealth Edison Company, six personnel from Hunter Corporation, three personnel from Powers-Azco-Pope, three personnel from

Hatfield Electric Company, two personnel from Pittsburgh Testing Laboratory and one person from Johnson Controls, Incorporated.

(5) Licensee's Quality Assurance Program

(a) Objective

The objectives of this assessment were to determine:

- . that the licensee's Quality Assurance Program, including all amendments, has been approved by NRR.
- . if the licensee has control of changes to the submitted Quality Assurance Program.
- . if the Quality Assurance Manual is consistent with the approved Quality Assurance Program.

(b) Discussion

The inspectors reviewed:

1. the licensee's Topical Report, CE-1-A, Revision 20, and determined that the original program and all subsequent revisions have been approved by NRR. The licensee submits all changes to NRR and includes minor or typographical changes at the same time as substantive changes are submitted.
2. the licensee's Quality Requirements and Quality Procedures and determined that the licensee initiated and controlled changes to the program through QP-2-1. The procedure requires the same level of review for a QA Program change as the original program received. The program has provisions to input a change due to feedback of experience, regulatory requirements, codes and standards, audits, and reviews.
3. the licensee's Quality Assurance Manual and referenced documents to determine whether adequate QA plans and procedures have been established (written, reviewed, approved, and issued) to implement the docketed QA program. The review indicated that the 18 Criteria of 10 CFR 50, Appendix B were addressed by the Quality Procedures of the Quality Assurance Manual.

The inspectors reviewed 6 of the 25 Quality Assurance Manuals assigned to Byron Station to determine they were of the latest revisions. The following manuals were reviewed and no problems were detected.

<u>Manual No.</u>	<u>Assigned To</u>
111	Project Construction Superintendent
208	Byron Station Superintendent
177	CECo OAD Supervisor
191	Byron Station Maintenance Supervisor
62	Byron Station Technical Staff Supervisor
115	Byron Station Quality Assurance Superintendent

(6) Quality Assurance Program of Contractors

(a) Objectives

The objectives of this assessment were to determine if the licensee has approved and routinely audits the Quality Assurance Programs of contractors for consistency with 10 CFR 50, Appendix B, and to determine the current status and effectiveness of licensee management of the on-site Quality Assurance Programs.

(b) Discussion

The inspectors reviewed documentation, conducted extensive interviews with licensee and site contractor personnel, and reviewed portions of the licensee's and contractor's QA manuals to determine levels of staffing, organizational independence from cost and schedule, position descriptions, and to determine if the status and adequacy of the QA Programs were regularly reviewed by the licensee and contractor's management.

At the time of inspection the licensee had 13 contractors on site and each was performing safety related work under their own specific Quality Assurance Programs (QAPs). These QAPs had been submitted to the licensee for review and approval. The licensee had reviewed and approved the QAPs prior to the contractors start of work. The licensee was fully aware of its ultimate responsibility for site Quality Assurance and had its own QA organization on site to monitor the activities of the various site contractors through the mechanisms of surveillances and audits.

Table 1 is a matrix of licensee and on-site contractors performing safety-related work indicating the areas checked and compliance with these areas.

Nontcompliance (454/82-05-01a; 455/82-04-01a)
 10 CFR 50, Appendix B, Criterion I, requires that "Such persons and organizations performing quality assurance functions shall report to a management level such that

this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided."

Contrary to this requirement, the inspectors found that the QA Managers of both Hatfield Electric Company and Powers-Azco-Pope (PAP) reported directly to on-site managers who had direct responsibilities for cost and schedule for their respective contracts. The Hatfield QA Manager reported to the Vice-President and the PAP QA Manager reported to the Project Manager.

Unresolved Item (454/82-05-02; 455/82-04-02)

In addition to the foregoing, it appeared that the QA Representative for Johnson Controls had production responsibilities that also conflicted with organizational independence. A review of the activities of Pittsburgh Testing Laboratories (PTL) indicates that there is no PTL on-site QA organization other than a site auditor and that for a substantial period of time each week PTL activities are not under surveillance. This condition occurs because there are two shifts for PTL inspectors and only one auditor.

The questions regarding Johnson Controls and PTL could not be resolved during the current inspection and are an unresolved item.

(7) Licensee Management Assessment of the Quality Assurance Program

(a) Objective

The objective of this assessment was to determine if a periodic assessment of the licensee's Quality Assurance Program is conducted by Commonwealth Edison Company upper level management.

(b) Discussion

The inspectors reviewed audits of the Byron Construction site conducted by a General Office Audit Team. These semi-annual audits are supplemented by a biennial audit conducted by an independent auditing organization. The audits cover the entire scope of the Quality Assurance Program and are reviewed by upper level management.

The licensee's Quality Assurance organization is headed by a site QA Superintendent. He is assisted by two Supervisor's who direct the activities of thirteen QA Engineers and Inspectors in monitoring and auditing the activities of the site contractors. In addition four Pittsburgh Testing Laboratory personnel are assigned to the organization for specific documentation related assignments.

Each engineer and inspector is assigned a specific list of responsibilities so that all contractor activities and other QA monitoring systems are fully covered. This type of organization should be able to effectively monitor site QA activities. However, the execution of the program is not satisfactory, as evidenced by the many problems uncovered by the inspectors. One factor affecting the execution is the stability of service for the QA personnel.

A key individual in a QA Program is the on-site superintendent. He has the direct responsibility for the QA performance of the contractors and other plant related activities. It is he who anticipates problem areas, sees to the training of his staff, directs the activities of his staff and is instrumental in producing a quality product. Since January 1976 there have been five QA Superintendents at the Byron Site:

J. Pizzies	January 1976 to May 1976
D. Jeritz	May 1976 to August 1977
R. Gousden	August 1977 to May 1978
T. McIntere	May 1978 to January 1981
M. Stanish	January 1981 to Present

In addition to this undesirable condition, the QA Engineers and Inspectors have an average on-site service time of approximately fourteen months and have limited prior QA experience. Part of this on-site time was spent in training and qualifying for various QA duties.

In addition to this problem, manpower is currently being sent to other sites so that the QA effort is substantially weakened. Out of a staff of sixteen, three men have been, and currently are at other assignments:

R. J. Schwartz	La Salle Station	12/7/81 to 2/19/82; 3/19/81 to Present
J. S. Hale	La Salle Station	1/8/81 to 2/26/82; 3/19/82 to Present
P. J. Nodgenski	Quad-Cities Station Byron Pre-op Testing	9/14/81 to 9/25/81; 4/5/82 to Present

The constant change over of personnel resulting in a minimum experience level and transfer of personnel could hinder the QA organization in meeting its obligation of effectively implementing a QA program.

In contrast to the experience level of the QA organization the inspectors made a review of the stability of the supervisory and engineering personnel in the construction organization. The key individuals and service time at the Byron Station are:

<u>Title</u>	<u>Name</u>	<u>On Site Since</u>
Project Superintendent	G. Sorensen	1976
Assistant Project Superintendent	R. Tuetken	1977
Lead Civil Engineer	J. Minovilovich	1975
Lead Mechanical Engineer	M. Lohmann	*1981
Lead Electrical Engineer	J. Binder	1978

*Six years prior experience as a Mechanical Engineer at La Salle County Station.

The pronounced difference in site time and experience level indicates there is the potential for a problem with QA personnel continually being transferred. In an effort to determine the cause of this potential problem a meeting was held with the Corporate Manager of Quality Assurance, W. J. Shewski, on April 16, 1982. His explanation was the the transfer of the QA Superintendents was for promotional opportunities in four cases and a death in the case of one superintendent. His explanation for the large turnover and inexperience level of the QA Engineers and Inspectors was that he desired to seed the licensee departments with QA experienced personnel and also not deny them promotional opportunities.

This constant change over of QA personnel as contrasted to the stable and experienced work force of the construction group indicates the need to create greater promotional opportunities in the QA organization, or the need to have some sort of system instituted to require QA personnel to acquire minimum service time at nuclear sites.

The inspectors reviewed the training that was given to CECO QA personnel after they had completed corporate quality assurance training. The Byron QA training is an on-the-job type training and is intended to supplement the corporate training and enhance the development of new QA personnel.

A review of BQI-24, Revision 1, Byron QA Training Program, revealed that although the stated purpose of the instruction was to provide the necessary training to appropriate personnel as quickly as possible, there was no specified length of time in which the training was to be completed. A lack of prompt training was a finding annotated by the General Office Audit of November 1981. A review of on-the-job training records revealed that prompt training was still not being accomplished and that the corrective action to prevent

recurrence, stated in the audit response, was not being effectively implemented. The on-the-job training system had no provision to alert supervisory personnel when a new employee's training was lagging.

BQI-24 also states, "It is the new employees responsibility to obtain and maintain the required training." It is our belief that the training of new employees is a management responsibility and cannot be delegated to the new employee.

Attachment A to BQI-24 lists fourteen areas of training, and specific individuals are designated as authorized trainers in each area. There are no lesson plans or other types of written guidance for the required training. The lack of a formalized training program is not conducive to the maintenance of a skilled, trained, and competent Quality Assurance Department. With some of the more experienced personnel assigned to duties at other locations the training of the QA department suffers.

Open Item (454/82-05-03; 455/82-04-03)

The inability of the licensee to dedicate resources to the Quality Assurance organization to see that their experience base is equivalent to other organizations, leads the inspectors to question the licensee's effectiveness in staffing the Quality Assurance Program Organization. In addition, there is no evidence of a Management Policy Statement emphasizing the dedication of the Company to Quality Assurance and quality in general. The licensee's position is that the Company policy is stated in the Quality Requirements of the Quality Assurance Manual. It is our belief that these are an explanation of the Quality Assurance Manual and not a statement of policy.

(8) Licensee Quality Assurance Organization

(a) Objective

The objective of this assessment was to determine if the Quality Assurance Program provides sufficient independence from cost and schedule.

(b) Discussion

The inspectors reviewed the organization charts in the licensee's Topical Report and they indicate adequate independence for the CECO Quality Assurance Organization. Further inspection resulted in concern regarding the activities of the Project Construction Department that

appear to be contrary to 10 CFR 50, Appendix B, Criterion I, regarding the independence of the Quality Assurance effort from production.

The licensee's site Project Construction Department is organized with a Manager, Technical Staff, Project Engineers and Field Engineers. The inspectors interviewed four supervisors and the assistant superintendent of the construction group and found each of them to be knowledgeable and experienced engineers fully capable of meeting their respective responsibilities. They all fully recognized the importance of quality assurance and control and were determined to build a quality plant.

The responsibilities of this group include:

- . Advisor to Engineering for design suitability for constructability.
- . Coordinate requests for field revisions.
- . Receipt and storage of materials.
- . Assist Project Engineering in development of overall schedule.
- . Verify conformance and completeness of contractor's installation to specification requirements.
- . Supervise and approve mechanical and structural construction tests.
- . Coordinate and provide assistance for electrical construction tests.
- . Coordinate preoperation tests.

The Project Construction QC Supervisor and Project Construction Electrical Supervisor have engaged in Quality Assurance activities independent of the Byron Superintendent of Quality Assurance and the offsite Manager of Quality Assurance. The licensee could not produce a position description for the areas of responsibilities and the duties of the Project Construction QC Supervisor. An example of specific QA activities engaged in by these supervisors is:

Letter of November 13, 1981 from the Electrical and QC Supervisors to the on-site Vice President of Hatfield Electric Company suggesting duties and responsibilities of the QA/QC Manager and a suggested organization chart.

The activities of the two supervisors in QA activities appears to be contrary to 10 CFR 50, Appendix B, Criterion I, that requires independence of QA supervisors from cost and schedule. In addition, it seriously undermines the effectiveness of the incumbent QA Superintendent

to monitor the activities of the site QA organizations. The activities of these two supervisors resulted in a reorganization of the Hatfield Electric Company QA/QC Department that was not described in the QA Manual. We believe that CECO QA should, at a minimum, be involved in a review and concurrence capacity when such suggestions are made to contractors.

In addition to the foregoing, a further problem with QA independence from cost and schedule arises in that the site Project Superintendent has final contractual approval for some contractor QA organizations concerning salary increases, promotions, and hires for QA non-manual personnel increases. The requests for such action from Hatfield Electric Company and Powers-Azco-Pope do not have a concurrence from the contractors Quality Assurance Department and come from the project construction management.

The following list indicate salary changes or promotions of QA inspectors for site contractors that were approved by the site Project Superintendent.

<u>Date</u>	<u>Contractor</u>	<u>Position</u>
2/24/82	Powers-Azco-Pope	QA Specialist
12/8/81	Hunter Corporation	QA Inspector
11/23/81	Hunter Corporation	QA Inspector
11/3/81	Hunter Corporation	QA Inspector
11/5/81	Hunter Corporation	QA Inspector

The inspectors recognize that the Project Superintendents' responsibility for contract administration requires his final approval for contractors staff size and changes in compensation, however, a question of satisfying the requirements of 10 CFR 50, Appendix B, Criteria I relative to QA independence arises. Mechanisms are currently now in effect for such independence in that the Pittsburgh Testing Laboratory contract is administered by the Corporate Quality Assurance Manager who is independent of cost and schedule.

Noncompliance (454/82-05-01b; 455/82-04-01b)

The lack of independence between the Quality Assurance Department and the Project Construction Department is in violation of 10 CFR 50, Appendix B, which states in part, "Such persons and organizations performing quality assurance functions shall report to a management level such that this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided.

Open Item (454/82-05-04; 455/82-04-04)

The involvement of the Project Construction Department in Quality Assurance Activities indicates the need for an Interface Document or Interface Procedure to explain the interaction of the licensee's Quality Assurance Organization with the Contractor's Quality Assurance Organizations, and the relation of the Project Construction Department to all on-site Quality Assurance Organizations.

(9) Quality Assurance Responsibility

(a) Objective

The objective of this assessment was to determine if the licensee has the prime responsibility for establishing and executing the Quality Assurance Program.

(b) Discussion

The inspectors reviewed the Topical Report and the Quality Assurance Manual and interviewed the licensee's Corporate and Site Quality Assurance Managers and the Quality Assurance Manager of selected contractors. The documentation review and the interviews showed that the responsibility of the licensee was established, documented and understood by responsible personnel in both the licensee's and contractor's organizations.

The inspectors were concerned about the lack of a policy statement from upper management that went beyond the explanation provided in Quality Requirement 1.0 and provided assurance that upper management of CECo supported the Quality Assurance Program and its objectives.

(10) Licensee Oversight of Contractor Activities

(a) Objective

The objectives of this assessment were to determine if the licensee has effective oversight of contractor activities and has detailed knowledge of those activities.

(b) Discussion

The inspectors conducted interviews with Quality Assurance personnel from the licensee, Hatfield Electric Company, Hunter Corporation, Powers-Azco-Pope, Johnson Controls, Inc., and Pittsburgh Testing Laboratory. These interviews were supplemented by the review of related quality assurance procedures, audits and documentations; tour of work

areas, warehouses and field offices; and discussions with licensee and contractor personnel. As a result of the above the inspectors determined that the licensee has a program that should provide an effective oversight of contractor activities. The ability of the licensee to provide this oversight is questionable due to the manpower limitation discussed in the "Licensee Assessment of the Quality Assurance Program" section of this report and the findings noted below.

Contractor QA Manuals

A review of the operating organization of two contractors, Hatfield Electric Company and Johnson Controls, Inc., revealed that the present organizations were not described in the latest Quality Assurance Manual revisions.

Johnson Controls, Inc., changed the title of the Senior QA Representative associated with Byron from the Quality Assurance Representative to the Quality Assurance Manager and did not update their Quality Assurance Manual. Johnson Controls operated for approximately five months with this discrepancy, and Commonwealth Edison Company Quality Assurance was not aware of the discrepancy.

