

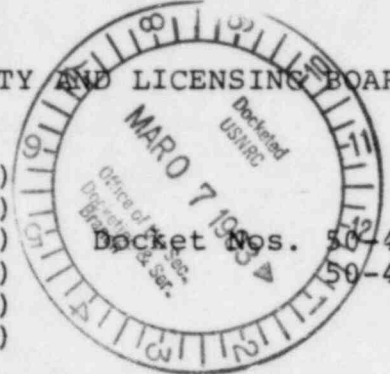
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Date: 2/1/83

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In The Matter of)
COMMONWEALTH EDISON COMPANY)
(Byron Nuclear Power Station,)
Units 1 & 2)



Docket Nos. 50-454 OL
50-455 CL

SUMMARY OF TESTIMONY OF
MALCOLM L. SOMSAG

Mr. Somsag is the Site Quality Assurance Supervisor for Hunter Corporation at Byron Station, and in this capacity was Michael A. Smith's superior while Mr. Smith worked for Hunter Corporation. Mr. Somsag's testimony is offered in response to the allegations made by Mr. Smith in support of DAARE-SAFE and League Contention 1A, which challenges the adequacy of quality assurance at the Byron site.

Mr. Somsag begins his testimony by describing Hunter Corporation's Quality Assurance Department at Byron and his responsibilities in the Department. (pp. 1-3). He then identifies Mr. Smith and describes Mr. Smith's training at Hunter Corporation. (pp. 3-5). Mr. Somsag then describes the work engaged in by Hunter Corporation's quality assurance staff, and describes how an audit is performed. (pp. 7-9).

The testimony next turns to the 1979 audit of component supports conducted by Mr. Smith and a co-auditor, describing first the installation and inspection of component

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supports. Mr. Somsag testifies that supports are installed in accordance with design drawings, or, if installation cannot be achieved in strict accordance with the design drawings, in accordance with design tolerances. (pp. 9-12). The audit and the follow-up audit are then described. The audit was conducted for the purpose of determining whether the use of design tolerances in the location of component supports was being documented and whether quality control inspectors were accepting support locations. The initial audit found significant deficiencies in both these areas, but the follow-up audit found that the problems appeared to be remedied. In the follow-up audit the findings of the initial audit were closed. During this portion of his testimony Mr. Somsag testifies that he reviewed a handwritten draft of the initial audit given to him by Mr. Smith and the co-auditor, but he made no changes to the audit. Mr. Somsag was unable to locate this handwritten draft in Hunter Corporation's files; there was no requirement that the draft be retained. (pp. 13-19).

After discussing the audit and follow-up audit Mr. Somsag's testimony addresses subsequent changes in the component support inspection procedures followed by Hunter Corporation. In response to a March, 1980, NRC inspection; Hunter Corporation adopted new timeliness and documentation procedures in its inspection process. In order to ensure that documentation of previously-installed supports was

consistent with subsequent documentation, a 100% reinspection of component supports installed before March 1, 1980, was undertaken. (pp. 20-23).

Mr. Somsag's testimony concludes with discussion of the circumstances of Mr. Smith's leaving Hunter Corporation. Mr. Smith was fired due to absenteeism (approximately 20%) and inefficient use of time at work. (p. 23).

TESTIMONY OF
MALCOLM LEO SOMSAG

Q1 Please state your name.

A1 Malcolm L. Somsag.

Q2 Mr. Somsag, what is the scope of your testimony?

A2 I am here to testify concerning allegations made by Michael Smith pertaining to the quality assurance program of Hunter Corporation at the Byron facility.

Q3 Who do you presently work for?

A3 Hunter Corporation.

Q4 What kind of business is Hunter Corporation involved in?

A4 Hunter Corporation is a construction contractor engaged in major mechanical construction, including nuclear work, petrochemical work, and steel mill work.

Q5 What kind of work is Hunter Corporation performing at the Byron site?

A5 Installation of piping systems.

Q6 What is your current position with Hunter Corporation?

A6 Site Quality Assurance Supervisor, Byron construction site.

Q7 How long have you been in this position?

A7 Since April 4th, 1977.

Q8 In this position, what are your job responsibilities?

A8 I manage the Quality Assurance Department at the site, which is responsible for ensuring that the work performed

meets the relevant procedural and technical requirements.

Q9 As Quality Assurance Supervisor, are you responsible for both quality assurance and quality control?

A9 Yes.

Q10 Mr. Somsag, is there a difference between quality assurance and quality control?

A10 Absolutely. Quality control is an inspection function. It involves the inspection of hardware to ensure conformance with quantitative or qualitative requirements. Quality assurance, on the other hand, is the administrative portion of the organization that evaluates the compliance of quality control individuals with their assigned inspection duties.

Q11 To whom do you report to?

A11 I report to the corporate quality assurance manager for Hunter Corporation, who is at Hunter Corporation's corporate offices in Hammond, Indiana.

Q12 What employees report to you?

A12 All the employees in the Quality Assurance Department report to me. The majority of my contact with staff is with the supervisors who report directly to me, however.

Q13 What are the titles of the supervisors who report to you?

A13 Material control supervisor, quality control supervisor, quality assurance administration supervisor and lead auditor.

Q14 Before you held this position at Byron, what did you do?

A14 I was assigned to Commonwealth Edison's Zion station in the same capacity with the same company.

Q15 How long were you there?

A15 From about the middle of July of 1976, until I was transferred over to Byron, April 4th of 1977.

Q16 How long have you been involved with quality assurance?

A16 Since around the beginning of 1973.

Q17 And what positions have you held in quality assurance?

A17 I have been a material control supervisor, a welding inspector, and a general quality control inspector. I also have been involved with procedure writing, administrative organization, and the performance of audits.

Q18 Does the Quality Assurance Department of Hunter Corporation at Byron include auditors?

A18 Yes, it does.

Q19 Do these auditors report to you?

A19 Yes, they do.

Q20 Are you familiar with allegations made by Michael A. Smith?

A20 Yes, I am.

Q21 Who is Mr. Smith?

A21 Mr. Smith was an employee of Hunter Corporation.

Q22 Do you recall the dates that Mr. Smith worked for Hunter Corporation?

A22 Fall of 1978 until mid-January of 1980.

Q23 What was Mr. Smith's position when he was initially hired by Hunter Corporation?

- A23 His initial placement was as a trainee in quality assurance.
- Q24 Generally, what type of training did Mr. Smith receive?
- A24 He received indoctrination to the corporate quality assurance manual and specific training in the site procedures.
- Q25 Did Mr. Smith ultimately become certified to perform certain functions?
- A25 Yes, he was certified as a Level 1 quality assurance inspector and as an auditor.
- Q26 What were the duties of an auditor at that time?
- A26 The duties of the auditor were to ensure that production and inspection personnel were performing their work in compliance with pertinent procedures.
- Q27 What was Mr. Smith's official title?
- A27 He was a quality assurance auditor.
- Q28 As Quality Assurance Supervisor, are you responsible for both quality assurance and quality control?
- A28 Yes.
- Q29 Did Mr. Smith perform any quality control functions while he worked for Hunter Corporation?
- A29 No, he did not.
- Q30 When did Mr. Smith complete his training period and become an auditor?
- A30 January, 1979.
- Q31 Who was Mr. Smith's immediate superior?
- A31 The lead auditor, Michael Zeise.

Q32 Does Mr. Zeise still work for Hunter Corporation?

A32 No, he does not. He works for General Public Utilities at Three Mile Island Generating Station.

Q33 Have you read Mr. Smith's affidavit?

A33 Yes, I have.

Q34 In his affidavit, on page 1, Mr. Smith alleges that the Hunter Corporation quality assurance program for Byron was "thrown together." Do you believe that is an accurate characterization of Hunter Corporation's Byron quality assurance program?

A34 No, I do not.

Q35 Could you please describe the development of Hunter Corporation's quality assurance program for Byron?

A35 Since about 1971, Hunter Corporation has had a corporate quality assurance manual for nuclear construction. Once a specific contract is obtained, the manual is modified to reflect the specific organizational characteristics of the site. So, when Hunter Corporation started work at Byron, which was in early 1977, it took its existing quality assurance manual and adapted it to the specific requirements of the Byron site.

Q36 Were Hunter Corporation's quality assurance procedures approved by any other entities?

A36 Yes, they were reviewed and approved by the licensee, Commonwealth Edison, and by the licensee's architect-engineer, Sargent & Lundy.

Q37 How many individuals worked in quality assurance/quality control at Hunter Corporation when Mr. Smith began his employment there?

A37 Approximately 20. Five individuals were in the Material Control Branch, eight were in the Quality Control Branch, six were in the Quality Assurance Administration Branch, and one was the Quality Assurance Department Supervisor, myself.

Q38 How many of these individuals acted as quality assurance auditors?

A38 At the time of Mr. Smith's employment, I believe two.

Q39 Did this staff increase while Mr. Smith was there?

A39 Yes, it did. By the time Mr. Smith left Hunter Corporation the quality assurance/quality control staff consisted of 31 individuals, including 3 auditors.

Q40 In your view, at the time Mr. Smith worked for Hunter Corporation was the size of the QA/QC staff adequate to perform the work assigned to it?

A40 Yes, it was.

Q41 At the time Mr. Smith worked for Hunter Corporation did budget problems limit the size of the QA/QC staff or any of its activities?

A41 A budget didn't exist, as such. The department had no established budget to function within. Personnel were recruited and trained as the workload increased.

Q42 As the Quality Assurance Supervisor did you ever feel any financial pressure to limit the number of individuals

working in your department or to limit the activities that your people undertook?

A42 No. If the workload required additional staff we were permitted to obtain additional people.

Q43 What are the activities engaged in by Hunter Corporation's quality assurance staff at Byron?

A43 Quality assurance performs surveillances and audits to ensure that production and inspection forces are performing their work in conformance with requirements.

Q44 What is a surveillance?

A44 A surveillance is, quite basically, an informal audit. It represents a snapshot of personnel performance as time goes by, while an audit represents a film, so to speak.

Q45 What is an audit?

A45 An audit is a formal review and evaluation of the work which was performed by production and inspection personnel for the purpose of determining whether the work comports with relevant requirements.

Q46 How were audits scheduled while Mr. Smith worked for Hunter Corporation?

A46 At the beginning of the year, a schedule would be established which would set forth each of the various audits to be conducted during that year.

Q47 Please describe generally how an audit is conducted.

A47 First, the audit instructions inform the auditors of the work activities which are the subject of the audit.

The auditors then familiarize themselves with the procedural and technical requirements which pertain to the work. Before the audit begins, an entrance meeting is held which includes the auditors and the production and inspection personnel whose work is being audited. The purpose of the entrance meeting is to ensure maximum knowledge for the auditors as they commence the audit and to develop cooperation between the auditors and the auditees. The audit itself is then conducted, after which an exit meeting is held with all pertinent personnel. At the exit meeting the auditors' conclusions are discussed, and the production and inspection forces contribute their input to the resolution of any problems which were found by the auditors. The audit is then written up in final form and, soon thereafter, a follow-up audit is performed to determine whether the problems identified in the initial audit have been remedied.

Q48 Are follow-up audits customarily performed if problems are discovered in an initial audit?

A48 Absolutely.

Q49 When problems are uncovered in an initial audit, are any reports or documents other than the audit itself generated?

A49 It is possible that nonconformance reports may be necessary if the audit discloses that items inspected by quality control do not conform to design requirements.

Q50 In 1979, did Mr. Smith assist to perform an audit of component supports?

A50 Yes, he did.

Q51 What is a component support?

A51 A component support is a metal structure which serves the purpose of suspending piping and equipment in a building.

Q52 Is "component support" another term for "hanger."

A52 Yes.

Q53 Is one of Hunter Corporation's jobs at Byron the installation of component supports at the site?

A53 Yes.

Q54 How are the supports installed?

A54 The actual physical installation of component supports is performed in accordance with pertinent Hunter Corporation procedures, such as welding procedures. The location of the supports is determined by the design drawings, or, in circumstances where a support cannot be placed in strict accordance with a design drawing, by the tolerances established by the architect-engineer.

Q55 How is installation of component supports documented by Hunter Corporation?

A55 Each component support has a job traveler package which includes all documentation pertaining to the physical installation of the support. The job traveler package is released from the Engineering Department with a

detail design drawing, which sets forth the location, configuration, and orientation of the support. This drawing is accompanied by a document known as a process sheet, which specifies the procedures to be employed by the production and inspection forces in installing and inspecting the support.

Q56 What are the responsibilities of Hunter Corporation's quality control inspectors with regard to the installation of component supports?

A56 The inspectors performed inspections in accordance with inspection points set out on the process sheets issued in the job traveler package. These inspections encompass evaluation of the completed installation for compliance with orientation and configuration requirements as specified on the component support detail design drawing, and, when appropriate, evaluation of the use of the design tolerances employed by the construction forces.

Q57 You have referred a couple of times to "design tolerances." What do you mean by this term?

A57 Installation of items often cannot be performed exactly as design drawings specify. Therefore, architect-engineer-approved tolerances are established in order to set forth the degree to which installation may vary from the design drawings. The tolerances, in sum, represent the installer's latitude in installation of an item.

Q58 At the time of the audit of component supports conducted by Mr. Smith were tolerances for component supports specified in any particular documentation?

A58 Yes, they were. Sargent & Lundy's Mechanical Drawing M-916 established the various dimensional changes that could be made to individual parts that comprise the overall component support assembly, and the degree to which actual installation could vary from the location specified by the design drawing. A copy of Sargent & Lundy Mechanical Drawing M-916 is attached to my testimony as Somsag Exhibit 1.

Q59 At the time of the component audit had Hunter Corporation production and inspection forces been informed of the design tolerances applicable to component supports?

A59 Yes, they were. Hunter Corporation inter-company correspondence HC-QA-#23 established the procedures that were to be followed with regard to the location of component supports. A copy of this document is attached to my testimony as Somsag Exhibit 2.

Q60 What Hunter Corporation personnel received or were made aware of the contents of this letter?

A60 Production foremen and supervisors, quality control inspectors, and quality assurance inspectors and auditors.

Q61 What were the procedures that were followed by Hunter Corporation quality control inspectors in their inspections of component supports at the time Mr. Smith worked for Hunter Corporation?

A61 In sum, the inspectors examined the installation and location of each component support. However, an entire inspection of a component support could not be performed at one time because of the nature of component support construction. Therefore, for example, an inspector would inspect certain welds earlier than others, because such welds could become inaccessible through subsequent installation work. Likewise, inspection of component support location usually was not performed immediately after installation of a support; because frequent design changes were being made, in 1979 our procedure was to hold off on location inspection until an entire system of component supports was stabilized in its final configuration. Component support inspection therefore was a process that was not completed until long after the support had been physically installed.

Q62 Let me direct your attention to the audit of component supports. Somsag Exhibit 3 is Audit No. 059-3, an audit of component support installation. Is this the audit pertaining to component supports in which Mr. Smith participated?

A62 Yes, it is.

Q63 Was this a regularly scheduled audit?

A63 Yes, it was.

Q64 Why were component supports scheduled to be audited at this particular time in the summer of 1979?

A64 Because the level of installation activity was starting to increase to a significant level.

Q65 Was this audit prompted by concerns raised by production workers, as Mr. Smith alleges on page 2 of his affidavit?

A65 Not to my knowledge.

Q66 What was the purpose of this audit?

A66 To assure that component supports were being installed in accordance with design requirements relative to welding and location. More specifically, with respect to the location of component supports the audit was designed to determine whether documentation indicated that supports were being installed within design tolerances and whether support locations were acceptable by quality control.

Q67 Who performed this audit?

A67 Mr. Michael Zeise and Mr. Michael Smith.

Q68 What were the auditors' instructions with regard to the location of component supports?

A68 As set forth in Checklist Items #10 and #11, located on the fourth page of Exhibit 3, the auditors were to verify that proper as-built data was being provided in situations where M-916 design tolerances were utilized in the installation of a support, and that the quality control welding inspectors were accepting the as-built data. In order to accomplish these activities the auditors were to review a sampling of component support job traveler packages. In sum, the auditors were to

see whether the procedures set forth in Hunter Corporation inter-company correspondence HC-QA-#23 were being followed.

Q69 Are the particular supports investigated specified in the audit?

A69 Yes. The five supports examined for each checklist item are listed on pages 8 and 10 of the audit.

Q70 Are the results of the audit of checklist items #10 and #11 set forth in the audit marked as Exhibit 3?

A70 Yes, they are. The audit of Item #10 is discussed at pages 7-9 of the audit, and the audit of Item #11 is discussed at pages 9-11 of the audit.

Q71 Generally, what were the results of the audit of Checklist Item #10?

A71 The auditors found that the Production Department was not doing an adequate job of detailing as-built data. Finding No. 6 states that on three of the five component supports examined the as-built data was incomplete. Observation No. 2 states that inadequate reproduction of data, in the sense of xeroxing, was also a problem.

Q72 How does a "finding" differ from an "observation?"

A72 A finding represents a more serious problem, although both findings and observations result in recommendations of appropriate corrective action.

Q73 What corrective action was recommended by the auditors with regard to this checklist item?

A73 The auditors recommended that the production supervisors must provide complete as-built data, as required by

Hunter Corporation inter-company correspondence HC-QA-#23, which is Exhibit 2. With regard to the reproduction problem, the auditors recommended that the hanger supervisor must ensure that copies are reproduced legibly.

Q74 Generally, what were the results of the audit of Checklist Item #11?

A74 The auditors found that for only one of the five component supports examined for this checklist item was quality control acceptance noted in the job traveler package. As stated in Finding No. 7, this represented a violation of Hunter Corporation inter-company correspondence HC-QA-#23.

Q75 What corrective action was recommended by the auditors?

A75 They recommended that quality control take action to accept or reject as-built documentation of component supports, according to the procedures set forth in HC-QA-#23.

Q76 On page 10 of the audit, under the heading "Auditors Note," the audit notes that measurements of component support location are never made, according to quality control inspectors, due to lack of time. What is your understanding of this reference?

A76 As I mentioned earlier, inspection of component support location often was not performed until well after installation of a support, due to interim design changes. The workload of our quality control inspectors reflected

the tasks that had to be accomplished at any particular time; therefore, since inspections of location were to a great degree premature as of the middle of 1979, the inspectors were occupied with the examination of component support welding or with other duties. This is also the reason why training of the quality control inspectors in the application of M-916 may not have been adequate at the time of the audit.

- Q77 Mr. Somsag, what is your understanding of the Auditors Note located at the bottom of page 10 of the audit?
- A77 The note addresses the forwarding of as-built data from the Hunter Hanger Department to the architect-engineer, Sargent & Lundy, and criticizes the methodology what was being employed. Although the audit itself did not require any corrective action to be taken, subsequently the reporting methodology was changed to reflect the comments made by the auditors.
- Q78 Did the findings of the audit mean that any component supports were improperly installed?
- A78 No. The audit addressed only the issue of documentation of support installation. The auditors were not examining whether actual installation of component supports was performed in accordance with either design drawings or with the tolerances set out in Sargent & Lundy Mechanical Drawing M-916.
- Q79 Did Mr. Smith and Mr. Zeise prepare a handwritten draft of this audit for your review?

A79 Yes, they would have.

Q80 Was it customary for Hunter Corporation auditors to prepare written drafts for your review before a final audit was released?

A80 Yes, it was.

Q81 What was the purpose of your reviewing handwritten drafts of audits?

A81 To verify that the necessary language was included in the audit report to make the conclusions clear and substantiated.

Q82 In reviewing the handwritten draft of this audit, did you make any changes to it?

A82 No, I don't believe I did.

Q83 Mr. Somsag, in preparation for your testimony did you examine the files at Hunter Corporation to determine if a handwritten draft existed for this audit?

A83 Yes, I did. I could not locate a handwritten draft of the original audit report.

Q84 Were there handwritten notes in this audit file?

A84 Yes, there were. Basically, the notes listed individual component support items, and, in many cases, various matrixing-type structures which were used for categorizing the information that was used in the audit report. In sum, the notes contained the information that would have been used to build and substantiate the language in the audit report.

Q85 Do you have any idea what happened to the handwritten draft?

A85 No, I do not. There was no requirement within the quality assurance program that handwritten notes be retained once a formal report was prepared.

Q86 Did you generally make changes in the handwritten drafts prepared by Mr. Smith for his audits?

A86 Occasionally.

Q87 For what reason?

A87 Primarily to add clarity or definition, or to remove unprofessional language. With regard to Mr. Smith's language, I believed that he tended to use harsh language which would have had the effect of discouraging cooperation from the auditees.

Q88 In your editing of Mr. Smith, did you ever delete one of Mr. Smith's findings or observations?

A88 No.

Q89 Did the audit marked as Exhibit 3 result in any non-conformance reports?

A89 I have not been able to find evidence of any that were generated as a result of this audit.

Q90 Was a follow-up audit performed?

A90 Yes, it was. The follow-up audit for Audit 059-3 is attached to my testimony as Somsag Exhibit 4.

Q91 Who performed the follow-up audit?

A91 It was performed by Mr. Smith and Mr. Zeise.

Q92 What was the purpose of this audit?

A92 To verify that corrective action was taken in response to the initial audit.

Q93 What procedures were followed by the auditors in the follow-up audit?

A92 According to the handwritten notes in the file of this audit, the auditors examined a total of 50 component supports, including those discussed in the initial audit, to determine whether the corrective action recommended in the initial audit had been implemented.

Q94 What were the results of the follow-up audit?

A94 The auditors found that appropriate corrective action had been taken, and the findings and observation of the initial audit pertaining to component support location were closed.

Q95 In discussing Finding No. 7 of the initial audit, the follow-up audit, at the bottom of its page 3, discusses the training of quality control inspectors to the design tolerances set out in M-916. Was such training conducted?

A95 Yes, it was. To my recollection, the training of the inspectors commenced shortly after completion of the follow-up audit.

Q96 Was Hunter Corporation's component support quality control inspection program a 100% inspection of supports?

A96 Of safety-related component supports, yes.

Q97 Subsequently, were changes made in Hunter Corporation's program of inspecting component supports?

A97 Yes, they were. The most significant changes were made after March, 1980 as a result of a NRC inspection in that month. The NRC inspection was documented in report 80-05.

Q98 What conclusions did the NRC reach pertaining to the inspection of component supports?

A98 The NRC disagreed with the philosophy of support inspection which we had been following. As I testified earlier, inspection of component support location was not being completed immediately upon installation of supports because of the perceived need to wait until all design changes had been finalized for a support system. As of March, 1980, no timeliness requirement for acceptance of component support location--that is, no requirement that the acceptance occur within a certain time of initial installation--had been established. The NRC disagreed with this approach to support location inspection because it believed that such an approach did not include provision for trend analysis. The NRC felt that under our system the potential existed that serious problems could be discovered at a late date, while a more timely inspection program would uncover such problems much earlier and make resolution easier and less costly. The NRC therefore required that an inspection program be implemented which accepted the

location of component supports within a certain period of time after installation.

The NRC also criticized the absence of specific inspection requirements pertaining to the location of component supports. Although our inspections ultimately encompassed all pertinent items, we did not have a specific inspection checklist which segregated each of the items for documentation purposes.

In addition, the NRC criticized Hunter Corporation's use of inter-company correspondence HC-QA-#23 to set forth inspection procedures. The NRC stated that the use of inter-company correspondence to update work procedures bypassed document control requirements and therefore was improper.

Q99 Did Hunter Corporation revise its component support inspection procedures in response to the NRC's inspection of March, 1980?

A99 Yes. The procedures which Hunter Corporation now follows are set forth in our Procedure 4000, entitled "Control of Construction Processes," and Procedure 4.201, entitled "Installation Verification." Procedure 4000 is attached to my testimony as Somsag Exhibit 5 and procedure 4.201 is attached as Somsag Exhibit 6.

Q100 Generally, what do these procedures include?

A100 These procedures incorporate the requirements laid down by the NRC. Thus they include timely inspection of component support location and provide for ongoing

trend analysis of the installation work being performed. Documents of support locations is completed through use of an inspection checklist, a copy of which is attached to Somsag Exhibit 7, which is discussed below. In addition, as-built drawings are generated as the production forces install the component supports, and the use of design tolerances is appropriately accepted by quality control.

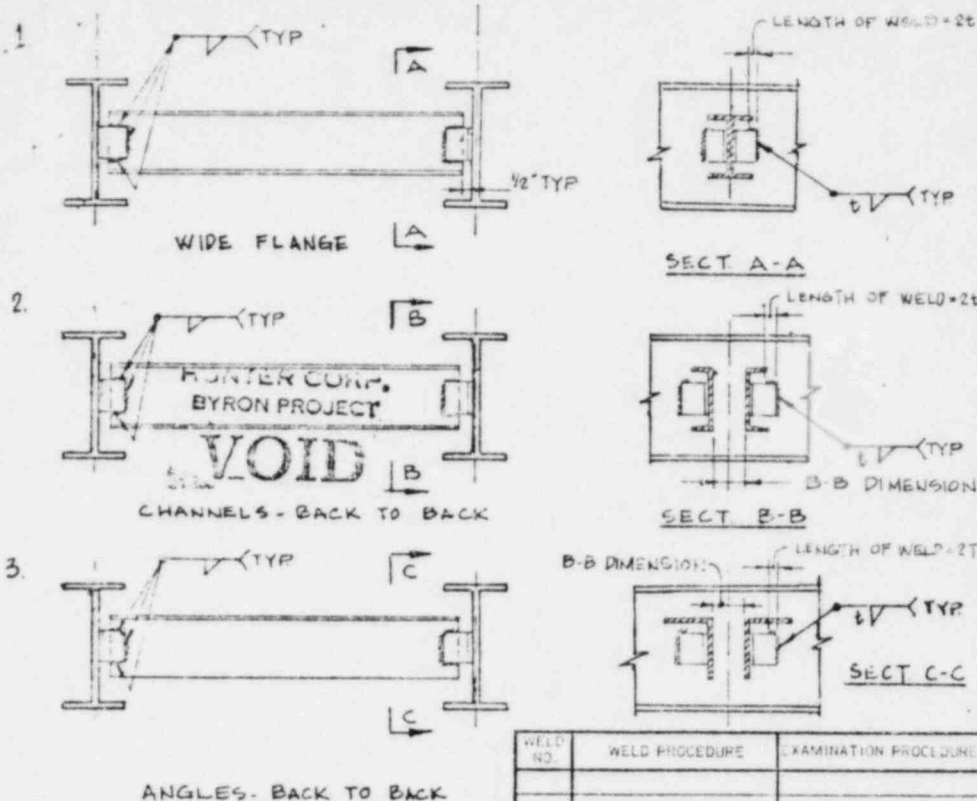
Q101 Mr. Somsag, was any reinspection performed on component supports installed before March, 1980?

A101 Yes. Component supports installed prior to March 1st, 1980, were subjected to a 100% reinspection program primarily for the purpose of bringing inspection documentation up to date with requirements that were current after March 1st of 1980.

Somsag Exhibit 7 is Hunter Corporation's proposal to Commonwealth Edison to perform the 100% reinspection I just mentioned. The exhibit includes the inspection checklist which was utilized for the reinspection and for all subsequent component inspections. This checklist was developed through the combined input of both Hunter Corporation and Commonwealth Edison Company.

