

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

REGION III

Report No. 50-373/78-06; 50-374/78-05

Docket No. 50-373; 50-374

License No. CPPR-99; CPPR-100

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

Facility name: La Salle County Nuclear Station, Units 1 and 2

Investigation at: La Salle Site, Seneca, IL

Investigation conducted: March 6-14, 1978

Investigator: J. E. Foster

J. E. Foster 4/14/78

Inspectors: T. E. Vandel

T. E. Vandel 4/18/78

K. R. Naidu 4/18/78

Reviewed by: Charles E. Norelius
Assistant to the Director

Charles E. Norelius 4/24/78

Investigation Summary

Investigation on March 6-14, 1978 (Reports No. 50-373/78-06; No. 50-374/78-05)

Areas Inspected: Special, unannounced investigation into construction procedures and documentation; review of pertinent records, inspection of construction activities, interviews with construction personnel.

The investigation involved 84 inspector-hours onsite by three inspectors.

Results: Of the areas investigated, one item of noncompliance was identified in the area of construction practices related to welding of electrical equipment supports (Findings section).

INTRODUCTION

The La Salle County Nuclear Power Station, Units 1 and 2, licensed to Commonwealth Edison Company (CECo), are under construction in La Salle County, Illinois. Sargent & Lundy is the Architect-Engineering firm for the plant, which is being constructed by Commonwealth Edison. Both Units are Boiling Water Reactors, Utilizing General Electric nuclear steam systems.

REASON FOR INVESTIGATION

As part of a continuing study of the functions of the Nuclear Regulatory Commission, the U.S. General Accounting Office (GAO) conducted interviews of construction personnel and reviewed quality control documentation at the La Salle construction site. During GAO's interviews with construction personnel, some individuals made comments which appeared to indicate construction problems and/or items of noncompliance with NRC regulations. Following receipt of the comments from the GAO, RIII initiated an investigation to determine their substance.

In addition, an individual employed at the La Salle site contacted RIII independent of the GAO information, and alleged that the design and welding of electrical equipment supports was improper at the La Salle site. This allegation was investigated concurrently with the comments developed by the GAO.

SUMMARY OF FACTS

During November 7-18, 1977, representatives of the U.S. General Accounting Office interviewed construction personnel at the La Salle Nuclear Power plant site as a part of a study of the functions of the NRC. During the interviews, four individuals made comments which were considered by GAO representatives to indicate construction problems and possible noncompliance with NRC regulations.

The comments made by these individuals were referred to the NRC for investigation.

In addition, on January 31, 1978, an individual employed at the La Salle site contacted RIII and alleged that the design and welding of electrical cable tray supports in the La Salle Unit 1 containment were improper.

All of the individuals who had made comments to the GAO representatives were contacted by telephone, and three of the individuals were interviewed at their residences. One individual had left the site, and was interviewed by telephone. The individual who had contacted RIII independently was contacted by telephone and interviewed off site.

Interviews with two of the individuals who had made comments to the GAO representatives revealed that they had not worked on safety-related equipment, and their comments did not reflect any noncompliance with NRC regulations. Investigation of the concerns of the remaining two individuals, who had made statements to the GAO representatives related to concrete consolidation practices, welder qualifications and welding documentation, did not indicate any violations of NRC regulations.

Investigation of the comments made by the individual contacting RIII independently indicated an item of noncompliance with NRC regulations. The RIII investigation revealed that proper quality control had not been exercised in the welding of supports for electrical cable trays in the Unit 1 containment.

The CECo Project Superintendent was informed of the findings of the NRC inspection of the welding on cable tray supports, and voluntarily halted further work in that area until proper quality control measures could be established.

The CECo Project Superintendent indicated that the contractor performing the welding on cable tray supports would be required to revise their procedures and inspection criteria, and that the revised documents would be reviewed by CECo Quality Assurance and by Sargent & Lundy for acceptability. These measures would be satisfactorily completed before the contractor would be allowed to resume work on the cable tray supports. CECo representatives indicated that RIII would be notified when the contractor was allowed to resume work on the cable tray supports.