Hatfield Electric Company was operating with a Quality Control Supervisor and a Quality Assurance Supervisor, both of whom report to the Quality Assurance Manager and who are not reflected in the Quality Assurance Manual. The reason for this disparity is a letter from the licensee's Project Construction Department to the Hatfield Electric Company Vice-President suggesting an organization change.

Noncompliance (454/82-05-01c; 455/82-04-01c)
10 CFR 50, Appendix B, Criterion I states, "The authority and duties of persons and organizations performing activities affecting the safety-related functions of structures, systems, and components shall be clearly established and delineated in writing."

The failure of Hatfield Electric Company to have its Quality Assurance Manual reflect the actual Quality Assurance Organization is contrary to the above and is an item of noncompliance.

The failure of Johnson Controls, Inc., to have its Quality Assurance Manual reflect the actual Quality Assurance Organization is contrary to the above and is an item of noncompliance.

The licensee has indicated that the above conditions have been corrected. These items will be examined during future inspections.

Safekeeping of Quality Records

A tour was made of the combined vault used by Johnson Controls, Westinghouse-SAMU, Midway Industrial Contractors, Ebasco Services, Inc., and Reliable Sheet Metal. The safes of Westinghouse SAMU and Midway Industrial Contractors were found unlocked and with no attendant at the door of the vault. The Westinghouse safe contained computer tapes which were described to be non-safety-related and the Midway safe contained quality records.

Noncompliance (454/82-05-05; 455/82-04-05)

10 CFR 50, Appendix B, Criterion XVII states, "Sufficient records shall be maintained to furnish evidence of activities affecting quality." ANSI N45.2.9-1974 states, "A full time security system shall be established to preclude the entry of unauthorized personnel into the storage area. This system shall guard against larceny and vandalism."

The failure of Midway Industrial Contractors to lock a safe containing quality records is contrary to the above and is an item of noncompliance.

The licensee has indicated that this situation and the condition of the Westinghouse-SAMU safe have been corrected. This item will be examined during a future inspection.

During tours of the combined vault, the Powers-Azco-Pope vault, the Hatfield Electric Company vault and the licensee's vault, the inspectors noted that entrance holes for conduit and other such piping had not been sealed and possible air paths from the exterior existed.

Unresolved Item (454/82-05-06; 455/82-04-06)

ANSI N45.2.9-1974 states that permanent and temporary records storage facilities shall be constructed to protect the contents from possible destruction by fire.

The inspectors are concerned that with the possible air paths around conduits and pipes that the Halon System may not be able to extinguish a fire.

The licensee has indicated that action has been taken to correct this condition. This item will be examined during a future inspection.

Surveillances

The inspectors reviewed the licensee's Quality Assurance Department 1981 surveillance schedule and noted that approximately seven percent of the scheduled surveillances were not conducted and there was no documented reason for their omission. The licensee did conduct approximately 800 more surveillances than were scheduled with an increase being made in some areas due to problems discovered or to follow up on audit findings. We recognize that such increased attention is necessary, but are concerned about the omission of surveillances without substantiating documentation, as surveillances are one of the intergal methods by which the Quality Assurance Organization provides an oversight of contractor activities.

Open Item (454/82-05-7; 455/82-04-7)

The inspectors are concerned about the omission of scheduled surveillances without substantiating documentation.

The licensee indicated that this item will be corrected. This item will be examined during a future inspection.

Drawing Control

The inspectors reviewed selected drawings in the on-site office of Johnson Controls, Inc., and at Hunter Corporation's Document Station 1-H, at the 426 level in the containment.

Twelve drawings were chosed at Johnson Controls, and of those chosen one was not the latest revision as indicated on the Sargent and Lundy master drawing list located in the CECO Quality Assurance office. Drawing M3393, Page 4 of 12, was Revision B and should have been Revision C, which was issued February 12, 1982. The M3393 drawing series is not marked to indicate how many drawings are in the series but are annotated as 1 of "blank".

Ten drawings were reviewed at Hunter Corporation's Document Station 1-H, at the 426 level in the containment, and of these two drawings, CS-58 and RH-15, were not the proper revisions according to the Hunter Engineering Department master list. Hunter Corporation personnel explained that the drawings in question were for work on the Unit 2 containment, which had been stopped, and all related drawings were supposed to have been recalled to document control. Hunter instituted an immediate recall of these drawings.

Noncompliance (454/82-05-08; 455/82-04-08)

10 CFR 50, Appendix B, Criterion VI states, "Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality." The failure of Johnson Controls, Inc., and Hunter Corporation to control the issuance of drawings is contrary to the above and an item of noncompliance.

The licensee indicated that the condition has been corrected. This item will be examined during a future inspection.

Process Traceability

The inspectors accompanied two CECO Quality Engineers, one electrical and one welding, on inspections in the containment, auxiliary building and the turbine building to determine if they could trace the installation and inspection process on welds, conduit hanger installation, and cable pan installation. No problems were identified.

Quality Assurance Procedures

Inspection identified that two on-site contractors performing safety related work were using forms which were not controlled by procedures.

Hatfield Electric Company is utilizing a Discrepancy Letter, also known as a Trouble Letter, for documenting incomplete construction, non-conforming construction, requirements for Field Change Requests and other discrepant items found during quality control inspections.

These Trouble Letters have been in use for approximately the last 18 months and about 800 have been generated in this time frame. The Trouble Letters are used as an intermediate document during inspections prior to corrective work or preparation of FCRs and NCRs and do not become part of the quality records. Trouble Letters numbers 640 thru 670 and 680 thru 720 were examined and it was found that in the inspectors opinion Trouble Letters 658, 662, 664, 669, 679, 696, 697, 700 and 721 should have been documented as non-conformance reports. As an example, in Trouble Letter 679, a Hatfield Electric Company QC Inspector reports a conduit strap backing plate that is not welded to a hanger. The failure to have a procedure for this Trouble Letter is contrary to Appendix B.

A similar condition exists with the instrumentation piping installer, Powers-Azco-Pope. When making Quality

Control inspections a Fabrication Installation Surveillance form, for which there is no prescribed procedure is used for purposes identical to the Hatfield Trouble Letter.

The inspectors examined FIS numbers 180 through 216 and in their opinion a number of the FIS's should have resulted in NCRs. As an example, FIS 186 reported items that were installed but did not have the required heat numbers.

We are not against the use of trouble letters or speed letters to expedite some contractor functions, however, when these documents are used to document inspection discrepancies they must be procedurally controlled.

Noncompliance (454/82-05-09a; 455/82-04-09a)
10 CFR 50, Appendix B, Criterion V states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

The failure of Hatfield Electric Company to utilize a procedure to control their Discrepancy Records is contrary to the above and is an item of noncompliance.

The failure of Powers-Azco-Pope to control their Fabrication Installation Surveillances is contrary to the above and is an item of noncompliance.

The licensee has indicated that these conditions have been corrected. These items will be examined during a future inspection.

Audits

The inspectors reviewed audits that were conducted by the corporate and site quality assurance organizations of Commonwealth Edison Company, Hatfield Electric Company, Hunter Corporation, Powers-Azco-Pope, Johnson Controls, Incorporated, and Pittsburgh Testing Laboratory. The audits were conducted according to an audit schedule and the scope and content of the audits was acceptable. The audit reports consistently failed to include a list of persons contacted during the conduct of the audit and a summary of audit results, including an evaluation statement regarding the effectiveness of the quality assurance program elements which were audited, as required by ANSI N45.2.12.

Noncompliance (454/82-05-10; 455/82-04-10)

10 CFR 50, Appendix B, Criterion XVIII states that a comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program.

ANSI N45.2.12-1977 states that audit reports shall provide a list of persons contacted during audit activities and shall have a summary including an evaluation statement regarding the effectiveness of the quality assurance program elements which were audited.

Contrary to the above, the audit reports of the licensee, Hatfield Electric Company, Hunter Corporation, Powers-Azco-Pope, Johnson Controls, Inc., and Pittsburgh Testing Laboratory consistently failed to include persons contacted during the audit and an evaluation statement regarding effectiveness of the program elements as indicated in the examples listed below:

<u>Auditor</u>	<u>Audit #</u>	<u>List of Persons Contacted</u>	<u>Evaluation Statement</u>
CECo	6-81-330	Yes	No
CECo	6-81-308	Yes	No
CECo	6-81-336	No	No
CECo	6-81-357	Yes	Yes
CECo	6-81-309	Yes	No
CECo	6-81-344	Yes	No
CECo	6-81-340	Yes	No
CECo	6-81-300	No	No
CECo	6-82-08	No	No
Hatfield	81-02	No	No
Hatfield	81-18	No	No
Hatfield	81-19	No	No
Hunter	84-4	No	No
Hunter	None July 9, 1981	No	No
Johnson	00501	No	Yes
Johnson	10801	No	Yes
PAP	52	No	No
PAP	54	No	No
PAP	55	No	No
PTL	81-21	No	No
PTL	81-23	No	No
PTL	81-25	No	No

The licensee has indicated that action has been taken to correct this situation in future audits. This item will be examined during a future inspection.

Measuring and Test Equipment

The inspectors reviewed the procedure and methods for control of Measuring and Test Equipment used by Hunter Corporation, Hatfield Electric Company, Powers-Azco-Pope, Johnson Controls, Inc., and Pittsburgh Testing Laboratory and inspected various instruments in office and field locations.

The inspectors identified no problems with Hunter Corporation, Johnson Controls, Inc., and Pittsburgh Testing Laboratory (PTL).

During a review of torque wrenches in the Hatfield Electric Company Quality Assurance office and the Powers-Azco-Pope Quality Assurance office the following items were identified.

Hatfield Electric Company: The storage of torque wrenches was not according to Hatfield Procedure #24 as the wrenches that were past the calibration date were not red tagged and they were stored on the same shelf as wrenches currently in calibration. HE-151, HE-142, and HE-135 are some of the untagged, uncalibrated torque wrenches stored with calibrated wrenches.

Powers-Azco-Pope: One torque wrench, TW-4, was marked as defective, but did not have a Reject Tag as required by Section 5.15 of Powers-Azco Pope Procedure FP-11, Calibration and Control of Measuring and Test Equipment (MSTE).

Noncompliance (454/82-05-11a; 455/82-04-11a)
10 CFR 50, Appendix B, Criterion V states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

The failure of Hatfield Electric Company to follow its procedure #24, with regard to tagging torque wrenches, is contrary to the above and is an item of noncompliance.

The failure of Powers-Azco-Pope to follow its procedure No. FP-11, with regard to tagging torque wrenches, is contrary to the above and is an item of noncompliance.

The licensee has indicated that these conditions have been corrected. These items will be examined during a future inspection.

Purchasing, Receiving and Storage

The inspectors reviewed the process used to obtain safety related material starting with a material request generated by a contractor and culminating with storage in a warehouse. The inspectors noted no discrepancies in the requesting, purchasing and receiving portions of the project, but during tours of warehouse areas the following items were noted:

- . In Warehouse No. 1, safety-related equipment was stored on shelves that also contained lumber, boxes of paper, scraps of rubbish and food in a housekeeping atmosphere that did not meet the requirements of Section 6.2 of ANSI N45.2.2.
- . In Warehouse No. 5, a pallet of bags containing charcoal type compound was stored above safety related valves. One of the bags had broken and the material had spilled onto the valves, shelving and floor, and the housekeeping was not in accordance with Section 6.2 of ANSI N45.2.2.

Noncompliance (454/82-05-11b; 455/82-04-11b)

10 CFR 50, Appendix B, Criterion V states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

The conditions maintained by the licensee in Warehouses No. 1 and No. 5 were contrary to Quality Procedure 13-1 and to the requirements of ANSI N45.2.2-1972, and are an item of noncompliance.

The licensee has indicated that action has been taken to correct the warehouse conditions. This item will be examined during a future inspection.

- . In Warehouse No. 4, Powers-Azco-Pope is storing material that is tagged Rejected next to Accept and Hold material and is not segregated as required by Section 5.6 of Powers-Azco-Pope Procedure No. PP-3, Material Receiving Inspection Control.
- . Powers-Azco-Pope is attaching a red tag that says "Safety-Related" to material that has also been tagged with PAP's Accept Tag. The red tag is not referenced in any PAP or CECO procedure.

Noncompliance (454/82-05-11c; 454/82-04-11c)

10 CFR 50, Appendix B, Criterion V states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

The failure of Powers-Azco-Pope to store rejected material in accordance with their procedure No. FP-3 is an item of noncompliance.

The licensee has indicated that this condition has been corrected. This item will be examined during a future inspection.

(11) Quality Assurance Staffing

(a) Objective

The objective of this assessment was to determine if the Quality Assurance Organizations of the licensee and contractors are adequately staffed.

(b) Discussion

The inspectors interviewed personnel involved in the management of the licensee's and selected contractor's Quality Assurance Organizations; and approximately 14 percent of the Quality Control inspectors employed by the contractors. Based on the interviews and a review of scheduled and completed audits and surveillance the inspectors were able to conclude that the Quality Assurance Organizations were supplied with sufficient manpower. The auditors of the selected organizations were found to be adequately qualified. Qualifications of Quality Control inspectors are discussed in detail in the "QC Inspector Effectiveness" section of this report.

The inspectors do not believe that the Quality Control Supervisor for Powers-Azco-Pope was qualified to be a Level II Supervisor on the day she was appointed to the position, as she did not have the one year of Level I experience as required by ANSI N45.2.6-1978. This is discussed in greater detail in section h., QC Inspector Effectiveness.

The CECO Quality Assurance Organization at Byron is fully staffed with 16 personnel, but the effectiveness of Quality Assurance section is being weakened by the

deployment of Byron Quality Assurance personnel at La Salle and Quad-Cities. This is discussed in more detail in paragraph b.(7), Licensee Assessment of Quality Assurance Program. In addition to the above, one Quality Engineer was transferred to the Operations Quality Assurance section during our inspection and a replacement is not scheduled to arrive until June 1982.

The transfer of the Quality Assurance personnel to support other programs is an area of concern.

(12) Trend Analysis Program

(a) Objective

The objective of this assessment was to determine if the licensee has an effective trend analysis program.

(b) Discussion

The inspectors reviewed the trend analysis reports of the licensee and Hatfield Electric Company. Licensee trending of NCR's is discussed in detail in section c., Corrective Action Systems. The licensee publishes an annual Trend Analysis Report which is a summary of NCR's by problem area for each contractor during the previous year, and the Corrective Action System is scheduled to be audited semi-annually.

(13) Compliance History

(a) Objective

The objectives of this assessment were to review the licensee's compliance history and the effectiveness of the associated corrective action.

(b) Discussion

The inspectors reviewed the licensee's history of noncompliances, unresolved items, 10 CFR 50.55(e) Reports, NCR's, IE Bulletins, IE Circulars, and IE information Notices and reviewed the systems used to assign responsibility and to track the resolution of the problem. A review of all 10 CFR 50.55(e) reports and 30% of the noncompliances showed that the corrective action was appropriate, with the cause identified and action taken to prevent recurrence. NCR's and their resolution are discussed in detail in section c., Corrective Action Systems.

Except as noted, within the areas inspected, no items of non-compliance or deviations were identified.

Prepared By: R. S. Love

c. Corrective Action Systems

(1) Objective

The objective of this assessment was to determine if:

- (a) corrective action procedures are adequate.
- (b) responsibilities have been adequately defined and that the affected personnel have been trained and understand the procedures.
- (c) procedures are being effectively implemented. This includes the areas of tracking and closeout, trending of nonconformances, and upper management's involvement.