Q102 How was the inspection format after March 1st, 1980, different from the format utilized before that date?

A102 Through the use of a checklist the new format was more specific in segregating for documentation purposes the individual segments of the complete inspections that



BILL OF MATERIAL		QUANTITY	WEIGHT	BY OTHERS
ITEM	QUANT. FIG. TRG. OR PART NO.	DESCRIPTION		
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HUNTER CORP. BYRON PROJECT VOID				
NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING				
		LOADS (LBS.)		
DESIGN	OPERATING	HYDROTEST	EMERGENCY	FACTED

WELD NO.	WELD PROCEDURE	EXAMINATION PROCEDURE

REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.

DRAWING RELEASE RECORD							SUPPORT CLASS
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENGR APPL	FILM	EMD REVIEW
A		5-10-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		
B		11-14-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

REVISION DESCRIPTION

DELETED FINAL SHEET INDICATOR
 F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE

WILLIAM C. CLEFF
 5221
 SEALS
 REGISTERED
 ENGINEER
 OF
 ILLINOIS

P. E. SEAL

PROJECT NO.
 4391-00 4392-00
 4683-00 4684-00

BYRON/BRAIDWOOD STATION
 UNIT-1 & 2
 COMMONWEALTH EDISON COMPANY
 CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL NOTES AND DETAILS

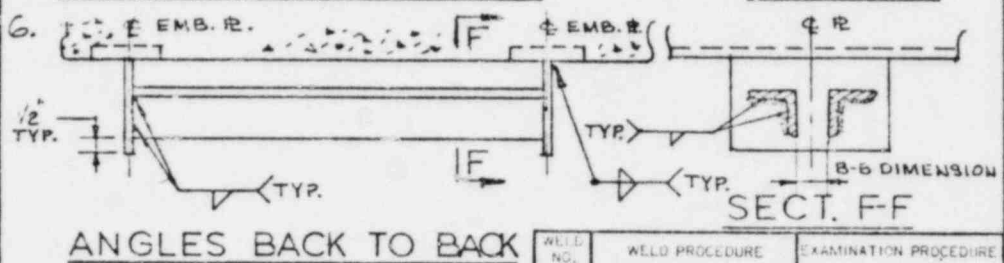
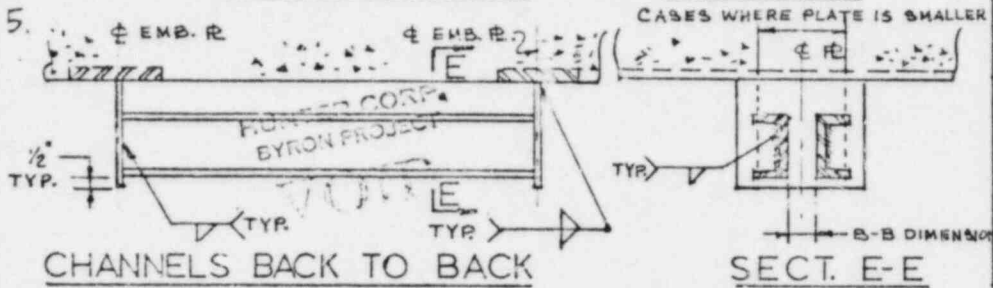
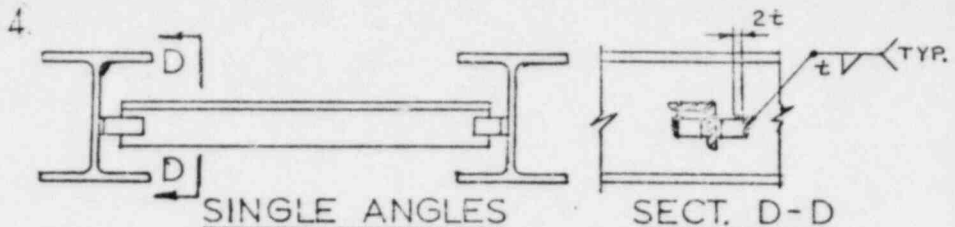
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 APPROVED

SARGENT LUNDY
 ENGINEERS
 CHICAGO

SUPPORT NO. REV.
 M-916 5 B

SHEET 1 OF 3

MO-15-1.2 (1-73) ENR APPROVED



WELD NO.	WELD PROCEDURE	EXAMINATION PROCEDURE

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ITEM	QUAN.	FIG. NO. OR PART NO.	DESCRIPTION	WEIGHT	BY OTHERS
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TOTAL WEIGHT					
LOADS (LBS.)					
DESIGN	OPERATING	HYDRO TEST	EMERGENCY	FAULTED	

MO-15.1.2 (1-76) FIRST APPROVED REPT. MGR.

REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	SUPPORT CLASS
DRAWING RELEASE RECORD									
REV	SPEC. NO.	DATE	DRAWN	CHECKED	ENGR APPL	FILM	EMD REVIEW		
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B		11-14-77	<i>Ramgob</i>	<i>W. C. Cliff</i>	<i>W. C. Cliff</i>				
REVISION DESCRIPTION									
DELETED FINAL SHEET INDICATOR. F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE									

WILLIAM CARL CLIFF
62-31871
REGISTERED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

P. E. SEAL

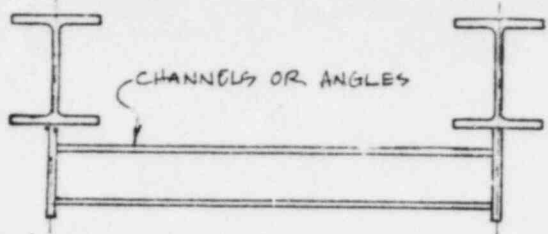
PROJECT NO.	
4391-00	4392-00
4683-00	4684-00

BYRON/BRAIDWOOD STATION
UNIT 1 & 2
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL
NOTES AND DETAILS

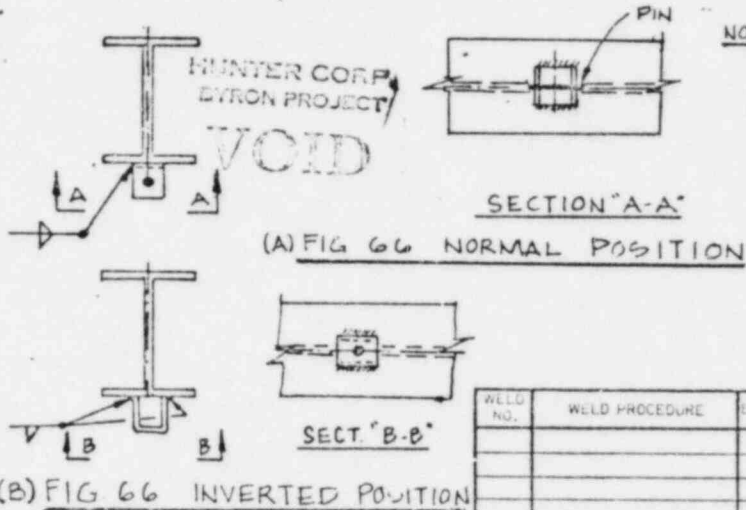
<p>NO. SCALE</p> <p>DATE</p> <p>DATE</p> <p>DATE</p>	<p style="text-align: center;">SARGENT & LUNDY ENGINEERS CHICAGO</p> <p>SUPPORT NO. REV</p> <p>M-916 8</p> <p>SHEET 2 OF 3</p>
--	---

10.



SIMILAR TO CASES 5,668 EXCEPT ATTACHMENT IS TO EXISTING STEEL

11.



NOTE:
POSITION FIG 66
FLUSH SIDE
PARALLEL TO
THE LENGTH OF
THE BEAM.

BILL OF MATERIAL

ITEM	QUAN- TITY OR PART NO	DESCRIPTION	COMPONENT WEIGHT	BY OTHERS	
				BY	DATE
<p>HUNTER CORP. BYRON PROJECT</p> <p>NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING</p>					
TOTAL WEIGHT					
LOADS (LBS.)					
DESIGN	OPERATING	HYDRO TEST	EMERGENCY	FAULTED	

WELD NO.	WELD PROCEDURE	EXAMINATION PROCEDURE

REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.

DRAWING RELEASE RECORD							SUPPORT CLASS	
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APP'L	FILM	EMD REVIEW	
A		5-10-72	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			
B		11-14-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			

REVISION DESCRIPTION

DELETED FINAL SHEET INDICATOR
FIL 2771 & FIL 2739 FOR INFORMATION & REFERENCE

P. E. SEAL

PROJECT NO.
4391-00 4392-00
4683-00 4684-00

BYRON/BRAIDWOOD STATION
UNIT 1 & 2
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS,

COMPONENT SUPPORTS GENERAL
NOTES AND DETAILS

<p>DRAWN: <i>[Signature]</i></p> <p>CHECKED: <i>[Signature]</i></p> <p>ENGINEER: <i>[Signature]</i></p> <p>APPROVED: <i>[Signature]</i></p>	<p>NO SCALE</p> <p>DATE: 5-3-77</p> <p>DATE: 5/5/77</p> <p>DATE: 5/5/77</p>
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SARGENT LUNDY
ENGINEERS
CHICAGO

SUPPORT NO. REV.
M-916 3 B

SHEET 4 OF 5

MD5-15.1.2 (1-75) FORM APPROVED 1-75 DEPT. MGR.

13. TACK WELDS

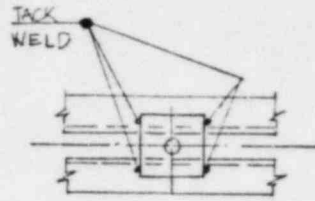
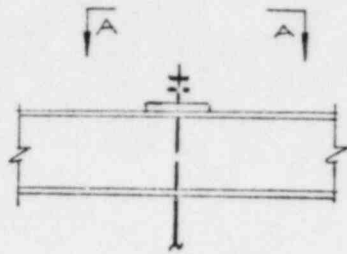


FIG. 13-A

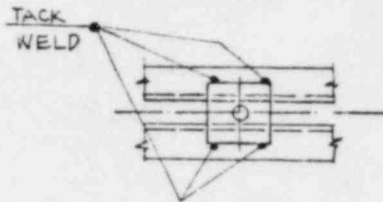


FIG. 13-B

HUNTER CORP.
BYRON PROJECT
VOID

NOTE: TACK WELD CAN BE DONE BY EITHER FIG. 13-A OR FIG. 13-B. BOTH METHOD IS ACCEPTABLE

SECTION 'A-A'

13 A. WELD ALL AROUND TOLERANCE

WHENEVER AN ALL AROUND WELD IS CALLED FOR IN THE SUPPORT DETAIL DWG AND DUE TO LIMITATION OF CONTACT SURFACE BETWEEN EMB. R AND COMPONENT ITEM TO BE WELDED, A WELD LIMITED TO CONTACT SURFACE OF THE PARTS TO BE WELDED IS ACCEPTABLE. (SEE FIG. 13-C.

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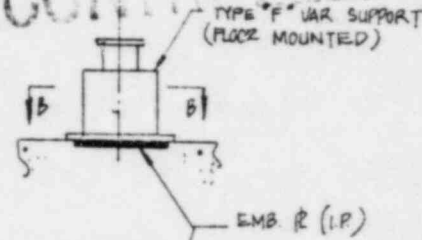
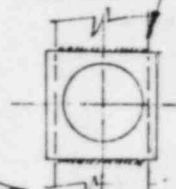


FIG. 13-C



SECT. 'B-B'

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BYRON PROJECT
VOID
INT. FOR PROJECT

**NUCLEAR SAFETY RELATED
ITEMS ARE SHOWN ON THIS DRAWING**

REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APP'.	FILM	SUPPORT CLASS
A	—	5-13-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		EMD REVIEW
B	—	11-14-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.

DRAWING RELEASE RECORD							
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APP'.	FILM	SUPPORT CLASS

REVISION DESCRIPTION	
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PROJECT NO.	
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BYRON/BRAIDWOOD STATION
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COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL
NOTES AND DETAILS

[Signature] NO SCALE
DATE 5-3-77

[Signature] CHECKED
DATE 5/8/77

[Signature] ENGINEER
DATE 5/8/77

[Signature] APPROVED
DATE 5/8/77

SARGENT & LUNDY
ENGINEERS
CHICAGO

SUPPORT NO.	REV
M- 916	3

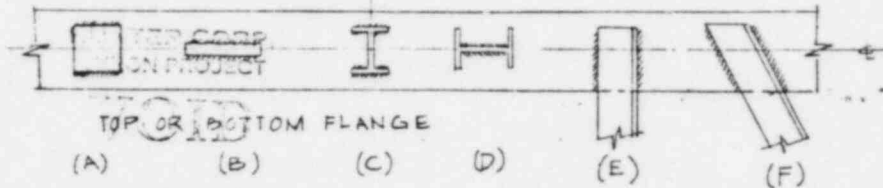
SHEET 6 OF 8

K05-15.1-2 (1-76) FORM REVISED 1-76

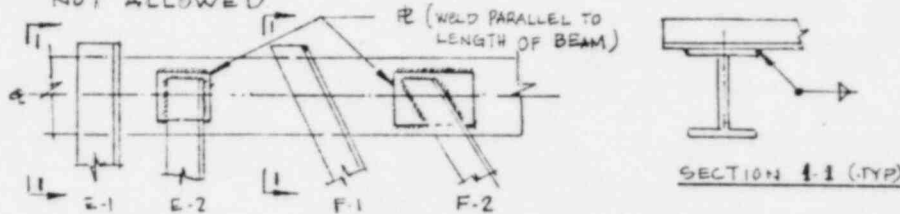
10. PERMISSIBLE WELDS ON STRUCTURAL STEEL BEAMS

- A) TO THE WEB, ANY DIRECTION OF WELD IS PERMISSIBLE.
- B) TO TOP & BOTTOM FLANGE, WELDS MUST BE ALWAYS PARALLEL TO THE LENGTH OF BEAM, NO CROSS WELDING IS PERMITTED.

ILLUSTRATIONS



FIGS. A, B, C, & D ARE ACCEPTABLE, FIGS. E & F ARE NOT ALLOWED



MODIFIED FIGS. E & F

MODIFIED FIGS. E-1, E-2, F-1 & F-2 ARE ACCEPTABLE. FIGS. E-1 & F-1 WELD IS ON BOTH EDGE OF THE FLANGE WHILE FIGS. E-2 & F-2 USED A RE WELDED TO THE FLANGE. ANY WELD TO THESE RE'S ARE PERMISSIBLE

ITEM		QUANTITY NO. OR PART NO.	DESCRIPTION	COMPONENT WEIGHT	NO. OF BOLTS	NO. OF NUTS	NO. OF WASHERS	NO. OF RIVETS	NO. OF PIPES	NO. OF VALVES	NO. OF OTHER	NO. OF OTHER
UNCONTROLLED COPY												
<p>NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING</p>												
TOTAL WEIGHT												
LOADS (LBS.)												
DESIGN			OPERATING			HYDRO TEST			EMERGENCY			FAULTED

MD-15.1.2 (11-70) ENCL APPROVED DEPT. MGR.

REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	SUPPORT CLASS
DRAWING RELEASE RECORD									
REV.	SPEC NO.	DATE	DRAWN	CHECKED	ENGR APPL	FILM	EMD REVIEW		
A	-	5-10-72	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>				
B	-	11-14-72	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>				
REVISION DESCRIPTION									
DELETED FINAL SHEET INDICATOR									
FL 2771 & F/L 2739 FOR INFORMATION & REFERENCE									

P. E. SEAL

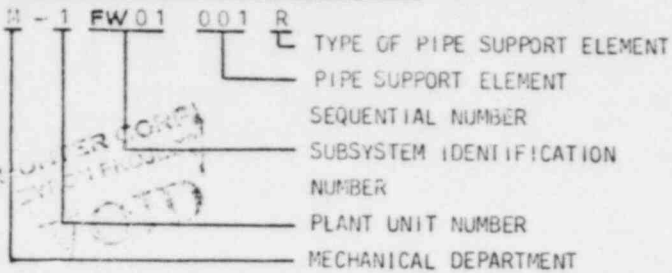
PROJECT NO.	
4391-00	4392-00
4683-00	4684-00

BYRON/BRAIDWOOD STATION
UNIT-1 & 2
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL NOTES AND DETAILS

 DRAWN CHECKED ENGINEER APPROVED	NO SCALE DATE 5-3-77 DATE 5/5/77 DATE 5/5/77	
		SUPPORT NO. M-916 REV. 3 SHEET 7 OF

NUMBERING PIPE COMPONENT SUPPORT:



TYPES OF PIPE SUPPORT ELEMENT:

- A = ANCHOR
- C = CONSTANT SUPPORT
- G = GUIDE
- R = RIGID SUPPORT
- S = SEISMIC (HYDRAULIC, SPRING TYPE, OR MECHANICAL) OR VIBRATION SWAY SUPPRESSOR (SNUBBER OR SWAY BRACE).
- V = VARIABLE SPRING SUPPORT
- W = PIPE WHIP RESTRAINT
- X = RIGID SEISMIC RESTRAINT

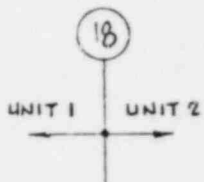


FIG. 1

**NUCLEAR SAFETY RELATED
ITEMS ARE SHOWN ON THIS DRAWING**

COMPONENT SUPPORT NUMBERING SYSTEM GUIDELINES:

- A. IN GENERAL, COMPONENT SUPPORT NUMBERING SYSTEM USE THE FORMAT AS DEFINED AND SHOWN HEREIN.
- B. FIG. 1 DEFINES THE BOUNDARY LINE THAT SEPARATES UNIT-1 AND UNIT-2 AS SHOWN IN THE TITLE BLOCK. THIS RULE IS APPLICABLE TO CONTAINMENT, AUXILIARY, FUEL HANDLING AND TURBINE BLDG COMPONENT SUPPORTS.
- C. FOR OUTLYING STRUCTURES, C.W. PUMPHOUSE, LAKE SCREEN HOUSE, RIVER SCREEN HOUSE WHERE COMMON SYSTEMS EXISTS, THE SUBSYSTEM ANALYSIS IDENTIFICATION AND COMPONENT SUPPORT NUMBERING SYSTEM IS BASED ON UNIT-1
- D. FOR A GIVEN SUBSYSTEM THAT INCLUDES TWO OR THREE SYSTEMS (E.G. RH, CS, SI), COMPONENT SUPPORT NUMBERING WILL BE BASED ON THE MAIN SYSTEM WHERE THE SUBSYSTEM ANALYTICAL IDENTIFICATION HAS BEEN ESTABLISHED. THIS MAY LEAD TO FOR INSTANCE CS PIPING BEING HUNG WITH HANGER 15104001R.
- E. FOR COMMON SYSTEMS IN THE AUXILIARY, FUEL HANDLING OR TURBINE BLDG WHICH CROSS COL. 18 (SEE FIG. 1), SUBSYSTEM ANALYTICAL IDENTIFICATION AND COMPONENT SUPPORT NUMBERING WILL BE BASED ON WHICH SUBSYSTEM IDENTIFICATION HAS BEEN USED, EITHER A UNIT-1 OR UNIT-2 DESIGNATION. THIS MAY LEAD TO FOR INSTANCE A UNIT-1 HANGER CAN HAVE A UNIT-2 NUMBER, 2CS03005R ON LINE 1CS0AB-4" OR 1CS03003R ON LINE 2CS05AB-6".

COMMONWEALTH EDISON COMPANY
 PROJECT
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REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.
DRAWING RELEASE RECORD								
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APPL.	FILM	EMD REVIEW	
A	-	11-14-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			
REVISION DESCRIPTION								
ADDED PER ECN-254 F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE								

PROJECT NO.	
4391-00	4392-00
4683-00	4684-00

BYRON/BRAIDWOOD STATION
UNIT-1 & 2
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL
NOTES AND DETAILS

DRAWN <i>[Signature]</i> CHECKED <i>[Signature]</i> ENGINEER <i>[Signature]</i> APPROVED <i>[Signature]</i>	NO SCALE 9-23-77 DATE 11/14/77 DATE 11-14-77 DATE	SARGENT & LUNDY ENGINEERS CHICAGO
SUPPORT NO. M-916		REV. A
SHEET 8 OF		

NO. 15.1.2 (1-76) ENEM APPROVED DEPT. MGR.

LOADS

THE FOLLOWING DEFINITIONS OF TERMS APPLY TO COMPONENT SUPPORT LOADS UNLESS OTHERWISE SPECIFIED:

- DESIGN = LOADING ASSOCIATED WITH NORMAL AND UPSET PLANT/SYSTEM OPERATING CONDITIONS AND INCLUDES THERMAL, WEIGHT, SEISMIC (OBE) AND TRANSIENT LOADS AS APPLICABLE.
 - OPERATING = LOADING ASSOCIATED WITH NORMAL PLANT/SYSTEM OPERATING CONDITIONS AND INCLUDES THERMAL AND WEIGHT LOADS ONLY. (THIS LOAD IS NOT TO BE USED AS A DESIGN BASIS FOR COMPONENT SUPPORTS. IT IS INTENDED FOR FIELD USE ONLY).
 - HYDRO, TEST = LOADING ASSOCIATED WITH HYDROSTATIC TESTING ONLY, AND INCLUDES THERMAL AND WEIGHT LOADS AS APPLICABLE.
 - EMERGENCY = LOADING ASSOCIATED WITH EMERGENCY PLANT/SYSTEM OPERATING CONDITIONS, AND INCLUDES THERMAL, WEIGHT, SEISMIC (SSE) AND TRANSIENT * LOADS AS APPLICABLE.
 - FAULTED = LOADING ASSOCIATED WITH THE PLANT/SYSTEM DESIGN BASIS ACCIDENT (LOCA) AND INCLUDES LOADS RELATED TO THE PIPE RUPTURE EVENT.
- * TRANSIENT LOADS MAY INCLUDE PLANT DYNAMIC LOADS ASSOCIATED WITH THE PLANT FAULTED CONDITION (LOCA), AS APPLICABLE, BASED ON THE SYSTEMS INTENDED FUNCTION.

ITEM	QUAN FIG NO OR PART NO	DESCRIPTION	COMPONENT WEIGHT	P.A.	V.M.P.	M.P.	BILL OF MATERIALS				
							DESIGN	OPERATING	HYDRO TEST	EMERGENCY	
VOID											
NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING											
							TOTAL WEIGHT				
							LOADS (LBS.)				
							DESIGN	OPERATING	HYDRO TEST	EMERGENCY	FAULTED

MDS-15, 1.2 (1-76) FORM APPROVED IN DEPT. MGR.

REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.

DRAWING RELEASE RECORD							SUPPORT CLASS
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APP'L	FILM	EMD REVIEW
A	-	11-14-77	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

REVISION DESCRIPTION
 ADDED PER ECN-254
 F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE

BYRON/BRAIDWOOD STATION UNIT-1 & 2 COMMONWEALTH EDISON COMPANY CHICAGO, ILLINOIS				
COMPONENT SUPPORTS GENERAL NOTES AND DETAILS				
DRAWN <i>[Signature]</i> CHECKED <i>[Signature]</i>	NO SCALE DATE 9-23-77	SARGENT LUNDY ENGINEERS CHICAGO		
ENGINEER <i>[Signature]</i>	DATE 11/14/77			SUPPORT NO. M-0916
APPROVED <i>[Signature]</i>	DATE 11-14-77			REV A
PROJECT NO. 4391-00 4392-00 4683-00 4684-00		SHEET 9 OF		

COMPONENT SUPPORT SYMBOLS AND DEFINITIONS

T.S. = TRAVEL STOP
 H.L. = HOT OR OPERATING LOAD
 C.L. = COLD OR SHUTDOWN LOAD
 WT. = WEIGHT
 SK. = SKETCH
 SECT. = SECTION
 DN = DOWN
 SUPPT. = SUPPORT
 AUX. = AUXILIARY
 PENET. = PENETRATION
 TYP. = TYPICAL
 CONN. = CONNECTION
 F.W. = FIELD WELD
 S.W. = SHOP WELD
 W.P. = WORKING POINT
 C.P.S. = COLD PISTON SETTING
 H.P.S. = HOT PISTON SETTING

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 BYRON PROJECT
VOID

C.S. = COLD SETTING FOR SNUBBER, CARB STEEL FOR MAT'L
 H.S. = HOT SETTING
 PL = PLATE
 C-C = CENTER TO CENTER
 B-B = BACK TO BACK
 TBE = THREAD BOTH END
 TOE = THREAD ONE END
 TFL = THREAD FULL LENGTH
 LH THD = LEFT-HAND THREAD
 DET. = DETAIL
 LG. = LONG
 SCH. = SCHEDULE
 THK. = THICKNESS
 C.POS. = COLD POSITION
 H.POS. = HOT POSITION
 MAT'L = MATERIAL
 S.S. = STAINLESS STEEL
 INSUL. = INSULATION
 ADD'L = ADDITIONAL
 C.T. = CALCULATED TRAVEL
 T.T. = TOTAL TRAVEL
 I.P. = IN PLACE
 N.S. = NEAR SIDE
 F.S. = FAR SIDE

P&S = PLATE & SHELL
 L = LINEAR
 CSS = COMPONENT STANDARD SUPPORT
 PRIM. = PRIMARY
 SEC. = SECONDARY
 AISC. = AMERICAN INSTITUTE OF STEEL CONSTRUCTION
 EL. = ELEVATION
 ASSY = ASSEMBLY
 MOV. = MOVEMENT
 L.A. = LOWER ATTACHMENT (FOR HANGER)
 U.A. = UPPER ATTACHMENT (FOR HANGER)
 EMB. = EMBEDMENT
 B/S = BOTTOM OF STEEL
 B/C = BOTTOM OF CONCRETE
 T/C = TOP OF CONCRETE
 T/F = TOP OF FLOOR
 T/G = TOP OF GRATING
 T/S = TOP OF STEEL
 T/CAN = TOP OF CAN (VARIABLE HANGER)
 VAR. = VARIABLE
 SPRG. = SPRING
 CONST. = CONSTANT

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**NUCLEAR SAFETY RELATED
 ITEMS ARE SHOWN ON THIS DRAWING**

BYRON/BRAWOOD STATION
 UNIT 1 & 2
 COMMONWEALTH EDISON COMPANY
 CHICAGO, ILLINOIS

**COMPONENT SUPPORTS GENERAL
 NOTES AND DETAILS**

REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APPL	FILM	EMD REVIEW
A	-	11/4-77	<i>R. [Signature]</i>	<i>A. N. [Signature]</i>	<i>R. S. [Signature]</i>		
REVISION DESCRIPTION							
ADDED PER ECN-254 F/L 2771 & P/L 2739 FOR INFORMATION & REFERENCE							

DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.