CONCLUSIONS

1. The comments of two individuals, referred to the NRC by GAO, did not pertain to safety-related equipment, and did not indicate items of noncompliance with NRC regulations.
2. The comments of two individuals, referred to the NRC by GAO, pertained to safety-related equipment, but investigation of the comments did not indicate that noncompliance with NRC regulations had occurred.
3. The allegations of the individual who contacted RIII independently of the GAO were essentially substantiated, and indicated an item of noncompliance with NRC regulations.

DETAILS

Personnel Contacted

Commonwealth Edison Company

L. J. Burke, Site Project Superintendent
P. F. Manning, Quality Assurance Engineer
R. M. Pokron, Quality Coordinator
R. T. Rose, Project Structural Engineer
W. J. Groszko, Field Engineer
B. M. McCann, Quality Assurance Supervisor
J. W. Giesecker, Quality Assurance Engineer
D. A. Johnson,
M. E. Lohman, Field Engineer
L. J. Tapella,
W. M. Ruof,
E. R. Wendorf, Field Engineer
D. J. Skoza, QA Engineer
B. A. McAndrew, Project Mechanical Supervisor
F. Pettejo,

H. P. Foley Company

R. M. Lundgren, Project Manager
D. F. Wiegert, Manager of Quality
B. Hirst, Director of Quality

Morrison Construction Company

K. Kranz, Welding Superintendent
R. C. Shulz, QC Supervisor
S. A. Damle, QA Manager
T. Meyers,
M. Wherry, QC Welding Supervisor

Walsh Construction Company

M. R. Dougherty, QA Supervisor

General Electric Company

C. T. Brinson, QA Representative
R. E. Spencer, Site Manager

Individuals

Individuals "A" through "E"

Scope

This investigation focused on (1) comments referred to the NRC by the U. S. General Accounting Office, and (2) on allegations concerning the design and welding of supports for cable trays at the La Salle construction site.

During February 25-March 3, 1978, telephone contacts were made and interviews held with four individuals.

During March 6-9, and 14, 1978, representatives of RIII visited the La Salle site, reviewed records, observed construction work in progress, inspected welds, and held discussions with licensee and contractor personnel.

On March 8, 1978, a fifth individual was contacted by telephone, and interviewed.

On March 14, 1978, an investigation/inspection exit interview was held with licensee and contractor representatives at the La Salle site.

Findings

Comments Referred to the NRC

The following comments, organized by the individual who made the comment, are those which were referred to the NRC by the GAO representatives for investigation:

1. Comment (referred from GAO)

Concrete is over vibrated at this site. I have never seen concrete vibrated as it is at this job. Concrete is vibrated until all the aggregate has settled at the bottom and foam has formed on the top. This results in some areas of the concrete being soft. Some areas are almost like chalk which can be scrapped away with a small bolt or nail. Evidence of incorrect vibration is most noticeable where wall pours join one another. Those areas that have been detected have been repaired. However, it is doubtful if all like areas have been detected. Most of the masons that I know feel as I do, that concrete is over vibrated.

Concrete samples are taken prior to vibration (of the concrete). If such tests were made before and after vibration, the results would be surprising. This would show that vibration is performed incorrectly.

Findings

Individual "A" was interviewed by RIII representatives on February 27, 1978. He indicated that during some past concrete placements, laborers had allowed their concrete vibrators to remain in one location for an extended length of time, and had sometimes used the vibrators to push the concrete into place in the concrete forms. Individual "A" stated that these actions may have resulted in concrete which was partially separated, as shown by the presence of excessive water and foam on the concrete surface.