(2) Discussion

(a) Commonwealth Edison Company (CECo)

1. Procedure Review

A review of CECo Quality Procedures QP No. 15-1, Revision 5, dated January 20, 1981, and QP No. 16-1, Revision 5, dated December 29, 1980, indicates that they appear to be adequate as relating to Corrective Action.

Adverse trends and problem areas are brought to the attention of the Vice President (Nuclear Operations), Manager of Projects, Project Manager and Manager of Quality Assurance.

2. Review of NCR Log

The inspector reviewed CECo's Nonconformance Report (NCR) log for the years 1979, 1980, and 1981. It was observed that for the year 1981, 101 NCRs were prepared and Hold Tags were applied in 96 instances. In the 5 instances where Hold Tags were not applied, the item was controlled by a Subcontractors tag or the NCR was generic in nature.

3. Review of Open NCRs

The inspector reviewed eleven open NCRs that were prepared during 1980. The following is a status of these NCRs.

- a. F-491, dated April 7, 1980. There is an open 50.55(e) report on this item.

- b. F-488, dated March 27, 1980. This NCR was sent to Project Construction Department (PCD) on May 15, 1980, for implementation of the disposition.
- c. F-526, dated June 27, 1980. This NCR is still at Station Nuclear Engineering Department (SNED) undergoing evaluation.
- d. F-539 dated July 22, 1980. This NCR is still at SNED undergoing evaluation, but, from information received by the NRC inspector, the subject cables have been terminated and energized based on a "Work can Proceed" notation on the NCR.
- e. F-544, dated August 8, 1980. This NCR is still at SNED undergoing evaluation.
- f. F-546, dated August 11, 1980. There is an open 50.55(e) report on this item.
- g. F-563, dated October 22, 1980. This NCR was sent to PCD on August 27, 1981, for implementation of the disposition.
- h. F-565, dated November 5, 1980. This NCR is still at SNED undergoing evaluation.
- i. F-575, dated November 26, 1980. This NCR was sent to PCD on January 28, 1981, for implementation of the disposition.
- j. F-577, dated December 8, 1980. This NCR was sent to PCD on February 13, 1981, for implementation of the disposition.
- k. F-582, dated December 12, 1980. This NCR was sent to PCD on July 14, 1981, for implementation of the disposition.

Open Item (454/82-05-12; 455/82-04-12)

The NRC is concerned about NCRs that remain open for an extended period of time in that as the fuel-load date approaches, there may be a tendency to accept items without proper engineering evaluation, including back-up data, or to accept items that should be reworked or repaired. Pending review of the action taken to close the NCRs listed above, this is an open item.

4. Review of Voided NCRs

The inspector selected six voided NCRs for review. The subject procedures do not address voiding NCRs but this is an accepted practice in the industry, when the NCR is voided for just cause.

- a. NCR F-597 was missing from the QA Records Vault. The NCR log indicated that the NCR was prepared on January 27, 1981 to document that Pump Motor OCC01P terminations were leaking. The log indicates this NCR was voided on April 13, 1981.
- b. NCR F-600 was missing from the QA Records Vault. The NCR log indicated that the NCR was prepared on February 6, 1981 to document some damaged cables. The log indicates this NCR was voided on April 3, 1981.
- c. NCR F-634, dated March 23, 1981, was prepared to document a minimum bend radius violation on cable 1RH119 and to point out that the cause of the bend radius violation was that the weight of the cable pulled the loop out of cable tray. ECN 1992 was issued to add a device to prevent cable slippage. The NCR was voided on July 24, 1981, without an evaluation of the subject cable. The licensee had an inspection/evaluation performed on the cable on April 7, 1982. Cable was acceptable.
- d. NCR F-645, dated May 7, 1981, was prepared to document that Westinghouse furnished wattmeters installed on various panels supplied by Systems Control did not meet the 1% tolerance requirements. The NCR was voided on June 3, 1981. Systems Control letter to Commonwealth Edison Company, dated August 19, 1981, stated in part, "The wattmeters will be returned to Westinghouse for repair at their expense."
- e. NCR F-650, dated May 18, 1981, was prepared to document certain nonconforming hangers. This NCR was voided on June 3, 1981, because it was being tracked on Hatfield NCR #298.
- f. NCR F-682, dated October 28, 1981, was prepared to document that concrete had been placed next to a pipe, resulting in a weld on the pipe becoming inaccessible for inspection.

tion under ASME Section XI. ECN 2336, dated December 8, 1981, was issued to enlarge the opening around the pipe so the weld would be accessible for inspection. The NCR was voided on December 16, 1981, because the ECN resolved the problem.

Noncompliance (454/82-05-13a; 455/82-04-13a)

The items listed in paragraph c, d, and f, above are examples of improperly voided nonconformances. For item c, the issuance of the ECN 1992 was a good corrective action to prevent recurrence but did not resolve the bend radius violation. For item d, the return of the instruments to Westinghouse for repair was a good resolution to the problem, not reasoning for voiding. Again, the issuance of the ECN 2336 was satisfactory resolution to the problem identified in item f, not a reason to void the NCR. Improper voiding of the NCRs is an item of noncompliance with Criterion XV of 10 CFR 50, Appendix B.

5. Review of Closed NCRs

On April 1, 1982, the Region III inspector reviewed the following NCRs for proper closure and for corrective action to prevent recurrence:

F-562, dated October 14, 1980, closed January 6, 1982
F-627, dated March 24, 1981, closed January 6, 1982
F-635, dated March 24, 1981, closed June 22, 1981
F-656, dated June 12, 1981, closed July 21, 1981
F-673, dated August 17, 1981, closed January 19, 1982
F-687, dated January 8, 1982, closed February 16, 1982
F-683, dated October 2, 1981, closed February 11, 1982

6. Review of Trend Analysis

On April 1, 1982, the Region III inspector reviewed the trend analysis of NCRs prepared by CECO. This trend analysis is prepared by the Projects Engineering Department (off-site). Reports dated January 8, 1981, March 19, 1981, September 17, 1981, October 21, 1981, November 12, 1981, December 17, 1981, January 12, 1982, January 19, 1982, and February 17, 1982 were reviewed during this inspection. All of the aforementioned reports bore the notation, "No trends are evident" or "No trends could be identified."

CECO QA (on site) does perform a trend analysis on contractor's nonconformances. On the trend analysis reviewed, they agreed with the analysis being performed by the individual contactors.

7. Interviews with Personnel

Interviews with CECo personnel indicate that they appeared to be knowledgeable in their own procedures on Corrective Action as well as their contractor's procedures.

(b) Blount Brothers Corporation (Blount)

1. Procedure Review

Blount utilizes a Deviation Report (DR) System versus an NRC system. If a DR requires CECo Project Engineering approval, CECo transcribes the information from Blount's DR onto a CECo NCR which is then forwarded to Project Engineering for approval.

A review of Blount's procedure number 4, Inspection Nonconformances and Corrective Action, Revision 8, Issue 9, dated February 12, 1981, indicates that it appears to be adequate as relating to correction action.

2. Review of NCRs

The inspector selected several DRs from the DR log for a detailed review for proper closure and corrective action to prevent recurrence. Following is a status of these DRs:

- a. Q3-485, dated July 7, 1980. Closed October 14, 1980.
- b. Q3-508, dated November 22, 1980. Closed January 22, 1981.
- c. Q3-505, dated December 1, 1980. Closed February 23, 1981.
- d. Q3-494, dated August 25, 1980. Closed June 2, 1981.
- e. Q3-545, dated October 19, 1981. As of April 2, 1982, this DR was at CECo for final approval for closure.

On all DRs reviewed, for years 1980, 1981, and 1982, the action to resolve the nonconformance and the steps taken to prevent recurrence appeared to be adequate.

3. Review of Trend Analysis

Per Blount's procedure, trend analysis are documented annually but a running count of DRs is made in each deviation area which results in a continuous trend analysis. The trends noted by the inspector had been documented on Blount's trend analysis report. These reports appear to be given wide distribution and includes a copy to CECO.

4. Interviews with Personnel

Interviews with Blount personnel indicate that the QA Manager was relatively new on the project but appeared to have an adequate knowledge of the procedures. The inspector was impressed by the knowledge displayed by the QC Inspector as pertaining to the DRs reviewed and the corrective action system in general.

(c) Hunter Corporation (Hunter)

1. Procedure Reviews

A review of Hunters Site Implementation Procedures Number 11.101, Nonconformance Processing, Revision 4, dated April 28, 1981, indicates that it appears to be adequate as relating to corrective actions.

2. Review of NCRs

The inspector made a general review of approximately 30 NRs and a detailed review of 10 NRs for proper closure and for corrective action to prevent recurrence. Following is a status of the NCRs that were reviewed in detail:

- a. NR-099, dated May 5, 1980. Closed September 16, 1980.
- b. NR-132, dated July 22, 1980. This NR was properly voided on August 4, 1980.
- c. NR-119, dated July 15, 1980. Closed on December 15, 1980.
- d. NR-193, dated January 28, 1981. Closed on March 18, 1981.
- e. NR-263, dated September 17, 1981. Closed on October 14, 1981.
- f. NR-151, dated August 4, 1980. Closed on February 16, 1981.
- g. NR-159, dated July 3, 1980. This NR was properly voided on December 2, 1980.
- h. NR-204, dated March 17, 1981. Closed on April 15, 1981.

- i. NK-231, dated June 5, 1981. Closed on August 21, 1981.
- j. NR-262, dated September 11, 1981. Closed on November 24, 1981.

3. Review of Trend Analysis

The inspector reviewed the nonconformance (NR) log for the years 1980, 1981 and 1982. It was observed that with the way the NR log was prepared, a trend would be observed. The inspector selected two attributes (unqualified welders and hold points bypassed) and performed a trend analysis for the years 1980 and 1981. A review of Hunter's trend analysis for the same period of time indicated that the two analysis (Hunter's and the inspector's) were comparable for the two attributes selected. Through training, unqualified weld NRs dropped from 11 in 1980 to 2 in 1981 and bypassing of hold points dropped from 23 in 1980 to 11 in 1981. Hunter recognizes that they still have problems with hold points.

4. Interviews with Personnel

Interviews with Hunter personnel indicate that they appeared to have a good working knowledge of their system and procedures. Their system and applicable procedures appear to be adequate.

(d) Powers-Azco-Pope (PAP)

1. Procedure Review

A review of PAP Field Operating Procedure Number QC-4, Nonconformance Control, Revision 7, dated September 30, 1981 and PAP Quality Assurance Manual, Section B-8, Nonconforming Material and Parts, Revision 1, dated October 22, 1981, indicates that they appear to be adequate as relating to Corrective Action.

2. Review of NCRs

The inspector performed a general review of approximately 30 NCRs and a detailed review of 13 NCRs and 11 Corrective Actions Requests (CARs). The following is the status of the NCRs reviewed in detail:

- a. NCR 14, dated July 25, 1980. Closed August 1, 1980
- b. NCR 19, dated September 18, 1980. NCR was unacceptable, with the note - see NCR 20.
- c. NCR 20, dated September 30, 1980. Closed October 1, 1980.
- d. NCR 23, dated September 21, 1980. Closed June 24, 1981.
- f. NCR 44, dated April 3, 1981. Closed April 24, 1981.
- g. NCR 39, dated February 27, 1981. Closed March 4, 1982.
- h. NCR 55, dated June 1, 1981. Closed August 13, 1981.
- i. NCR 71, dated February 13, 1981. Closed November 16, 1981.
- j. NCR 73, dated July 15, 1981. Closed July 24, 1981.
- k. NCR 81, dated July 31, 1981. Closed November 9, 1981. Re-instruction was required as part of corrective action.
- l. NCR 90, dated September 10, 1981. Closed January 6, 1982.
- m. NCR 117, dated November 20, 1981. Closed December 28, 1981.

Noncompliance (454/82-05-11d; 455/82-04-11d)

Of the 13 Powers-Azco-Pope NCRs reviewed in detail, 12 of the NCRs did not contain any corrective action to prevent recurrence which is in violation of PAP's Quality Assurance Manual, Section B-8, Revision 1, dated October 7, 1981, Paragraph 13-8.8.2. The licensee was informed that this was an item of non-compliance with Criterion V of 10 CFR 50, Appendix B.

3. Review of CARs and Trend Analysis

Of the 11 CARs generated by PAP as a result of their trend analysis, the corrective action appeared to be adequate.

4. Interviews with Personnel

Interviews with PAP personnel indicate that they appeared knowledgeable in their system and procedures.

(e) Hatfield Electric Company (HECo)

1. Procedure Review

The inspector reviewed HECo Procedure #6, Reporting of Damaged or Nonconforming Material or Equipment,

Revision 6, dated January 15, 1982, and Section XVI, Corrective Action, Revision 5, of the QA Manual. During review the following observation was made.

Noncompliance (454/82-05-09b; 455/82-04-09b)

The only reference to corrective action to prevent recurrence in the above mentioned procedures is in Section XVI, Paragraph 2.4, of the QA Manual. This paragraph discusses corrective action for adverse audit findings. The NCR form in use at the Byron Station, as contained in procedure 6, has a section titled "Action to Prevent Recurrence" but there is no directions in the body of the procedure for this section.

Failure to assure that applicable regulatory requirements are correctly translated into procedures and instructions is an item of noncompliance with Criterion V of 10 CFR 50, Appendix B.

2. Review of NCRs

The inspector reviewed approximately 180 NCRs for proper closure and for corrective action to prevent recurrence. The NCR log in use when most of the NCRs were prepared did not provide a description of the nonconformance, resulting in a larger number of NCRs reviewed. The following observations were made.

- a. NCRs 98, 99, and 100 were prepared to document a violation of concrete expansion anchor (CEA) edge distance. The NCRs were voided on February 25, 1980, because an FCR was or will be issued to accept the CEAs as installed. One FCR (2500) was not issued until July 16, 1980. By voiding the NCRs, they were removed from the trending system. After this was pointed out by the NRC, the contractor prepared NCR 432, dated April 9, 1982, to document the items originally contained in NCRs 98, 99, and 100.
- b. NCR 168, dated March 2, 1981, documented that a cable was deformed at routing point 1899B. CECO engineering evaluated the cable and dispositioned the NCR as "Remove, Damaged Cable" and pull a new cable. Hatfield made the decision, without CECO's concurrence, that the subject cable did not need to be replaced. The NCR was closed on August 22, 1981.

- c. NCR 154, dated February 24, 1981, documents that cables 1FW441, 1FW482, and 1DC198 were damaged and the disposition was to replace the cables. Review of records indicate that cable 1DC197 was pulled out and scrapped on June 4, 1981 instead of cable 1DC198. The NCR was closed on June 4, 1981. A review of cable pull cards for cables 1DC197 and 1DC198 indicated that 1DC197 had been pulled and scrapped on June 4, 1981, and that 1DC198 was initially pulled on July 24, 1981. On April 6, 1982, the HECO QA Manager corrected the subject NCR and the attached documentation.
- d. NCR 107, dated March 21, 1980. Closed November 21, 1980.
- e. NCR 97, dated February 20, 1980. Closed August 21, 1981.
- f. NCR 152, dated February 23, 1981. Closed June 24, 1981.
- g. NCR 164, dated March 2, 1981. Closed August 15, 1981.
- h. NCR 160, dated February 16, 1981. Closed September 3, 1981.
- i. NCR 103, dated March 6, 1980. Closed January 8, 1981.
- j. NCR 184, dated March 4, 1981. Closed June 8, 1981.
- k. NCR 177, dated March 4, 1981. Closed March 23, 1981.