SUPPORT CLASS

PROJECT NO.
 4391-00 4392-00
 4683-00 4684-00

NO SCALE

DATE 9-23-77

DATE 11/14/77

DATE 11-14-77

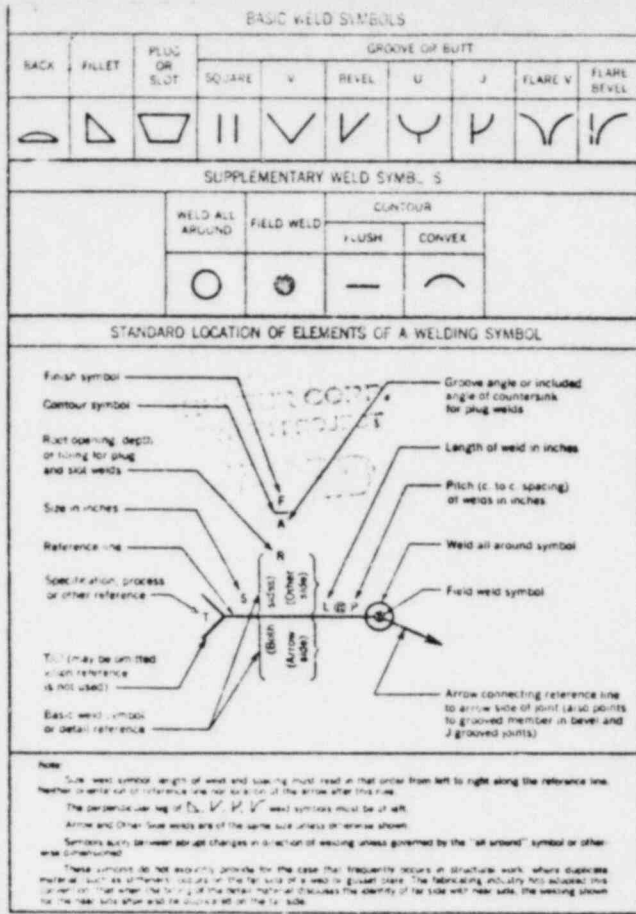
SARGENT & LUNDY
 ENGINEERS
 CHICAGO

SUPPORT NO. M-916

REV A

SHEET 10-0F

MOB-15.1.2 (1-7-76) FORM APPROVED



WELDED JOINTS
 Standard symbols
 AMERICAN INSTITUTE OF STEEL CONSTRUCTION

BILL OF MATERIAL

ITEM	QUAN FIG NO OR PART NO	DESCRIPTION	COMPONENT WEIGHT	LBS	KGS	MATERIAL	SPECIFICATION	STANDARD	BY	DATE		
											<p style="font-size: 2em; opacity: 0.5;">UNCONTROLLED COPY</p>	
<p style="font-weight: bold;">NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING</p>												
TOTAL WEIGHT												
LOADS (LBS.)												
DESIGN			OPERATING			HYDRO TEST			EMERGENCY		FAULTED	

MD-15, 1.2 (11-76) FINISH REVISED DEPT. MGR.

REFERENCE DRAWINGS	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.	DWG. NO.	REV.
DRAWING RELEASE RECORD								
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APP'L	FILM	E'ND REVIEW	
A	-	11-14-77	<i>Ramona</i>	<i>A. N. Justice</i>	<i>B. S. Johnson</i>			
REVISION DESCRIPTION								
ADDED PER ECN-254 F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE								

SUPPORT CLASS	
P. E. SEAL	
PROJECT NO.	
4391-00	4392-00
4683-00	4684-00

BYRON/BRAIDWOOD STATION UNIT-162 COMMONWEALTH EDISON COMPANY CHICAGO, ILLINOIS																									
COMPONENT SUPPORTS GENERAL NOTES AND DETAILS																									
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<i>Ramona</i>	NO SCALE																								
<i>A. N. Justice</i>	9-23-77																								
CHECKED	DATE																								
<i>B. S. Johnson</i>	11/14/77																								
ENGINEER	DATE																								
<i>M. A. Chapp</i>	11-18-77																								
APPROVED	DATE																								
SARGENT & LUNDY																									
ENGINEERS CHICAGO																									
SUPPORT NO.	REV																								
M-916	A																								
SHEET 11 OF																									

COMPONENT SUPPORT INSTALLATION:

- (A) COMPONENT SUPPORTS ARE TO BE INSTALLED IN THE LOCATION AS INDICATED ON THE SUPPORT DETAIL DRAWING.
- (B) IN ALL CASES, THE LATERAL DISTANCE BETWEEN THE UPPER AND LOWER ATTACHMENT AS SHOWN ON THE INDIVIDUAL SUPPORT DETAIL DRAWING MUST BE MAINTAINED.
- (C) TOLERANCES ARE TO BE USED ONLY WHEN THE COMPONENT SUPPORT CANNOT BE INSTALLED AS SHOWN ON THE INDIVIDUAL SUPPORT DETAIL DRAWING.

COMPONENT SUPPORT INSTALLATION TOLERANCES:

- (A) RIGID SUPPORTS LOCATED IN STRAIGHT RUNS OF PIPE HAVE A TOLERANCE OF $\pm 6"$ FROM THE LOCATION SHOWN ON THE SUPPORT DETAIL DRAWING. FOR VARIABLE AND CONSTANT TYPE SUPPORTS, THE TOLERANCE IS $\pm 3"$ (SEE FIGS. A-1 THRU A-D).
- (B) SUPPORTS ADJACENT TO A VERTICAL RISERS HAVE A TOLERANCE OF $\pm 3"$ (SEE FIG. C-1).
- (C) THE FIRST TWO SUPPORTS LOCATED ADJACENT TO EQUIPMENT (PUMPS, HEAT EXCHANGERS, TANKS, ETC) HAVE A TOLERANCE OF $\pm 2"$ (SEE FIG. D-1).

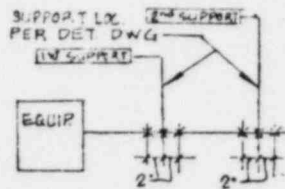


FIG. D-1

NOTES:

- 1. FIGS. B-1, B-2 & C-1 ARE APPLICABLE TO VARIABLE AND CONSTANT TYPE SUPPORTS.
- 2. WHEN RELOCATING SUPPORT TOWARD A WELD, THE SUPPORT SHALL NOT BE CLOSER THAN 3" TO THE WELD.
- 3. WHEN THE LOCATION OF THE SUPPORT COVERS A WELD, THE SUPPORT IS TO BE RELOCATED LONGITUDINALLY ALONG THE PIPE, 3" AWAY FROM THE WELD.

NUCLEAR SAFETY RELATED
ITEMS ARE SHOWN ON THIS DRAWING

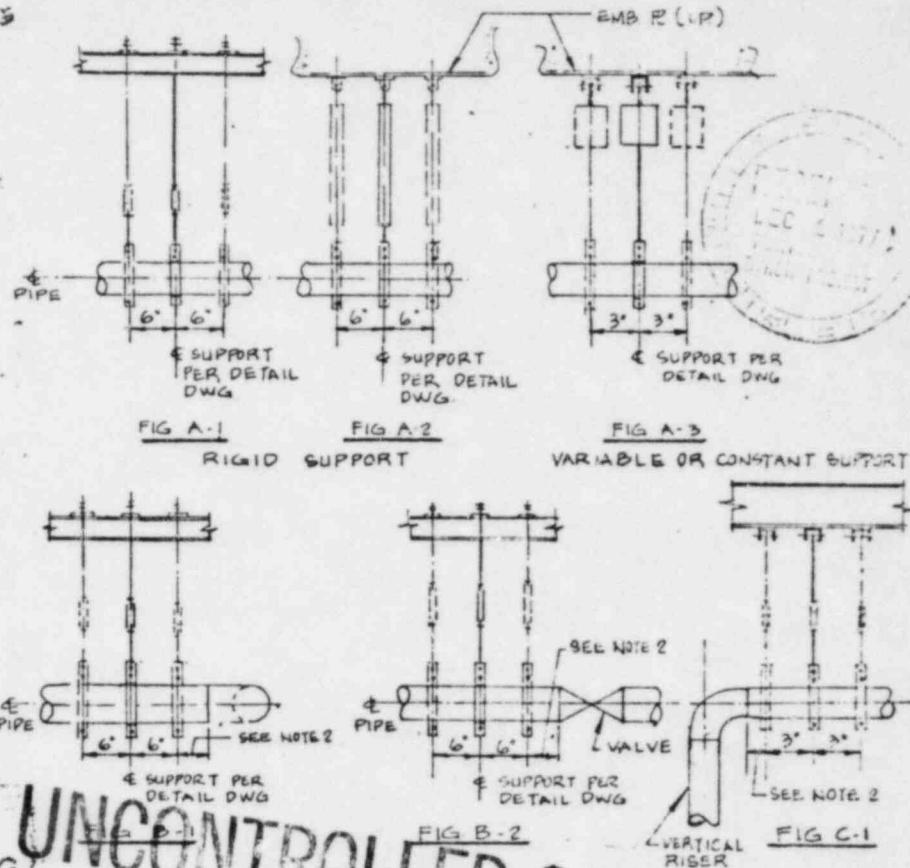


FIG. A-1

RIGID SUPPORT

FIG. A-2

FIG. A-3

VARIABLE OR CONSTANT SUPPORT

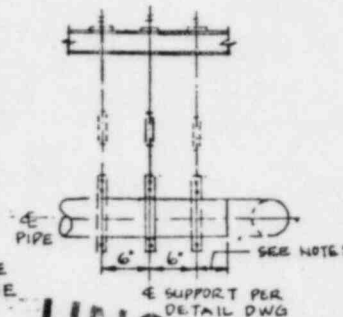


FIG. B-1

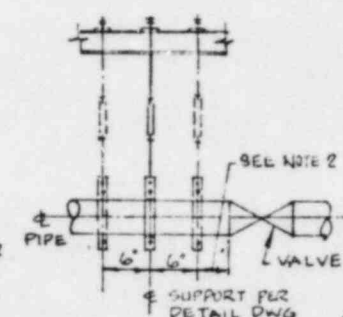


FIG. B-2

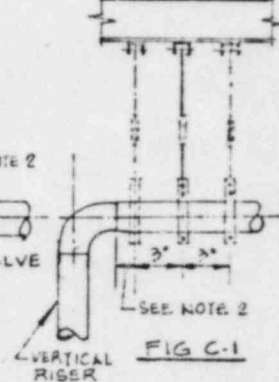


FIG. C-1

REFERENCE DRAWINGS							
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DRAWING RELEASE RECORD							SUPPORT CLASS
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APP'L	FILM	EMD REVIEW
A	-	11-14-77	<i>Carroll</i>	<i>ANN</i>	<i>B39</i>		

REVISION DESCRIPTION							
ADDED PER ECN-254							
F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE							

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HUNTER CORP.
HYDRO-ELECTRIC PROJECTS
VOID
FOR FIELD USE

P. E. SEAL

COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL
NOTES AND DETAILS

NO SCALE

DATE 9-23-77

DATE 11-14-77

DATE 11-14-77

DATE

SARGENT & LUNDY
ENGINEERS
CHICAGO

SUPPORT NO. M-916

REV. A

SHEET 12 OF

MDS-15, 1, 2 (1-76) FROM APPROVED

(E) TRAPEZOID TYPE SUPPORTS (USING TWO GRINNELL FIG. 211, FIG. 200, FIG. 201, FIG. 306 OR FIG. 307) SHALL BE PARALLEL UNLESS OTHERWISE NOTED ON THE DETAIL DRAWING.

(F) SEISMIC SUPPORTS SHALL BE WITHIN $\pm 5^\circ$ OF THE DESIGNED POSITION AS SHOWN ON THE DETAIL DRAWING. SEISMIC RESTRAINT BRACKET ATTACHED TO THE PIPING LUGS SHALL BE PARALLEL (FIGS F-1 & F-2)

(G) SEISMIC SUPPORTS USING CLAMP AS PIPE ATTACHMENT SHALL HAVE A TOLERANCE OF $\pm 6"$ FROM THE LOCATION SHOWN ON THE DETAIL DRAWING EXCEPT WHERE THE SEISMIC SUPPORTS ARE LOCATED ADJACENT TO EQUIPMENT (PUMPS, HEAT EXCHANGERS, TANKS, ETC) SHALL HAVE A TOLERANCE OF $\pm 2"$. (THIS APPLIES TO THE FIRST TWO SEISMIC SUPPORTS FROM THE EQUIPMENT)

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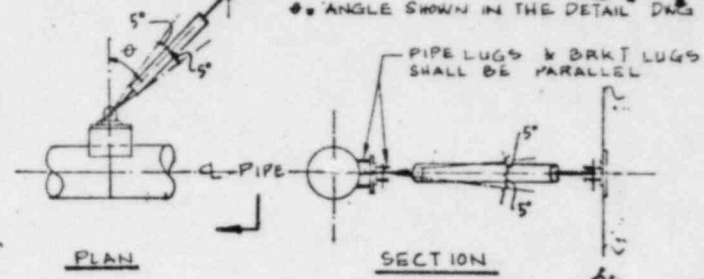


FIG F-1

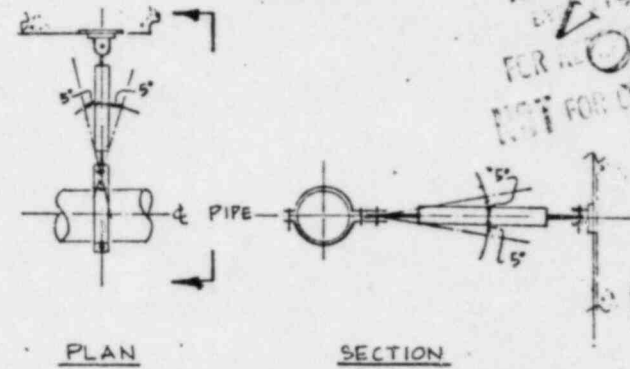
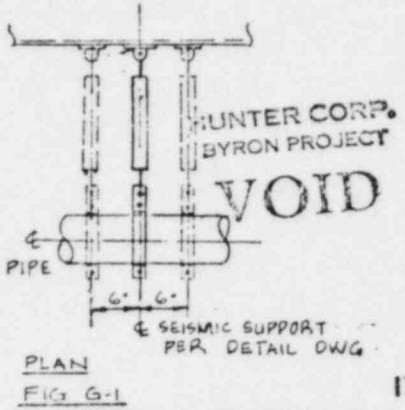


FIG F-2

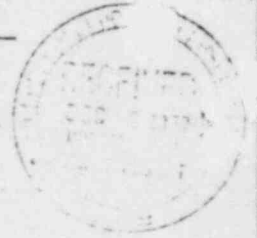
NOTE:
FIGS F-1, F-2 & G-1 ILLUSTRATES TOLERANCES SPECIFIED BY ITEMS (F) & (G). SEISMIC SUPPORT TYPE IS INDICATED BY ALPHA LETTER "X" OR "S" (SEE PAGE B.)



PLAN
FIG G-1

**NUCLEAR SAFETY RELATED
ITEMS ARE SHOWN ON THIS DRAWING**

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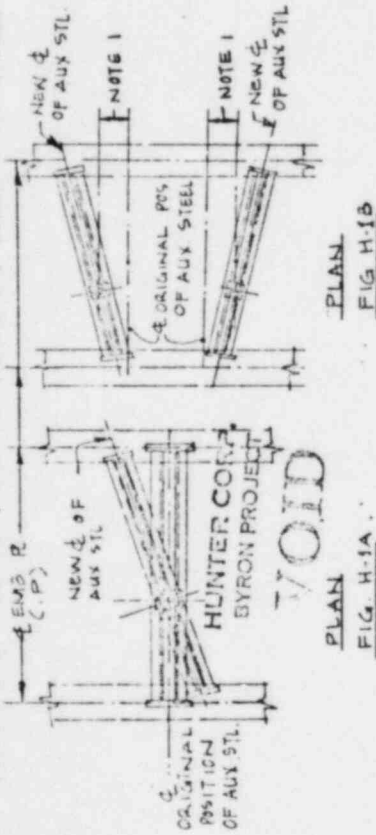
DRAWING RELEASE RECORD							SUPPORT CLASS
REV.	SPEC. NO.	DATE	DRAWN	CHECKED	ENG'R APPL	FILM	EMD REVIEW
A	-	11-14-77	<i>ANN Nuetis</i>	<i>ANN Nuetis</i>	<i>W. B. Johnson</i>		
REVISION DESCRIPTION							
ADDED PER ECN -254							
FIL 2771 & FIL 2739 FOR INFORMATION & REFERENCE							

P. E. SEAL	
PROJECT NO.	
4391-00	4392-00
4683-00	4684-00

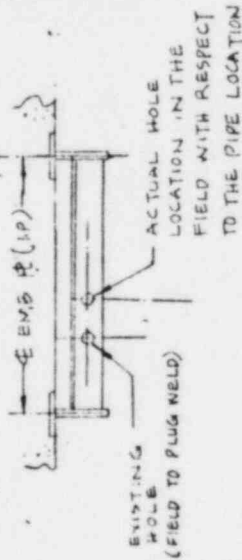
UNIT-1 & 2 COMMONWEALTH EDISON COMPANY CHICAGO, ILLINOIS	
COMPONENT SUPPORTS GENERAL NOTES AND DETAILS	
DRAWN: <i>ANN Nuetis</i> CHECKED: <i>W. B. Johnson</i> ENGINEER: <i>W. B. Johnson</i> APPROVED: <i>W. B. Johnson</i>	NO SCALE DATE: 9-23-77 DATE: 11/14/77 DATE: 11-14-77
SARGENT & LUNDY ENGINEERS CHICAGO	SUPPORT NO. M-916 REV. A
SHEET 13 OF	

MGR. MOE-15.1.2 (1-77) FORM APPROVED

(A) WHERE THERE IS A NEED FOR FIELD ADJUSTMENT OF AUXILIARY STEEL (UPPER ATTACHMENT) TO AVOID INTERFERENCE WITH DRAIN LINES, ELECTRICAL CABLE TRAYS & SUPPORTS, HVAC DUCTS & SUPPORTS, OR PIPING OFF FROM DESIGNED LOCATION, THE FOLLOWING MODIFICATION TO AUXILIARY STEEL SHALL BE USE:

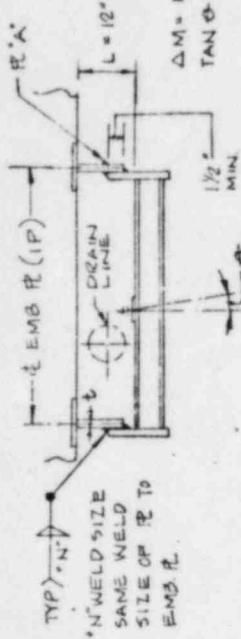


PLAN
FIG. H-1A



SECTION
FIG. H-2

- NOTES:
- COMPONENT SUPPORT INSTALLATION TOLERANCES MUST BE MET. (SEE PAGE 10)
 - FIG. H-2 IS ALSO APPLICABLE WHEN TOP SIDE OF AUXILIARY STEEL HAS THE HOLE.



$\Delta M =$ PIPE LATERAL MOVEMENT
 $TAN \phi = \frac{\Delta M}{R}$
 $R =$ ROD LENGTH
 (FROM ϕ/M , DET. DNG.)

MAX. ALLOWABLE LOAD

R/A SIZE	ANGLE ϕ	2°	3°	4°
W T				
4" 3/8	8273	4672	3254	2435
6" 3/8	10410	7008	4881	3743
8" 3/8	16546	9375	6505	4991
10" 1/2	34153	19705	14040	10840

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 BYRON PROJECT
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REV. SPEC NO. DATE	DRAWN CHECKED ENGR APPL FILM	EMD REVIEW
A - 11-14-77	Drawn by P. N. N. Checked by P. N. N. Applied by P. N. N.	
P. E. SEAL PROJECT NO. 4683-00 4683-00 4684-00 ADDED PER ECN-254 F/L 2771 & F/L 2739 FOR INFORMATION & REFERENCE		

UNIT 1 & 2
 COMMONWEALTH EDISON COMPANY
 CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL
 NOTES AND DETAILS

DRAWN: P. N. N.
 CHECKED: P. N. N.
 ENGINEER: P. N. N.
 APPROVED: P. N. N.

NO SCALE
 DATE: 4-15-77
 DATE: 11/14/77
 DATE: 11-14-77

SARGENT LUNDY
 ENGINEERS
 CHICAGO

SUPPORT NO. M-916
 SHEET 14 OF A

NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING

1) WHEN A HANGER MISSED THE EXISTING EMB R OR STRUCTURAL STEEL AND THERE IS NO ADJACENT EMB R OR STRUCTURAL STEEL AND WHERE THE SAGE OF AUXILIARY STEEL IS BETWEEN THEM CANNOT BE UTILIZED, MODIFICATION TO THE UPPER ATTACHMENT SHALL CONFORM WITH THE TABLE 1 FOR FIGS J-1 AND J-2, TABLE 2 FOR FIG. J-3.

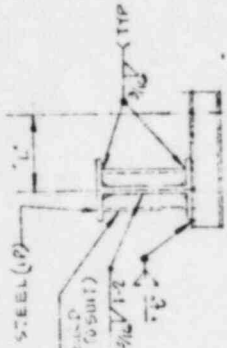


FIG. J-2
TABLE 2

LOAD (LBS)	L (INCHES)	AUX STL SIZE	WELD SIZE (IN)
100	24	W4 x 13	3/16
200	16.2	W4 x 13	3/16
300	10.8	W4 x 13	3/16
400	8.1	W4 x 13	3/16
500	6.5	W4 x 13	3/16
600	5.5	W4 x 13	3/16
700	4.6	W4 x 13	3/16
800	4.0	W4 x 13	3/16
900	3.6	W4 x 13	3/16
1000	3.2	W4 x 13	3/16

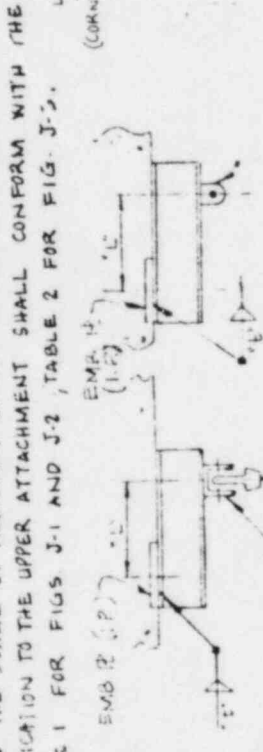


FIG. J-1

TABLE 1

LOAD (LBS)	L (INCHES)	AUX STL SIZE	WELD SIZE (IN)
1000	28.5	W4 x 13	5/16
2000	23.5	W4 x 13	5/16
3000	20.5	W4 x 13	5/16
4000	18.5	W4 x 13	5/16
5000	16.5	W4 x 13	5/16
6000	15.5	W4 x 13	5/16

NOTE:

APPLICATION OF FIGS. J-1, J-2 & J-3 MUST BE LIMITED TO 2 FOR EMB R OR STRUCT. STEEL. OVER THIS LIMIT, SARGENT & LUNDY MUST BE CONSULTED.

GRINNELL H-55 (REF.)

GRINNELL FIG. 66 (REF.)



M-916-8
SH-15

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REFERENCE DRAWINGS

DRAWING RELEASE RECORD

DATE	BY	REASON	CLASS
11-14-77	W.C. Johnson	FOR PROJECT	SUPPORT
2-1-78	W.C. Johnson	FOR PROJECT	EMD REVIEW

REVISION DESCRIPTION

NO.	DATE	DESCRIPTION
1	4/23/78	FOR INFORMATION & REFERENCE
2	4/28/78	FINAL PAGE INDICATOR

COMPONENT SUPPORT GENERAL NOTES AND DETAILS

SARGENT LUNDY ENGINEERS

SUPPORT NO. REV. NI-916 B

DATE: 11-8-77, 11-14-77, 11-14-77

BY: W.C. Johnson, W.C. Johnson, W.C. Johnson

PROJECT NO. 4391-00, 4392-00, 4384-00

SHEET 15 OF 3

2-916-W
91110
S1116

WHERE PIPE LOCATION DIFFERS BETWEEN SUPPORT DETAIL DRAWING AND THE SINGLE LINE SYSTEM DRAWING, THE SINGLE LINE DRAWING GOVERNS PROVIDED THAT ALL SUPPORT COMPONENTS CAN BE USED. RESTRICTIONS TO THIS GUIDELINE IS WHEN NEW SUPPORT COMPONENTS ARE TO BE USED IN THE RE LOCATION SEE FIGS K-1 & K-2 FOR ILLUSTRATION SARGENT & LUNDY MUST BE NOTIFIED OF DISCREPANCIES BETWEEN SUPPORT DETAILS AND SINGLE LINE SYSTEM DRAWING.