Individual "A" indicated that the overvibration of concrete did not occur often, and that the laborers have been doing a better job in recent months, moving the concrete vibrators as required. He indicated that it was possible that the improper concrete vibration may have been done by individual laborers who are no longer employed at the site. Individual "A" indicated that the concrete placement crews had been reduced in recent months, due to the decreasing volume of concrete placement work, and the contractor had retained the better workers.

Individual "A" was questioned as to the locations of improperly consolidated concrete, and he indicated that there had been problems at elevation 815', along the J-line wall of Unit 1. He stated that indications of improper concrete consolidation could also be found by inspecting the joins of concrete pours.

Individual "A" indicated that Quality Control inspectors observed the concrete placements closely, identify any improper practices, and closely observe any repair work that is done on concrete. He stated that there was very little honeycombing of concrete on the site, and that any observed honeycombing or otherwise improper concrete which was identified was carefully repaired.

Individual "A" stated that he felt that the concrete should be sampled and tested after it had been vibrated, as the sample would be more representative of the finished product.

The Walsh Construction Company (Walsh) procedures for vibration of concrete were reviewed, and found to be acceptable. Their procedures require that concrete vibrators be held stationary for approximately five to fifteen seconds, then moved, and concrete is not to be moved horizontally with a vibrator. Records reviewed indicated that training in vibration procedures had been given during September 1976, and July 1977.

Walsh nonconformance reports were reviewed for indications of improper consolidation of concrete. Several nonconformance reports noted improper consolidation of concrete due to debris in the concrete forms, but no references to overvibration of concrete were observed.

It was found that the indicated problem area, at approximately elevation 815', had been identified by NRC inspectors during an inspection on October 4, 1977 (IE Inspection Reports No. 50-373/77-11 and No. 50-374/77-10).

The NRC inspectors found that the concrete in that area had several honeycomb areas "caused by debris, i.e., paper, wood, polyurethane material and scrap wire which was not cleaned out prior to concrete placement." The licensee was cited for an item of noncompliance regarding improper cleaning of forms, and the repairs made of the area were inspected during later NRC inspections.

On March 14, 1978, RIII representatives witnessed concrete placement activities in Unit 2 (Pour #2RB-19MW-5,6,7, and 8), with particular attention to concrete vibration practices, and no items of noncompliance were observed. Inspections of several joints between concrete pours indicated that some areas had been repaired, but the size and quantity of such repairs did not appear abnormal.

The American Concrete Institute, in Standard 309, titled "Consolidation of Concrete," in Chapter 7, Recommended Vibration Practices for General Construction, Section 7.7, addresses under-vibration and overvibration. It notes that "Normal weight concretes which are well proportioned and have the recommended slump are not readily susceptible to overvibration. Consequently, if there is any doubt as to the adequacy of consolidation, it should be resolved by additional vibration." The section does note that overvibration can occur due to careless operation of equipment, or if the vibration is "many times the recommended amount."

A review of the specification for concrete Class BA-45, which is commonly used for safety-related concrete work at La Salle, indicated that it would be less susceptible to overvibration than many mixes, as it is a relatively dry mix with a narrow band of aggregate size.

Test sampling of concrete after vibration is not required by the Walsh procedures, or applicable concrete codes. Walsh representatives indicated that sampling of concrete after it

has been vibrated, and air voids thereby removed, should give an indication of a superior product, compared with samples taken before vibration.

The ACI manual of concrete inspection, ACI Publication SP-2, in Section 10, Testing of Concrete, indicates that "Sampling for purposes of control of quality of the concrete as produced should be performed as the concrete is delivered from the final mixer.... However, specifications may require, or the engineer may designate for a special purpose, regular or occasional sampling elsewhere, such as from the concrete as it is placed in the forms but before it is vibrated."

The allegation regarding overvibration of concrete during concrete consolidation could not be substantiated, and no items of noncompliance with NRC regulations were observed.