The inspector reviewed 42 NCRs generated between September 15, 1981 and February 15, 1982. The following is a status of the disposition of the subject NCRs:

- 23 - Use-as-is, FCR issued
- 4 - Repair the item
- 4 - Open as of April 7, 1982
- 3 - Voided
- 2 - Replace the item
- 1 - FCR issued to add side rails
- 1 - Reject the item
- 1 - Reorder replacement item
- 1 - Retrain the cables

1 - Closed - Being tracked by CECO NCR
1 - Clean the item
42

Noncomplaine (454/82-05-13b; 455/82-04-13b)
The licensee was informed that items a and b
above are additional examples where NCRs were
improperly closed/voided and is an item of non-
compliance with Criterion XV of 10 CFR 50,
Appendix B.

3. Review of Trend Analysis

A review of Hatfields trend analysis for 1981 and
1982 indicates that it was adequate.

4. Interviews with Personnel

Interviews with HECO personnel indicate that they
appeared knowledgeable in their procedures and
system.

Except as noted, within the areas inspected, no items of
noncompliance or deviations were identified.

Prepared by: H. M. Wescott

d. Design Change Control

(1) Objectives

The objectives of this assessment were to ascertain that, site design change interfaces are clearly defined and implemented, design change control is adequate, personnel understand and use appropriate procedures, and that the procedures are being implemented to assure the timely revising and distribution of drawings.

(2) Discussion

(a) Review of QA Manuals and Procedures

The inspector examined QA Manuals and Implementing Procedures as follows:

1. Nuclear Power Services, Section No. 3, Revision 1, dated December 30, 1980, "Design Control".
2. Powers-Azco-Pope QA Manual, Section B.1, Revision 1, dated October 7, 1981, "Design and Document Control".
3. Hunter Corporation QA Manual, Section 2, Revision 5, dated August 1, 1981, "Drawing and Specification Control".
4. CECQ QA Manual, Quality Requirement, QR No. 30, Revisions 1, 3, 13, and 18, dated December 29, 1980, December 29, 1980, September 9, 1980, and December 29, 1980 respectively, "Design Control".
5. CECQ QA Manual, Quality Procedure, QP No. 3-2 thru Revision 13, dated November 12, 1981, "Design Change Control".
6. Johnson Controls, Inc., QA Manual, Section 4, Revision 0, dated June 29, 1978, "Design Control".
7. Byron Site Instruction No. 20, Revision 8, dated December 17, 1981, "Instruction for Site Design Document Receipt, Distribution and Control".
8. Byron Site Instruction No. 21, Revision 0, dated July 13, 1978, "ECN Routing".
9. Westinghouse Policy/Procedure, WRD-OPR 3.0, Revision 2, dated March 20, 1981, "Design Control".

10. Westinghouse WRD-OPR 3.1 "Reactor Coolant System Design Definition (Power Capability Working Group)" Revision 3, dated March 22, 1981.
11. Westinghouse Instruction/Guidance SMD 1.4, Revision 4, dated January 18, 1982, "Byron Unit 1 Engineering Change Notice".
12. Westinghouse Instruction/Guidance SMD 1.5, Revision 0, dated October 31, 1980; Byron Unit "Field Change Requests".
13. AZCO Field Procedure FP-9, Revision 6, dated December 21, 1981, "Design Change Control".

(b) Review of Audits of Site Contractors

The inspector reviewed CECO's audits of site contractors concerning design change control as follows:

1. Sargent and Lundy Nos. 6-81-301, 6-81-314, 6-81-339 and 6-28-07.
2. Westinghouse SAMU No. 6-81-317.
3. Powers-Azco-Pope Nos. 6-81-326, 6-80-247 and 6-82-10.
4. Nuclear Installation Service Company Nos. 6-81-311 and 6-80-281.
5. Hatfield Electric Company Nos. 6-80-254 and 6-81-331.
6. Hunter Corporation Nos. 6-82-09 and 6-81-350.
7. Blount Brothers Corporation Nos. 6-80-248, 6-81-294 and 6-82-02.
8. Johnson Control, Inc. No. 6-80-250.
9. Hunter Corporation, Hatfield Electric Company, Reliable Sheet Metal Works, Inc., Powers-Azco-Pope Services, Inc., Blount Brothers Corporation, Westinghouse SAMU, Pittsburgh Testing Laboratory, and Nuclear Installation Services Company No. 3/8-10/82.

(c) Review of Design Specifications

The inspector reviewed design specifications as follows:

1. Certified piping design specification for the "Outdoor Essential Water System" dated February 19, 1982.
2. Certified piping design specification for the "Indoor Essential Water System" dated December 14, 1981.
3. Certified design specification for the "Reactor Vessel" dated May 15, 1972.
4. Design Criteria for Category 1 Cable Tray, Cable Tray Supports, Bus Duct Supports, HVAC Duct Supports, Conduit and Conduit Supports, DC-51-03 BY/BR.

It is noted that item 2. above did not have the Professional Engineer's Seal for Certification. Sargent and Lundy further researched ten piping design specifications and found three that did not have the required seal. These were to be revised to include the seal by April 23, 1982.

(d) Review of Control of Field Change Requests (FCR's) and Engineering Change Notices (ECN's)

The inspector randomly selected fifteen (15) FCR's and three (3) ECN's at Powers-Azco-Pope, seven (7) FCR's at Hatfield Electric Company, and three (3) ECN's at Westinghouse SAMU. They were verified to be under CECO control. Additionally five (5) traveller packages for in-process welding were verified to have the correct drawing revisions in place.

The following are the totals of FCR's and ECN's issued as of this inspection:

Electrical FCR's	4,492
Mechanical FCR's	13,702
Structural FCR-s	101
*Mixed FCR's	4,999
ECN's	<u>2,454</u>
TOTAL	25,746

*Mixed FCR's contain all disciplines prior to separation by discipline.

(e) Review Site Design Change Interface

The inspector reviewed the following:

1. Interface Control Agreement, Westinghouse Piping and Structural Evaluation Program for the Byron Station Unit 1, dated October 13, 1980. Paragraph 4.3 states that, "The Byron Project Engineering Organization, as the Owner, has overall responsibility for the activities described in this agreement."
2. Flow Chart for routing CECo Field Change Request, Byron Site Instruction No. 10, Revision 5, dated March 25, 1982.

(f) Personnel Interviewed

The inspector interviewed personnel from CECo, Westinghouse, Powers-Azco-Pope, Sargent & Lundy, Hatfield Electric Company, and Hunter Corporation.

Within the areas inspected no items of noncompliance or deviations were identified.

Prepared By: E. H. Nightingale

e. Material Traceability of Installed Structures and Components

(1) Objective

The objective of this assessment was to determine that material traceability was maintained from procurement through installation for structural beams, small bore piping and welding materials.

(2) Discussion

The following contractors were involved and their areas of responsibility are as indicated:

Hatfield Electric Company: Cable Trays
Hunter Corporation: Small Bore Pipe Systems
Powers-Azco-Pope: Small Bore Piping Systems
Blount Brother Corporation: Structural

(a) Hatfield Electric Company

1. Review of Procedures

The following site procedures were reviewed:
#5, Class I Materials and Equipment, Receiving and Inspection

#13AA, Class I Shielded Metal Arc Field Welding (S.M.A.F.W.)

#13AB, Class I S.M.A.F.W. (Procedure Qualification)

#13AC, Qualification of Welders

#13AD, Arc Welding Electrode Control

2. Review of Records

The documents reviewed for material traceability were as follows:

- . Weld Material Request
- . Material Certification
- . Weld Rod Request
- . Weld Data Sheet
- . Weld Material Issue Tag

3. Review of Welder Qualification

The review of welder qualification records consisted of reviewing the original qualification records as well as the supportive documents pertaining to their "up-date" qualification records. Hatfield Electric Company welding efforts are to AWS Code which requires six (6) month re-qualification periods.

The following welders had their certification and qualification records reviewed:

<u>Name</u>	<u>Welder ID#</u>
N. Larrabee	WW
C. W. Werner	W
J. A. Dickson	MM
Greene	CG
R. S. Glenny	CF
C. Stagg	CS
W. McVay	EM
D. Gavin	DG
T. Whitcomb	TW
F. Plegge	FP

These ten (10) welders are representatives of the sixty (60) welders qualified by Hatfield and are presently on site.

4. Review of Weld Material Control

The review of weld material control procedures and direct observation of in-process activities indicate that sufficient efforts are being implemented to assure material traceability and control.

Open Item (454/82-05-14; 455/82-04-14)

The Hatfield daily weld rod issue log did not indicate the actual time weld rod was issued and returned. The log only noted "a.m." or "p.m.". The licensee has provided information to indicate that Hatfield form HP-13AD-1 has been revised to include provisions for the actual rod issue and return times. This item will be reviewed during a future inspection.

(b) Hunter Corporation

1. Review of Procedures

The following site implementation procedures were reviewed:

- 1.601, QA Procedures and Instructions
- 3.102, Material and Services Procurement
- 3.602, Material Received and Inspected
- 5.101, Weld Filler Material Control
- 5.201, Welding Procedure Qualification Control
- 5.301, Welding Qualification
- 5.501, Weld Material Issuance
- 6.002, Visual Examination and Verification
- 6.501, NDE

2. Review of Records

The inspector selected three (3) safety related small bore piping systems for review of material traceability. The review of the data packages consisted of documentation from the purchase order to installation of the item. The systems involved were as follows:

- . Safety Injection (3)
- . Reactor Coolant (2)
- . Chemical Volume (4)

The documents reviewed were as follows:

- . Material/Services Request
- . Material Receiving Report
- . Receipt Inspection Checklist
- . QA Documentation Requirements List
- . Material List
- . Requisition
- . Shipping Order/Packing Slip
- . Material Certificate
- . NDE Request
- . Process Sheet
- . Weld Record
- . Material List
- . Material Certification
- . Weld Material Issue Report

The inspector reviewed data packages for the following small bore piping systems:

<u>SYSTEM</u>	<u>SPOOL PC</u>	<u>ITEM</u>	<u>HT #</u>	<u>MATERIAL REPORT</u>
1016-S-CV-001	2	2" sch/160	462460	MSR 4967
1016-S-RC-001	1	2" sch/160	462460	MSR 4967
CECO-S-RC-001	105	3/4" sch/160	483245	MRR 9575
1016-S-SI-001	5	2" sch/160	462460	MSR 4967
1016-S-SI-001	16-5	2" sch/160	462460	MSR 4967

<u>SYSTEM</u>	<u>SPOOL PC</u>	<u>ITEM</u>	<u>HT #</u>	<u>MATERIAL REPORT</u>
1018-S-CV-100	1-5	3/4" sch/40	462224	MSR 4967
1016-S-CV-100	8-7A	2" sch/160	462460	MSR 4967
1016-S-CV-100	9-8	2: sch/160	462717	MSR 4967
1065-S-SI-100	29-10	1" sch/160	HD7123	MSR 4967

The total footage involved consisted of 19,884'.

An expanded study of small bore piping was made to include valves and fittings. Data packages for the following items were reviewed:

<u>NAME</u>	<u>LOCATION</u>	<u>SYSTEM</u>	<u>SPOOL</u>	<u>MRR</u>
Globe Valve	1RC8039B	S-RC-001-51	2	10084
M.O.V.	1RC8037B	S-RC-001-51	2	10062
M.O.V.	1-SI-8871	S-SI-001	33	10144

<u>NAME</u>	<u>TYPE</u>	<u>HT #</u>	<u>SPOOL</u>	<u>MRR</u>
CPLG Fitting	2.0" 6000# S.S.-S.W.	TL	2	4968
CPLG Fitting	3/4" 6000# S.S.-S.W.	EGJ	2	5338

3. Review of Welder Qualification

The review of welder qualification records consisted of reviewing the original qualification record as well as the supportive documents pertaining to their "up-date" qualification record. Hunter Corporation welding efforts are conducted to the ASME Code which requires three (3) month re-qualification periods. Hunter Corporation routinely re-certifies their welders in two (2) month periods to preclude any loss of certifications due to vacations, illness, etc.

The following welders had their certification and qualification records reviewed:

<u>NAME</u>	<u>WELDER ID #</u>
R. Sturm	D40
B. Strom	B17
D. Colby	E52
R. Decker	A38
D. Upstone	F19
E. Baker	E56
B. Burns	E82
R. Bilyeu	B91

<u>NAME</u>	<u>WELDER ID #</u>
A. Arnold	E48
V. Burdene	C19
D. Radke	A12
L. Anderson	F3

These twelve (12) welders are representative of the 237 welders qualified by Hunter Corporation and are presently on site.

4. Review of Weld Material Control

The review of weld material control procedures and direct observation of in-process activities indicate that sufficient efforts are being implemented to assure material traceability and control.

The documents reviewed for material traceability are as follows:

- . Weld Material Stores Requisition
- . Purchase Requisition
- . Materials/Services Request
- . Material Receiving Report
- . Receipt and Inspection Checklist
- . Material Certificate

(c) Powers-Azco-Pope

1. Review of Procedures

The following procedures were reviewed:

- . QC-4, Nonconformance Control
- . FP-2, Control of Procurement and Requisitioning of Material and Services
- . FP-3, Material Receiving, Inspection Control
- . FP-5, Weld Filler Material Control
- . FP-6, Material Handling
- . FP-7, Transfer Package and Weld Record Control
- . WE-2, Welders Performance Qualification and Control

2. Review of Records

The inspector selected three (3) safety related small bore piping systems for material traceability review. The review of the data packages consisted of documentation from the purchase order to installation of the item involved. The systems selected were as follows:

- . Feedwater
- . Containment Spray
- . Reactor Coolant

The documents involved for review were as follows:

- . Weld Filler Material Requisition
- . Receiving Inspection Check List
- . Final As-Built Isometric (Supplement Weld and Inspection Record)
- . Material Certification
- . Weld Rod Issue Tag
- . P.O. (CECo Responsibility)
- . NDE Records

A study of the data packages, for the systems selected, consisted of the following items:

<u>SYSTEM</u>	<u>PIPE SIZE</u>	<u>HT #</u>	<u>REC. & INSP.</u> <u>Report #</u>	<u>ISO#</u>
RX Coolant	0.50"	462,444	MRR# 7074	1F1S-418B
Feed Water	0.50"	M81,577	RIR# 040	1LT-542
Feed Water	0.50"	D85,772	RIR# 040	1LT-542
Feed Water	0.50"	E89,871	RIR# 040	1LT-542
Containment Spray	0.50"	744-783	MRR# 7074	1FT-CS011

Total footage of piping involved consisted of 27,900'.

The suppliers of weld material for the Byron facility is Hunter Corporation. The pipe materials are supplied to the small bore piping contractors by CECO. Therefore, purchase orders are originated from these two (2) sources. This system of purchasing in large quantities by one contractor/ licensee enhances material traceability.

An expanded study of small bore piping was made to include valves and fittings. Data packages for the following items were reviewed:

<u>ITEM</u>	<u>HT#</u>	<u>FIELD</u> <u>WELD #</u>	<u>REC & INSP.</u> <u>REPORT #</u>	<u>ISO#</u>
Coupling	EGJ	41	057	1PT-RC009
90 Elbow	OZ	52	131	1PT-403
Valve S/N N11591	1RV048	N/A	20049	11J-461
Valve S/N N11526	1RC025E	N/A	230	1FT-415

3. Review of Welder Qualification

The review of welder qualification records consisted of reviewing the original qualification record as well as the supportive documents pertaining to their "up date" qualification record. PAP welding efforts are conducted to the ASME Code which requires three (3) month re-qualification periods.

The following welders had their certification and qualification records reviewed:

<u>Name</u>	<u>Welder ID#</u>
B. Strom	CS
R. Sutherland	AF
H. Arteaga	DU
L. Flynn	DX
D. Tucker	BH
H. Mitchell	AJ
R. Boyle	BM
D. Shurely	CE
P. Meyers	DE
W. Meyers	DG

These ten (10) welders are representative of the 46 welders qualified by PAP and are presently on site.