(L) WHERE PIPE ELEVATION DIFFERS BETWEEN SUPPORT DETAIL DRAWING AND THE SINGLE LINE SYSTEM DRAWING, THE SINGLE LINE DRAWING GOVERNS PROVIDED THAT ALL SUPPORT COMPONENTS CAN BE USED LONGER ROVS CAN BE CUT TO SUIT FIELD CONDITIONS WHEN THE MEANS OF ADJUSTMENT RUN OUT OF RANGE TO FACILITATE SUPPORT INSTALLATION. RESTRICTION TO THIS RULE IS WHEN NEW SUPPORT COMPONENTS ARE TO BE USED. SEE FIGS L-1 & L-2 FOR ILLUSTRATION SARGENT & LUNDY MUST BE NOTIFIED OF DISCREPANCIES BETWEEN SUPPORT DETAILS AND SINGLE LINE SYSTEM DRAWING

(M) OPTIONAL REPLACEMENT OF AUX STEEL CLASSIFIED UNDER A588 (PRIMARILY UPPER STEEL MEMBERS) TO BIGGER SIZES ARE ALLOWED PROVIDED INTERFERENCE PROBLEMS ARE NOT CREATED AND MODIFICATION TO SUPPORT INSTALLATION IS NOT NEEDED. ALSO MATERIAL SPEC MUST BE FOLLOWED, SA FOR CLASS A, B, C, AND CLASS A FOR CLASS D SARGENT & LUNDY MUST BE NOTIFIED WHEN AUX STEEL SIZES ARE CHANGED

NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING

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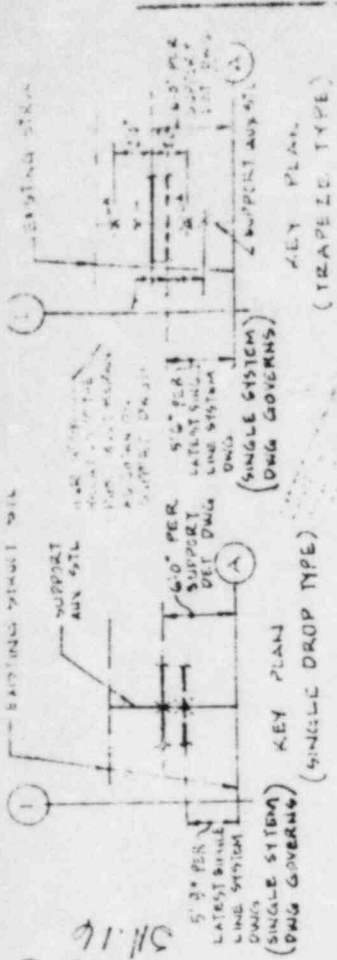


FIG. K-1
KEY PLAN
(SINGLE DROP TYPE)

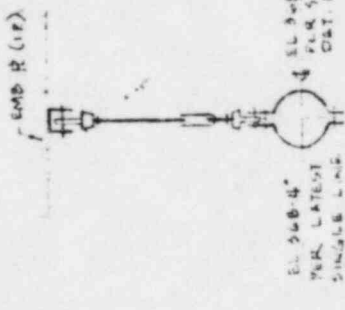


FIG. L-1
KEY PLAN
(SINGLE SYSTEM)

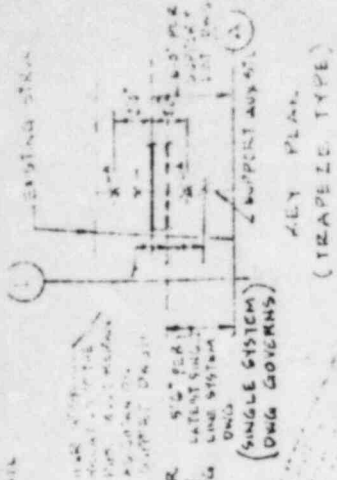


FIG. K-2
KEY PLAN
(TRAPEZOID TYPE)

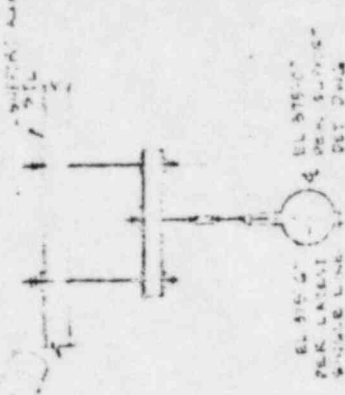


FIG. L-2
KEY PLAN
(SINGLE SYSTEM)

REV.	DATE	BY	CHK'D BY	REV.	DATE	BY	CHK'D BY	REV.	DATE	BY	CHK'D BY
A	01-78										
B	5-30-78										

DRAWING RELEASE RECORD

PROJECT NO. 4391-00

PROJECT NO. 4683-00

PROJECT NO. 4392-00

PROJECT NO. 4384-00

REVISION DESCRIPTION

FL 2711 & F/L 2729 FOR INFO & REF FOR CONSTRUCTION

REV. B. REVISED PAGE SEQUENCE

REV.	DATE	BY	CHK'D BY	REV.	DATE	BY	CHK'D BY
	2/17/78				2/17/78		
	2/17/78				2/17/78		
	2/17/78				2/17/78		

COMPONENT SUPPORTS GENERAL NOTES AND DETAILS

SARGENT LUNDY

SUPPORT NO. M-916 A B

SHEET 16 OF 17

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(N) FIG 211 SWAY STRUT CAN BE SHORTENED WHEN EXTENSION PIECE "W" IS TOO LONG BUT NOT LESS THAN MINIMUM "W" AS RE-QUIRED PER GRINNELL CAT FH-76 & ICD SHEETS APPENDIX "A" PAR 5 BY USING EITHER METHOD SHOWN BY FIG N-1 & FIG N-2 THIS METHOD TO BE USED WHEN PROPER ADJUSTMENTS RUN OUT OF RANGE

(P) REAR END BRACKETS OF FIG 211 SWAY STRUT ASSY, FIG 306 & FIG 307 MECHANICAL SNUDBERS, FIG 200 & FIG 201 HYD. SNUDBERS CAN BE ROTATED TO ANY POSITION AS SHOWN BY FIG P-1 & FIG P-2 THESE ALTERNATE SELECTIONS OF REAR BRACKET POSITION SHALL BE USED WHEN NORMAL POSITION SHOWN BY COMPONENT SUPPORT DETAIL PNGS CANNOT BE FOLLOWED. WELD REQUIREMENTS MUST BE MAINTAINED.

NOTE: SUPPORT MUST BE PERPENDICULAR TO PIPE & TO STRUCTURAL ATTACHMENT

(Q) WELDED BEAM ATTACHMENT FIG 66 (GRINNELL) FIG 67 (ELGEN) FIG 401 (COENNEZ & LADA) CAN BE POSITIONED AS SHOWN BY FIG. Q-1 & FIG Q-2 THESE ALTERNATE BEAM ATTACHMENT POSITIONS MAY BE USED WHEN NORMAL POSITION SHOWN ON COMPO-NENT SUPPORT DETAIL DRAWING CANNOT BE FOLLOWED

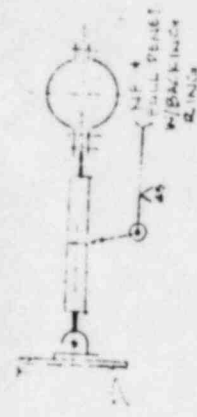


FIG. N-1

CSW WELD PER PIPE CLASS

FIG. N-2

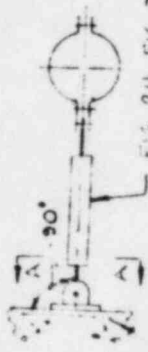


FIG. P-1
L & B R (P) FIG 211, FIG 306, FIG 307
FIG 200, FIG 201

FIG. Q-1

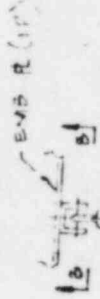


FIG. Q-1

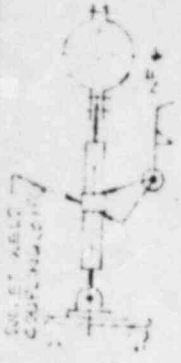


FIG. N-2

VOID
CHECK PROJECT

FIG. P-2

SECT. A-A & DIFF. BEAM POSITION



SECT. B-B (LOOKING UP) & DIFF. BEAM ATTACHMENT

FIG. Q-2

NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING

REF. DRAWING	DATE	BY	CHKD.	REV.

DRAWING RELEASE RECORD

DATE	BY	REASON
5-22-78	W. J.

REVISION DESCRIPTION

F/L 277 & F/L 279 FOR INFO & REF

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UNIT 1 & 2
GENERAL INVESTIGATIVE COMPANY
MILLERSVILLE, MISSOURI
COMPONENT SUPPORTS GENERAL NOTES AND DETAILS

SARGENT LUNDY
SUPPORTING FIRM
M-210
SHEET 17 OF

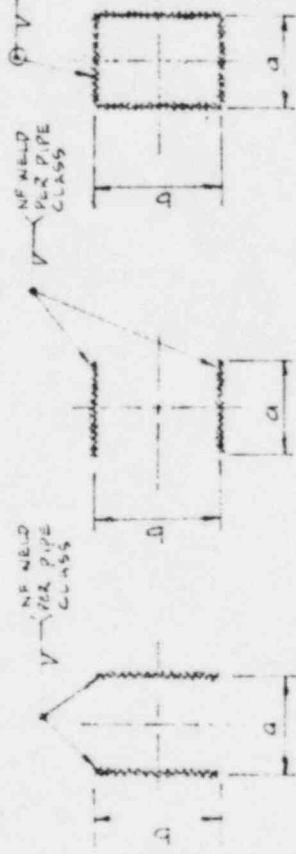
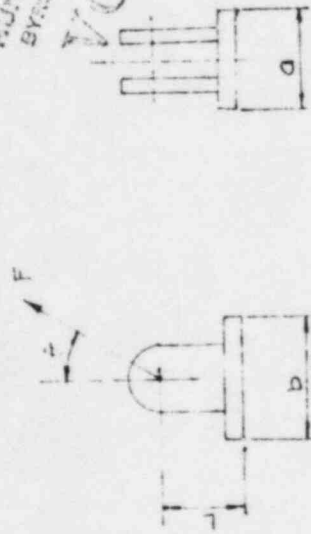
PROJECT NO
4391-00 4992-00
4687-00 4684-00

SEISMIC RESTRAINT REAR END BRACKET WELD SIZE

I WELD CONFIGURATION

NUMBER CORNERS
BYRON PROJECT
VOID

M 9118
51.18



MINIMUM WELD SIZE TABLE

SWAY STRUT SIZE	BRKT DIM		FORCE DIRECTION					
	a	b	L	TYPE 'A'	TYPE 'B'	TYPE 'C'	TYPE 'C'	
A	150	288	100	3/16	3/16	3/16	3/16	
B	362	500	212	3/16	3/16	3/16	3/16	
C	362	500	212	3/16	3/16	3/16	3/16	
1	288	450	250	3/16	3/16	3/16	3/16	
2	288	450	250	3/16	3/16	3/16	3/16	
3	356	538	325	3/8	3/8	3/8	3/8	
4	356	538	325	3/8	3/8	3/8	3/8	
5	425	619	400	7/16	7/16	7/16	7/16	
6	538	788	500	3/4	3/4	3/4	3/4	

MECHANICAL SNUBBER SIZE

1/2	150	288	100	3/16	3/16	3/16	3/16
1	50	288	100	3/16	3/16	3/16	3/16
2	212	400	162	3/16	3/16	3/16	3/16
3	316	500	212	3/16	3/16	3/16	3/16
10	400	700	288	3/4	3/4	3/4	3/4

NOTES

1 WELD SIZES BASED ON ITT GRINNELL LOAD RATINGS AT FORCE DIRECTION OF FIG 2.11 FIG 306 & FIG 307

2 TYPE 'A' OR TYPE 'B' SIZES CAN BE USED

NUCLEAR SAFETY RELATED ITEMS ARE SHOWN ON THIS DRAWING

ENGINEERING SERVICE

ILLINOIS INDUSTRIAL FILM

CHICAGO, ILLINOIS

COMPONENT SUPPORTS GENERAL NOTES AND DETAILS

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APPROVED: [Signature] 5-30-79

SUPPORT NO. W 316

SHEET 12 OF 18

PROJECT NO.

4391-00 4392-00

4683-00 4684-00

REFERENCE DRAWINGS

DATE: 5-30-78

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ENGINEER: [Signature]

DESIGNER: [Signature]

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REV	DATE	REV	DATE	REV	DATE	REV	DATE
1	5-30-78	2		3		4	

SUPPORT CLASS: [Blank]

REVISION DESCRIPTION: F/L 277, & F/L 279 FOR NFO & REFERENCE

(S) ALLOWABLE MATERIALS THAT CAN BE USED FOR PIPE LUGS, PIPE STANCHIONS & SUPPLEMENTARY STEELS ARE AS FOLLOWS:

A. LUGS

1. CARBON STEEL PIPING

- (a) CLASS A, B, OR C - SA 515 GR 65 OR SA 515 GR 70
- (b) CLASS D - A 515 GR 70

2. STAINLESS STEEL PIPING

- (a) CLASS A, B, OR C - SA 240 TP 304 OR SA 240 TP 316
- (b) CLASS D - A 240 TP 304 OR A 240 TP 316

BYRON CORP.
BYRON PROJECT

B. STANCHIONS

1. CARBON STEEL PIPING

- (a) CLASS A, B, OR C - SA 106 GR B
- (b) CLASS D - A 106 GR B OR A 53 GR B

2. STAINLESS STEEL PIPING

- (a) CLASS A, B, OR C - SA 312 TP 304 OR SA 312 TP 316
- (b) CLASS D - A 312 TP 304 OR SA 312 TP 316

C. SUPPLEMENTARY STEELS

1. CARBON STEEL

- (a) CLASS A, B, OR C - SA 36 OR SA 515 GR 65 OR SA 515 GR 70
- (b) CLASS D - A 36 OR A 515 GR 65 OR A 515 GR 70

2. STAINLESS STEEL

NONE USED.

(T) LOCKING DEVICES - LOCK NUTS OR JAM NUTS ARE RECOMMENDED LOCKING DEVICES FOR THREADED FASTENERS WHERE LOCK NUTS OR JAM NUTS ARE SPECIFIED AS LOCKING DEVICE AFTER SUPPORT WAS INSTALLED UPSET THREADED ARE ACCEPTABLE BUT NOT RECOMMENDED. SARGENT & LUNDY IS TO BE GIVEN "AS INSTALLED" INFORMATION WHENEVER THIS OPTION IS USED.



M-916-09
K.B.

UNCONTROLLED ITEMS ARE SHOWN ON THIS DRAWING

REV.	SPEC NO.	DATE	DWG NO.	REV.	DWG NO.	REV.	DWG NO.	REV.	DWG NO.	REV.	SUPPORT CLASS
A		5-30-78									
B		6-6-79									

DRAWING NO. 62-31871
 PROJECT NO. 4392-00
 SHEET NO. 4683-00
 DATE 5-30-78
 DATE 5-30-79
 DATE 5-30-79

APPROVED: *[Signature]*
 ENGINEER: *[Signature]*
 CHECKED: *[Signature]*
 DATE: 5-30-78

PROJECT NO. 4392-00
 SHEET NO. 4683-00

SARGENT & LUNDY ENGINEERS

COMPONENT NOTES AND DETAILS
 GENERAL
 SUPPORTING NO. 916
 SHEET 19 OF 19

COMMONWEALTH EDUCATIONAL COMPANY
 CHICAGO, ILLINOIS

WILLIAM CARL CLIFF
 PROJECT NO. 4392-00
 SHEET NO. 4683-00

REV'D - TAPPED OPTIONAL MATL
 F/L 2711 Y F/L 2739 - FOR FAB & CONST.

HUNTER CORPORATION
INTER-COMPANY CORRESPONDENCE

Smith REP. EX. NO. 2
FOR ID. AS OF 1/15/83 pmj

HC-QA-#23

DATE: March 7, 1979
TO: See Distribution
FROM: B. Krasawski/M.L. Somsag
SUBJECT: Component Support Discrepancy Reporting.

This letter supercedes the letter dated January 12, 1979, which addresses Safety Related Hanger Installation.

Due to recent developments pertaining to Component Support Discrepancy documentation, the following methods of reporting discrepancies shall be adhered to.

1. Component Supports shall be installed in accordance with the construction copy drawings wherever possible.
2. Component Supports that cannot be installed per the construction copy drawings, may be installed per the S & L M-916 adjustment tolerances. When the M-916 tolerances are used, the cognizant supervisor must provide as-built data relative to the extent of the changes. As-built data may be provided either on the face of the construction copy drawing (for simple changes), or on the back of the drawing (for complex changes). Changes must be noted in black ink and initialed and dated by the supervisor. Changes must be documented prior to contacting a Q.C. Representative for installation acceptance. Q.C. acceptance of the as-built data will be indicated by the Inspector's initials and the date adjacent to the supervisor's initials and date. For Job Traveller packages that do not have an inspector sign-off on the process sheets for non"NF" welds, inspection will be documented in the same manner as in the past. Copies of the as-built component support drawings will be transmitted to the Hanger Engineer, (for review by Engineering and Consulting Engineers) whenever invocation of M-916 criteria occurs.
3. Component supports that cannot be installed per the construction copy drawing and M-916 adjustment tolerances, may not be installed until documented resolution is received from the owner or S & L. This resolution shall be secured in the following manner:

MALCOLM LEO SOMSAG
EXHIBIT No. 2

UNCONTROLLED COPY

- a) The cognizant supervisor shall initiate a Piping Support/CEA Discrepancy Report (Form HC-99, Rev. 2) and forward it to the Hanger Engineer.

* NOTE: This form serves the same purpose as the former Hanger Field Problem Sheet (Form HC-99 Rev. 0), as well as providing a method of documenting and reporting CEA discrepancies, which is explained in detail in Letter No. 18 posted with S.I.P. 20.513. A copy of Form HC-99, Rev. 2, is attached to this letter.

- b) Upon receipt of the Piping Support/CEA Discrepancy Report, the Hanger Engineer will enter the information into the Discrepancy Report Transmittal Log and forward to S & L for resolution. If a more expedient resolution is necessary to satisfy production continuance, the Discrepancy Report resolution shall be obtained in the following manner:
- c) The Hanger Engineer shall prepare a telephone memorandum with information obtained by verbally contacting S & L. He will then forward the memorandum and a copy of the Discrepancy Report to the cognizant CECO Construction Department Representative for use in preparing a CECO Field Change Request (FCR).
- d) The CECO SCD Representative prepares an FCR and forwards a copy of the same to the Hunter Hanger Engineer.
- e) The Hanger Engineer completes the Piping Support/CEA Discrepancy Report by adding data from the CECO prepared FCR and by referencing the FCR number on the lower portion of the Discrepancy Report. A copy of the FCR should also be attached to the completed Discrepancy Report.
- f) The completed Discrepancy Report is returned to the cognizant production supervisor, and authorizes him to proceed with installation of the component support as described within the context of the Piping Support/CEA Discrepancy Report. The Discrepancy Report and FCR if attached, shall be attached to the affected construction copy drawing by the production supervisor.

4. Instructions for filling out form HC-99, Rev. 2, Piping Support/CEA Discrepancy Report, may be obtained in the Hunter Controlled Form Usage Manual.

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Since this memo is supplemental in nature, and (as previously stated) supercedes the letter dated January 12, 1979, it must be placed in all S.I.P. Manuals with S.I.P. 4.002 by Document Control. Copies of the referenced form are available through Document Control.

B. Krasawski

B. Krasawski
Project Manager

M.L. Somsag

M.L. Somsag
Q.A. Supervisor

Distribution:

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AUDIT SUMMARY

AUDIT NO. 059-3

AUDIT DATE 7/27/79 to 8/28/79

DISCIPLINE Process Control
cc: B. Krasawski
A. Simon
K. Selman
H. Richardson

PERSONNEL PRESENT AT ENTRANCE MEETING

NAME	TITLE	NAME	TITLE
Ken Dash	Hanger Engineer	F. Rosenstein	Hanger Superintendent
Paul Hardenbrook	Hanger Draftsman	D. St. Angel	Hanger Superintendent
Mike Zeise	Q.A. Lead Auditor		

AUDITOR COMMENTS: The Entrance Meeting was conducted on July 24, 1979.

PERSONNEL PRESENT AT EXIT MEETING

NAME	TITLE	NAME	TITLE
D. St. Angel	Hanger Superintendent	P. Hardenbrook	Hanger Engineer
D. Johnson	Hanger Foreman	F. McGhee	Q.C. Inspection Superintendent
K. Berta	Warehouse Supervisor	Audit Team	

AUDITOR COMMENTS: Hanger Foreman, Dave Johnson, represented Fred Rosenstein, the Containment Building Hanger Superintendent, during his absence.

AUDIT RESULTS: 7 FINDINGS 2 OBSERVATIONS

AUDITOR	DATE	AUDITOR	DATE
Michael A Smith	9-25-79		
Mark P. V. ...	9-25-79	(This auditor is in training)	9-25-79

REVIEWED BY Michael Zeise DATE 9-25-79 LEAD AUDITOR APPROVED BY [Signature] DATE 9/25/79 Q.A. SUPERVISOR

FOLLOW-UP AUDIT REQUIRED: [X] YES* [] NO DATE FOLLOW-UP TO BE PERFORMED 10-22-79

CORRECTIVE ACTION ACCEPTABLE: [X] YES [] NO IF NO, THE CORPORATE Q.A. MANAGER WAS

NOTIFIED BY DATE [] TELEPHONE [] LETTER

COMMENTS: This audit closed March 11, 1980 LETTER HC-QA, 107

* FOLLOW-UP AUDITS SHALL BE PERFORMED WITHIN ONE (1) WEEK FROM THE DATE OF THE EXIT MEETING. FOR IDENTIFIED DISCREPANCIES, CORRECTIVE ACTION SHALL BE INITIATED IMMEDIATELY UPON ADJOURNMENT OF THE EXIT MEETING.

AUDIT CHECKLIST

HUNTER CORPORATION

Control

PREPARED BY: Michael A. Smith

DATE 7-25-79

QUESTIONS/INSTRUCTION	Q.A.M. ART.	SIP/ART. REV	OTHER REV/DATE	YES	NO	REMARKS
<p>INSTRUCTIONS: A random sampling of in-process Component Support JTPs will be selected from each Category 1 (Safety Related) work area to verify compliance with applicable codes, specifications and procedures in accordance with the following questions.</p>						
<p>PROCESS SHEET SYSTEM Select five (5) Component Support JTPs that require Safety Related welding and verify the following:</p>						
1) Are Safety Related welds from the Design Drawing appropriately identified on the respective Process Sheet(s)?		4.002 R/2 sub 4.1 par 4.1.c		X		
2) Are welders qualified to the WPS identified on the Process Sheet(s) and does the welder have a properly completed WMSR?		5.501 R/6 sub 4.1			X	Finding #1
3) Are the surfaces to be joined reasonably smooth and free of scale, rust, oil, grease or other deleterious foreign material prior to welding?			HC-WPS 23 page 7	X		
4) Is the preheat temperature at a minimum of 60° F prior to welding and are interpass temperatures properly monitored?			HC-WPS 23 Pages 12 & 13	X		
5) Is interpass cleaning being performed between weld passes?		5.502 R/2 Sub 7.1 Par 7.1.3		X		
6) Is the Q.C.W.I. measuring the fillet weld size?		5.502 Figure 3		X		

* Discrepancy noted during previous audit.
 (See attached report for details)

AUDIT CHECKLIST

HUNTER CORPORATION

Control

PREPARED BY: Michael A. Smith

DATE 7-25-79

QUESTIONS/INSTRUCTION	Q.A.M. ART.	SIP/ART. REV.	OTHER REV/DATE	YES	NO	REMARKS
7) Does the fillet measurement agree with the fillet weld size identified on the drawing?		5.502 R/2		X		* Discrepancy noted during previous audit.
8) After Q.C. acceptance, does the finished weld meet the following visual inspection requirements?				X		
A. Are "as welded" surfaces free of coarse ripples, grooves, overlaps, abrupt ridges and valleys?		5.502 R/2 Art 7 Par 7.1.1		X		
B. Can cracks, linear or rounded indications greater than 1/16" be found on the weld?			ASME III Sub NF Art NF5360	X		
C. Are undercuts greater than 1/32" being considered acceptable by Q.C.?		5.502 R/2 Art 7 Par 7.2.1		X		
JOB TRAVELLER PACKAGE Select five (5) Component Support JTPs where Safety Related welding has been completed and verify the following:	Sec 4 Sub 4.2.a					
9) Where applicable, does the JTP contain the following documents and are they properly completed and/or appropriately referenced?					X	Finding #2, 3, 4, and 5. Observation #1
A. Process Sheets B. Weld Records C. Weld Requisitions D. Nonconformance Reports E. NDE Reports F. NDE Requests G. Heat Treat Chart H. Drawing and Specifications I. Rework Requests J. Final Inspection Report K. RND						



AUDIT CHECKLIST

HUNTER CORPORATION

Control

PREPARED BY: Michael X. Smith

DATE 7-25-79

QUESTIONS/INSTRUCTION	Q.A.M. ART.	SIP/ART. REV	OTHER REV/DATE	YES	NO	REMARKS
<p><u>WORK CHANGE SYSTEM</u> Select five (5) Component Support JTPs where Field Revisions are required and verify the following:</p>						<p>* Discrepancy noted during previous audit.</p>
<p>10) Where a field change can be accomplished thru the use of M916 adjustment tolerances, has the cognizant supervisor provided proper as-built data on the Construction Copy Drawing?</p>	5		HC-QA-23		X	Finding #6 Observation #2
<p>11) Is the Q.C.W.I.s acceptance of the as-built data indicated by the inspector's initials and date adjacent to the supervisor's initials and date?</p>	5		HC-QA-23		X	Finding #7

Reviewed by

Michael Zeise 7-25-79
 Michael H. Zeise
 Quality Assurance Lead Auditor

Approved by

M.L. Somsag
 M.L. Somsag
 Quality Assurance Supervisor



Audit No. 059-3
Date: 7/27/79 to 8/28/79

HUNTER CORPORATION

3800 - 179TH STREET, HAMMOND, INDIANA 46323, (219) 845-8000

AUDIT REPORT

HANGER PROCESS CONTROL

Auditors Note: At the time of this Audit, it was agreed upon between the Audit Team and the Hanger Supervisor of the Auxiliary Building, D. St. Angel, that Audit Team members would be notified when Safety-Related Component Supports were being installed. However, between 8/2/79 and 8/20/79, notification had not been received by this office that Safety-Related Component Supports were being installed. Even after several personal visits to Mr. St. Angels' area, we were informed that no Component Supports were to be installed for an undetermined period of time due to priority conflicts in schedules. However, a review of Daily Inspection Reports on 8/20/79 revealed that fourteen (14) Safety-Related Component Supports were installed in the Auxiliary Building between 8/2/79 and 8/13/79, thus creating an unnecessary three week delay in Quality Assurance Audit activities.

The following items are responses to the questions which appear on the attached audit checklist. Those items which were found to be discrepant are identified as either Findings or Observations throughout this Report.

For checklist Items No.'s (1) through (8), five in-process Safety-Related Component Supports were selected, two from Containment Building No. 1 and three from the Auxiliary Building. Those selected are as follows:

<u>COMPONENT SUPPORT</u>	<u>LOCATION</u>
1SI21007S R/1	Containment
1SI21003S R/O	Containment
2SX40017V R/O	Auxiliary
2SX40007R R/O	Auxiliary
2SX40015R R/O	Auxiliary

NOTE: Of the five (5) in-process Component Supports audited, No.'s 1SI21003S and 2SX40007R could not be installed per the Construction Copy drawing. Component Support No. 1SI21003S could not be installed due to an interference with a Pipe Spool and 2SX40017V could not be installed due to an interference with a cable tray support.

Therefore, Hanger Field Problems for both Component Supports were initiated and submitted to S & L for resolution. It is felt that Component Supports 1SI21007S, 2SX40017V, and 2SX40015R will be sufficient for the subject of checklist Items (1) through (8).

Item #1 The safety related welds on the three in-process Component Support Process Sheets are as follows:

<u>Component Support</u>	<u>Location</u>	<u>Safety Related Welds on Drawing and Process Sheet</u>
1SI21007S R/1	Containment Building	Two Non-NF welds and one NF-5213 (FW-1)
2SX40007R R/O	Auxiliary Building	Two Non-NF welds and one NF-5233 (FW-1)
2SX40015R R/O	Auxiliary Building	Two Non-NF welds and two NF-5233 (FW-1 and 2)

All safety related welds from the Design Drawings were appropriately identified on the respective Process Sheets. The non-NF welds are identified on the Process Sheets as "All non-NF welds".

Item #2 The welder's qualification and the applicable WMSRs were reviewed for each in-process Component Support. The results of this review are as follows:

<u>Component Support</u>	<u>Welder's Stamp No.</u>	<u>WPS</u>	<u>WMSR No.</u>
1SI21007S R/1	HF-20	23	78564
2SX40007R R/O	HE-96	23	79302
2SX40015R R/O	HO-85	23	79313

The Weld Procedure identified on the three (3) Process Sheets was WPS 23(R/1), which is a Carbon Steel Fillet Weld procedure. In order to verify that each welder being audited was qualified to WPS 23 during the time period indicated on the WMSRs and Process Sheets, the Welders' Qualification Log Manual was utilized. This manual indicated that each welder was qualified to WPS 23.