2. Comment (referred from GAO)

Sometimes Morrison Project Management says to accept some things that are not according to our standard operating 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." Example: "On an open butt weld the welder has to be qualified for open butt as well as backing plate. He has seen evidence where a window was closed by a welder not qualified, and management has okayed the weld."

Findings

Individual "B" was interviewed by RIII representatives on March 2, 1978. Individual "B" indicated that since his interview with GAO representatives, the Morrison Company (Morrison) had changed their procedures to require that a weld "window" be closed by an open butt procedure. Individual "B" stated that his comment regarding welders being qualified after making a weld that they had not been qualified to perform was related to this procedure. As the procedural change had been made, he stated that his concern regarding this area was diminished.

Individual "B" indicated that other problems existed at Morrison, including the documentation for weld RH-99 in the Unit 2 diesel generator room. He indicated that the documentation for this weld was incorrect in that the wrong weld rod and wrong welding procedure were indicated.

He stated that Morrison personnel often revise design drawings, and there is no change in the revision number on the newly revised drawings. Individual "B" indicated that revisions are often brought about through Mechanical Revision Directives.

Individual "B" stated that he felt that there is insufficient management support for the QC function at the Morrison Company, and that the QC inspectors were somewhat frustrated as a result. No particular incidents were indicated by Individual "B" when questioned for specific instances.

Individual "B" indicated that there had been problems related to welding in the off-gas system located in the turbine building. This system is not classified as a seismic Class 1 system and these comments were not investigated.

A review of documents was performed to determine if any instances of post-qualification of welders had occurred. During the review, it was found that Nonconformance Report (NCR) No. 66, initiated on August 19, 1976, indicated that weld #WRH-123 was performed by an unqualified welder. Mr. Jorge Corerra, the welder involved, was qualified to weld with a backing ring, utilizing Welding Procedure Specification (WPS) P1-3. He was not qualified to perform welding without a backing ring. On August 19, 1976, he performed the above weld without utilizing a backing ring. NRC No. 66 was generated when it was observed that he was not qualified to the procedure required, and he was tested on the same day and qualified to procedure P1-3 without a backing ring.

Records indicated that the Authorized Inspector requested requalification of the welder, stipulating that the qualification weld be radiographed in addition to the standard bend test. On September 9, 1976, Mr. Corerra performed the qualification weld, which was found acceptable.

The weld in question, weld WRH-123, was radiographed as per Code requirements, and unacceptable indications were repaired, re-radiographed and determined acceptable. No other documents related to post-qualification of welders were found during the document review.

The documentation for weld No. RH-99 (weld traveler No. 2RH-T20) was reviewed. Inconsistencies between the carbon copy #7 of traveler No. 2RH-T20 and carbon copy #4 of the traveler were identified. Copy #7 of the traveler indicates that a 36 inch diameter, 2 inch thick pipe (2RH80AB), was welded to a type 4AA closure plate; weld procedure P1-18LS was specified, and

use of weld rod type E7018 was specified for both root pass and fill. A backing ring was specified, however, the use of a backing ring for a double bevel joint where backgouging was not possible is considered incorrect.

Carbon copy #4 of the same traveler indicates the use of weld procedure P1-3LS (instead of P1-18LS), weld rod type E6010 for root pass (instead of rod type E 7018), and a backing ring was specified.

Morrison personnel indicated that in this particular case, all but the seventh and eighth copies of the original Weld Data Report package (consisting of eight copies) had been lost. The seventh and eighth copies were stored in the documentation station in the field. Duplicate documentation was prepared, and the data from the seventh and eighth copies of the report was transferred. When the new documentation was generated, the seventh and eighth copies of the original package were not destroyed.

Morrison personnel indicated that the new documentation reflected a change from the double bevel joint configuration to a single bevel joint with a backing ring. They stated that this was the reason for the conflicting information contained in the copies of the weld traveler. The backing ring originally specified was acknowledged as an error. Morrison representatives stated that the errors on the two sheets would be corrected.