4. Review of Weld Material Control

The review of weld material control procedures and direct observation of in-process activities indicate that sufficient efforts are being implemented to assure material traceability and control.

The documents reviewed for material traceability are as follows:

- . Weld Filler Material Requisition
- . Receiving Inspection Check List
- . Material Certification
- . Weld Rod Issue Tag
- . Weld and Inspection Record

(d) Blount Brothers Corporation

1. Review of Procedures

The following procedures were reviewed:

- . QC 3385 #1, Document Control
- . QC 828 #2, Procurement Control
- . QC 3012 #4, Inspection (Nonconformance and Corrective Action)
- . QC 3262 #7, Calibration of Tools, Gages and Instruments Concrete)
- . QC 835 #10, Receiving, Storage and Handling
- . QC 3333 #11, Welding - (AWS D1.1) 1974
- . QC 845 #21, Structural Steel Erection
- . QC 1992 #33, Personnel Qualification and Certification

2. Review of Records

The inspector selected nine (9) structural beams for material traceability. Beams selected were three from Unit #1 containment building and three beams from Unit #1 auxiliary building. Three more beams were selected from Unit #2 containment building.

Beams selected were as follows:

<u>Beam I.D.</u>	<u>Building</u>	<u>Unit #</u>	<u>Drawing #</u>
A220B2	Containment	2	E-205
A230BB3	Containment	2	E-205
A250BB1	Containment	2	E-205
A152B5	Containment	1	E-102
B111BB2	Containment	1	E-102
B104BB1	Containment	1	E-102
333B3	Auxiliary	1	E-201
326G1	Auxiliary	1	E-201
603B1	Auxiliary	1	E-201

The inspector reviewed the data packages for the following structural steel for material traceability.

Beam # 326G1 - Film Roll 3 - Dr. #326

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
440	2R6969	12-28-76
435	J-31694	11-30-76
464	96266	12-28-76
474	96723	11-29-76
461	63062	11-08-76
Mill B8	L511159	02-28-77

Beam # 333B3 - Film Roll 3 - Dr. #333

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
351	K-24080	11-10-76
474	96723	11-19-76

Beam #B104BB1 - Film Roll 1 - Dr. #B104

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
11133	69C076	06-29-77
11127	69C050	07-01-77
90126	66C242	07-01-77
90127	69C167	08-10-77
80123	63729	05-26-77

Beam #A230BB3 - Film Roll 1 - Dr. #A230 - 80230

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
38	70C576	02-07-78
62	K58219	02-06-78
	K58377	02-06-78
573	T47512	06-26-78
S-22	87495	06-27-78

Beam #B111BB2 - Film Roll 1 - Dr. #B111B

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
11113	VY4703	07-01-77
11106	70C266	07-01-77
90126	66C242	07-01-77
90127	69C167	08-10-77
80123	63729	05-26-77

Beam #A220B2 - Film Roll 1 - Dr. #A220

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
B-9	J-51717	12-13-77
S-43	44B489	07-19-78
B-1	A-325	Bolts 09-12-78
B-2	A-325	Bolts 06-09-78

Beam #A132B5 - Film Roll 1 - Dr. #A132

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
80135	24456	05-26-77
C-80119	W35079	07-11-77
A-80190	B-34009	08-10-77

Beam #603B1 - Film Roll 3 - Dr. #603

<u>Index #</u>	<u>Heat #</u>	<u>S&L Letter Date</u>
1407	10005	03-04-77
287	18216	10-12-76

Beam #A240BB1 - Revised to Beam #E144-1
S&L Drawing S-1001, Revision H., Dated 3-16-78,
Note 10. Fabricated by Midcity Architectural
Iron Company (on-site contractor).
Heat # K62702 and #83833
A-325 Bolts - C6810; 4048

3. Review of Welder Qualifications

The review of welder qualification records consisted of reviewing the original qualification record as well as the supportive documents pertaining to their "up-date" qualification records. Blount Brothers Corporation welding efforts are to AWS Code which require six (6) month re-qualification periods.

The following welders had their certification and qualification records reviews:

<u>Name</u>	<u>Welder ID #</u>
K. Knaub	K-5
R. Long	K-4
P. Fadness	P-4
R. Sullivan	B-4
D. Lower	L-4
W. Thompson	V-4
K. Flosi	W-3
R. Schusler	W-18
K. Todo	Y-4
D. S. Wielan	D-5

The ten (10) welders are representative of the fifteen (15) welders qualified by Blount Brothers Corporation and are presently on site.

4. Review of Weld Material Control

The review of weld material control procedures and direct observation of in-process activities indicate that sufficient efforts are being implemented to assure material traceability and control.

The documents reviewed for material traceability are as follows:

- . Material Requisition
- . Receiving Inspection Report
- . Material Certification
- . Weld Material Issue Sheet
- . Weld Data Report

Within the areas inspected, no items of noncompliance or deviations were identified.

Prepared By: R. S. Love

f. Electrical Cable Installation

(1) Objective

The objectives of this assessment were to determine if:

cable installation procedures are in accordance with FSAR commitments and that they are adequate for controlling cable installation activities.

the cable installation personnel and QC inspectors have been adequately trained in this activity.

safety related cables are routed, separated, and loaded in accordance with procedure requirements.

(2) Discussion

(a) Review of Electrical Procedures

The inspector reviewed the following Hatfield Electrical Company procedures:

1. Procedure No. 5, Class I Material and Equipment Receiving and Inspection, Revision 4, Issue 1, dated January 26, 1981. This procedure was reviewed and accepted by Sargent and Lundy on January 27, 1981.
2. Procedure No. 6, Reporting of Damaged and Nonconforming Material or Equipment, Revision 6, dated January 15, 1982. This procedure was reviewed and accepted by Sargent and Lundy on February 11, 1982.
3. Procedure No. 9-A, Class I, Cable Pan Hanger Installation, Revision 11, dated November 20, 1982. This procedure was reviewed and approved by Sargent and Lundy on December 23, 1981.
4. Procedure No. 9-B, Class I, Cable Pan Installation, Revision 9, dated November 20, 1981. This procedure was reviewed and approved by Sargent and Lundy on December 23, 1981.
5. Procedure No. 9-E, Class I, Cable Pan Identification, Revision G, Issue 1, dated January 23, 1981. This procedure was reviewed and approved by Sargent and Lundy on January 26, 1981.

6. Procedure No. 10, Class I, Cable Installation, Revision 14, dated February 8, 1982. This procedure was reviewed and approved by Sargent and Lundy on February 18, 1982.

Open Item (454/82-05-15; 455/82-04-15)

Procedure No. 9-B, Class I, Cable Pan Installation, Revision 9, dated November 20, 1981, did not address the installation of cable pan end riser covers. The inspector was informed that Procedure No. 9-C would address the installation of covers as required by the Byron/Braidwood FSAR. This is an open item.

Unresolved Item (454/82-05-16; 455/82-04-16)

During review of Procedure 9-E, Class I, Cable Pan Identification, Revision G, Issue 1, dated January 23, 1981, the inspector observed that paragraph 5.3.1 of the subject procedures states in effect that the requirements to apply segregation identification to raceway at a minimum of every 15' does not apply to risers. This is contrary to the requirements stated in paragraph 5.1.2 of IEEE 384-1974. Pending a review of installed riser identification markings for compliance to requirements, this item is an unresolved item.

Noncompliance (454/82-05-09c; 455/82-04-09c)

During review of Procedure No. 10, Class I, Cable Installation, Revision 14, dated February 8, 1982, the inspector observed that the subject procedure does not address:

- a. the requirements to calculate electrical cable sidewall pressure. Maximum cable sidewall pressures are specified by the cable manufacturers,
- b. electrical cable rework. Example - An electrical cable has been installed per Revision A of the cable pull card and Revision B of the pull card requires that the cable be "pulled back" to a given point in the raceway system and re-routed to a different landing point. What precautions are taken to prevent damage to the cable being "pulled back" and to the cables remaining in the raceway. This would be especially important when the cable was installed in conduit or duct banks. Another example would be that as a result of an NCR, a cable had to be removed (Ref. Hatfield NCR's 164, 154, 107).

Failure to provide adequate instructions or procedures to accomplish activities affecting quality in accordance with Quality Assurance Program provisions is an

item of noncompliance with Criterion V of 10 CFR 50, Appendix B.

(b) Review of Storage Facilities - Cable Yard

The inspector toured the Hatfield Electric Company cable reel yard to verify proper storage and to select several cable reel numbers for follow-up review of material receiving reports and vendor documentation. The cable reels were stored on dunnage (plywood), identified, and separated as to cable type. Electrical cable reel numbers 02146-409, 04146-215, 03367-7, and 01115-43 were selected for records review.

(c) Review of Electrical Work Activities

1. During a tour of the power block the inspector observed that the weld heat affected zone inside cable tray 11774J-C2E, located at the 439' elevation of the cable spreading room, had not been touched-up with zinc rich paint in accordance with Hatfield Electric Company Procedure No. 9-B, Class I, Cable Pan Installation, Revision 9, dated November 20, 1981. The licensee took immediate action to have the subject area cleaned and galvanized. This was the only area identified where the weld or heat affected zone had not been touched-up.
2. The inspector observed that non-safety related pipe number FP-41-4-10" was installed 3 1/2" from safety related cable tray number 11461J-C2E. These items are located in the Auxiliary Building between column lines 17 and P at the 426' elevation. Further investigation indicates that the fire protection (FP) system is classified as moderate energy piping and is seismically supported in the area observed. This appears to meet the intent of Regulatory Guide 1.29, Seismic Design Classification.
3. The inspector verified that electrical cable number 1VX105 was routed in accordance with the cable pull card, Revision A. The subject cable is a 12c/14, 600V and was pulled from cable reel 12146-201. The cable extends from 1AP32E (MCC 132X5) to 1VX02J (Vent System Local Control Panel). The cable was physically verified in routine points 11461J-C2E, 1R369-C2E, 1910F-C2E, 1R353-C2E, 11375M-C2E, and verified that the cable entered the conduit to the equipment.

The raceway was accepted on January 18, 1982, and cable pulled on January 19, 1982.

4. During discussions with an electrical foreman and one electrical craftsperson, the inspector observed that, with respect to cable pulling, they were very knowledgeable and proud of their work. The subject craftsperson assisted the inspector in verifying the routing of electrical cable 1VS105 (Ref. Paragraph (c)3 above).

(d) Review of Procurement Documentation - Class IE Cable

The inspector reviewed the procurement documentation relative to 600V and 5KV electrical cable. The inspector reviewed the cable specifications, Material and Equipment Receiving and Inspection Reports (MRR), and vendor documentation. The following observations were made:

1. The licensee purchased the following electrical cable from Okonite Company to Sargent and Lundy specification F-2823.
 - a. Cable reel number 02146-409 contained 2500 feet of 2c/14, 600V cable and was received May 11, 1981 on MRR 50217.
 - b. Cable reel number 04146-216 contained 3124 feet of 4c/14, 600V cable and was received April 22, 1980 on MRR 8569.
 - c. Cable reel number 03356-7 contained 2060 feet of 3c/350 MCM, 600V cable and was received October 4, 1978 on MRR 4187.

The following data was included in the on-site documentation packages for the above listed cables:

- . Certificate of Compliance
- . Certificate of Conformance
- . Certified Test Report
- . Results of Water Absorption Test
- . Results of Ozone Resistance Test
- . Results of High Potential Voltage Test
- . Sargent and Lundy letter, dated June 20, 1980, that accepted the results of Flame Tests and Tests for Design Basic Events.

2. The licensee purchased electrical cable, reel number 01115-43 from Okonite Company to Sargent and Lundy specification F2851. This reel contained 1094 feet of 1c/1000 MCM, 5KV cable and was received

July 11, 1979 on MRR 7032. The following data was included in the on-site documentation package for this cable:

- . Certificate of Compliance
- . Certificate of Conformance
- . Certified Test Report
- . Results of Water Absorption Test
- . Results of Ozone Resistance Test
- . Results of High Potential Voltage Test
- . Sargent and Lundy letter, dated June 20, 1980, that accepted the result of Flame Tests and Tests for Design Basic Events.

(e) Review of Class 1E Cable Pull Cards

The inspector reviewed 20 completed cable pull cards to verify that correct cable type was installed, raceway was inspected prior to pulling cable, and that QC accepted the cable pull. The following typical observations were made:

1. Cable 1VX105 was pulled on January 19, 1982 from Cable Reel 12146-201. Revision A to the cable pull card indicates the cable type code as 12146 which is 12/c-14, 600 volt cable. The raceway was accepted on January 18, 1982, and the cable pull was accepted January 19, 1982. This was a complete pull.
2. Cable 1RC223 was pulled on April 9, 1981 from Cable Reel 02166-41. Revision A to the cable pull card indicates the cable type code as 02166 which is one twisted pair, #16 (shielded), 600 volt cable. The raceway was accepted on March 27, 1981, and the cable pull was accepted April 9, 1981. This was a complete pull.
3. Cable 1VC019 was pulled on June 23, 1981 from Cable Reel 09146-84. Revision A to the cable pull card indicates the cable type code as 09146 which is 9/c-14, 600 volt cable. The raceway was accepted on June 22, 1981 and the cable pull was accepted on June 23, 1981. This was a complete pull.

Except as noted, within the areas inspected, no items of noncompliance or deviations were identified.

Prepared By: H. M. Wescott

g. In-Process Inspection

(1) Objectives

The objective of this assessment was to ascertain that in-process inspection procedures are adequate and properly implemented.

(2) Discussion

(a) Review of Procedures

The inspector reviewed procedures concerning in-process inspection as follows:

1. Powers-Azco-Pope Quality Control Field Procedure FP-7, Revision 6, dated October 16, 1981, "Traveller Package and Weld Record Control PAP Isometric and Installation Control".
2. Powers-Azco-Pope QC-6, Revision 6, dated September 30, 1981, "Quality Assurance Documentation".
3. Hatfield Electric Company Procedure 9-A, Revision 11, dated November 20, 1981, "Class I, Cable Pan Hanger Installation".
4. Hatfield Electric Company Procedure 9-B, Revision 9, dated November 20, 1981, "Class I, Cable Pan Installation".
5. Hatfield Electric Company Procedure 20, Revision 8, dated November 20, 1981, "Class I, Exposed Conduit System Installation".
6. Hunter Corporation, Site Implementation Procedure SIP No. 1.601, Revision 1, dated March 3, 1981, "Quality Assurance Procedures and Instructions".
7. Hunter Corporation, SIP No. 4.201, Revision 4, dated January 19, 1982, "Installation Verification".

(b) Observation of Work Activities

The inspector accompanied two Hatfield Electric Company QC inspectors and observed their inspection of conduit hangers located in the control room.

The inspector also observed the inspection and torquing of four concrete expansion anchors.

(c) Review of Records

The inspector reviewed records as follows:

1. Hunter Corporation completed traveller packages for welds Numbered 45, Part No. 1-SA-76-AD-3; 565, Part No. 1-CC-50-B-4"; Number 571, Part No. 1-CC-50-C-6"; Number 1608, Part No. 1-CC-50-C-6" rework; Number 1171 and 1178, Line No. 1-D-C-33-CA-3/4".
2. Hunter Corporation Field Order JTP No.'s 5-PS-100-78, 5-PS-10-77, HOG-72-1, S-NT-100-2-15-A, and OG-61-7.
3. Hatfield Electric Company QA Process Sheet File No. 13.09B.1, Class I, Cable Pan Inspection Checklists (approximately 33 checklists).
4. Hatfield Electric Company Concrete Expansion Anchor File No. 13.25.02, Travellers 1901 thru 1950.
5. Hatfield Electric Company Conduit Inspection Reports, File No. 13.20.01, 766 thru 850.