A review of the WMSRs in Containment revealed that production completed each requisition properly. However, the following observation was noted during the Audit of JTP2SX40007R in the Auxiliary Building:

Finding No. 1: Weld Material Stores Requisition No. 79302 for JTP 2SX40007R had "As shown" entered in the Weld Number Section instead of the appropriate Field Weld numbers (FW 1 and Non-NF). Without an accurate indication of the deployment of Weld Filler Material and Welders, accurate traceability cannot be accomplished.

Recommended Corrective Action:

All Craft Supervisors and Foremen must concisely identify all Field Welds and Welders on the appropriate WMSR to provide Weld Filler Material and Welder deployment traceability.

Item #3 For Component Support Nos. 1SI21007S, 2SX40007R, and 2SX40015R, all surfaces to be joined were smooth and free of scale, rust, oil, grease or other deleterious foreign material prior to welding. This was accomplished by wire brushing the areas to be welded.

Item #4 While observing the in-process welding of the three (3) Component Supports, no preheat or interpass temperature checks were made by either the welders, fitters, or Q.C.W.I.s. After conversing with the production personnel, it was understood that no torches are issued to welders during summer months because it is assumed that when the ambient air temperature of an area is above 60°F, so will the temperature of the weld areas be. Thus, no preheating is deemed necessary. This practice appears to be questionable in terms of actual temperature spread since the audit team physically checked the temperatures of randomly selected weld surfaces in the Auxiliary Building when the ambient temperature was well above 70°F. The results were that selected base metals between elevations 401' and 330' read 62°F. This check was performed on 9/7/79 with pyrometer No. PT209.

As far as interpass temperatures are concerned, welders deduce that if the joint is hand warm between passes, then it is within the min-max tolerances.

These methods for determining whether or not temperatures are within the given parameters prescribed by procedures and specifications, appear dubious but nevertheless, acceptable.

Item #5 Interpass cleaning was performed by wire brushing the slag and other deleterious materials between each weld pass. This was observed on all three Component Supports.

Item #6 After witnessing the in-process inspection performed by the Q.C.W.I.s, it was noted that fillet weld sizes are indeed measured through the utilization of Fillet Weld or Hi-Lo Gauges. It was also noted that after qualification and certification as a Q.C.W.I., each Inspector is issued one of the above gauges through the Q.C. Inspection Superintendent.

Item #7 The fillet measurements made for Component Support Nos. 2SX40015R and 2SX40007R did in fact agree with those measurements identified on the Construction Copy drawings. However, for JTP 1SI21007S, the two Non-NF fillet weld sizes identified on the Construction Copy drawing were 5/16", but the actual measurements made on the Fillet Welds were 5/16" for one weld and 1/2" for the second. This 1/2" Fillet Weld was considered acceptable since drawings only specify minimum weld sizes. And, in order to provide adequate strength in this weld (due to the embed plate being set 1/4" deeper into the concrete on one side), a larger fillet weld was necessary.

Item #8 For items "A" and "C", the three (3) Component Supports being utilized for this audit were found to have no linear indications, no rounded indications greater than 1/16 inch and no undercuts greater than 1/32 inch through visual examination by the Q.C.W.I.s. However, for item "B", Component Support 1SI21007S had arc strikes and undercutting in the finished weld which Q.C.W.I., Tom Brown, rejected. These defects were then dressed-up by grinding, and then accepted by the Q.C.W.I. The other two Component Supports "as welded" surfaces were free of ripples, valleys, grooves and accepted by the Q.C.W.I.

Item #9 To verify that Job Traveller Packages (J.T.P.) contain the proper documents and that they are properly completed and/or appropriately referenced, ten (10) J.T.P.'s of Safety Related Category I Component Supports were selected from Containment Document Station #1-H and Auxiliary Building Document Station #2.

NOTE: Due to the large number of Component Support JTPs in the completed weld status, ten (10) JTPs were selected from each Document Station as follows:

<u>Doc. #1-H</u>	<u>Documents Properly Completed and/or Appropriately Ref.</u>
A) 1SI01006S R/0	No
B) 1SI01007S R/0	No
C) 1FW06014S R/1	No
D) 1FW05010X R/0	No
E) 1CC22006R R/0	No
F) 1RH02031V R/0	No
G) 1RH02013S R/1	No
H) 1CC39033R R/1	No
I) 1SD03015V R/0	No
J) 1SI01009S R/1	No

Finding No.2:

It was noted on the Weld Records for 1SI01006S R/0, 1FW06014S R/1, 1FW05010X R/0 and 1RH02031V R/0 that the information entered in the Heat or Lot No. Section did not correspond to the information entered in the Heat or Lot No. Section on the WMSR as per SIP 4.002 R/2 paragraph 4.10.a.6 and Intercompany Correspondence Letter HC-QA-46. SIP 4.002 paragraph 4.10.a.6 states that the Heat or Lot No. shall be entered on the Weld Record as it appears on the WMSR. Intercompany Correspondence Letter HC-QA-46 Section 3 states in part:

"Effective 6/18/79, all Process Sheets which indicate the use of coated electrodes must show the lot numbers from which the coated electrodes were drawn. Only the lot number shall be recognized as acceptable documentation for coated electrodes prior to sign off by the Q.C. Welding Inspectors on the Process Sheets. Where bare wire and consumable inserts are utilized, the heat number shall be recognized as acceptable documentation prior to sign off."

On the effective date of 6/18/79, the attendant in Rod Issue Station #13 began placing the Lot Number in the Heat or Lot No. Section of the WMSR. The Area Foremen in the Containment Building were not aware of the WMSR entry change and continued to place the Heat Number on the Weld Records. The Hanger Supervisor, Fred Rosenstein, did not inform his Area Foremen of the change in the WMSR Heat or Lot number entries.

Recommended Corrective Action:

In the future, the Hanger Supervisors must make available to the Area Foremen all the Intercompany Correspondence Letters that pertain to their responsibilities and duties. Also, the Area Foremen shall review all WMSR Lot number entries prior to the entry of that number on the Weld Record, since the Lot number does change periodically. In addition, the QCWI is responsible for reviewing the in-process Weld Record information entered by the Craft Supervisors (Ref. SIP 4.001 para 4.11).

<u>Doc. #2</u>	<u>Documents Properly Completed and/or Appropriately Ref.</u>
A) 1PB09004X R/O	No
B) 1AB09003X R/O	No
C) 2FP03075R R/O	No
D) 2FP05006X R/O	No
E) 2FP05002X R/O	No
F) 1SX41017X R/O	No
G) 1AB09002X R/O	No
H) 2FP03032X R/O	No
I) 1FP20004R R/1	No
J) 1FP12001X R/O	No

Observation #1

While reviewing the Weld Records and WMSRs for 2FP05002X R/O, 1SX41017X R/O, and 2FP03075R R/O, it was noted that the WMSRs were closed out one to three days after the QCWI signed and dated the Final Weld Inspection Sequence.

This discrepancy was also noted on J.T.P.s 1SX41005R R/O, 2FP03082R R/O and 2FP03060R R/O in Document Station #2. The Rod Issue Station attendants are not closing out the WMSR in the proper amount of time to assure an adequate weld filler material control system.

The responsible Rod Issue Station attendant was asked to explain the late entries. He stated that he can only close-out a WMSR when he is notified that the weld is complete. If the welder or welder Foreman does not inform the Rod Issue Station Attendant, he will hold the unconsumed rod in the Holding Oven until notification. This notification may or may not take place for a time period of one to four days and the attendant may not back date the WMSR to coincide with his Oven Log entry.

Recommendation:

In the future, Rod Issue Station Attendants must be notified by the welder or welder Foreman in a more timely manner when returned weld rod is not to be reissued. It is recommended that the Warehouse Supervisor inform the Rod Issue Station Attendants of this requirement, as well as requiring the attendant to automatically close out a WMSR at the end of a shift, unless he is informed to do otherwise.

Upon review of Weld Records for Component Support Nos. 1FP12001X R/O and 1SX41017X R/O, the dates of Q.C. Acceptance were found to differ from the dates entered by the cognizant Craft Supervisor.

Finding No. 3

A) For 1FP12001X, the Weld Record indicated the weld was made by Welder No. E-44 on 6/15/79, information entered by the Craft Foreman (RB) on 6/15/79, and inspected by QCWI (BT) on 5/16/79, which is one month previous to the date the weld was made.

B) The Weld Record for 1SX41017X indicated that the weld was made by Welder No. E-44 on 6/29/78, information entered by the Craft Foreman (DSA) on 6/29/79, and inspected by QCWI (BT) on 6/29/79. This is a one year difference between the completed weld and inspection.

Recommended Corrective Action:

For packages "A" and "B" the Q.C. Inspection Superintendent must review his daily inspection records to verify the actual date of inspection acceptance and take action to correct this discrepancy. In addition to correcting the above discrepancy, the Inspection Superintendent must assure that his personnel are aware of the importance of providing complete and accurate traceability for the control of processes identified on drawings, process sheets, and Weld Records.

From the twenty (20) JTPs selected for this checklist question, discrepancies in the preparation of Field Orders were noted.

Finding No. 4:

After reviewing the Field Orders for all twenty (20) packages, it was noted that no MRR/MSR numbers were recorded (where specified) by the Warehouse Supervisor at the time of material issuance. In accordance with S.I.P. 4.101, Article 4.4, which addresses the Warehouse Supervisor and states in part, "Assignment of accepted materials is accomplished by the Warehouse Supervisor making entries on all copies as follows: (reference article 4.4.3 paragraph a.) "Enter the MRR or MSR number that the item was received against. The MRR and MSR Documents list the actual Purchase Order (P.O.) number that materials were procured on." During final review, traceability back to the Certification of Conformance will be difficult without a MRR or MSR number.

Recommended Corrective Action:

Immediately upon the close of the Exit meeting, the Warehouse Supervisor must assure that all Field Orders processed for future orders will contain the appropriate traceability requirements as outlined in applicable procedures.

Finding No. 5:

Upon review of the Weld Record for Component Support JTP No. 1AF01011R R/1, it was noted that WMSR No. 72703 was not recorded. However, the WMSR number was recorded on the Construction Copy drawing.

In accordance with SIP 4.002 paragraph 4.11 which states in part; "The QCWI is responsible for as-built Quality Assurance Records and must update them at each inspection point." This Quality Control function is not being completely adhered to.

Recommended Corrective Action:

The Inspection Superintendent must assure that all QCWIs are aware of the requirements for updating Quality Assurance Records, as specified in SIP 4.002 paragraph 4.11. In addition, the responsible Production Supervisor shall enter WMSR 72703 on the Weld Record.

Item #10

In order to verify that the cognizant Supervisor provided proper as-built data on the Construction Copy drawing, five (5) Component Support drawings were selected from the Auxiliary Building. At the time of this audit, Intercompany Correspondence Letter HC-QA-23 allowed for two types of reporting component support discrepancies to the Design Engineer. The two types referenced are use of the Component Support/CEA Discrepancy Report (HC-99 R/2) and providing S & L M-916 adjustment tolerances relative to the extent of changes, either on the face of the Construction Copy drawing (for simple changes), or on the back of the drawing (for complex changes). Since the Containment Building does not utilize S & L M-916 adjustment tolerances, only Component Supports from the Auxiliary Building were selected.

The following five (5) Component Supports were selected from the Hanger Department's "as-built" data file:

<u>Hanger No.</u>	<u>Proper As-Built Data Provided</u>
A) 2FP03082R R/O	Yes
B) 1SX41005R R/O	Yes
C) 1AF01011R R/1	No
D) 2FP03075R R/O	No
E) 2FP03060R R/O	No

The cognizant supervisor has provided the proper as-built data on Component Support's 2FP03082R R/O and 1SX41005R R/O. The adjustment tolerances were per S & L M916 sheet 16 paragraph (K) which states in part:

(K) Where pipe location differs between support detail drawing and the single line system drawing, the single line drawing governs provided that all support components can be used.

Component Support 2FP03082R R/O had a correction on the pipe elevation per M545 sheet 18 revision F and 1SX41005R R/O had a key plan measurement corrected per M-544 sheet 12 revision E.

Finding No. 6:

In accordance with Intercompany Correspondence Letter HC-QA-23, the following Component Supports did not have proper as-built data provided on the Construction Copy drawing.

A) 1AF01011R R/1:

The as-built data supplied on the back of the drawing did not contain the "L" dimension of the attachments necessary to compute the design and operating loads by S & L (per M916 sheet 15). A visual inspection of the Component Support's installed configuration revealed that the two W4x13 (I-Beam) supports were welded to the embedment plate at two different angles of incidence, which was also excluded from the as-built data. One support was placed approximately 45° from the embed perpendicular, and the other was 30°; thus, two different "L" dimensions exist.

In addition to these discrepancies, the M916 paragraph letter was incorrectly referenced. The Hanger Supervisor, Dave St. Angel, referenced the M916 adjustment tolerance as M916-6 paragraph "J". A review of M916 sheet 6 revealed that no paragraph "J" exists, but paragraph 13A did. Also, the Hanger Supervisor should have included M916 sheet 15 paragraph J, since it also applies to the as-built data.

B) 2FP03075R:

The as-built dimensions provided on this drawing did not reference an S & L M916 page or paragraph number to explain why a change was made; and, as-built dimensions on the key plan were explained as a movement in auxiliary steel to match the location of existing embed plates. This was also excluded from the Construction Copy drawing.

C) 2FP03060R:

A dimension was revised in the key plan on this drawing (Ref: M916 sheet 16 paragraph K) correctly; however, this change affected the "L" dimension of the auxiliary steel welded to the embed plate. This "L" dimension change was not identified on the drawing.

Recommended Corrective Action:

In accordance with Intercompany Correspondence letter HC-QA-23, whenever a Component Support cannot be installed per the Construction Copy drawing and S & L M916 adjustment tolerances are utilized, "the cognizant supervisor must provide as-built data relative to the extent of the changes". As stated in the above Finding, this is not being performed adequately.

AUDITORS NOTE:

Whenever a Craft Supervisor utilizes the S & L M916 Component Support adjustment tolerances, he is authorized to provide the as-built data either on the front or back of the Construction Copy drawing. After as-built data is provided, a copy of the Construction Copy drawing is to be transmitted to the Hanger Engineer for concurrence and transmittal to the Design Engineers. The Design Engineer will then utilize the as-built data drawing copy to revise the Component Support drawing to reflect the as-built condition of the support. However, the following discrepancies were revealed while reviewing copies of as-built drawings that were transmitted to the Hanger Department by Document Station No. 2.

Observation No. 2:

For Component Support No. 1SX17029X R/O, the as-built drawing copy was so unsatisfactorily reproduced, that the actual Hanger number as well as the as-built data provided, could not be identified without an in-depth investigation of original documentation by the Hanger Engineer. Component No. 1SX10004R R/O was also poorly reproduced, which production tried to rectify by penciling over the Hanger number and dimensions. In doing so, the as-built was so obscured that it could not be identified.

Recommendation/Commitment:

The responsible Hanger Supervisor, D. St. Angel, must reproduce legible copies of the aforementioned Component Support as-built drawings, and resubmit to the Hanger Department.

Item #11

Of the Component Support JTP's selected for scrutiny under the Work Change System, the following five (5) JTP's were audited for Q.C. acceptance of as-built data. These Component Supports were selected only from the Auxiliary Building, since the Containment Building Hanger Supervisor has elected not to utilize the Design Engineer's M916 adjustment tolerances. Instead, he utilizes the Hanger Field Problem system.

<u>Hanger No.</u>	<u>QCWI Acceptance Of As-built Data</u>
2FP03075R	No
1AF01011R	Yes*
2FP03082R	No
2FP03060R	No
1SX41005R	No

* Component Support No. 1AF01011R was the only Construction Copy drawing with QCWI acceptance available for the as-built data supplied.

Finding No. 7:

The remaining four (4) packages noted above do not indicate QCWI acceptance of as-built data. This is in violation of Intercompany Correspondence Letter HC-QA-23, which is a supplemental attachment to S.I.P. 4.002 R/2.

AUDITORS NOTE:

After questioning several QCWI's as to their failure to supply acceptance to as-built data on Construction Copy drawings, it was noted that no measurements of hanger locations are ever made due to lack of time involved, either prior to or after the initial installation.

Therefore, it is a concern of the QCWIs that acceptance of such alterations to the Construction Copy drawings without properly measuring any locations, should be the function of the Design Engineers and/or the Hunter Hanger Engineer.

Recommended Corrective Action:

Q.C. should take whatever action necessary to provide either acceptance or rejection to as-built data provided on Component Support Construction Copy drawings. It is also recommended, that adherence to procedures relative to quality control are not deviated from without first obtaining documented approval through proper channels.

It should also be mentioned, that if QCWIs are to verify Component Support locations, proper equipment, time allocations, and training to the criteria encompassed in M916 should be provided. However, if it is determined that QCWIs should not assume the responsibility of acceptance of the cognizant supervisor's as-built data entries, then a revision to S.I.P. 4.002 is recommended.

AUDITORS NOTE:

After reviewing the method employed by the Hanger Department for reporting as-built conditions to the Design Engineers, it is questionable whether or not a controlled system exists. As it appears, the Field Hanger Supervisor makes a xerox copy of the blue-line Construction Copy drawing with as-built data contained therein and forwards the xerox copy to the Hanger Engineer. The Hanger Engineer then reviews the as-built data entries for

completeness and accuracy prior to transmittal to S & L. If, however, a discrepancy or questionable item should arise during this preliminary review, it is currently a policy to simply place these drawings aside in a pile of unresolved items. This results in a delay of transmitting as-built drawings to S & L. Such a delay could be considered acceptable if a method of correcting these unresolved discrepancies was implemented; however, as of this writing, no such method exists. Thus, as-built detail drawings with discrepancies are not being transmitted either to S & L or back to the originator (production supervisors) for clarification as necessary.

It was also noted that filing of copies of as-built drawings by the Hanger Department is being done in no type of systematic order. In essence, filing is not maintained in a numeric or alphabetic type of arrangement.

Therefore, at the discretion of the Hanger Engineering Department Supervisor, it is recommended that a more efficient method of transmitting as-built drawings to S & L be implemented, as well as returning those drawings determined unacceptable to the responsible supervisor for correction. It is also recommended that a more efficient system for filing of as-built drawing copies be devised to facilitate an easier means of document retrieval when called upon to do so.

SUMMARY:

The previous audit of Hanger Process Control (Audit No. 4-03) incorporated both Process Control and Drawing and Document Control sections of the Q.A. Manual. This was due to the fact that S.I.P. 4.002 R/2 incorporated both sections of the Manual for Component Supports.

In this audit, Process Control was separated from Drawing and Document Control to coincide with the sections of the Q.A. Manual. For this reason, the discrepancies noted in the previous audit (Three Findings) were not identified in this audit since they are a Drawing and Document Control activity. A Hanger Drawing and Document Control audit will be conducted during the Fourth Quarter of this year and will include the discrepancies of the previous audit.

In checklist Item #10, five (5) Component Supports were selected from the Auxiliary Building for verification of proper as-built data. Of the five (5) selected, only two (2) supplied the proper as-built data; however, this sample group was not adequate for a trend analysis. The follow-up report for this audit will contain a sample group of fifty (50) to one hundred (100) installed Component Supports to verify as-built data.

Prepared by

Mark F. Weiss
Michael X. Smith

Date 9-25-79

Quality Assurance Auditors

Reviewed by

Michael Zeise

Date 9-25-79

Michael H. Zeise
Quality Assurance Lead Auditor

Approved by

M.L. Somsag

Date 9/25/79

M.L. Somsag
Quality Assurance Supervisor



HUNTER CORPORATION

3600 - 179TH STREET, HAMMOND, INDIANA 46323, (219) 845-8000

Ref. Audit No. 059-3
Date: 9/28/79

FOLLOW-UP REPORT
FOR
AUDIT NO. 059-3
HANGER PROCESS CONTROL

Prepared by:

M.A. Smith

Date 10/23/79

M.A. Smith
Q.A. Auditor

cc: B. Krasawski
K. Selman
A. Simon
H. Richardson

✓ file

Original: Will's took to file

MALCOLM LEO SOMSAG
EXHIBIT NO. 4
YOUNGSTOWN, OHIO

FOLLOW-UP REPORT

FOR

AUDIT NO. 059-3

HANGER PROCESS CONTROL

In order to verify that corrective action had been initiated in response to the Findings and Observations identified in Audit No. 059-3, a Follow-up Audit was conducted between the dates of 10/1/79 and 10/11/79.

The following is a listing of each discrepancy in order of its appearance in the original Hanger Process Control Audit 059-3, as well as the corrective action taken by those personnel affected and identified in the audit as being responsible for rectifying the discrepancies relative to their areas of supervision.

FINDING NO. 1

Weld Material Stores Requisition No. 79302 had "As Shown" in the Weld Number section instead of the appropriate Field Weld number. A discussion with the Area Superintendent, L. Hill, was held with the Q.A. Auditors to assure this practice does not continue. It was requested of Mr. Hill to submit a "Speed Memo" to this department to document what action was taken to verify this assurance. (See ATTACHMENT NO. 1). This Finding is now closed.

FINDING NO. 2

This discrepancy dealt with the improper transferral of WMSR traceability information to the Weld Records by the Containment Building Production Foremen. This was in violation of Hunter Inter-Company Correspondence Letter No. HC-QA-46, dated 6/14/79. This letter addresses the clarification of identification of Coated Electrodes on WMSR's, Process Sheets, and Weld Records as well as the necessity for properly identifying the Heat/Lot numbers for Weld Filler Material to provide accurate traceability. After discussing the discrepancies noted, it was determined that a review of this letter by the Containment Building Production Foremen would be sufficient for being reasonably assured that they are familiar with Weld Material traceability requirements. A further assurance has been made by a speed letter submitted by F. Rosenstein, the Hanger Area Foreman in the Containment Building. (See ATTACHMENT No. 2) This Finding is now closed.

OBSERVATION NO. 1

For WMSRs not being closed out in a timely fashion, Inter-Company Correspondence letter HC-QA-71 dated 10/22/79 addresses the criteria for properly closing out WMSRs. For the purpose of assuring the integrity of the contents of this letter, surveillances will continue (as in the past) to be performed and documented to indicate the fulfillment of the letter's requirements. This observation is now closed.

FINDING NO. 3

Component Support JTPs 1FP12001X and 1SX41017X were identified as having discrepant date entries on their respective Weld Records.

For JTP 1FP12001X, Q.C.W.I., B. Tucker, verified the correct date of inspection through the utilization of the Daily Inspection sheets maintained by the Q.C. Inspection Superintendent; and, this date has been rectified on the Weld Record.

For JTP 1SX41017X, the cognizant Craft Foreman, R. Brunson, has corrected the error in transferring the correct date from the WMSR to the Weld Record.

Since the responsible personnel have had documented training to the S.I.P.s governing the proper methods for document entries; and since the element of Human error shall always exist under various conditions, this Finding shall be considered closed.

FINDING NO. 4

Of the twenty (20) JTPs selected for Item #9, none had Field Orders identified with MRR/MSR numbers. A further investigation into this matter has resulted in additional delineation of traceability requirements. These requirements are as defined in Inter-Company Correspondence letter No. HC-QA-72 (See ATTACHMENT NO. 3). This letter will satisfy the discrepancies of Finding No. 4. However, this Finding will remain an unresolved item until such time as S.I.P. 4.101 Rev. 1 is revised to incorporate the requirements of Inter-Company Correspondence Letter HC-QA-72, and until surveillances of this subject provide an adequate confidence that traceability requirements are being satisfied.

FINDING NO. 5

This Finding addressed the omission of WMSR No. 72703 from the Weld Record for Component Support No. 1AF01011R. Further investigation during this Follow-Up Audit revealed this WMSR was utilized for a "Non NF" weld. At the time of its (WMSR) issuance, it was not required for "Non-NF" welds to be documented in any manner other than as defined within Inter-Company Correspondence letter dated 1/11/78 pertaining to Safety Related Component Supports. Therefore, this Finding is considered closed.

HUNTER CORPORATION

FINDING NO. 6

During the review of the data compiled in response to this Finding, the following was revealed:

- A. 1AF01011R(R/1) - Hanger Field Problem AB571 with proper as-built data has been submitted to the Hanger Engineering Department
- B. 2FP03075R(R/O) - The as-built information supplied on this drawing has been considered sufficient.
- C. 2FP03060R(R/O) - It was determined by S & L on-site representative, W. Wellborn, and the Q.A. Supervisor, that providing all dimensional changes are identified properly, the design/operating load dimension can easily be computed by S & L. Therefore, this dimension was not necessary in this case, but, in the future the necessity of dimensions of this nature being identified on the Construction Copy drawing, will be included at the discretion of the Hanger Engineering Department Supervisor. This Finding is now closed.

OBSERVATION NO. 2

The as-built drawings on file in the Hanger Engineering Department for Component Support numbers 1SX17029X and 1SX10004, have been marked up sufficiently to satisfy the Hanger Engineering Department. This is adequate enough to supply the Design Engineers, therefore, this Observation is now closed. (See Note Below).

AUDITORS NOTE: The results of the Exit Meeting held on 9/13/79 were as follows:

- A. Whenever Component Supports cannot be installed per the Construction Copy Design Drawings, and installation has been made, the cognizant Craft Supervisor shall provide complete and accurate as-built data relative to the extent of the current as-built configuration on an HC-99 Form.
- B. When in doubt about the extent of information necessary to be included on an HC-99 Form, the Craft Supervisor must consult with the Hanger Engineering Department.
- C. And finally, completeness and accuracy of as-built information supplied by Hanger Area Foremen will be assured through continuance of surveillances by the direction of the Quality Assurance Supervisor.

FINDING NO. 7

Since Q.C.W.I.s have not been trained to the criteria encompassed in the Design Engineers' M916 adjustment tolerances, their acceptance to the Craft Supervisors' as-built data has not been documented.

HUNTER CORPORATION

In the future, when a Q.C.W.I. is summoned for a Component Support installation, a copy of the as-built must be made available for his evaluation of the as-built configuration of the support. In addition, training of Q.C.W.I.s to the M916 tolerances has been committed by the Q.A. Supervisor, and will commence at his discretion.

This sufficiently closes out this Finding.

PREPARED BY:

M.A. Smith

Date 10/23/79

M.A. Smith
Q.A. Auditor

REVIEWED BY:

Michael Zeise

Date 10/23/79

M.H. Zeise
Q.A. Lead Auditor

APPROVED BY:

M.L. Somsag

Date 10/23/79

M.L. Somsag
Q.A. Supervisor

Speed Letter. 44-902

GrayLine

Speed Letter

To A.T. Somsag Q.C. Sup. From FRED ROSENSTEIN A.F.
A.T. Simon FR.
Phil Pacifico FR.
 Subject Clarification of I.D. on WMSR's + Process Sheets

- No. 8 FOLD
MESSAGE

We have read the letter + understand the procedure to be used.

REPLY

Date 10-10-79 Signed Fred Rosenst

- No. 8 FOLD

- No. 18 FOLD

Date Signed

Wilson Jones Company
DALLAS, TEXAS 75246
© 1977 WILSON JONES COMPANY

RECIPIENT—RETAIN WHITE COPY, RETURN PINK COPY

Speed Letter.

To

Quality Assurance Dept.