The RIII inspectors observed the final weld and determined that the appearance of the weld was acceptable. A 1 3/8" weld was specified; a 2" concave weld was observed, whose configuration would meet the required 1 3/8" weld size.

An inspection was performed to evaluate the comment that QC inspectors lack independence, and the comment that sometimes drawings are changed without revising the drawing revision number. The following are the results of that inspection:

- a. The organization chart included in the QA Manual (QAM) as attachment A depicts the QA/QC separation and independence from the project construction staff as required by the ALAB 153 directive. The separate onsite QC staff reports off-site to the corporate QA Manager who in turn reports to the President of the Morrison Company. Further, it was established that a home office QA staff does the onsite auditing of all quality assurance program activities at the site in addition to vendor surveillance activities.

- b. Twenty-six QC inspectors do daily inspections of activities being performed on site. Three senior QC inspectors and eleven QC welding inspectors, whose level of inspection expertise has been established and certified by corporate office examiners, perform the daily routine inspection of the welding activities on a 100% basis.

The welding attributes are listed on a Weld Data Report (Attachment 7E to the QAM) that is prepared in advance for each weld and lists the procedures and acceptance requirements to be involved. Inspection parameters included on the Data Report were considered acceptable.

- c. The inspector visited the Unit 1 containment area and selected a recently completed weld for review of inspection and material documentation. The weld selected, weld WRH 692, of the Residual Heat Removal system, is a weld to the nozzle of the reactor pressure vessel. The weld procedure listed in the appropriate space was P1-47LS revision 1, and the inspector noted that listed above that procedure number was procedure number P1-48LS revision 1. Morrison personnel indicated that procedure P1-47LS, revision 1, dated May 23, 1977, was a consumable insert utilized for this weld and that the P1-47LS, revision 1 procedure is an open butt procedure which was used to close the openings in the consumable insert, used for the root pass inspection (to visually examine the inside of the root pass).

It was noted that a NCR, No. 199, had been issued for the inspected weld (relative to minimum wall variation). Review of records of qualifications for the welding procedures, for the welder qualifications, for the qualification of the inspectors, and for the disposition of the NCR did not identify any items of noncompliance with NRC regulations.

- d. During the review of the concern regarding lack of drawing revisions, the inspector was informed that Morrison is preparing all piping spool and isometric drawings for the piping spool fabrication and installation on site. These drawings, once completed and approved by Morrison, are submitted to the Architect-Engineer (Sargent & Lundy) for review and approval. Revisions to the drawings are controlled by the use of Mechanical Revision Directive (MRD) forms submitted to S&L for review and disposition. Changes thus dispositioned permit fabrication work to continue on

a timely basis, while the final review and/or sign off by S&L of the revised drawings may come at a later date. When approved by S&L, the revision number is changed.

- e. During a discussion with the Morrison Project Manager, it was learned that, for assurance of independence of inspection activity and determination of acceptable welding activity, heavy reliance is placed on the Level III QC Welding Supervisor for final determinations. It was indicated that the QC Welding Supervisor spends much of his time reviewing questionable items of welding. He then provides guidance as to the appropriate actions to take to assure that the item will meet final acceptance. The QC Welding Supervisor stated that he had not experienced any difficulty with either welders or QC inspectors regarding his dispositions.

No items of noncompliance with NRC regulations were observed.

3. Comment (referred from GAO)

Some cable pulls in the service building have been pulled beyond the 270 degree limit without being pulled through a special sleeve or out into a junction box. Cable is often pulled right through a junction box. He has seen junction boxes and conduit pulled off the wall because of the strain on cables when trying to go through more than three 90 degree bends at once.

Findings

Individual "C" was interviewed by telephone by the RIII investigator on March 8, 1978. Individual "C" indicated that his comment was related to the pulling of cable for a welding receptacle in the machine shop. He stated that the welding receptacle, secured to a wall with lead anchors, was pulled several inches off of the wall when cable was pulled through it. Individual "C" indicated that the receptacle would not have been pulled off the wall if a pull sleeve had been utilized. Individual "C" stated that a pipe in the supply house had been similarly damaged during a cable pull. He stated that he had not worked on safety-related cable pulls, nor used cable tensiometers in his work.