(d) Personnel Interviewed

The inspector interviewed two QC inspectors from Hatfield Electric Company.

Noncompliance (454/82-05-17; 455/82-04-17)

The inspector interviewed four welders performing in-process safety related welding (two from Hunter Corporation and two from Powers-Azco-Pope). Three of the welders did not have the welding procedure specification (WPS) with the traveller packages. When the inspector asked where the WPS was, two welders did not appear to know what a WPS was and one stated that he knew the WPS should be in the weld material issue point but stated that he had not seen it.

This item is considered to be in noncompliance with the requirements of 10 CFR 50, Appendix B, Criterion IX.

Except as noted, within the areas inspected, no items of noncompliance or deviations were identified.

Prepared By: W. Forney

h. QC Inspector Effectiveness

(1) Objective

The objectives of this assessment were to determine if:

- (a) any problems exist that inhibit an inspector from properly executing his assigned functions.
- (b) the training, qualifications, and certification of QA/QC personnel working for contracting organizations to the licensee are in compliance with 10 CFR 50, Appendix B, ANSI N45.2.6-1978; ANST SNT-TC-1A, USNRC Regulatory Guides 1.58, USNRC Generic Letter 81-01; CECo Quality Assurance Program Manual; CECo Response to Generic Letter 81-01 (L. O. DelGeorge to D. G. Eisenhut-August 17, 1981); and Contractor Quality Assurance Manuals.

(2) Discussion

Individuals selected for interview were chosen at random by the NRC inspector. All contractors utilizing QA/QC personnel to monitor and accept production activities at the site were selected. The organizations selected, production function monitored by the inspectors, number of inspectors in the organization, number of inspectors interviewed and percentages are identified in Table 2. Each inspector interviewed was asked a standard set of questions. The answers provided were summarized and are provided as Table 3.

Individuals selected for QA/QC inspector interview were requested to provide the record of their training, qualification and certification to the inspector. The inspector reviewed each of the training, qualifications and certification records to verify compliance with applicable regulatory requirements, standards and commitments. In verifying the implementation of the approved requirements emphasis was placed on (1) determination of initial capability by suitable evaluation (2) evaluation of performance/reevaluation (3) written certification in appropriate form (4) physical requirements identified and examined yearly, and (5) qualification criteria followed and (6) records of qualification established and maintained.

Table 3 is provided as a summary of inspector answers to the standard set of interview questions. Answers to questions 1, 2, 4, 5 are self evident and do not require further definitions. However, the answers to remaining questions require further clarification and conclusions.

Question 3 - relates to the number of inspectors that indicated during their answer to Question 2 that they had prior inspection experience. Of the 30 inspectors interviewed 47% indicated prior inspection experience; however, only 27% had prior inspection experience in nuclear work related activities.

Question 6 - of the 19 inspectors interviewed that regularly worked frequent or excessive overtime one worked less than 8 hours weekly, fourteen worked from 8 to 16 hours weekly, and four work greater than 16 hours weekly. The two inspectors that provided qualified answers indicated the overtime was intense at times based upon fluctuations of production activities. All of the inspectors that answered yes or qualified their answer were asked if the frequent or excessive overtime caused the accuracy of their inspections to be diminished. Without exception, none of the inspectors felt the accuracy of their inspections were affected.

Question 7 and 8 - the inspectors that provided a qualified answer to these questions indicated that the lack of adequate staff and/or failure to conduct inspections promptly were a result of fluctuations in production activities.

Open Item (454/82-05-18; 455/82-04-18)

Question 9 - indicates that inspectors generally do not feel they have the authority to stop an activity in their contractor's work that is not being properly performed, nor have they been provided written management policy in this area. The inspectors that provided qualified answers indicated that they would inform the area supervisor. The inspectors were also asked if they felt they could immediately stop the work activity of another contractor worker who was performing work that was hazardous to safety related equipment. The majority of inspectors indicated they did not have that authority.

The licensee management committed to take actions to re-emphasize to all inspectors their responsibility to stop an activity which does not conform to applicable quality requirements. This item will be examined during a future inspection.

Question 10 - the majority of inspectors interviewed indicated that the training they received was adequate for the work activity they are required to perform. One inspector did not feel his training was adequate and the remaining inspectors felt that although their training was not the best, that if they needed additional guidance or clarification that management would provide the information immediately.

Question 11 - indicates that inspectors do not feel that a lack of inspection personnel is the cause for construction activities to come to a stop and is consistent with the answers provided in Question 8.

Question 12 - the inspectors that qualified their answer generally indicated that their activity did not require a check list but was normally accomplished utilizing a combination of installation plans and/or procedures.

Question 13 - the inspectors that qualified their answer indicated that they would have to follow the chain-of-command which could be untimely.

When asked to discuss their opinion of how their management portrays the relationship of quality to production the majority of inspectors stated that quality was first and production second, a number of inspectors stated that quality and production were on an equal basis, and a few of the inspectors (predominately from one contractor) stated that production was first and quality second.

When asked to discuss their opinion of the overall finished product of their contractors activities the majority of inspectors stated that the work generally exceeded minimum acceptable standards, a few stated the work generally met minimum standards, and no inspectors felt that the work did not meet minimum acceptable standards.

Noncompliance (454/82-05-19; 455/82-04-19)

Based on a review of training qualification and certification records of a minimum of ten percent of the QA/QC personnel working for contractors performing safety-related work it is apparent that an effective program does not exist to ensure that a suitable evaluation of initial capabilities is performed, that written certification is provided in an appropriate form, and that qualification criteria is established.

Certain contractor QA/QC supervisors and inspectors were not adequately qualified and/or trained to perform safety-related inspection functions. The following examples of apparent non-compliance were identified:

a. Contractor - Reliable Sheet Metal Works, Inc.

- (1) The contractor Quality Assurance Manual did not require inspection personnel to be trained and certified to ANSI N45.2.6-1978.
- (2) The certification record for the QA/QC supervisor did not contain a satisfactory basis for certification.
- (3) The certification record for the QA/QC supervisor did not contain the level of capability.

b. Contractor - Johnson Controls, Inc.

- (1) The certification records reviewed did not contain a determination of initial capability.
- (2) The certification records reviewed did not contain a copy of the individuals high school diploma or verification of prior work history.
- (3) The certification records reviewed did not support adequate testing prior to certification. It is noted that testing was accomplished by oral examination consisting of 25 questions to determine the individuals knowledge of 26 procedures. The oral examination noted the individual was weak in ability to work with drawings. However, there is no record to indicate additional training was provided or that the individual was subsequently tested and found to be proficient in his ability to work with drawings.

c. Contractor - Powers-Azco-Pope

- (1) The certification records for the QC Supervisor did not provide an adequate determination of initial capability.
- (2) The certification records for the QC Supervisor did not contain a high school diploma, or verification of previous employment.
- (3) The certification records for the QC Supervisor did not contain adequate evaluation and justification for certification to Level I or subsequent certification to Level II Supervisor.
- (4) The certification records for three (3) QC inspectors did not contain a high school diploma.
- (5) The certification folder for three (3) QC inspectors did not contain verifications of prior employment.
- (6) The certification records for the QC Supervisor and three (3) QC inspectors contain open book examinations that do not provide an adequate level of knowledge prior to certification. The records did not contain results of a capability demonstration to support certification.
- (7) The certification records for three (3) QC inspectors did not contain adequate evaluation and justification for certification to Level I and subsequent certification to Level II inspector.

d. Contractor - Hunter Corporation

- (1) The certification records for two (2) of the seven (7) QC inspector qualifications reviewed did not provide determination of equivalent inspection experience to support the level of certification.

e. Contractor - Hatfield Electric Company

- (1) The certification records for three (3) of the nine (9) inspector qualifications reviewed did not contain a Certification Evaluation Sheet.
- (2) The certification record for one (1) of the nine (9) QC inspector qualifications reviewed did not have records of examinations or work samples.
- (3) The certification records for two (2) of the nine (9) QC inspector qualifications reviewed did not provide complete evaluation and justification for certification to perform the level of inspection identified.

f. Contractor - Blount Brothers Corporation

- (1) The certification record for one (1) of the two (2) QC inspector qualifications reviewed did not indicate the expiration date of certification as a Level I lead auditor.

g. Contractor - Midway Industrial Contractor, Inc.

- (1) The certification record for the QC inspector qualifications reviewed did not indicate the activities certified to perform.

h. Contractor - Pittsburgh Testing Laboratory

- (1) The certification record for one of the three (3) QC/QA inspector qualification records reviewed did not have an evaluation of prior work experience.

Based on a sample review of CECO audits conducted in the area of training qualification and certification for the period 1979-1981 it was determined that a program exists to routinely review the acceptability of QA/QC personnel. It was noted that many audit findings were identified and resulted in notable improvements of contractor adherence to ANSI N45.2.6-1978. During the meeting conducted April 9, 1982, CECO management committed to develop an alternate plan for certification of contractor QC inspectors when the recommendations of ANSI N45.2.6.-1978, Section 3.5 are not complied with. Additionally, a commitment was made to require each contractor to verify inspectors education and experience.

TABLE 1

Licensee and On-site Contractors

<u>Organization</u>	<u>Services Performed</u>	<u># Cract Workers</u>	<u>QA/QC Staff</u>	<u>QA/QC Organ. Indep.</u>	<u>Periodic Review of QA Program</u>	<u>QA/QC Supv. Pos. Des.</u>
Commonwealth Edison	Licensee	N/A	16	Yes	Yes	Yes
Flount Brothers	Plant Structures	220	5	Yes	Yes	Yes
Ebasco Services	Inservice Inspection	10	2	Yes	Yes	Yes
Hatfield Electric Company	Electrical Installation	555	83	No	Yes	No
Hunter Corp.	Piping Systems	944	71	Yes	Yes	Yes
Johnson Controls	HVAC Controls	47	2	(2)	Yes	Yes
Midway Indust.	Field Finish	10	2	Yes	Yes	Yes
NISCO	Mechanical Erector	10	2	Yes	Yes	Yes
Nuclear P.S.	Mechanical Design	*96	1	Yes	Yes	Yes
Pittsburgh Test Lab	Testing	#28	1	Yes	Yes	Yes
Powers-Azco-Pope	Instrumentation	135	11	No	Yes	Yes
Reliable Sheet Metal	HVAC	37	2	Yes	Yes	Yes
Sargent & Lundy	A. E. Field Group	*72	0	(1)	Yes	(1)
Westinghouse SAU	Mechanical Design	*47	0	(1)	Yes	(1)

- Testers * - Engineers

(1) - Not reviewed (2) - Unresolved item

TABLE 2

QA/QC INSPECTOR INTERVIEW SUMMARY

<u>Organization</u>	<u>Function</u>	<u>Total Inspectors</u>	<u>Inspectors Interviewed</u>	<u>%</u>
EBASCO Services	Inservice Inspection	2	1	50
NISCO	Erect miscellaneous mechanical equipment, final setting and erection of NSSS equipment.	2	1	50
Reliable Sheetmetal	HVAC	2	1	50
Johnson Controls	HVAC Controls	2	1	50
Powers Azco Pope (FAP)	Instrumentation	11	4	36.36
Hunter Corporation	Piping System	71	7	9.86
Hatfield	Electrical Installation	83	9	10.84
Blount Brothers	Plant Structures	5	2	40
Midway	Field Finish Coating	2	1	50
Pittsburgh Testing Lab	Onsite NDT	28	3	10.71
TOTALS		208	30	14.42

TABLE 3

SUMMARY OF QUESTIONS ASKED

QC/QA INSPECTORS DURING INTERVIEWS

1. How long employed as an inspector onsite?	<u>3 mo.</u>	<u>6 mo.</u>	<u>6 mo.-1 yr.</u>	
	2	4	8	
	<u>1-2 yr.</u>	<u>2-3 yr.</u>	<u>4 yr.</u>	
	7	4	5	
2. Prior inspection experience?	<u>Yes</u>		<u>No</u>	
	14		16	
3. What discipline(s)?	<u>Nuclear</u>		<u>Non-Nuclear</u>	
	8		6	
4. Is there a sense of intimidation based upon the need/requirement to keep up with construction?	<u>Yes</u>	<u>No</u>	<u>Qualified</u>	<u>Implemented Qualified Answer</u>
	29	1		
5. Is there a reluctance to make adverse findings if they will impact on the construction or audit schedule?	<u>Yes</u>	<u>No</u>	<u>Qualified</u>	<u>Implemented Qualified Answer</u>
	29	1		
6. Is it routine for QC inspectors to be working frequent and/or excessive overtime?	19	9	2	
	7. Do the inspectors feel that their particular section is adequately staffed?	19	2	9
8. Do they feel the required inspections are being conducted promptly?		18	2	10
	9. Do the QC inspectors have stop work and/or stop process authority?	13	3	14
Have they ever used this authority?		13	9	
If so do they feel they were supported or will have the support of management in the event of a stop work?	19	1	3	7

	<u>Yes</u>	<u>No</u>	<u>Qualified</u>	<u>Implemented Qualified Answer</u>
10. Do the inspectors feel the training they have been provided is adequate?	24	1	5	
11. Do situations arise where the lack of a QC inspector causes construction activities to come to a stop?	1	27	2	
12. Are the QC inspectors provided adequate check lists for all activities they are inspecting or are they sometimes using vague guidelines?	15		15	
13. Do they feel that they have an avenue to management if they come across a problem?	28		2	
Do they feel management will get involved or just pay lip service?	27		3	

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D. C. 20555

September 17, 1982

IE INFORMATION NOTICE NO. 82-34, REV 1: WELDS IN MAIN CONTROL PANELS

Addressees:

All holders of a nuclear power reactor operating license (OL) or construction permit (CP).

Purpose:

This revision is made to provide the specific time period during which the potentially significant problem pertaining to welds in main control panels may have existed. The panels of concern were supplied to a number of operating plants and construction sites by Systems Control of Iron Mountain, Michigan prior to March 1980; Reliance Electric of Stone Mountain, Georgia prior to March 1982; and Comsip of Linden, New Jersey prior to March 1982. Only those panels manufactured prior to these dates are now included in the list of sites which may have panels with defective welds. The potential safety significance of this problem is still under review by the Nuclear Regulatory Commission (NRC) staff. If NRC evaluation so indicates, further licensee action may be requested. In the interim, the staff expects licensees to review the information herein for applicability to their facilities. No specific action or response is required at this time.

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Description of Circumstances:

Inspections at the vendors' facilities conducted in March of 1980 (Systems Control) and March of 1982 (Reliance and Comsip) disclosed numerous welding practices not in accordance with the American Welding Society (AWS) Standards and several quality assurance practices not in compliance with the vendors' procedures or NRC requirements. Among these were the following:

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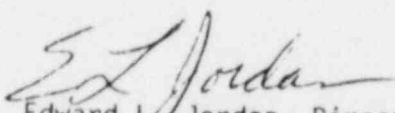
1. Certified material test reports not obtained, not available, or not in accordance with AWS specifications
2. Changes to drawings not properly reviewed and accepted
3. Welding being done by unqualified individuals without qualified procedures and using uncalibrated equipment
4. Poor welds, including lack of fusion, undercuts in excess of 1/32", and weld wire remnants from 1/2" to 4" in accepted welds
5. Welding procedure qualification and welder qualification testing required by AWS Standards not accomplished
6. Essential variables as specified by AWS Standards violated
7. Management oversight not accomplished for lengthy periods; lack of separate review and approval for Quality Assurance
8. Unidentified weld filler metal used
9. Gas tungsten arc welding (GTAW) process used but not documented in place of required gas metal arc welding (GMAW) or shielded metal arc welding (SMAW) processes

R1

Since the inspection determined that the non-conforming practices of all three vendors were similar and widespread at each manufacturing facility, it can be assumed that any panel furnished by these vendors prior to the respective NRC inspection dates may have defective welds. Although the vendors have seismically qualified similar panels, improper welding practices and defective welds prior to the NRC inspection may affect the validity of those qualifications. R1
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Some control panels were identified during vendor inspections as having defective welds. Sites which have received panels that may have defective welds are as follows: Palo Verde 1, 2, and 3; Byron 1 and 2; Braidwood 1 and 2; Midland 1 and 2; Vogtle 1 and 2; Callaway 1; Comanche Peak 1 and 2; Waterford 3; Wolf Creek; Brunswick 1 and 2; Seabrook; Susquehanna; Three Mile Island 1; Salem 1 and 2; Hope Creek; Monticello; Perry 1 and 2; Hatch 1 and 2; Indian Point 2; Shearon Davis 1, 2, 3, and 4; St. Lucie 2; Shoreham; Virgil Summer; Dresden; and Appleton. R1
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If you have any questions regarding this matter, please contact the administrator of the appropriate Regional Office or this office.