From

Jenny Hill
Aux Bldg Supt.

Subject

Not putting proper FW identification on
hanger process sheets.

-No. 88 10 FOLD

MESSAGE

I have relayed to all personnel involved with hanger installation that "All welds as shown" is not acceptable and that all field welds will be properly identified.

Date

10/16/79

Signed

Jenny Hill

REPLY

-1st 8 FOLD

-1st 10 FOLD

Date

Signed



HUNTER CORPORATION

INTER-COMPANY CORRESPONDENCE

HC-QA-72

DATE: October 22, 1979
TO: See Distribution
FROM: B. Krasawski/ M.L. Somsag
SUBJECT: Traceability Requirements for Field Ordering of Class 1 Component Supports/Materials

To assure that traceability to the Certified Material Test Reports is maintained, the following requirements for Field Ordering of Class 1 Component Supports/Materials shall be implemented.

1. When the Area Superintendents requisition Class 1 Plate and Shell, and linear support materials, they must inform the Warehouse Supervisor that CMTR traceability must be documented on the Field Orders.
2. This shall be accomplished by review of the Design Drawings Bill of Materials by the cognizant Area Superintendent (or his designee) to determine if Class 1 Plate and shell or linear support materials are required.
3. The Area Superintendent must then initiate a Field Order identified with "Class 1 CMTR Traceability Required" on the line, "JOB SEGMENT", and submit to the Warehouse Supervisor.
4. The Warehouse Supervisor must then assure that MRR/MSR numbers and Heat numbers are entered on the Field Orders for Class 1 Plate and Shell, and linear supports and materials. This must be accomplished prior to the issuance of the materials.
5. Finally, the Area Superintendent is further responsible for assuring that Class 1 Plate and Shell, and linear supports/materials maintain traceability throughout installation. This must be done by utilizing the upper portion of the Weld Record for identifying MRR/MSR numbers, and other item I.D. numbers for all Class 1 Support materials used other than as specified on the Construction Drawing's Bill of Materials.

NOTE: When installation results in an overage of materials, the transfer of traceability data on materials must be performed in the same manner utilized for Process Piping.

Any questions regarding this matter should be brought to our attention immediately

B Krasawski

Date 10/22/79

B. Krasawski
Project Manager

M.L. Somsag

Date 10/22/79

M.L. Somsag
Q.A. Supervisor

- cc: A.T. Simon, Jr. (5)
F.W. McGhee (10)
L.E. Jones (5)
H. Lindquist (5)
K. Berta (5)
W. Everett (10)
L. Hill (10)
F. Walters (5)



Commonwealth Edison
Byron Generating Station
P.O. Box B
Byron, Illinois 61010

Date 9-29-82

TO: ✓ HUNTER Corp / M.L. SOMSAG
FROM: G. Sorensen
SPECIFICATION: F2739

The Commonwealth Edison Company has reviewed the following procedure(s) and found them acceptable for use:

<u>PROCEDURE #</u>	<u>REVISION/DATE</u>
SIP 1.201	Rev. 5 8/30/82
SIP 2.201	Rev. 8 7/29/82
SIP 4.000	Rev. 9 7/26/82
HC-WPS-8	Rev. 9 8/2/82
HC-WPS-13	Rev. 7 7/27/82
HC-WPS-5	Rev. 9 7/27/82



SEP 30 1982

HUNTER CORP.
BYRON PROJECT

Very truly yours,

COMMONWEALTH EDISON

J. T. Patten
for

G. Sorensen
Project Superintendent
Byron Station

GS/kl

cc: Site File
Site C Supervisor

MALCOLM LEO SOMSAG
EXHIBIT No. 5

UNCONTROLLED COPY

SARGENT & LUNDY
ENGINEERS
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603
TELEPHONE 312-269-2000

AGS
2/1/83
JTP

September 22, 1982
Project No. 4391-05

Commonwealth Edison Company
Byron - Units 1&2

Piping System Installation
S&L Specification: F-2739

Mr. M. A. Stanish
Byron QA Superintendent
Commonwealth Edison Company
Byron Station

Dear Mr. Stanish:

Enclosed is a copy of the following Hunter Corporation procedures which have been reviewed and accepted.

Procedures:	HC-WPS-5	Rev. 9	7-27-82
	HC-WPS-13	Rev. 7	7-27-82
	HC-WPS-8	Rev. 9	8-2-82
	SIP 2.201	Rev. 8	7-29-82
	SIP 4.000	Rev. 9	7-26-82

Also enclosed, is a copy of the following procedure. Please revise as noted and resubmit, contractor may proceed based on making revisions noted.

Procedure: HC-WPS-41 Rev. 7 8-3-82

Please respond with a disposition/resolution of these comments by October 22, 1982.

Yours very truly,

FRANK A. KOSIK/ANITA MILLER

F. A. Kosik
Senior Quality Control Coordinator

FAK:AMM:brm
In duplicate
Enclosures

Copies:

J. V. Westermeyer (1/1)
G. Sorensen ✓ (1/1)
C. W. Fruche (1/0)

D. L. Leone/W. C. Cleff (1/0)
R. J. Rakowski/K. J. Green (1/1)

COPY



QUALITY CONTROL PROCEDURES REVIEW REPORT

Client Commonwealth Edison Company Project Byron
Contractor Hunter Corporation Project No. 4391-05 Unit 1&2
S&L Specification No. F-2739

PROCEDURE TITLE See Below

Procedure No. _____ Rev. _____ Date _____

~~XXXXXXXXXXXXXXXXXXXX~~

Reviewed & Accepted

Revise as noted and resubmit.
Hold fabrication.

Revise as noted and resubmit.
Contractor can proceed based
on making revisions noted

Results do not meet speci-
fication requirements.

COMMENTS:

SIP 2.201 Rev. 8 7-29-82 Design Control

SIP 4.000 Rev. 9 7-26-82 Control of Construction Processes

Distribution:

Reviewed by F. A. Kosik
~~XXXXXXXXXXXXXXXXXXXX~~

Date September 22, 1982

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-92

PAGE 1 OF 54

HUNTER CORPORATION

CONTROL OF CONSTRUCTION PROCESSES

TABLE OF CONTENTS

Article No.	Description	Page
1.0	Purpose	2
2.0	Scope	2
3.0	Assignment of Responsibilities	2
4.0	Process Sheet System	3
5.0	Work Planning System	4
6.0	Initiation of JTPs	4
7.0	Distribution and Production Implementation	6
8.0	Field Routing < 2" Class B and C Piping	9
9.0	Field Tolerances for Component Support	12
10.0	In-Field Design Change To Component Supports	13
11.0	Method for Rework/Modification	16
12.0	JTP Revisions	19
13.0	Directives Relative To Fabrication/Installation	20
14.0	Training Requirements	26
---	Appendix 1 pg. 1 Fabricating Tolerances	27
---	Appendix 1 pg. 2	28
---	HN-14 Form Process Sheet	29
---	HN-15 Form Weld Record	30
---	HN-14A Form Process Sheet (P-1-P8 Butt Welds)	31
---	HN-15A Form Weld Record	32
---	HN-14B Form Process Sheet (Component Supports with Fillet Weld Joints)	33
---	HN-14C Form Process Sheet (Piping Socket Weld)	34
---	HN-15C Form Weld Record	35
---	HN-14D Form Process Sheet (Pipe Bending)	36
---	HN-14E Form Process Sheet (Mechanical Joint) front	37
---	HN-14E Form Process Sheet (Mechanical Joint) back	38
---	HN-14F Form Process Sheet (Component Supports with Fillet Weld Joints)	39
---	HN-15F Form Replacement/Modification Materials Used	40
---	HN-14G Form Process Sheet (Pipe Whip Restraint)	41
---	HN-15G Form Weld Record	42
---	HN-14H Form Process Sheet (Piping Socket Weld)	43
---	HN-14I Form Process Sheet (Pipe Bending)	44
---	HC-30 Form Isometric/Spool Drawing Control	45
---	HC-54 Form Drawing/Document File Sign-Out	46
---	HN-18 Form Rework Request	47
---	HN-15B Form Weld Record	48
---	HC-81 Form Engineering Log of Rework Requests (RR)	49
---	HC-81A Form Field Log of Rework Requests, Nonconformances (NR) and Reports of Nondestructive Examination Defects (NND)	50
---	Mechanical Snubber Connection Code Key	51

SARGENT & LUNDY

ACTION SHEET DATE: 07/26/92
 DRAWING NO: 4.000-01-001
 F. A. KOSIK
 SPEC: 7/26/92 1:00 PM

CONTROL OF CONSTRUCTION PROCESSES

/9

1.0 PURPOSE

- 1.1 To provide general requirements and instructions for the control of hardware fabrication, installation, alteration, and removal.

/9

2.0 SCOPE

- 2.1 This SIP governs work activity on hardware categorized as Safety Related on the design drawings and corresponding lists.

- .1 Safety Related structures and hardware will be identified by a Roman Numeral one (I) on the design drawings or the drawings will contain a statement such as: Safety Related or Safety Related items are shown on this drawing.

- .A The various lists (piping line, valve, equipment, or support) will indicate the Quality Class (A, B, C, D, E, F, G, or H).

- .2 Non-Safety Related related structures or hardware will be identified by a Roman Numeral two (II) on the design drawings or the drawings will not contain a statement on safety categorization.

- 2.2 This SIP is also applicable to hardware under the jurisdiction of Section XI of the ASME Boiler and Pressure Vessel Code.

- .1 Section XI shall be applicable once all fabrication, installation, examination, and testing requirements of Section III have been complied with, as demonstrated by a N-5 Code Data Report with Hunter Corporation and Hunter Corporation Authorized Inspection Agency representative signatures.

3.0 ASSIGNMENT OF RESPONSIBILITIES

- 3.1 The Project Engineer is responsible for initiation, checking, distribution, and revision to Job Traveler Packages (JTPs), according to this SIP.

/9

- 3.2 The Quality Assurance Administrative Supervisor (QAAS) is responsible for review of JTPs prior to their release to the Production forces, to assure that the JTPs identify and fulfill all Code, Specification, and regulatory requirements.

/9

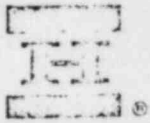
- 3.3 The Field Superintendents are responsible for implementation of and adherence to approved JTPs, this SIP and any other procedures that interface with fabrication and/or installation of work within the Scope

- 3.4 The Quality Assurance Lead Auditor(s) are responsible for monitoring the implementation of this SIP.

- 3.5 The Inspection Supervisor is responsible for directing the performance of inspections required by the process control documents.

4.0 PROCESS SHEET SYSTEM

- 4.1 Process Sheets serve to specify technical requirements and necessary inspections and identify acceptance of the work by both Hunter Corporation Inspectors and the Authorized Nuclear Inspector (ANI). Owner acceptance measures can be incorporated as directed.
- 4.2 Controlling process plans are initiated by Engineering and reviewed for Code and/or Specification compliance by Quality Assurance. Process plans are composed of Construction drawings and Process Sheets.
- .1 Construction drawings shall be prepared using good engineering practice. Construction drawings shall be in sufficient detail to make the process sheets intelligible and traceable to each job segment in terms of joint number, components, special processes, etc. Construction drawings shall be checked by Engineering personnel other than those who prepared them.
 - .2 Process sheets shall be prepared by Engineering personnel. The process sheets shall be from one of two basic formats. The formats are:
 - .A Process sheets with predetermined and preprinted technical information fields, such as indicated by Form III-14A. The specifics of the technical information is filled in by Engineering. Data to be furnished or compiled is determined by the Project Engineer and Quality Assurance Supervisor. These types of process sheets are designed for mass production to suit and control activities such as butt welds, socket welds, fillet welds on hangers, and so forth. Process sheets of this type are submitted to the ANI for format acceptance prior to their use by Engineering.
 - .B Process sheets with generic information fields, as indicated by Form III-14. The specifics, in terms of format presentation and concept that will be added to provide instruction for and control of the work, are provided by the Project Engineer in conjunction with the Quality Assurance Supervisor. These types of process sheets are designed with relative inspections and acceptance criteria for special work on a case by case basis. An example of such special work could be assembly and inspection of a machine element.



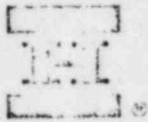
- .3 Regardless of the process sheet format employed, all pre-construction JTPs are reviewed by Quality Assurance prior to their issue to the Production forces. Any JTPs that are under the jurisdiction of the ASME Boiler and Pressure Vessel Code are presented to the ANI for acceptance prior to their issue to the Production forces. Revisions to JTPs are handled in the same manner.

5.0 WORK PLANNING SYSTEM

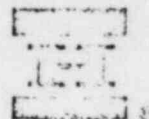
- 5.1 The Owner, through coordination meetings, advises the Hunter Corporation Field Superintendents and Project Engineer of the schedule and coordination requirements for plant construction.
- 5.2 The Project Engineer directs the Engineering Department to review Design documents (such as A&E drawings and Vendor drawings) to determine Safety classification of work to be undertaken to satisfy the schedule.
 - .1 Any Design documents under ASME Code and/or Safety Related - Category 1 jurisdiction shall have JTPs prepared for use for the Production forces.
 - .2 The Field Superintendents shall advise the Project Engineer of their intentions relative to work initiation so as to produce a reasonably smooth flow of necessary JTPs to the field.
 - .3 The Field Superintendents shall provide any necessary input to the Project Engineer that the Project Manager and Quality Assurance Supervisor deem necessary to minimize interference between Production and Inspection.
 - .4 The Field Superintendents shall not cause any erection or assembly work that is indicated as ASME Code and/or Safety Related - Category 1 to be initiated without simultaneous implementation of the governing JTPs.
- 5.3 During the course of erection and assembly, if field interference and/or revision notification is encountered, further processing shall be according to this SIP.

6.0 INITIATION OF JTPs

- 6.1 The Project Engineer directs preparation of Construction drawings as the schedule requires. The Construction drawings may be generated from Vendor drawings or A&E detail drawings with Hunter Corporation overlays, or the Engineering Department may prepare them from the details furnished by the A&E Design drawings. All Construction drawings shall be prepared and controlled in the Engineering Department in accordance with the SIP for Isometric and Spool Drawing Control.



- .1 Only Design and/or Vendor drawings transmitted by the Owner and/or A&E as "For Your Use," "For Fabrication/Installation" or "Advance Copy" status may be employed to generate Construction drawings. This shall be in accordance with the Document Control SIP.
 - .2 The Project Engineer shall maintain drawing control as specified in the SIP that addresses Document Control.
- 6.2 Utilizing the drawing generated by Article 6.1, Specifications and applicable subsection of the Code, the Project Engineer prepares a set of process sheets for the segment of work.
- .1 The process sheets shall describe each segment of work in terms of:
 - .A The sequence of operations and processes, such as component inspection, fit-up, root pass welding, weld out, finished weld visual inspection, and the performance of nondestructive examination (NDE).
 - .B Specifications and thicknesses of materials to be used.
 - .C Joint designs, welding processes, filler metals, preheat temperature, interpass temperature, NDE, and post weld heat treatment (PWHT) requirements for the welding procedures and materials specified.
 - .D Special requirements, such as flat topping of finished welds.
 - .E In-process Quality Control and Authorized Nuclear Inspector inspection hold and witness points.
 - .F Procedures to be used for accomplishing the work and for inspection.
 - .2 Various types of process sheets are utilized for joining and installation activities. The only variations from one type to another will be that the technical requirements (description of job segment), sequence of operations and operation descriptions will change (i.e. a welded joint for ASME Class 1 piping has more complex requirements than does a Subsection HF, Class 3 fillet weld).



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6.3 For work that involves welding and requires a record of materials used and/or welders involved, a weld record is included to record weld data in the field. The weld record may be printed on the back side of the process sheets, or included as a separate document. A sample weld record format is indicated on Form HN-15. The provisions of Article 4.2.2 apply likewise to weld records.

.1 When a weld record is issued as a separate document, Engineering shall provide all data above the chart area to provide traceability to the governing process sheets.

6.4 The Project Engineer forwards the prepared process sheets and the Construction Copy Drawing(s) - (CCD) - stamped in red, to Quality Assurance for review. The CCD is reproduced from the drawing generated by Article 6.1. A Field Order (Form HN-10) shall be included in piping JTPs.

.1 The Field Order is employed by the field Production forces to requisition components and materials (except welding materials) needed for fabrication and installation. The Field Order is prepared and processed in accordance with the SIP that addresses same.

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6.5 Quality Assurance reviews the process sheets and CCDs for Design Specification and Code requirement compliance and establishes inspection points or concurs with those established by Engineering.

.1 A Hold Point shall be designated by a check mark (✓) and a Witness Point by an asterisk (*).

.A A Hold Point is a completion level beyond which work shall not proceed without Production obtaining the inspection required.

.B A Witness Point requires the Inspector to physically witness a work activity.

6.6 Quality Assurance coordinates the review of process sheets and CCDs with the ANI (if work is under ASME jurisdiction). The ANI establishes Hold and/or Witness Points as necessary and accepts the package.

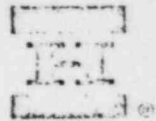
6.7 The preconstruction package, displaying QA approval, and ANI acceptance (for work under ASME jurisdiction), is returned to Engineering for distribution.

7.0 DISTRIBUTION AND PRODUCTION IMPLEMENTATION

7.1 The Project Engineer distributes the QA approved process sheets and drawings as follows:

- .1 Project Engineer's files.
 - .A The Engineering copy of the process sheets.
 - .B The drawing generated by Article 6.1.
 - .2 Construction copy JTP to the Area Superintendents.
 - .A The Construction copy of the process sheets.
 - .B The Construction copy of the drawing.
 - .C For piping installation drawings that have component support locations added, an additional CCD or Controlled Copy shall be issued for use in support installation.
 - .3 Additional copies of process control documents may be issued by Engineering for reference or investigative purposes. The Field Superintendents shall use only copies marked "Construction Copy" in red for fabrication, installation, and inspection. Engineering may issue controlled or uncontrolled copies for reference or investigative purposes, as specified by the party requesting the documents.
- 7.2 All copies of the JTPs shall be maintained in a fire resistant environment when not in use by Engineering for reference/update, or by the Field Production forces to accomplish the work.
- 7.3 Engineering reference copies, and Construction copies (of JTPs in the Field) shall be filed by system in numerical progression.
- 7.4 When JTPs or portions thereof are withdrawn from the field Document Stations, a Drawing/Document File Sign-Out card (Form HC-54) shall be initialed, dated and placed on file. As an alternate to the HC-54 Sign-Out card, a Sign-Out Log may be used. When JTPs are returned to the file, the card shall be withdrawn and marked-up to reflect the JTP return.
- 7.5 JTPs withdrawn from the Document Station shall be located as close as practical (considering the potentially harmful effects of wind, water, fire and other damaging factors) to the activities being conducted in conjunction with the JTP. It shall be the responsibility of the individual Craft Supervisors to maintain the JTPs in a safe and secure manner in a location that is known and accessible to all personnel involved in the activities the JTPs prescribe.

- 7.6 The individual Production Supervisors are responsible for entering all Production status data and traceability data in the in-process JTPs. Data relative to technical status, personnel performing the work, and material traceability is required to be recorded on the process sheets, weld records, rework requests, RNDs, and etc. The individual Production Supervisors shall enter the required data in the following time frames.
- .1 When procedures for performing the work (i.e. welding, heat treatment, bolting, etc.) are specified on the JTP documents, the current approved revision numbers to which the work is to conform shall be entered on the document specifying the procedure. This shall be done prior to or concurrently with initiation of the work. Inspections and tests shall be performed to the acceptance criteria specified in the procedure and revision number used to perform the production operation.
 - .2 Personnel performing the work according to specified procedures and revision numbers shall be identified on the JTP documents as each operation is performed. For those operations that require more than one working day to complete, the data should be recorded prior to the end of the workday, and shall be recorded prior to presentation of the work for inspection.
 - .3 Material traceability data (i.e. heat/code numbers on pipe, fittings, plate and structural shapes, or; serial numbers on valves, strainers, flow elements, etc., or; heat and lot/code numbers of welding materials) shall be entered in the same manner as specified for personnel identification in 7.6.2. Materials used shall in all cases be as identified on the corresponding field order or requisition.
- 7.7 As the work progresses, it is the responsibility of the individual Production Supervisors to obtain the approval for work from a Quality Control/Welding Inspector when Hold or Witness Points are reached. Work may not proceed past these inspection points without obtaining the required inspection or getting written approval from the Quality Assurance Supervisor.
- .1 When ANI Hold or Witness Points are reached, it is the responsibility of individual Production Supervisors and Quality Control/Welding Inspectors to contact the ANI to schedule the inspection. Work may not proceed past these inspection points without obtaining the required inspection or getting the approval of the ANI.



7.8 The Quality Control/Welding Inspectors are responsible for assuring that all as-built is complete and up to date at each inspection point. If as-built data is incomplete, the Inspector shall notify the cognizant Production Supervisor to correct the deficiencies. No inspections shall be performed if deficiencies exist on the documentation.

19 .1 Under routine conditions the QC Inspectors will use the "Construction Copies" of the documentation controlling the work. The QC Inspector initials in the space marked "Inspected By" and this will signify acceptance of that step in the sequence. Under special conditions uncontrolled copies of drawings may be used for performance of inspections. When uncontrolled drawings are used the controlling documentation shall identify and authorize their use.

7.9 As the work progresses, the JTP will acquire additional documentation. The following documents will be contained in the implemented JTP or interface during the construction operations.

.1 Will be contained in the JTP

Construction Drawing
Process Sheets
Weld Material Stores Requisition
Results copies of NDE Requests

May interface with the JTP

Heat Treat Charts
Rework Requests
Reports of Nondestructive Examination Defects
Nonconformance Reports

8.0 FIELD ROUTING OF ≤ 2 " CLASS B AND C PIPING

8.1 For the subject 2" and under piping, a drawing shall be prepared by either the A&E or Hunter Corporation Engineering, which specifies piping configuration and dimensions. The drawings shall be prepared on A&E furnished format. The drawings shall have a Hunter Corporation Title Block added by the Engineering Department.

.1 { A note shall appear on each drawing that states, "Configuration and dimension is approximate". Field to determine actuals and mark-up drawing to reflect as-built conditions.

.2 The Project Engineer may direct dimensional/configuration changes to drawings furnished by the A&E prior to their release to the field. Any changes shall be described in the Drawing Release Record portion of the Hunter Title Block.

.3 In all other respects, the requirements of Section 6.0 apply.

- 8.2 Once the 2" and under piping JTP is distributed to the field for implementation, it shall be the responsibility of the Field Superintendent to fabricate and/or install the piping line(s) to the line, elevation, location, and dimensions shown on the CCD wherever possible. If however, it is impossible or impractical to install the line(s) as shown, due to interferences or other unforeseen circumstances, the Field Superintendents may direct whatever changes in location, elevation, and dimensions are necessary to facilitate the installation of the line.
- .1 The Area Superintendent shall be responsible for directing the mark-up of the CCD to show changes necessary to accomplish the installation. A contrasting color (preferably red) shall be used for these mark-ups whenever possible.
 - .A If mark-up of the front side of the drawing would make the drawing difficult to interpret, it will be permissible to use the back side.
 - .B All as-built dimensions shall be reported to the nearest inch.
- 8.3 If rerouting results in the need to use additional materials, add or delete weld/pipe bends, the following methods shall be employed:
- .1 If additional materials are necessary, they shall be of the same specification, type or grade, size, rating or schedule and quality class as the materials between the welds/bends where field routing is being employed.
 - .A The process sheets furnished by Engineering provide the specifics of material requirements for the various product forms. Only those materials may be used.
 - .B Continuation Process Sheets, as described in the following Articles, shall be added to the JTP before starting the field route.
 - .2 If additional socket welds are necessary, the Production Supervisor shall add Continuation Socket Weld Process Sheets (Form HN-14H) to the JTP. The continuation sheets serve the purpose of being an inspection checklist and are of the format identified in Article 4.2.2.A. The continuation process sheets display predetermined Hold Points.

- .A When welds are added, they shall be assigned Field Weld (FW) numbers by the Production Supervisor. These numbers shall be plainly marked on the CCD and on the continuation process sheets. The added sheets shall also have the governing JTP number noted. Added field weld numbers shall consist of the lower of the two existing field weld numbers between which the new welds are added, followed by a dash and a numerical progression. If field welds are required for a drawing for which no field welds existed before, the Project Engineer shall be contacted to assign field weld numbers, welding procedure and NDE requirements.

Example: If three new welds are added between existing Field Welds FW-145 and FW-146, the added welds will be designated FW-145-1, FW-145-2 and FW-145-3.

- .B Added welds shall be performed using the same Welding Procedure Specification (WPS) that is specified on the process sheets furnished by Engineering for the welds between which field routing is being employed.
- .C The Production Supervisors shall record all welding and material traceability data (including additional piping material as discussed in Article 8.3.1) on the back side of the continuation process sheets. This includes the WPS and revision number for each added weld.
- .D Nondestructive examination requirements for added welds shall be the same as for the welds between which field routing is being employed. The Quality Control Welding Inspectors (QCWI) shall therefore refer to the process sheets furnished by Engineering for NDE requirements.
- .E If welds other than socket welds are required, the Project Engineer shall be contacted for resolution.
- .3 If field weld(s) are deleted, the process sheet and CCD shall be marked-up to indicate the deletion.
- Examples: (A) "Weld deleted due to reroute"
(B) "Weld deleted. Replaced by Bend No. XX"
- .4 If additional Field Bends are necessary, the Production Supervisor shall add continuation Pipe Bending Process Sheets (Form HW-141) to the JTP. These continuation sheets are in all other respects identical to those specified in Article 8.3.2 and are applicable to 2" and under piping only.

- .A When field bends are added, they shall be assigned Field Bend (FB) numbers in the same fashion as for Field Welds. In all other respects, the requirements of Article 8.3.2.A apply. If field bends are required for a drawing for which no field bends existed before, the Project Engineer shall be contacted to assign field bend numbers.
 - .B All field bends shall be according to the SIP for Cold Bending of Pipe and Tube.
 - .C The Production Supervisors shall record all material traceability data on the process sheets for the connecting welds.
- .5 If bend(s) are deleted, the process sheet shall be marked to indicate the deletion.

Examples: (A) "Bend deleted due to reroute"

(B) "Bend deleted. Replaced by Welds XXX and XXX."

9.0 FIELD TOLERANCES FOR COMPONENT SUPPORTS

9.1 All component support installations shall be performed in accordance with the requirements of the support CCD (relative to configuration details and location details - when pipe line fixed point dimensions are provided in the key plan) and the corresponding piping isometric (relative to attachment location to the pipe line - when the support CCD does not provide fixed point pipe line locations in the key plan).