Mr. F. Metallo, CECO test engineer, indicated that on November 15, 1977, he had observed the welding receptacle after it had been pulled from the wall in the machine shop common to Units 1 and 2. He stated that he felt that the box was loosely mounted, and

the cable improperly pulled so as to place outward force on the receptacle. He indicated that he was not aware of any similar occurrences.

Foley personnel indicated that there had been a 270 degree limitation on cable bends at one time, but that this was deleted upon review by Sargent & Lundy. A review of Foley procedures indicated that they are required to comply with the conduit drawings, and monitor cable tension with tensiometers during safety-related cable pulls. Maximum tension and minimum bend radius for various cables is referenced in their procedures.

The comment was found to pertain to nonsafety related equipment. No further investigation was indicated, and no items on noncompliance with NRC regulations were observed.

4. Comment (referred from GAO)

He has had no procedures to follow in welding cable trays except the welding markings on some Sargent & Lundy Prints. He had not seen any Foley welding procedures until the day before his interview with GAO. The Foley general foreman gave Individual "D" 1½ hours in the foreman's office to read the Foley welding procedures. The foreman does not appear to know what welding procedures apply. When asked whether a certain cable tray should be full welded or tacked up, the foreman sometimes tell him to do the work as he thinks best and he sometimes tell him to look at the way other trays are done. He had worked on trays located at elevation 715, lines 25, 26, 27, on the column line separating the Auxiliary building and the turbine building.

Often the foreman 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. One hanger arm was positioned such that it hit the cable tray nuts. The foreman bent the hanger arm and told him to weld it rather than moving the arm to fit between the nuts. It was next to the wall so they will never see it.

In February 1977, while working for Morrison, the water intake values for Unit 2 were too large for the pipe so the 12' diameter pipes were split back and then spread to accomodate valve. The welds to repair the pipe often cracked because of the cold weather. Sometimes the actual cracking of the pipe welds would be loud enough to shake the building. There were so many repair welds that the pipe now looks like dried cook spaghetti.

Findings

Individual "D" was interviewed by RIII representatives on February 27, 1978. He repeated the comments made to the GAO representatives regarding the Foley Company, and indicated that the Morrison Company welder qualification program was not being done properly.

Individual "D" stated that he had not been given any instructions to follow in welding cable trays, although he felt that he had used the correct weld rod and welding procedure when working on the cable trays. He stated that he had worked in the Unit 2 turbine building, and in the screen house. Individual "D" stated that he had never observed any QC inspections of his work in either area. Individual "D" also stated that he had performed welding on a radwaste hold-up tank in the lower level of Unit 1, and not stamped his welds with his identifying stamp.

A review of documents and construction drawings was made to verify the designation of the equipment Individual "D" had worked on. Elevation 715', lines 25, 26, 27, on the column line separating the auxiliary building and turbine building were found to be within the turbine building for Unit 2, and were all nonsafety related equipment. The radwaste hold-up tank described (Waste Collector Surge Tank 1WE02T, Specification J-2538) was also found to be designated as nonsafety related.

It was determined through discussions with Individual "D" that the 12" diameter valves commented on were a part of the system supplying water to the condenser for Unit 2. This is not classified as a safety-related system, and no further investigation was indicated in this area.

Individual "D" stated that during his welding qualification test for Morrison, taken in January, 1977, he had observed that an individual taking the test with him had not passed the qualification test, and yet this individual was allowed to perform welding.

A review of Morrison records indicated that no individual with the name provided had been employed by the Morrison Company, and no such individual had taken a welder's qualification test on days when Individual "D" had taken his welding qualification. When later contacted, Individual "D" stated that he might have been incorrect. The names of all individuals who had taken the welding qualifications tests on the same date as Individual "D" had been tested

were reviewed with Individual "D", and he stated that none of the names corresponded to the individual he recalled.