Edward L. Jordan, Director
Division of Engineering and
Quality Assurance
Office of Inspection and Enforcement

Technical Contact: M. S. Wegner
301-492-4511

Attachment:
List of Recently Issued IE Information Notices

This article was prepared by the Vermont Vanguard Press for publication through the National Association of Alternative Newsweeklies, of which Illinois Times is a member.

Pumps critical to the safe emergency cooling of reactor cores in at least twenty-nine nuclear power plants, four of which are in Illinois, may be seriously defective and may fail in use, according to five former employees of the Hayward Tyler Pump Company in Burlington, Vermont.

If such pumps failed during a loss-of-coolant accident, such as occurred at Three Mile Island, a core meltdown could result. Such an accident, according to the Nuclear Regulatory Commission (NRC), could kill tens of thousands of people in a thickly settled area, injure up to a quarter million more, and cause billions of dollars in property damage.

"I personally would never live in the vicinity of a nuclear facility that had Hayward Tyler pumps in any sort of critical capacity," says Alfred J. Thomas, a former methods technician for the manufacturing department at Hayward Tyler. "I have no faith in the product that I was involved with in manufacturing."

Commonwealth Edison, Chicago's electricity utility, has pumps manufactured by Hayward Tyler at four nuclear plants under construction, two at Byron, south of Rockford, and two at Braidwood, south of Joliet. Unlike some of the pumps made by Hayward Tyler, those at Commonwealth Edison's plants are not directly related to the Emergency Core Cooling System, the most critical safety system in a nuclear plant. They are, nonetheless, important to the overall safety of the plant in an emergency and CE officials are taking the allegations of shoddy workmanship seriously.

"We can't afford any slip-ups," said Jim Toscas, nuclear communication specialist with CE. "We have already notified our engineering staff to investigate." Toscas said the pumps in question, two at each of the four nuclear plants, are used to supply cooling water to a diesel engine on a backup electrical power generator. The generator would be used to supply power to the nuclear plant in the case of a major storm or earthquake disrupting the plant's normal electric supply. "If there were a blackout, this generator would be needed to supply power to the Emergency Core Cooling System," Toscas said, "so in that sense it is related."

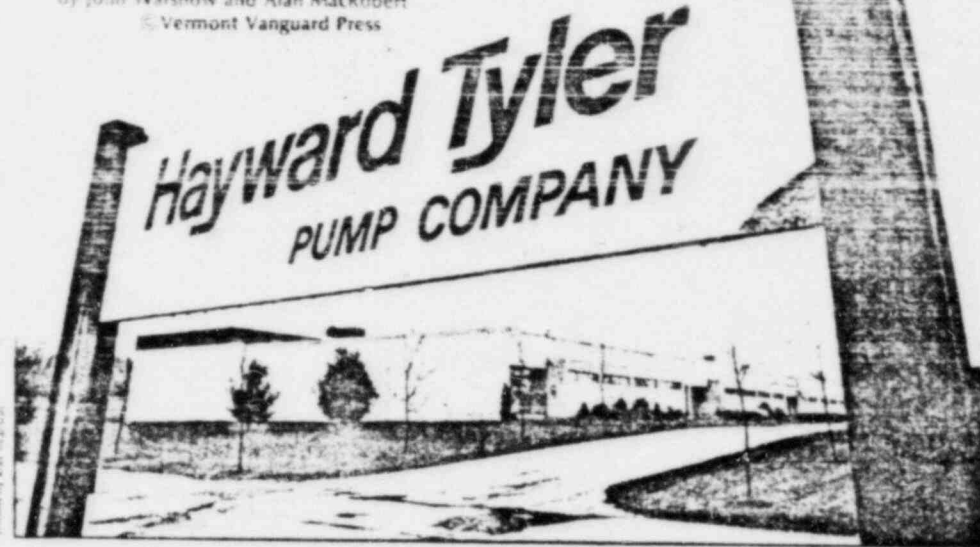
Toscas said Commonwealth Edison does not routinely conduct its own quality tests on such equipment but instead takes the word of the supplier company that the part is free of defects. "They're bound by their program to conduct these inspections," he said. "You can't go in and inspect everything yourself." But former employees say taking Hayward Tyler's word about the quality of its pumps could be a fatal mistake.

Alfred Thomas and the four other ex-employees—machinist David DesLauriers, manufacturing secretary Janice Perraudin, former chief

Nuclear time bombs?

Workers say they built faulty pumps that could cause a nuclear power plant accident

by John Warshaw and Alan MacRobert
Vermont Vanguard Press



Company headquarters in Burlington, Vermont.

welder Fred Lozon, and another ranking ex-employee who wishes to remain anonymous—recently presented affidavits spelling out their charges to the U.S. House Interior Committee's Subcommittee on Oversight and Investigations, chaired by Rep. Edward Markey (D-Massachusetts). All five were employed by Hayward Tyler for between one and three years between 1976 and 1980. Three of the five say they quit voluntarily for reasons of professional ethics. One was laid off, and one was fired.

Their statements to the subcommittee run to 170 typewritten pages, mostly sworn under oath and including some company documents. They allege dozens of instances of faulty manufacture, corner-cutting, ignoring of defects, and violations of the strict record-keeping required for work done on critical nuclear power plant components.

Company officials have denied these charges, and term them "utterly without merit." They say the pumps in question routinely pass inspections by all the parties involved with them. They say they welcome an investigation.

After receiving the affidavits, Congressman Markey's subcommittee on December 11 asked NRC

Chairman Nunzio J. Palladino to conduct a full investigation of the workers' charge, one that would include testing and X-raying of a "relevant sample" of pumps that have been received by Hayward Tyler's nuclear customers—mostly nuclear plant construction firms and electric utilities.

Says Congressman Markey, "If these allegations prove correct, I am shocked that the NRC failed to turn up evidence earlier in its previous probes of quality assurance at the plant. If Hayward Tyler Company pumps of major safety significance to nuclear power plants have indeed been sent out with serious quality defects, we need to move swiftly to discover where these pumps are located, to forestall a possible nuclear accident worse than Three Mile Island."

NRC investigators are at the Vermont plant this week.

The Hayward-Tyler Pump Company employs 155 people and has sales of \$10 million to \$12 million a year, according to a 1981 statement by the com-

Ex. F

Exhibit F

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pany's then-president Dennis Chalmers. He said 40 to 50 percent of the company's business is nuclear.

Most of the five ex-employees had never discussed their allegations among themselves before John Warshaw of the *Vermont Vanguard Press* brought them together during his eleven-month investigation for the Vermont alternative newspaper. But their allegations are very similar, and they paint an alarming picture of shoddy manufacturing practices which top management at the plant knew about but failed to correct.

How could Hayward Tyler have passed routine inspections by the Nuclear Regulatory Commission and the American Society of Mechanical Engineers (ASME), and two special investigations by the NRC and one by the FBI?

Fred Lozon, former chief welder for Hayward Tyler, says in his deposition to the Markey subcommittee, "ASME...looks at the paperwork, whether it was signed off right; they look at the date, and whether each job was done in order. They never look at the part....It was the same when the NRC came through. They'd come out and look at the paperwork again but not look at the part."

"...If this is their attitude in auditing and inspecting certain parts, you can come up with any kind of part, you can put anything out there—you could use Mattel parts as far as that goes, plastic toy parts."

In her sworn statement, Janice Perraudin, employed as a secretary to the manufacturing manager at Hayward Tyler from 1978 until January 1980, says that in November 1979 (shortly before she was fired without explanation), she personally altered crucial paperwork on orders from her boss.

"One week before the ASME inspection for the 'N-stamp' [nuclear manufacturing authorization] renewal, my work consisted of updating, retyping, and changing documents," she states. "The company's purpose for this was to make all of the manufacturing practices and inspection results previously performed conform to the guidelines of the revised Quality Assurance Manual."

"I got the feeling I was to cover up for all the mistakes out in the shop," she added during an interview.

These various allegations might never have seen the light of day had it not been for the determination of machinist David DesLauriers and his attorney, fellow Vietnam era veteran Tom Bailey. They met at a local veterans' center. Bailey represented DesLauriers in unemployment hearings when he quit his job in late 1979 in disgust over alleged poor manufacture, after working a year at Hayward Tyler.

In the course of his unemployment hearings, DesLauriers charged that Hayward Tyler was grossly negligent...in their disregard for product safety." He said that parts for nuclear pumps were being machined without the required approval of inspectors; unfinished pumps were being sent out to utility plants; management was continually overriding in-house inspectors in order to approve use of rejected pump parts; contracted blueprints, parts, and designs were altered without the required approval of the customers; and paperwork was routinely forged or altered to cover up the deficiencies. All



Janice Perraudin and David DesLauriers: accounts for hasty manufacture, broken regulations, and altered documents.

these charges have been repeated in the sworn and signed affidavits to Markey's subcommittee.

Bailey then repeated the charges to John Warshaw of the *Vermont Vanguard Press*, who conducted an exhaustive investigation that included dozens of interviews and collection of documents from the FBI, NRC, and the Vermont Department of Labor and Industry through the Freedom of Information Act.

No one at Hayward Tyler would respond formally to the allegations despite repeated calls. Later, Larry Clark, manager of corporate communications for Indian Head, Inc.—the New York-based multinational holding company that owns Hayward Tyler, explained that all questions should be directed to him.

When first contacted, Clark said he could not answer questions about Hayward Tyler because he was unfamiliar with the plant and had never been there. He later presented the following statement from the company:

"We believe allegations of poor quality control in the construction of 'N-rated' pumps at Hayward Tyler's Burlington, Vermont plant to be utterly without merit. Any pump or replacement part for any pump that is sold for use in a nuclear facility must pass a variety of inspections—by regulatory third-party inspectors, inspections by the product manufacturer, in this case Hayward Tyler, and by the purchaser. Furthermore, Hayward Tyler has never received a product quality complaint from purchasers of its pumps for installation in nuclear facilities....It is our policy to operate within the spirit and letter of all laws and regulations and to conduct all our businesses with the highest moral and ethical standards. Indian Head believes the practices at

Hayward Tyler reflect that mandate."

The most critical of the various nuclear pumps manufactured by Hayward Tyler are those used in pressurized water reactor emergency core cooling systems (ECCS). Flawless operation of these pumps is essential to the functioning of the system in an emergency.

Nuclear fission in a power reactor creates heat. The main reactor coolant system pumps water through the reactor core; the water transfers the heat to the feedwater system where it is used to produce steam that drives turbine generators to produce electricity.

A break or significant leak in the reactor coolant system—a loss-of-coolant accident—is the type of accident nuclear plant operators fear most. The pumps in the ECCS must then immediately start flooding the reactor core with thousands of gallons of water a minute to keep the core from overheating. If the ECCS should fail, water might no longer cover the reactor fuel, which would then become white hot and begin to melt, possibly eating through the reactor pressure vessel and the containment building, and releasing billions of curies of lethal radioactivity into the environment.

According to workers who built and handled ECCS pumps, some of those pumps will fail shortly after going into operation under accident conditions.

Before joining Hayward Tyler, Al Thomas served in Vietnam as a helicopter mechanic and crew chief.

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then worked for the Electric Boat division of General Dynamics in Groton, Connecticut, manufacturing parts for the Navy's nuclear submarines. He worked for several months in Hayward Tyler's shop as a machinist before being promoted to become a methods technician in the front office. He declared in his affidavit to Congressman Markey, "Pump castings, impellers, shafts, back covers—any given pump component was at one time or another, in my experience, railroaded through the shop without the benefit of compliance with the Quality Assurance System."

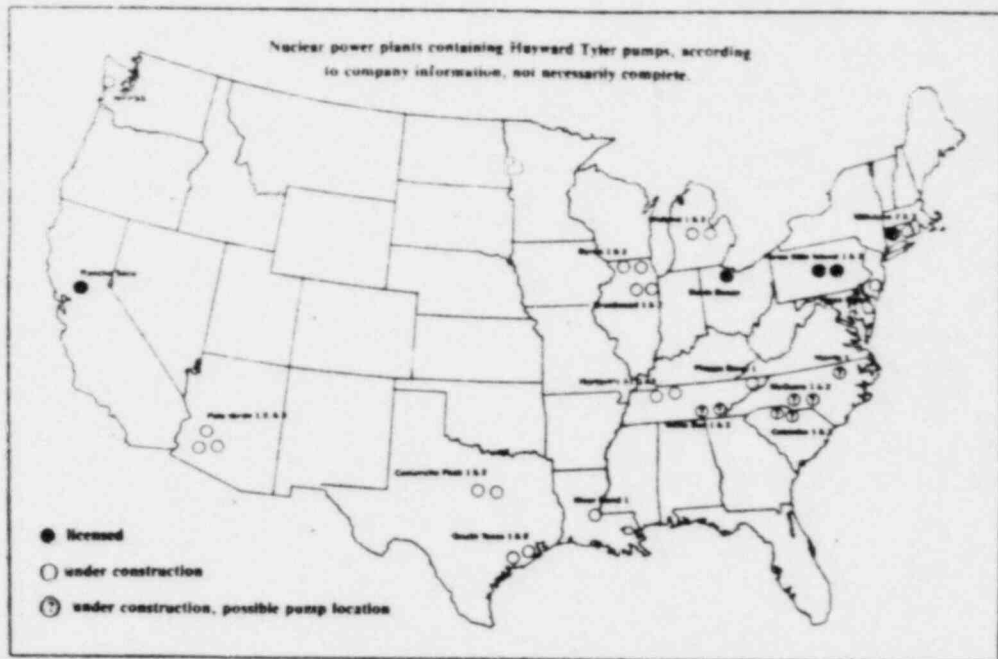
Dave DesLauriers came to Hayward Tyler directly out of the Navy, where he performed "sub-safe level work in relation to valves and pumps that were used in submarines." He was hired in the fall of 1978 as a horizontal boring mill operator.

"I had on numerous occasions helped the assembly workers assemble some of those pumps that were going out for shipment," DesLauriers wrote to Markey. "I found bearings being put on shafts with sledgehammers, and Crazy Glue being used on pumps....In the navy...when we found cracks and defects in casings, we had them immediately melted down and then we remade the casings....I did not see this happen at Hayward Tyler."

"I know on various occasions pumps went out to different facilities around the country missing some of their key internal parts. One pump went out to a company on the West Coast and did not have its impeller, its bearings, or anything inside. [It] just had the shaft that the impeller would ride on."

If these allegations are accurate, one might wonder why the defects have not been detected by the customers. Robert Pollard, nuclear safety engineer with the Union of Concerned Scientists in Washington, D.C., and a former licensing project manager for the NRC, thinks he may have an answer. Pollard quit the NRC in 1976 after working for the agency for six and a half years because, he says, "I was convinced the NRC was more interested in protecting the industry than the public."