- .1 When interferences prevent installation of supports per the CCDs, the A&E support tolerances shall be employed.
 - .A The Production Supervisor shall analyze the problem and direct installation in accordance with the most effective A&E support tolerances.
 - .B In the event that a lug welded or to be welded to the pipe line (or any other pressure boundary component) must be relocated, Engineering shall be contacted for resolution.
 - .C All welding of elements that form an extension of the building structure (AISC/PC/Non HF) and all welding of elements that attach to the extensions of the building structure (HF) shall be performed in accordance with the fillet weld WPS specified on the process sheet. In the event a full penetration weld is necessary, Engineering shall be contacted for assistance. Use of A&E Support tolerances will usually not result in the

addition of "NF" welds (welds that may require MT, PT, RT, or UT per ASME III Subsection NF rules), but may result in the relocation of existing ones. If NF welds are added through use of the A&E support tolerances, the Production Supervisor shall document the welds in the manner specified in 9.1.3.A.

- .2 The tolerances used shall be graphically described on a Component Support/CEA Discrepancy Report (Form HC-99), which shall be marked "As-Built" and initiated as specified in the SIP that addresses Design Control.
 - .A The HC-99 report number shall be marked on the corresponding CCD, the HC-99 shall be included in the JTP, and all welding data shall be recorded on the existing or a continuation weld record (by the Production Supervisor), prior to presenting the work to Quality Control.
- .3 If a support assembly is interchanged per the allowances of the A&E support tolerances, the Production Supervisor shall prepare a HC-99 indicating the change in the Bill of Materials and mark the HC-99 number on the CCD.
 - .A If the interchange, or use of other tolerances, involves the addition of "NF" welds designated an NF-5213 (for fillet welds with ≤ 1 " throat thickness only), 5222, 5223, 5232, or 5233, the Production Supervisor shall indicate the additional "NF" welds on the HC-99. A continuation process sheet shall be generated for the additional welds.
- .4 The completed installation shall be inspected to the criteria of the HC-99, CCD, and WPS specified for fillet welds on the process sheet (unless the welds are full penetration; then a separate or revised process sheet with appropriate WPS criteria will be necessary).

10.0 IN-FIELD DESIGN CHANGE TO COMPONENT SUPPORTS

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- 10.1 The field forces may install a component support concurrently with the processing of an ECR/FCR, as specified in the SIP that addresses Design Control. The changes necessary to accomplish installation may render the existing current JTP ineffective relative to documentation of ASME III Subsection NF welding, examination, and inspection requirements, and established Owner requirements.



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10.2 Prior to proceeding with installation concurrently with the processing of an ECN/FCR, the Production Supervisor shall analyze the A&E representative approved resolution sketch to determine impact on the existing current JTP.

.1 The Production Supervisor shall compare the A&E approved resolution sketch to the current CCD to determine if Subsection NF weld examination designations (i.e. NF - 52 XX; where XX indicates variable numerals) for welds assigned a Hunter weld number have been changed; or, if NF weld examination designations have been added that are not assigned a Hunter weld number.

.A The purpose of this step shall be to identify any welds on the resolution sketch that have different examination requirements from the existing current CCD and process sheets, and to identify any NF welds and examination designations that are in addition to; not specified by; or detract from the ones identified on the existing current CCD and process sheets.

.B NF weld examination designations NF-5213 (for fillet weld, with < 1" throat thickness only), NF-5222, NF-5223, NF-5232, and NF-5233 indicate visual examination requirements and can be installed concurrently with processing of an ECN/FCR. Any supports with other NF weld examination designations shall not be installed concurrently with processing of an ECN/FCR. In those cases, Engineering shall be contacted for issuance of a revised JTP.

10.3 If all NF weld designations on the A&E representative approved sketch are one or a combination of those identified in Subarticle 10.2.1B, and if the existing current CCD displays only one or a combination of those same designations, and the NF weld quantities are the same on both the CCD and sketch, the Production Supervisor shall

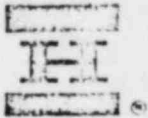
.1 Mark up the sketch with the Hunter weld number designations in a fashion that parallels the method used on the CCD, and;

.2 Identify the sketch and ECN/FCR number on the CCD and existing process sheets, and;

.3 Proceed with the installation per the sketch, any applicable portion of the CCD, and the existing process sheet.

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- 10.4 If the same conditions exist as identified in Article 10.3 except that the sketch has less quantities of NF welds than the CCD, the Production Supervisor shall:
- .1 Mark up the sketch with the required number of Hunter weld number designations in a fashion that parallels the method used on the CCD, and;
 - .2 Identify the sketch and FCR/ECN number on the CCD and existing process sheets, and;
 - .3 Mark the unnecessary Hunter weld number designations on the process sheets, "DELETED," and;
 - .4 Proceed with the installation per the sketch, any applicable portion of the CCD, and the existing marked up process sheets.
- 10.5 If the same conditions exist as identified in 10.3 except that the sketch has a greater quantity of NF welds than the CCD, the Production Supervisor shall:
- .1 Mark up the sketch with the existing Hunter weld number designations, and when they run out, continue on in ascending numerical progression in a fashion that parallels the method used on the CCD, and;
 - .2 Identify the sketch and FCR/ECN numbers on the CCD and existing process sheets, and;
 - .3 Initiate and add a Continuation Process Sheet (Form HN-14B) to the JTP, and;
 - .4 Proceed with installation per the sketch, any applicable portion of the preexisting process sheets and the continuation process sheets.
- 10.6 Non-NF welding resulting from a design change (processed in accordance with the Design Control SIP) shall be documented on either the process sheet issued with the CCD or on a continuation process sheet at the discretion of the Production Supervisor.
- .1 The Production Supervisor shall utilize the Welding Procedure Specification (WPS) identified on the original process sheet. If no previous Non-NF welds were present, the WPS recognized for use on said welds shall be utilized.



- .2 In any event, the Production Supervisor shall indicate the WPS and WPS Revision number utilized on the weld record.
- 10.7 In the event that previously inspected Non-NF welds are to be reworked as a result of a design change, the rework shall be documented on either the original process sheet or a continuation process sheet at the discretion of the Production Supervisor.
- .1 In any event, the inspecting QCWI shall indicate that previously performed inspections are no longer applicable by making one line through the previous inspector's signature and date and documenting the new inspection.

11.0 METHOD FOR REWORK/MODIFICATION

- 11.1 Rework and repair during installation operations is performed to make modifications, correct unacceptable conditions or to correct defective or nonconforming items.
- .1 Rework of this nature will usually be such that utilization of process sheets would be disadvantageous from a control and economic standpoint. Rework of this nature would be specialized and shall be approached on a case by case basis through the use of a Rework Request (Form HN-18).
- 11.2 Rework requests shall be prepared through either the Welding Engineer/Supervisor or by the Project Engineer, depending on the expertise needed for providing and accomplishing satisfactory rework.
- .1 Prepared rework requests shall be logged in the Rework Request Log (Form HC-81). The Welding Department and the Engineering Department shall maintain separate logs. Rework requests shall be assigned numbers in ascending numerical order from the logs. The Welding Department shall prefix their numbers with "WD."
- 11.3 The prepared rework request shall be stamped "Construction Copy" in red and forwarded to the Quality Assurance Department for review and approval in the same manner as process sheets.
- .1 The Quality Assurance Department forwards the Rework Request to the ANI, if the work is under ASME jurisdiction, for review and acceptance.
- 11.4 The approved and accepted rework request is then forwarded to Engineering for distribution to the affected Field Superintendent(s).

- .1 The Field Superintendents shall maintain a Document Station Rework Request Log (Form HC-81A) to track requests. Rework requests shall be signed out and returned in the same manner as JTPs. Rework requests shall be maintained in a Rework Request file.
 - .2 The rework request is implemented in the construction operation by the Production Supervisor. All requirements must be satisfied in sequence as the rework request shall furnish step by step instructions to be followed by Production and Inspection.
- 11.5 Once all requirements of the rework request have been completed, the QCWI involved last shall review the request as it directs.
- .1 The QCWI shall note the rework request on the affected process sheet at the sequence that necessitated its development.
- 11.6 The reviewed request shall be returned to the Production Supervisor for closing out the Document Station Rework Request Log entry and forwarding to QA.
- .1 Quality Assurance shall review the completed rework requests to assure all requirements, as stated, have been complied with.
 - .2 The approved rework requests (for ASME work only) shall then be presented to the ANI for completion acceptance.
 - .3 Once completion reviews are finished, the reworks are placed on file according to the SIP for QA Record Storage.
- 11.7 Other documents, such as Nonconformance Reports (NRs) and Reports of Nondestructive Examination Defects (RNDs) will be issued to the field Production forces to correct unsatisfactory conditions. These documents are initiated and implemented as described in the Nonconformance Processing, Base Metal Repair, and Weld Repair SIPs. In other respects, these documents shall additionally be processed as follows.
- .1 The Field Superintendents shall direct the maintenance of Document Station NR and RND Logs (Form HC-81A) to track the status of NRs and RNDs. NRs and RNDs shall be maintained in the same manner as JTPs.
 - .2 The Quality Control/Welding Inspector shall indicate NR and RND numbers on the affected process sheets in the same manner as specified for rework requests in Article 11.5.1.

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11.8 During the construction process, the Production Supervisor may direct the disassembly of hardware in order to conduct owner requested investigations, to prepare for rework, modification, or to temporarily remove obstructions. When the disassembly is not controlled by types of documentation identified previously in this SIP, the Production Supervisor shall initiate a Hardware Removal/Alteration Report (Form HC-160). Each document station initiating reports shall maintain a Hardware Removal/Alteration Report Log (Form HC-160A). Hardware Removal/Alteration Reports shall be numbered in a manner that will not result in duplication of numbers between document stations.

- .1 The initiating document station retains a copy of the report and forwards the remaining copies to the Project Engineer.
 - .A Hardware may be disassembled prior to receiving Engineering disposition and QA approval, only when authorized by the Project Engineer.
- .2 The Project Engineer evaluates the report to determine if any special instructions are necessary for disassembly and determines what action will be taken for reassembly. The Project Engineer retains a copy of the report and forwards the remaining copies to Quality Assurance.
- .3 Quality Assurance reviews the Engineering disposition for compliance with the requirements of the QA Program and records status change on the appropriate logs (Inspection Status Logs addressed in the SIP addressing Installation Verification). Quality Assurance retains a copy of the report and arranges for return of the report to the initiator for close out.
 - .A Close out may or may not include processing of additional controlling documentation such as Rework Requests, Process Sheets, and Construction Drawings. The need for use of additional controlling documentation will be at the discretion of the Quality Assurance Supervisor and Project Engineer. If feasible, original controlling documentation will be released to accomplish reassembly.
- .4 The report number initiator implements the approved Engineering disposition and obtains Quality Control concurrence. The closed out report and any additional controlling documentation is reviewed for completeness and accuracy by Quality Control and sent to Quality Assurance for records retention. Quality Assurance updates the appropriate logs to indicate status change of the hardware.
 - .A If the controlling documentation that was used to initially accomplish fabrication, installation, rework, or repair is in the field at the time of disassembly (either with Production or Quality Control), the Production Supervisor shall obtain the documentation and notify Quality Control of the disassembly.

- .B Quality Control shall mark up the documentation to indicate the invalidation of the previously acceptable inspections and/or examinations. This shall be accomplished by lining through the previous signatures, acceptance dates, and corresponding data; and applying a brief description of the reasons for doing so. The inspectors shall initial and date all invalidations and justifications.
- .C All reassembly work shall occur in accordance with the established design control and construction tolerance provisions of the established Quality Assurance Program. During reassembly, all previous inspection and examination requirements shall be reapplied. Replacement or additional controlling documentation may be requested from the Engineering or Welding Department at the discretion of the Inspection Supervisor. Any such documentation shall be provided and implemented prior to reassembly.

12.0 JTP REVISIONS

12.1 Job Traveler Packages shall be revised to provide necessary changes once allowances of the Design Control SIP have been exhausted. Revision shall occur as follows:

12.2 Once Engineering has completed recall of affected JTPs or portions thereof, the CCD shall be revised and controlled by Engineering in the same manner as it was initially produced.

- .1 Process sheets, weld records, and field orders shall be revised, added or deleted by Engineering in order to affect changes.
- .2 If the revision requires that an existing process sheet be revised, the revised sheet will be assigned the next revision number in sequence. The revision number of all other process sheets in the JTP shall remain unchanged.
- .3 If the revision requires the addition of process sheets, the revision level of existing process sheets will not be advanced, nor will the referenced drawing revision numbers on those process sheets be advanced.
 - .A Added process sheets shall be issued as Revision 0 if they are of the type specified in Article 4.2.2.A.
 - .B Added process sheets shall be advanced by one Revision level if they are of the type specified in Article 4.2.2.B.
 - .C Added process sheets shall be noted in the title block of the revised CCD.

- .4 If the revision requires the issuance of a revised drawing, but not the issuance of revised process sheet(s), the drawing revision number which is entered on the process sheet(s) will remain unchanged. The only time that the drawing revision number entered on the process sheet will change is when that particular sheet of the process sheet(s) has been revised to reflect a change required by a revised issue of the drawing. Each individual sheet of the process sheets will always reflect the revision to the referenced drawing to which that particular sheet of the process sheets was prepared and issued.
- .5 Revised JTPs or portions thereof, will be rerouted through Quality Assurance and the ANI in the same manner as directed in Article 4.2.3 of this SIP, except as allowed by Section 8.0 and/or 9.0 of this SIP.
- .6 All information transfers on documentation shall be made or directed by Quality Assurance.

13.0 DIRECTIVES RELATIVE TO FABRICATION/INSTALLATION

- 13.1 Upon receipt of Construction Copy JTPs for fabrication/design change, the Field Superintendent shall consult the Lead Field Superintendent to determine if the site Fabrication Shop or Area Superintendent will perform the work.
 - .1 If it is determined that the Fabrication Shop will perform the work, the Construction Copy ISO drawing, process sheet and related documents are routed to the Fab Shop for fabrication.
 - .2 The schedule of priorities for fabrication and installation shall be determined through the Project Manager.
- 13.2 All welding and bulk materials necessary for fabrication/installation shall be requisitioned according to the SIPs addressing weld and bulk material ordering.
 - .1 All items shall be rigged and handled with safety of personnel and property considered.
 - .A The selection of rigging and equipment shall be in accordance with correct weight, physical dimensions, location placement, and working radius of crane boom, if required.
 - .B All work requiring wire rope slings and wire rope will be as suggested by manufacturer's chart for capacities, as will shackles, cable clamps, forged steel hooks, hand lines, and rollers for moving equipment. Reference guides shall be available to responsible Supervisors.

- .C Nylon/fabric slings shall be utilized for handling stainless steel material and coated and wrapped materials when loading conditions permit.
- .D Phones for audible signals will be available as required. Attachment of phones will not interfere with view or dexterity of operation.
- .2 The following methods of handling and hoisting will be considered standard practice.
 - .A Determine method of attachment of the load using factory mountings as supplied or required. Care will be exercised not to cause undue strain or twist which would cause distortion.
 - .B Use of lifting beams as required.
 - .C Use of matched wire rope slings.
 - .D Determine any angle of attachment when required.
 - .E Use of isolators and softeners when necessary.
 - .F Chain hoists will be used to balance or tilt load when required.
 - .G Lashing may be used in lieu of slings for various loads as necessary and shall include:
 - .1 Proper placement of cable clamps.
 - .2 Torque cable clamps when necessary.
 - .H Proper loading and securing of material and equipment from storage to erection.
 - .I Use care in securing lifting and hoisting attachments to building steel.
 - .J Make constant references to design of building for floor loadings.
- .3 The users of hoisting equipment and machinery shall check for the following prior to use:
 - .A Wire rope.
 - .1 Check for broken strands and follow manufacturer's recommendations for dispensing.
 - .2 Inspect for worn appearance of wire rope.

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM

REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 22 OF 54

HUNTER CORPORATION

- .3 Check for pitted or corroded wire rope.
 - .4 Periodically check wire rope for reduced diameter, flattening, and abrasion.
 - .5 Lubrication as required.
 - .B Wire rope block.
 - .1 Check sheave groove for wear.
 - .2 Field inspect blocks to ascertain that proper diameter rope matches the sheave groove.
 - .3 Disassemble rope blocks periodically; check internally for wear.
 - .4 Clean, assemble, and lubricate.
 - .C Nylon/fabric sling.
 - .1 Check for broken strands and/or fraying.
 - .2 Check for wear with particular attention to formed "eyes".
 - .3 Store in secure, dry area when not in use.
 - .4 Welding of temporary clips, lugs, dogs, pad-eyes, or other devices to piping for lifting, rigging, jiggling, alignment, or fit-ups may be made, providing that the SIP for Temporary Attachments is followed.
 - .5 Plant equipment shall be handled, rigged, and placed in accordance with manufacturer's instructions. Supplemental procedures will be used as directed by the Owner for those items requiring special handling.
- 13.3 The work shall be fabricated and installed to the configuration and dimensions shown on the CCD utilizing the materials stated on the process sheets and field order, except as stated in previous sections.
- .1 All 2½" or greater piping shall be fabricated in accordance with the tolerances specified in PFI-CS-3 (1974 Edition) included in this SIP as Appendix 1.

.2 Materials issued for a specific job segment shall not be utilized in any other job segment. Materials left over from fabrication or installation shall be scrapped or processed in accordance with the SIP for Overage Materials.

.3 For all piping, component support auxiliary steel, and hardware on component supports identified as primary members and classified as linear or plate and shell items, heat number/code identification shall be maintained on all cut pieces of material by the craftsman doing the work. This will be accomplished by marking the heat number on all sides of the cut prior to parting. Identification marking shall consist of low stress stamping or paint/ink markings. Paint/inks utilized on stainless steel shall conform to Article 13.8.

.A When welding obliterates the heat number, the craftsman working on the fabrication will transfer the heat number to a visible location by the method described above.

.4 All Quality Control Welding Inspection shall be performed in sequence as required by presence of Hold/Witness Points, and shall be in accordance with the specified process specification procedure and/or acceptance criteria specified on the process sheets.

.A Any fabrication or installation activities on ASME Section III work (except for Material Handling where materials are being delivered from storage to the Fab Shop or field installation area, or at the discretion of the Quality Assurance Supervisor) requires the presence of Quality Control Welding Inspection Personnel in the field forces. Work shall not proceed beyond the mandatory inspection hold points until the Quality Control Welding Inspector has inspected and approved the appropriate sequence of operations.

13.4 All welding shall be inspected to the criteria established by the approved WPS. Verification of fit-up on socket welds shall be accomplished as follows:

- .1 The pipe is inserted into the fitting and butted against the inside shoulder of the socket weld fitting.
- .2 A scribe mark or low stress dots shall be placed around the circumference of the pipe where it intersects with the fitting.
- .3 The fitting is backed-off a minimum of 1/16" and tacked.
- .4 A QCWI shall verify fit-up gap prior to deposit of the first weld pass.

13.5 Welding shall be accomplished following the welding procedures and processes called for on the process sheet.

- .1 Where screw joints are to be back-welded, pipe dope or compound shall not be used. All other screw joints shall be made with an approved pipe dope or compound.
- .2 Prior to making a joint, screwed or welded, ends and openings shall be cleaned of oil, grease, scale, rust, paint or any other contaminant.
- .3 All weld passes shall be scrutinized by the craftsman for evidence of weld defects and/or conditions that contribute to weld defect. Any such conditions shall be eliminated by the craftsman before the next pass is deposited.
- .4 All welding shall be monitored by the craftsman in relation to preheat and interpass temperature requirements of the specified WPS.
- .5 Hot working of materials shall not be employed until such time as an approved SIP is developed.

13.6 Traceability of certain items to their certifications is required. Whenever the process sheet(s) indicate "traceability required" or "record material mark numbers" or if the support CCD identifies primary members classified as linear or plate and shell items, it shall be the responsibility of the Production Supervisor to record the data as indicated.

Example: For pipe, fittings, plate and lugs, enter the Heat Number.

For valves, enter the manufacturer's serial number as indicated on the ASME nameplate.

For supports, enter the heat number(s) of the materials used under the portion of the process sheet labeled "Replacement/Modification Materials Used".

- .1 Traceability of weld data and weld materials is always required. The Production Supervisor shall enter this data on the weld record that corresponds to the weld joint(s).
- .2 The Quality Control/Welding Inspectors shall verify that all required data entries have been made.

13.7 Precautionary measures shall be taken to avoid contamination of and/or damage to the piping and piping system components. All end and opening covers, caps, or plugs shall be kept in place until they need to be removed for fit-up or other purposes.

- .1 At the end of each shift, fit-ups for welds shall be covered

- .2 Metal or plastic end caps, covers, or plugs shall be used to cover open ends of components. In all other respects, the requirements of the Material Storage SIP apply.
- .3 Power tool buffing, brushing, abrasive and boring or cutting attachments shall be color coded at the direction of the Field Superintendents with a coat of yellow paint or dye to identify them for use on stainless steel only.
 - .A Any items coded as stated shall not be used to fabricate or install any carbon or low alloy steels.
- .5 Necessary temporary supports shall be provided during installation to adequately support pipe. Plant equipment such as pumps, tanks, etc., shall not be used as temporary supports for a run of pipe.
 - .A Welded attachment areas on embedments and structural steel shall be evaluated by the Production Supervisor once the attachment is removed to assure the surface is smooth, uniform, and free from obvious mechanical marks and cracks or tears. If repair is necessary, the Production Supervisor will direct same using the current approved welding procedure that is employed for component support installation.

13.8 The acceptable limits of halogens, sulfur and heavy metals in certain construction consumables shall be as follows:

- .1 For Marking pens and inks
 - 200 PPM maximum halogens
 - 100 PPM maximum sulfur
 - 50 PPM maximum heavy metals
- .2 For Liquid Penetrant Dye
 - 300 PPM maximum halogens
 - 300 PPM maximum sulfur
 - 50 PPM maximum heavy metals
- .3 For Liquid Penetrant Developer or Cleaner, Ultrasonic Couplant and Abrasive Products
 - 300 PPM maximum halogens
 - 300 PPM maximum sulfur
- .4 For Cutting Fluids, Acetone, Denatured Alcohol and Adhesive Products
 - 1000 PPM maximum total of halogens and sulfur.

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM

REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 26 OF 54

HUNTER CORPORATION

/9

14.0 TRAINING REQUIREMENTS

14.1 Each Production Supervisor, Engineering Department Supervisor, Quality Assurance Department Supervisor, Inspector and Auditor shall receive training to this SIP, if they perform work within its Scope. Supervision participating in the review/approval process need not receive formal training. Instructions on the use of referenced forms shall be provided during training.

/9

14.2 Whenever reference is made to mark-up of ECM/FCR number on JTP documents (CCD, process sheets, etc.) the Production Supervisor shall also enter his initials and date as the individual making the entry.

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM

REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 27 OF 54

HUNTER CORPORATION



APPENDIX 1

Page 1

PSI Standard FS-3 -
(April 1974)

FABRICATING TOLERANCES

1. Scope

- 1.1 This standard covers general pipe shop fabricating tolerances for prefabricated piping assemblies.

2. Linear Tolerances

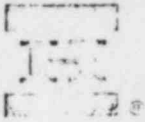
- 2.1 The tolerances on linear dimensions (intermediate or overall) apply to the face to face, face to end, and end measurements of fabricated straight pipe and headers; center to end or center to face of nozzles or other attachments; or center to face of bends; as illustrated on Fig. 1. These tolerances are not accumulative.
- 2.2 Linear tolerances on "A" are $\pm 1/8"$ for sizes 10" and under and $\pm 3/16"$ for sizes 12" through 36".
- 2.3 Linear tolerances on "A" for sizes over 36" are subject to tolerances of $\pm 3/16"$, plus or minus $1/32"$ for each 12" in diameter over 36".
- 2.4 Due to the cumulative effects of tolerances on fittings or flanges, when joined without intervening pipe segments, deviations in excess of those specified in paragraphs 2.2 and 2.3 may occur.

3. Angularity and Rotation Tolerances

- 3.1 Angularity tolerance across the face of flanges and weld end preparation and on rotation of flanges are as stated on Fig. 1.

4. Closer Tolerances

- 4.1 When closer tolerances than those given in paragraphs 2.2, 2.3 and 2.4 are absolutely necessary, they shall be subject to agreement between the Purchaser and Fabricator.



APPENDIX 1

Page 2

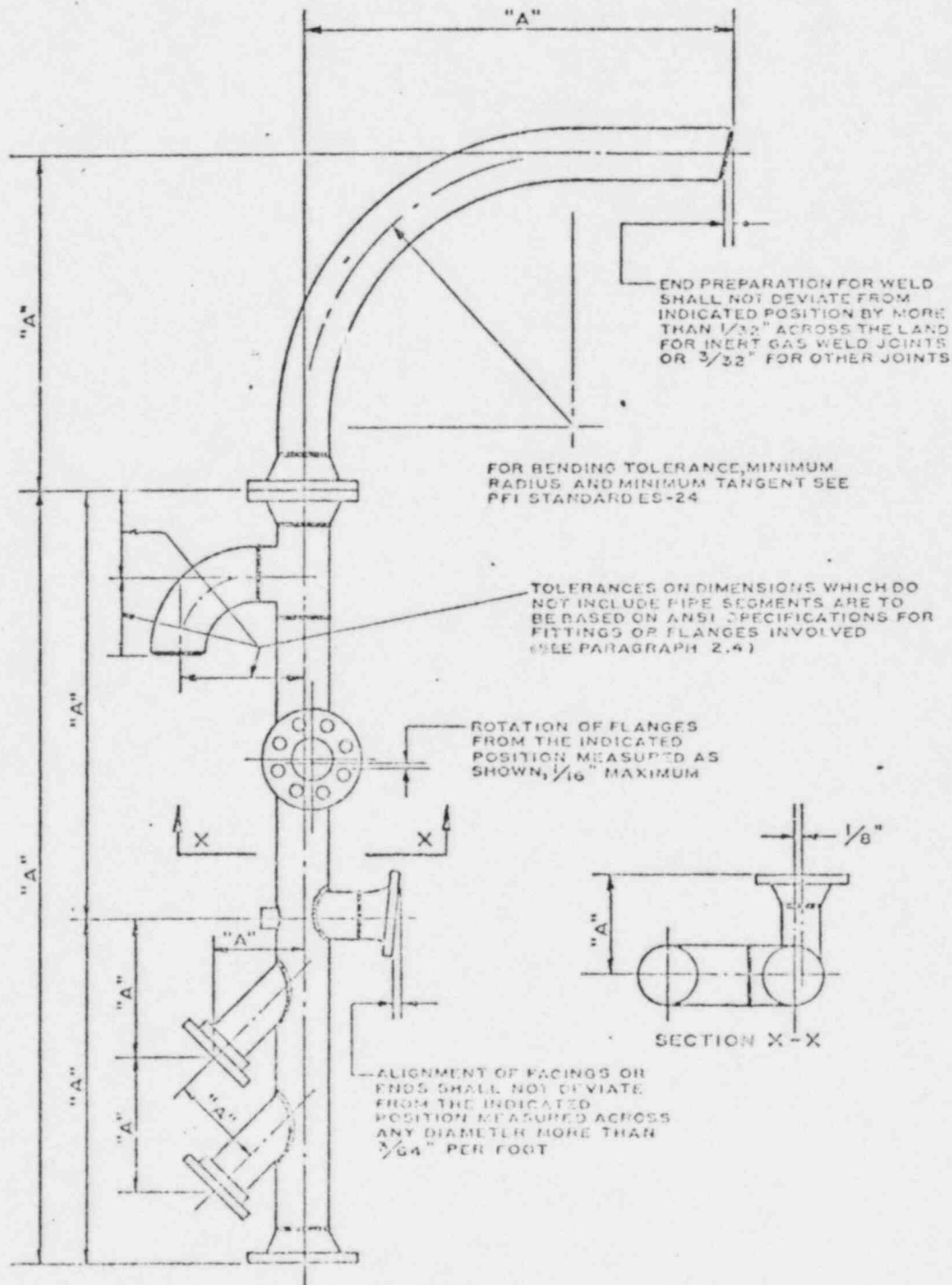
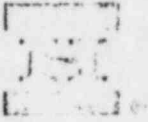


FIGURE 1

APPLICATION OF PIPE FABRICATION TOLERANCES

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 31 OF 54

HUNTER CORPORATION

PROCESS SHEET (P-1-P-8 BUTT WELDS)

CONTINUATION

PROJECT D-091-D-002

LOCATION 303-10

PROJECT D-091-D-002

PROJECT D-091-D-002

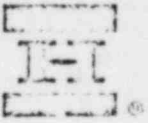
CUSTOMER	COMMERCE BANK	PROJECT	D-091-D-002	LOCATION	303-10
RECORD MATERIAL	WELDING PROCESS	JOINT TYPE	OPEN BUTT	CONS. INSERT	BAC. NO. STRIP
ROOT IS GTAW	ROOT IS GTAW	PASS	GTAW	GTAW	GTAW
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK
REWORK	REWORK	REWORK	REWORK	REWORK	REWORK

REV.	Q.A. DATE	AV. DATE	REV. ENG.	DATE	DESCRIPTION OF REV.	PERFORMED UNRELATED BY & DATE	AN I	AN I	AN I
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

HW-1A(1-80)

S.I.P. NO. 4,000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

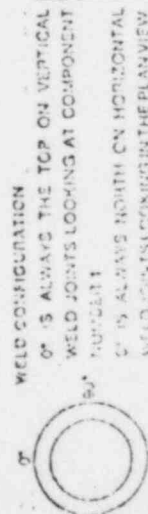
DATE 7-26-82

PAGE 32 OF 54

HUNTER CORPORATION

WELD RECORD

SEQ. NO.	WELD DESCRIPTION	WELDED BY	DATE	TYPE	SIZE	WELD MATERIAL HEAT OR LOT NO.	WELD PEO. NO.	WELD PROCOR REV. NO.	ENTRIES BY	DATE



WELD RECORD FORM USAGE IN THE FIELD

1. THE WELD RECORD FORM IS TO BE FILLED OUT FOR ALL DATA SHEETS ON ALL WELDS MADE IN THE FIELD. THE FIRST WELD MADE IN A PROJECT IS TO BE THE FIRST WELD MADE IN THE FIELD. THE WELD RECORD FORM IS TO BE FILLED OUT FOR ALL WELDS MADE IN THE FIELD. THE WELD RECORD FORM IS TO BE FILLED OUT FOR ALL WELDS MADE IN THE FIELD. THE WELD RECORD FORM IS TO BE FILLED OUT FOR ALL WELDS MADE IN THE FIELD.