The Morrison weld test records, which include the printed name and signature of the individual taking the weld test, appeared complete, and no alterations were observed.

Individual "D" indicated that he had not been provided with a copy of Quality Control Procedure 5 (QCP-5) until just prior to his interview with GAO representatives. He stated that he was familiar with the contents of QCP-5, but had not been given a copy of the document previously.

A review of Morrison records indicated that Individual "D" had qualified on appropriate welding procedures.

No items of noncompliance with NRC regulations were observed.

Allegation Received Independently

The following Allegation was received at RIII:

5. Allegation

On January 31, 1978, Individual "E" contacted RIII by telephone, and indicated that he felt that the design and welding of electrical cable tray supports in the Unit 1 containment was improper.

Individual "E" was interviewed on March 1, 1978. He indicated that he was concerned because he felt that the supports for electrical cable trays in the Unit 1 containment were not sturdy, and improper welding to the containment wall was being performed.

Individual "E" stated that the electrical cable trays in the Unit 1 containment did not appear nor feel sturdy, and their design did not seem adequate. He indicated that he was afraid that the cable trays would fall down, even when empty.

Individual "E" stated that uncontrolled welding to the Unit 1 containment wall was occurring, due to revision of the placement for electrical cable tray supports. He indicated that he had noticed several instances where a support bracket had been welded to the containment wall, and then removed. He stated that the repair of such areas was not properly conducted, and that there were no quality control inspections of either the welds or the repair process. Individual "E" stated that he was familiar with one of the welders who had welded on the

support beams for the cable trays above the 740 foot elevation, and while the welder was qualified, the welder had trouble with the welds, and they are probably not good welds.

6. Findings

Individual "E" furnished the RIII representatives with the locations of possible problem areas within the Unit 1 containment. These areas were indicated as locations of improper welds or improperly repaired welds. The following locations were provided:

- 99 degrees - vertical member, top weld
- 170 degrees, elevation 750'
- 135 degrees, elevation 740'
- 260 degrees, elevation 744' + 8½"
- 130 degrees, elevation 757' + 6"
- 115 degrees, above airlock door

An inspection of the above areas, of the contractor's procedures, and of design drawings for the electrical cable trays in the Unit 1 containment was performed by RIII personnel. Inspection of the areas provided to the RIII representatives indicated that questionable welds were present at several locations, and that brackets had been placed and removed from several areas.

A review of the design drawings indicated that the cable trays and supports are of conventional design, and were approved by the Architect-Engineer.

The inspectors observed completed welds on the following cable tray support hangers inside the Unit 1 containment building:

Identification	Elevation	Azimuth (Degrees)	Nelson Stud Welds	Fillet Welds	Hanger Weld
2HV14	750'	233	R	A	A
2HV14	755'	233	A	A	R
2HV14	750'	237	R	A	--
---	750'	257	R	R	--

R - denotes welds may not meet AWS D1.1-75 acceptance criteria
 A - denotes visually acceptable

Discussions with licensee and contractor personnel indicated that these areas had not been inspected, and that inspections would be conducted after the completion of the installation of the hangers. The RIII inspectors advised licensee representatives that this method of inspection precluded prompt detection and correction of unacceptable fillet welds and Nelson stud welding. The licensee acknowledged the inspector's concern, and issued a stop work order terminating further

installation of electrical cable tray support hangers by the electrical contractor (H. P. Foley Company) in the containment building, pending revision of the inspection procedure QCP-5.

The inspector reviewed H. P. Foley (HPF) procedure QCP-5, Revision 3, approved by CECo on March 15, 1977, and discussed the following statements of the above procedure with HPF personnel.