"You have some deficiencies that are potentially



sleepers—that is, they will pass the incoming inspection," Pollard says. "You may wind up having a plant in operation with a defective pump whose defect is not going to show up unless there is an accident. These pumps are not required to perform at their design capacity except during an accident."

Pollard adds that NRC inspections of plants under construction are woefully inadequate: "It's entirely a paper inspection. They don't do any inspection of the equipment, and they don't even inspect all the paper. It's a spot inspection of the paper."

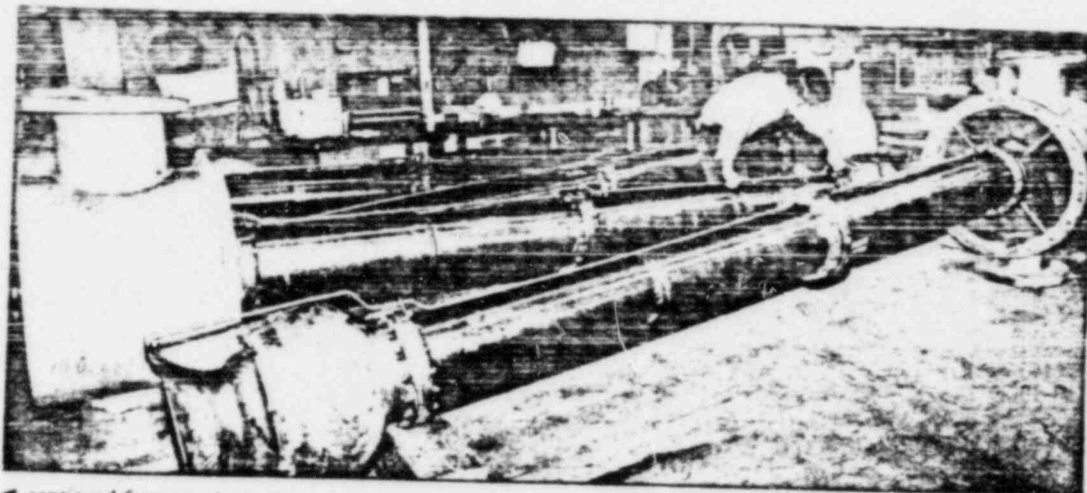
How could this all happen? The high-ranking ex-employee who wishes to remain anonymous ex-

plains the circumstances in which irregularities at Hayward Tyler became, he says, a matter of routine.

"In the beginning, things went rather smoothly," he wrote to Markey's subcommittee. "I worked long hours but enjoyed them. When we started building nuclear pumps, the trouble began...."

"After about two and a half years, we weren't standing up to our production commitments with Stone Platt [then the parent company]. Management was told they would make these commitments or be out on their ears. To make a long story short, the whole place turned into a human time bomb—a complete state of chaos. Men were working an

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Vertical service water pumps for nuclear power plants under construction in the Hayward Tyler plant.

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 unbelievable amount of hours under unheard-of pressure....

"Things started getting worse instead of better. The deadline was getting close. Management ran around like escaped lunatics, but hell or high water, pumps were being shipped. Somewhere, we lost the feeling of becoming the best pump company in the world. Men were tired and manners were few. Everyone was at their wits' end. Still, management insisted on more overtime.

"A pair of shoes should not be built under these conditions.... Parts were remachined after inspection; employes were asked to sign off on route sheets who did not perform the operation; men were complaining about a part not being up to standard and were very smoothly convinced by management that the part was okay; when a contract called for a percentage of pumps in that contract to be tested, the ones we were not so sure of were naturally the ones we did not test...."

The ex-employees cite the second shift as the time when irregularities were most commonplace. "The second shift was tacitly acknowledged as the shift that got the work done," says Al Thomas. "One of the reasons behind that was that we didn't have to deal with engineers and the Quality Assurance and Quality Control people. There was a great deal of

assembly work done at night."

Thomas claims that during the second shift machine operators were often told to forget the paperwork, forget the Quality Assurance system:

"You know what has to be done—I want the base plate (or whatever component) finished when we get it in the morning," is the kind of thing Thomas said he heard.

"It's very possible that welding work was done by others than me or the welders working under me," Fred Lozon explains. "There were cases of work we started to do, that weren't finished at the end of the shift. The next day they weren't there—they were completely gone—we had no idea who did them. What they did at night I have no idea."

The unnamed employe says that in his mind, "The biggest thing of all was the impellers [rotors that propel water through the pump]. Some would not fit correctly and didn't run true or concentric. They were knocked around, tightened and loosened until they would run true. There were also the keys for the impellers which did not fit, and were ground by hand till they ran true. If a pump was run to a maximum RPM, they could become loose or out of balance and seize a pump up or shake it to bits. I believe these impellers are supposed to be interchangeable; and if they are, and a change is made in the field not knowing this, it would be a catastrophe."

The big question now is whether the NRC will follow through on the request from Markey's committee to carry out an intensive investigation of the several hundred pumps in question, including X-raying and dismantling a significant number of them to look for defects.

If the NRC does so, the question will become whether it can be trusted to do a competent job. Robert Pollard of the Union of Concerned Scientists says, "I don't think the NRC has the capability to do it. They're going to have to contract it out to some national laboratory or some other place."

Pollard is also apprehensive on another score: "The NRC has this tendency to...protect themselves.... The people who wrote these allegations may become the target of the investigation rather than the company or the pumps."

Congressman Markey shares Pollard's concerns. "The onus should not be on the five former workers at the plant who have spoken out; they should be congratulated," Markey stated before sending his letter to NRC Chairman Palladino. "The onus should be on the NRC and the Hayward Tyler Pump Company to show that the pumps are indeed safe."



AFFIDAVIT OF EDWARD M. GOGOL

My name is Edward M. Gogol, and I am a professional author and consultant on nuclear power plant hazards, costs and benefits. I have studied these issues since 1974, with particular reference to Commonwealth Edison's nuclear plants, and have participated in several proceedings before and petitions to the Nuclear Regulatory Commission. I received a B.S. degree in chemistry from the University of Chicago in 1976 and have since done graduate studies in environmental health science. I am familiar with the history of Commonwealth Edison's infractions of NRC regulations for which it has been fined. Recently I have made an exhaustive study of all public information concerning construction deficiencies at Edison's LaSalle County Station, including sworn affidavits from construction workers, and including NRC documents obtained from the NRC under the Freedom of Information Act.

I have read numbers 4 through 16 in Edison's "Material Facts For Which There Is No Genuine Issue". The affidavits from LaSalle construction workers and the NRC's own documents concerning the LaSalle station indicate that indeed there are grounds to question Edison's qualifications and willingness to build and operate the Byron station safely.

Edison alleges that it employs people for its nuclear operations who "are dedicated to safety." This assertion is directly contradicted by the construction workers who have given sworn affidavits concerning the LaSalle nuclear plant. These workers described how adherence to correct procedures was a low priority at LaSalle due to management pressure to get the job done quickly no matter what the consequences. These workers also described how Edison managerial personnel knowingly and deliberately covered up construction defects and lack of adherence to specifications, ordered workers to follow unsafe and and incorrect procedures, and threatened that any worker who described these conditions to NRC inspectors would be fired. Specific construction flaws and defects included:

- a. Concrete work is defective and honeycombed with holes;
- b. The steel reinforcing rod structures within the concrete were indiscriminately cut and severed, drastically weakening the structures;

- c. There are many flaws in high-density concrete block walls used for radiation shielding;
- d. Welding was done without adequate training or adherence to quality control procedures;
- e. Piping was defective, and Edison altered color-codes on equipment to make it appear as if the correct component had been installed when in fact it had not;
- f. Quality control and inspections were inadequate; construction deficiencies were covered up.

The following material is directly quoted from these affidavits, which were filed with the Nuclear Regulatory Commission on March 24 and April 28, 1982, or from material obtained from the NRC via a Freedom of Information Act Request 1982. The full text of these allegations is appended hereto:

"I have seen enough cases of shoddy construction [at LaSalle] that my question is not a shot in the dark. Most of the time the poor work was because of pressure to rush the job.

* *

"I repeatedly saw the results of sloppy concrete pours - holes and honeycombs in the concrete."

* *

"I performed core drilling in all buildings, at all elevations, throughout the plant site...From the time I began drilling at LaSalle in June, 1978 until about February, 1980, it was the usual practice, upon contacting metal reinforcement or rebar during core drilling, to drill through the metal rebar. I was instructed to follow this practice, and to the best of my knowledge, it was the general practice among the other core drillers.

"On one occasion I drilled a 6" diameter hole through rebar in the reactor building of Unit 1. It was at a place where all the steel tied together, and I removed about 25-40 pounds of steel. It took me 2 or 3 days to drill this hole. [The foreman] instructed me to keep drilling this hole, and he added, "If you can't do it, we'll get someone who can."

* *

"Construction crews core-drilled right through the reinforcement

bars...Reinforcement bars may have been broken throughout the plant. The construction crews routinely did not use metal detectors to locate the rebar. They would just start drilling. The quality control inspectors did not seem to care. Quality control was more like a joke at LaSalle than anything else."

* *

"I do not trust the mortar work at LaSalle. Sometimes the problem was that the mortar was not used...When I complained to a foreman he said that Quality Control did not care...Even when mortar was used, it was shoddy quality. There was too much sand in the mortar...Around a third of the time my superintendent was present and ordered me to add extra sand...There were mortar tests, but the superintendent always knew when the tests were scheduled and let me do it right then."

* *

"Sometimes Morrison project management says to accept some things that are not according to our standard operation procedures. For example welders may be certified to a weld procedure after the weld is made. Sometimes, if a welder is not qualified on a weld he has made, the management says, 'We will call it another kind of weld.'"

* *

"The foremen don't appear to know what welding procedures apply...Often the foremen say sloppy work is okay because it is in some place hard to see. The foremen say they will never see it; it is okay."

* *

"The installation of parts did not always match their location on the blueprints. Sometimes one part was installed in a location where the blueprints called for another...For instance, the metal in hanger supports is identified by a color code. When construction had the right size supports but not enough of the right color, they just repainted the color on the hanger."

* *

"Management always knew two days in advance of NRC inspections and had us clean up the plant superficially. That was good enough. The NRC never took initiatives to talk to us workers... We always wondered why the NRC didn't come when the utility didn't know in advance."

* *

"All too often management would hire Mexican or other foreign welders on

the street by obtaining temporary work permits. These employees were not always well qualified and frequently could not communicate well due to language barriers. They were very well paid and were totally at the mercy of the company to keep their jobs. As a result, they could not be counted on for thorough, professional work independent of pressures to speed production.

"Another reason for my doubts is the management attitude at LaSalle, which was heavy-handed toward workers who raised safety concerns...Management officials harassed the workers who spoke out. There were also utility spies among the construction workers. On balance, employee morale was very low. Most employees I spoke with had become apathetic. They felt that their complaints would not make a difference except for themselves - they might lose their jobs."

* *

"Many times I have overheard a quality control inspector tell construction that something was done wrong and that he would be back. Soon the inspector would come back and say the defect was OK after all."

Clearly, Edison's lower-level employees ostensibly responsible for quality assurance at LaSalle carried out their duties in a manner which may have produced a severely flawed and deficient structure. Concerning the high-level Edison personnel responsible for the overall quality assurance program, one of two conclusions must hold: either (1) Edison's top management knew of, permitted, encouraged and bears ultimate responsibility for these construction defects and violations; or (2) Edison's top management did not know of these defects and violations, which casts doubts on the entire competence and efficacy of these personnel.

The NRC is currently investigating the evidence put forward by construction workers at LaSalle (in response to a petition filed by the State of Illinois requesting a suspension of licensing activities at LaSalle and full public hearings regarding this evidence). Regardless of the eventual outcome of this investigation, the sworn affidavits by construction workers prove that any allegation that Edison's employees put safety first is on its face untrue.

Edison alleges that the quality assurance program to be employed at Byron during station operation meets the criteria set forth in 10 CFR Part 50. Edison has made similar allegations concerning construction activities at

LaSalle. Since these allegations are on their face untrue at LaSalle, Edison's allegation concerning Byron should be viewed by the NRC with the strongest scepticism.

Edison alleges that it has created "corporate level departments to utilize experience from each of its operating stations to improve operation at all stations", that it has "engaged a group of distinguished scientists and business leaders from the Chicago area to evaluate the effectiveness of its nuclear operations, and has improved its corporate control of nuclear operations based on recommendations made by the panel." If this were truly the case, it would have been Edison itself, not the State of Illinois or the Government Accountability Project, which has brought the evidence of construction fraud and deficiencies at LaSalle to the NRC's attention. Clearly, these "corporate level departments" and "business leaders" are mere window-dressing, designed to make it look as if Edison is dealing with a problem.

Edison attempts to down-play the significance of the many violations of NRC regulations for which it has been fined. In reality, Edison's past record casts severe doubt on its technical competence to operate a plant as technically complex and demanding as a nuclear plant. At one point in the last several years, NRC Regional Director James A. Keppler was quoted as saying that Edison's management at the Zion plant was so lax that "the right hand doesn't know what the left is doing". This attitude on the part of Edison's management is directly in contradiction with the utility's claim to put safety first.

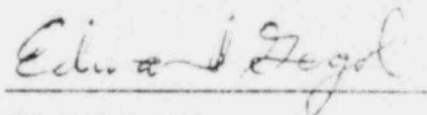
Edison alleges that the number of deficiencies identified by NRC inspectors at Edison plants has declined over the last five years. Regardless of whether this allegation is true, the allegation equally could imply that Edison has become more adept at covering up these deficiencies from the NRC inspectors or that the NRC inspectors themselves have become more lax. Evidence that such coverups occurred at LaSalle is in the hands of the NRC; there is no reason to suppose that such coverups were not occurring at Byron.

Edison alleges that its Quality Assurance Programs have been reviewed by a variety of outside agencies. Clearly these must have been "paper reviews". The question must again be asked: why did not these outside agencies, or Edison itself, report to the NRC the huge amount of evidence of construction defects at LaSalle which has been brought forward in the last few months by the State of Illinois and other sources?

Ultimately, Edison's assertions are based on affidavits from several of Edison's high level employees. Clearly these employees' allegations cannot be taken at face value; their allegations are opinions, not "material facts." Only an investigation by an outside body which would interview lower-level reactor operators, engineers and technicians while promising complete anonymity to these personnel, could adequately assess to what degree the company actually adheres to quality assurance standards and to what degree the company makes safety its first concern. Such an investigation would have to be done by an outside body and would have to promise workers complete anonymity or it would have no validity: as the LaSalle workers made clear, they are afraid that if they do make unsafe conditions public or complain about them even internally, they will be summarily fired.

Over the last five years I have interviewed numerous Edison employees at Dresden and at LaSalle, including several reactor operators or reactor operator trainees. Many of these employees have had attitudes showing that safety is not a concern at all; in many cases, the employees believed that nuclear plants could not be unsafe, and they indicated a great deal of ignorance of the special dangers of nuclear power which have necessitated that plants be located in relatively unpopulated areas, that evacuation plans be in place for all residents located within 10 miles from the reactor, and that a special government bureaucracy be created to regulate nuclear plants. It is this ignorance which is perhaps the most frightening aspect of Edison's inability to operate nuclear plants safely: the people running the plant have little or no awareness of the special hazards of the plant.

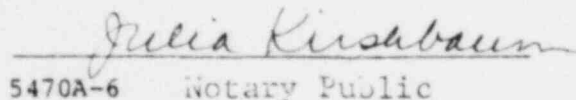
I have read this six-page affidavit; it is true and complete to the best of my knowledge.



Edward Gogol

Date _____

Acknowledged and sworn to
before me this 22nd day
of September, 1932.



5470A-6 Notary Public