Paragraph 3.4.4 on page 3.4.1, states that nelson studs should conform to ASTM-A-108, but does not specify that the grade should be between 1010 to 1020 as stipulated in the AWS D.1.1-75 Code. Review of the product-material certifications from TRW Nelson Stud Division, Lorain, Ohio, for 2000 pieces of $\frac{1}{2}$ x 1 $\frac{3}{4}$ inch CPL Nelson Studs (heat #654-A-221) indicates that the studs meet the requirements of ASTM-A-108 grade 1015. Contractor personnel acknowledged the inadequate reference to the grade level, and indicated that this will be incorporated in the revision to procedure QCP-5.

Paragraph 3.2.13.4 on page 3.2., references the use of "type EXX14 and low hydrogen electrodes" for welds in the vertical and overhead positions. When questioned how type EXX14 weld rod is controlled, contractor personnel stated that type EXX14 weld rod was not used.

Paragraph 3.4.7 on page 3.4.2 requires areas which are to be welded to be wire brushed, peened, prick punched or ground. The inspector inquired how the contractor verified that the preparation of base metal for welding was acceptable without in-process inspections. The contractor stated that their inspectors perform surveillances on a random basis.

Paragraph 3.4.8 on page 3.4.2 describes nelson stud welding and references parameters for current and voltage only (not time). The inspector stated, and contractor personnel agreed, that the time element should be specified.

Paragraph 3.4.11 states "the nelson stud welding qualification was conducted per AWS D1.1-75 paragraph 4.30 for a sample of five $\frac{5}{8}$ x 256L studs welded to a $\frac{3}{4}$ inch plate, all welding was done on the horizontal position." The inspector stated and contractor personnel agreed that the nelson studs were welded in the vertical position, although the qualification was performed in the horizontal position.

The welding surveillance checklist used in conjunction with procedure QCP-5 does not require the specific welds inspected to be documented.

The stud welder inspection report requires the inspector to verify whether a 270 degree fillet was obtained; this acceptance criteria is contrary to the 360 degree fillet weld criteria stated on paragraphs 3.4.9 and 3.4.10 on page 3.4-3. The contractor personnel stated that the acceptance criteria would be corrected.

Summarizing the discussions with the contractor personnel, the inspector determined that the following requirements of Section 6.5 of the AWS D1.1-75 were not met:

- a. Random surveillances were not performed to assure that the current and voltage parameters were within those prescribed in the respective welding procedures, and no records were maintained.
- b. The welding inspectors did not identify with a distinguishing mark all parts of joints that were inspected and accepted. Instead, hanger drawings were marked to indicate that the welds were inspected and determined acceptable.
- c. Nelson stud welding was performed without proper procedural qualification.

The inspector stated that the above conditions involving the welding of seismic Category 1 cable tray support hangers were contrary to the requirements of 10 CFR 50, Appendix B, Criterion IX and the CECo QA Manual, Quality Requirement QR-9. This is an item of noncompliance with NRC regulations.

Licensee personnel stated that the contractor had acknowledged the stop work order, had performed QC inspections of all referenced welds in the containment building, and had issued several nonconformance reports as a result of the inspections. It was indicated that the stop work order would not be rescinded until the contractor had revised their procedures, and the procedures had been reviewed by both CECo Quality Assurance personnel and the Architect-Engineering firm (Sargent & Lundy) and found to be acceptable. Licensee personnel committed to inform RIII when the stop work order was to be rescinded.

INDIVIDUAL IDENTIFIER CODE
REPORTS NO. 50-373/78-06 AND NO. 30-374/78-05

Individual	Name	Position	Company
"A"	Francis Donnelly	Concrete Finisher	Walsh
"B"	Gerald Bitner	QC Inspector	Morrison
"C"	Tommy Canady	Electrician	Foley
"D"	Leslie Cole, Jr.	Welder	PSI (former Morrison, Foley)
"E"	Carl Peacock	Electrician	Foley (terminated before in- vestigation concluded)