PROCESS SHEET FORM USAGE IN THE FIELD

1. THE PROCESS SHEET FORM IS TO BE FILLED OUT FOR ALL DATA SHEETS ON ALL WELDS MADE IN THE FIELD. THE FIRST WELD MADE IN A PROJECT IS TO BE THE FIRST WELD MADE IN THE FIELD. THE PROCESS SHEET FORM IS TO BE FILLED OUT FOR ALL WELDS MADE IN THE FIELD. THE PROCESS SHEET FORM IS TO BE FILLED OUT FOR ALL WELDS MADE IN THE FIELD.

J.T.P. NO. _____ WELD NUMBER _____ P.W.H.T. CHART NO. _____

REGURER _____ DATE _____ P.W.H.T. ENTRIES BY _____ P.W.H.T. DATE _____

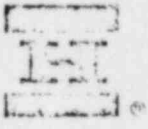
CONCRETE _____ P.W.H.T. EQUIPMENT NO(S) _____ APPROVED BY _____ DATE _____

CONCRETE _____ P.W.H.T. DATE _____

CONCRETE _____ P.W.H.T. DATE _____

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

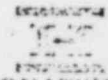
DATE 7-26 82

HUNTER CORPORATION

PAGE 33 OF 54

PROCESS SHEET

(COMPONENT SUPPORTS WITH FILLET WELD JOINTS)



(FOR FIELD CONTINUATION)

HUNTER CORPORATION

JTP No. _____ REV. _____ FOR No. _____ ACCEPTED BY _____ DATE _____

FORM USAGE

THE PRODUCTION SUPERVISOR WHO HAS JURISDICTION OVER THE WORK IS RESPONSIBLE FOR ENTRY OF ALL INFORMATION RELATIVE TO WORK PROGRESS, PRODUCTIVITY AND WELDS. WELDS ADDED TO A COMPONENT SUPPORT IN THE FIELD SHALL BE RECORDED ON THIS PROCESS SHEET.

SEQ. NO.	DEPT.	OPERATION DESCRIPTION	WELD POINT Q.C. #	PERFORMED/INSPECTED BY AND DATE	ANT AND DATE
1	PROD.	WELD NO. _____ FILLET WELDING OF _____		ENTER WELDING DATA ON REVERSE SIDE	
	QC	PERFORMED WITH PROTECTIVE CHIMNEY _____	✓		
	QC	WELDS TO BE ACCEPTABLE AND REPORT NUMBERS _____			

SEQ. NO.	DEPT.	OPERATION DESCRIPTION	WELD POINT Q.C. #	PERFORMED/INSPECTED BY AND DATE	ANT AND DATE
1	PROD.	WELD NO. _____ FILLET WELDING OF _____		ENTER WELDING DATA ON REVERSE SIDE	
	QC	PERFORMED WITH PROTECTIVE CHIMNEY _____	✓		
	QC	WELDS TO BE ACCEPTABLE AND REPORT NUMBERS _____			

SEQ. NO.	DEPT.	OPERATION DESCRIPTION	WELD POINT Q.C. #	PERFORMED/INSPECTED BY AND DATE	ANT AND DATE
1	PROD.	WELD NO. _____ FILLET WELDING OF _____		ENTER WELDING DATA ON REVERSE SIDE	
	QC	PERFORMED WITH PROTECTIVE CHIMNEY _____	✓		
	QC	WELDS TO BE ACCEPTABLE AND REPORT NUMBERS _____			

SEQ. NO.	DEPT.	OPERATION DESCRIPTION	WELD POINT Q.C. #	PERFORMED/INSPECTED BY AND DATE	ANT AND DATE
1	PROD.	WELD NO. _____ FILLET WELDING OF _____		ENTER WELDING DATA ON REVERSE SIDE	
	QC	PERFORMED WITH PROTECTIVE CHIMNEY _____	✓		
	QC	WELDS TO BE ACCEPTABLE AND REPORT NUMBERS _____			

SEQ. NO.	DEPT.	OPERATION DESCRIPTION	WELD POINT Q.C. #	PERFORMED/INSPECTED BY AND DATE	ANT AND DATE
1	PROD.	WELD NO. _____ FILLET WELDING OF _____		ENTER WELDING DATA ON REVERSE SIDE	
	QC	PERFORMED WITH PROTECTIVE CHIMNEY _____	✓		
	QC	WELDS TO BE ACCEPTABLE AND REPORT NUMBERS _____			

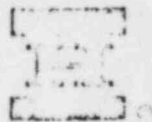
SEQ. NO.	DEPT.	OPERATION DESCRIPTION	WELD POINT Q.C. #	PERFORMED/INSPECTED BY AND DATE	ANT AND DATE
2	QC	LOCATION VERIFICATION _____	✓		

NOTE: THE SEQUENCE 2 WELD POINT FOR LOCATION VERIFICATION SHALL BE RECORDED IF THE ATTACHING COMPONENT IS DAMAGED OR REMOVED.

REMARKS: _____

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 34 OF 54

HUNTER CORPORATION

CONSTRUCTION COPY

PIPING SOCKET WELD
PROCESS SHEET



J.T.P. NO. _____

CUSTOMER CISCO PROJECT 4391 4392 LOCATION 324 JOB NO. C-751009

DESCRIPTION OF JOB SEGMENT

WELD NUMBERS	WPS NUMBER	FILLER METAL AWS NUMBER	PREHEAT TEMP. RANGE IN °F	MAX. INTERPASS TEMP. IN °F	FWHT			FINAL NO.			
					N/A	RFD	PROCEDURE	MT	FT	OTHER	

MATERIALS TO BE USED

ITEM	P. NO.	DESCRIPTION (INCLUDE SIZE, SCHEDULE OR RATING, AND SPECIFICATION AND GRADE)
PIPE		
FITTINGS		
VALVES		
SPECIALS		

DRAWING NO. _____ PROCESS SHEET
ISSUED UNDER REV. _____ LINE NO. _____

REMARKS: _____ BY & DATE _____

SPECIAL INSPECTION INSTRUCTIONS _____ BY & DATE _____

AMT & DATE	QA & DATE	ENG. & DATE	REV.	DESC. OF REVISION	AMT & DATE	QA & DATE	ENG. & DATE	REV.	DESC. OF REVISION

SEQ. #	DEPT	OPERATION DESCRIPTION	HOLD PT.		PERFORMED, INSPECTED BY & DATE	A.M.T. & DATE
			QC	AMT		
1	PROD	WELD NO.			ENTER WELDING DATA ON REVERSE SIDE	
	QC	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input type="checkbox"/>			
	QC	INTERIM DATE INSPEC. <input type="checkbox"/>				
	PROD	POST WELD HEAT TREAT				
	QC	FWHT INSPEC. SET UP <input type="checkbox"/> TEMP. <input type="checkbox"/>				
2	QC	FINISHED WELD INSPEC. IDENT. <input type="checkbox"/> DAMAGE <input type="checkbox"/>				
		E. GAP <input type="checkbox"/> CONTOUR & SIZE				
		F. SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NO.				
3	QC	ENTER ACCEPTABLE NO. REPORT NO.				
CONDITIONS: MANUFACTURING POINTS: VISUAL FOUR METHOD FOR FIT UP: VISUAL METHOD IS NOT EMPLOYED						
1	PROD	WELD NO.			ENTER WELDING DATA ON REVERSE SIDE	
	QC	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input type="checkbox"/>			
	QC	INTERIM DATE INSPEC. <input type="checkbox"/>				
	PROD	POST WELD HEAT TREAT				
	QC	FWHT INSPEC. SET UP <input type="checkbox"/> TEMP. <input type="checkbox"/>				
2	QC	FINISHED WELD INSPEC. IDENT. <input type="checkbox"/> DAMAGE <input type="checkbox"/>				
		E. GAP <input type="checkbox"/> CONTOUR & SIZE				
		F. SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NO.				
3	QC	ENTER ACCEPTABLE NO. REPORT NO.				
1	PROD	WELD NO.			ENTER WELDING DATA ON REVERSE SIDE	
	QC	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input type="checkbox"/>			
	QC	INTERIM DATE INSPEC. <input type="checkbox"/>				
	PROD	POST WELD HEAT TREAT				
	QC	FWHT INSPEC. SET UP <input type="checkbox"/> TEMP. <input type="checkbox"/>				
2	QC	FINISHED WELD INSPEC. IDENT. <input type="checkbox"/> DAMAGE <input type="checkbox"/>				
		E. GAP <input type="checkbox"/> CONTOUR & SIZE				
		F. SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NO.				
3	QC	ENTER ACCEPTABLE NO. REPORT NO.				
1	PROD	WELD NO.			ENTER WELDING DATA ON REVERSE SIDE	
	QC	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input type="checkbox"/>			
	QC	INTERIM DATE INSPEC. <input type="checkbox"/>				
	PROD	POST WELD HEAT TREAT				
	QC	FWHT INSPEC. SET UP <input type="checkbox"/> TEMP. <input type="checkbox"/>				
2	QC	FINISHED WELD INSPEC. IDENT. <input type="checkbox"/> DAMAGE <input type="checkbox"/>				
		E. GAP <input type="checkbox"/> CONTOUR & SIZE				
		F. SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NO.				
3	QC	ENTER ACCEPTABLE NO. REPORT NO.				

S.I.P. NO. 4,000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 35 OF 54

HUNTER CORPORATION

MATERIAL TRACEABILITY RECORD			
WELD NO.	ITEM NO(S)	M/K - NO.	ENTRIES BY & DATE

COMPLETED PROCESS SHEET AND WELD RECORD APPROVED BY: _____

Date _____
O. C. Inspector

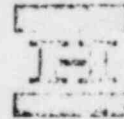
WELD RECORD									
WELD NO(S)	POSTHEAT CHART NO	TYPE	SIZE	WELD MATERIAL HEAT/LOT NO.	REQUISITION NO.	PERFORMED WPS & P.W.H.T. BY & DATE	P.W.H.T. PROC. CHART NO.	REV. NO.	ENTRIES BY & DATE

FORM USAGE IN THE FIELD

The Production Supervisor who has jurisdiction over the work is responsible for entry of all information relating to work progress and traceability of materials and welders. Data shall be recorded as designated, and in the same manner as required for butt welds. Data for post weld heat treatment shall be recorded in detail on the corresponding Production Application Instructions.

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 36 OF 54

HUNTER CORPORATION

CONSTRUCTION COPY

PIPE BENDING
PROCESS SHEET

HUNTER
CORPORATION

J.T.P. NO. _____

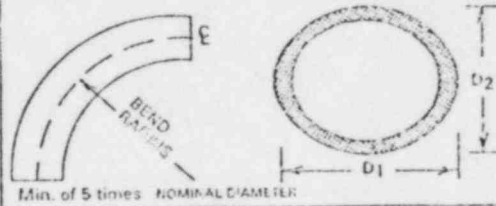
CUSTOMER CECO PROJECT 4391 4392 LOCATION 324 JOB NO. C-751005

DESCRIPTION OF JOB SEGMENT

OVALITY MEASURED AT THE CENTER OF THE BEND SHALL NOT EXCEED 8% AS DETERMINED BY THE FOLLOWING FORMULA:

$$100 \times \frac{(D_1 - D_2)}{D_0}$$

D₀ = Min. diameter before bending
D₁ = Max. diameter after bending
D₂ = Min. diameter after bending



ALL BENDING PER

PROCESS SPEC NO. _____

MATERIALS TO BE USED

ITEM	P. NO.	DESCRIPTION (INCLUDE SIZE, SCHEDULE OR RATING, AND SPECIFICATION AND GRADE)
PIPE		
TUBE		

DRAWING NO. _____ PROCESS SHEET ISSUED UNDER REV. 9 LINE NO. _____

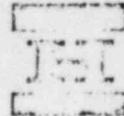
REMARKS: _____

BY & DATE _____

RELEASED FOR CONST									
ANI & DATE	QA & DATE	ENG & DATE	REV	DESC. OF REVISION	ANI & DATE	QA & DATE	ENG & DATE	REV	DESC. OF REVISION
S/O NO.	DEPT.	OPERATION DESCRIPTION			HOLD PT.	PROCESS SPEC REV NO.	PERFORMED/INSPECTED BY & DATE		ANI & DATE
					OC ANI				
1	PROD.	BEND NO.							
2	O.C.	BEND INSPECTION							
		BEND RADIUS ACCEPTABLE ()							
		OVALITY ACCEPTABLE ()							
		SURFACE DISCONTINUITIES ACCEPTABLE ()							
1	PROD.	BEND NO.							
2	O.C.	BEND INSPECTION							
		BEND RADIUS ACCEPTABLE ()							
		OVALITY ACCEPTABLE ()							
		SURFACE DISCONTINUITIES ACCEPTABLE ()							
1	PROD.	BEND NO.							
2	O.C.	BEND INSPECTION							
		BEND RADIUS ACCEPTABLE ()							
		OVALITY ACCEPTABLE ()							
		SURFACE DISCONTINUITIES ACCEPTABLE ()							
1	PROD.	BEND NO.							
2	O.C.	BEND INSPECTION							
		BEND RADIUS ACCEPTABLE ()							
		OVALITY ACCEPTABLE ()							
		SURFACE DISCONTINUITIES ACCEPTABLE ()							
1	PROD.	BEND NO.							
2	O.C.	BEND INSPECTION							
		BEND RADIUS ACCEPTABLE ()							
		OVALITY ACCEPTABLE ()							
		SURFACE DISCONTINUITIES ACCEPTABLE ()							

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

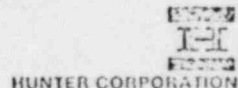
DATE 7-26-82

PAGE 37 OF 54

HUNTER CORPORATION

CONSTRUCTION COPY

MECHANICAL JOINT
PROCESS SHEET



J.T.P. NO. _____

CUSTOMER CECO PROJECT 4301 4392 LOCATION 325 JOB NO. C-751006

DESCRIPTION OF JOB SEGMENT AND MATERIALS TO BE USED

JOINT NO. _____ PRESSURE RATING 155 JOINT TYPE REGULAR OFFICE FLANGE FLANGE BOWTIE

GASKET TYPE N/A ASBESTOS FILLED ASBESTOS COMPOSITION

STUD SIZE _____ ELONGATION READINGS N/A REQUIRED

STUD SPECIFICATION & GRADE _____ NUT SPECIFICATION & GRADE _____

PROCESS SPECIFICATION NO. _____ TORQUE VALUES (FT. LBS.) INITIAL _____ INTERMEDIATE _____ FINAL _____

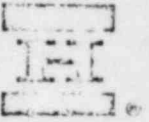
DRAWING NO. _____ PROCESSED SHEET ISSUED UNDER REV. _____ PART OF _____ REMARKS _____ BY & DATE _____

SPECIAL INSPECTION INSTRUCTIONS _____ BY & DATE _____

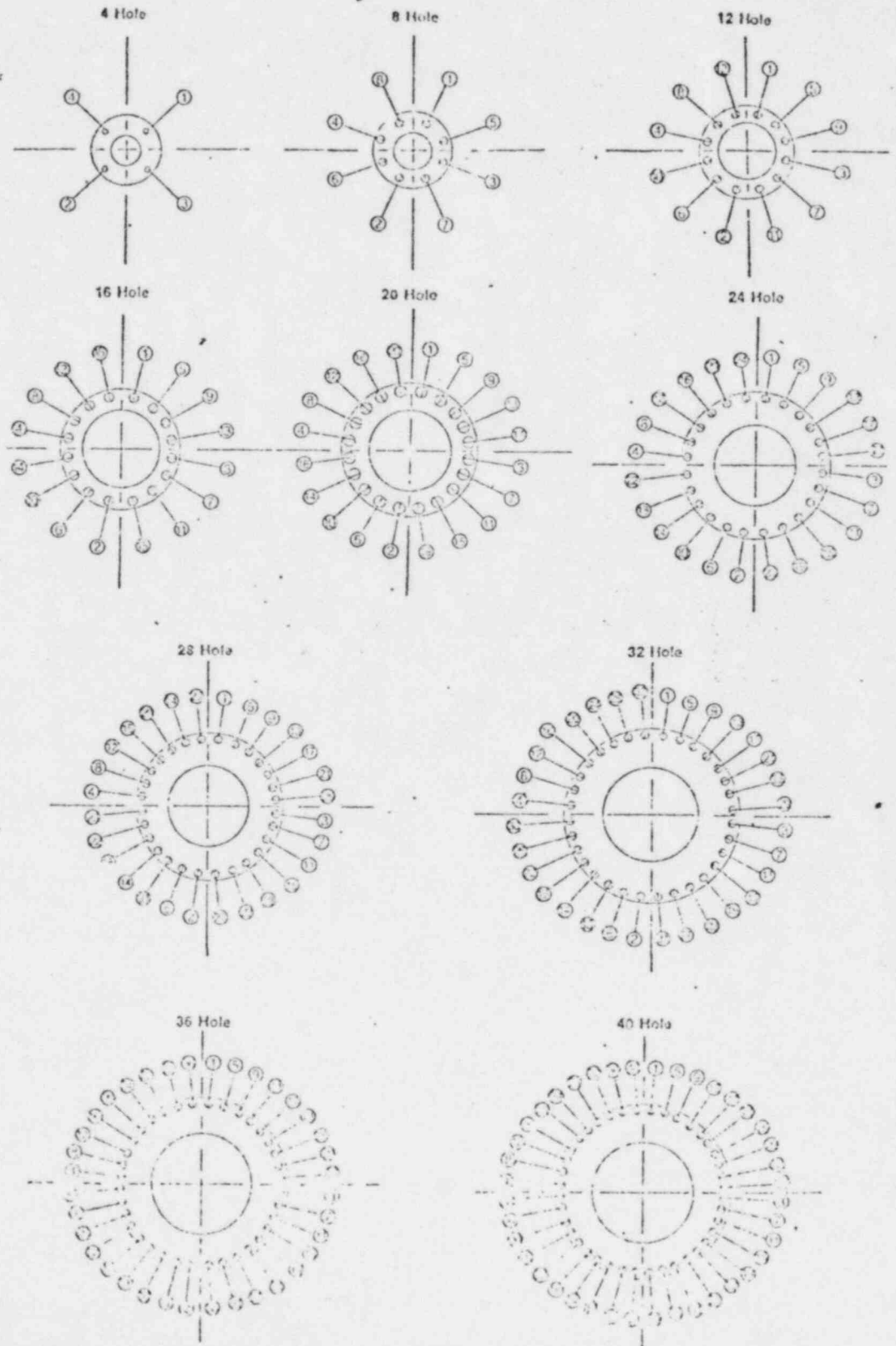
AMT. DATE	QA DATE	ENG. DATE	REV.	DESC. OF REVISION	AMT. DATE	QA DATE	ENG. DATE	REV.	DESC. OF REVISION
				<input type="checkbox"/> RELEASED FOR CONST.					
SEQ. NO.	DEPT.	OPERATION DESCRIPTION			PERFORMED	PERFORMED/INSPECTED BY & DATE		AMT. DATE	
1	O.C.	PRE-ASSEMBLY INSPECTION <input type="checkbox"/> IDENT <input type="checkbox"/> SEATING SURFACE <input type="checkbox"/> GASKET <input type="checkbox"/> STUDS & NUTS							
PRODUCTION NOTE: JOINT MUST NOT BE MADE TIGHT IF A HOLD-FIT IS PRESENT IN SEQUENCE NUMBER 1									
2	O.C.	LINE UP INSPECTION <input type="checkbox"/> THREAD COMPOUND <input type="checkbox"/> DRIVE PLATE <input type="checkbox"/> IF REQUIRED <input type="checkbox"/> CASKET <input type="checkbox"/> ALIGNMENT							
3	PROD.	IF REQUIRED FACETS INITIAL STUD LENGTHS AND MEASURING INSTRUMENT ID. NO. PRIOR TO TORQUING							
4	O.C.	VERIFY PERFORMANCE OF SEQUENCE NUMBER 3							
5	PROD.	TORQUE TO SPECIFIED VALUES. RECORD WRENCH ID. NO.							
6	O.C.	WITNESS INITIAL TORQUE <input type="checkbox"/> SEQUENCE <input type="checkbox"/> TORQUE VALUES. WITNESS INTERMEDIATE TORQUE <input type="checkbox"/> SEQUENCE <input type="checkbox"/> TORQUE VALUES. WITNESS FINAL TORQUE <input type="checkbox"/> SEQUENCE <input type="checkbox"/> TORQUE VALUES.							
7	PROD.	RECORD STUD & NUT ID. NO.'S AND REVISION NO. OF PROCESS SPECIFICATION. IF REQUIRED, RECORD FINAL ELONGATION OF STUDS AND ELONGATION MEASUREMENT SYSTEM.							

MECHANICAL JOINT RECORD

BOLTING NO.	INITIAL STUD LENGTH	FINAL STUD LENGTH	MATERIAL NO. & Q.S.			BOLTING NO.	INITIAL STUD LENGTH	FINAL STUD LENGTH	MATERIAL NO. & Q.S.		
			STUD	NUT	NUT				STUD	NUT	NUT
1						20					
2						21					
3						22					
4						23					
5						24					
6						25					
7						26					
8						27					
9						28					
10						29					
11						30					
12						31					
13						32					
14						33					
15						34					
16						35					
17						36					
18						37					
19						38					
20						39					
21						40					
22						41					
23						42					
24						43					
25						44					
26						45					
27						46					
28						47					
29						48					
30						49					
31						50					
32						51					
33						52					
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36						55					
37						56					
38						57					
39						58					
40						59					
41						60					

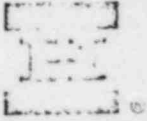


TOUCHING SEQUENCES



QUALITY ASSURANCE PROGRAM

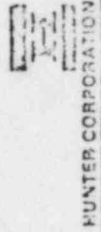
SITE IMPLEMENTATION PROCEDURE



HUNTER CORPORATION

CONSTRUCTION COPY
 P. NO. _____

COMPONENT SUPPORT PROCESS SHEET



HUNTER CORPORATION

PROCESS SHEET
 ISSUED UNDER REV. _____

FORMER CCCO PROJECT 4391 4392 LOCATION 024 JOB NO. C-751006 DRAWING NO. _____

DESCRIPTION OF JOB SEGMENT

N.D.S. REQUIREMENTS

S.I.P. NO.	WELDING PROCESS	WELDER STAMP	FILLER METAL AVG. NUMBER	PREHEAT TEMP RANGE IN °F	MAX INTERPASS TEMP IN °F	P.O.U.T.				FOR OUR REQUIREMENTS CONTAINED ON N.D.S. WORK				
						W/A	REQ	PROCEDURE	VIS	MT	PT	UT	VIS	MT

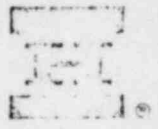
S.I.P. NO.	DEPT.	WELDING PROC.	OPERATION DESCRIPTION	DESC. OF REVISION	AM & DATE	DA & DATE	REV. DATES		DESC. OF REVISION
							NO.	BY AND DATE	
1	PROD	WELB W	WELDING PROC. CHANGE FROM MIG TO TIG WELDING						
2	PROD	WELB W	WELDING PROC. CHANGE FROM TIG TO MIG WELDING						
3	PROD	WELB W	WELDING PROC. CHANGE FROM TIG TO MIG WELDING						

S.I.P. NO.	DEPT.	WELDING PROC.	OPERATION DESCRIPTION	DESC. OF REVISION	AM & DATE	DA & DATE	REV. DATES		DESC. OF REVISION
							NO.	BY AND DATE	
1	PROD	WELB W	WELDING PROC. CHANGE FROM TIG TO MIG WELDING						
2	PROD	WELB W	WELDING PROC. CHANGE FROM TIG TO MIG WELDING						
3	PROD	WELB W	WELDING PROC. CHANGE FROM TIG TO MIG WELDING						

- REMARKS
- 1. THROUGH REQUIREMENT CONNECTION CASE NUMBER 1
 - 2. EXHIBIT 1 (P. 10)
 - 3. EXHIBIT 2 (P. 11)
 - 4. EXHIBIT 3 (P. 12)
 - 5. EXHIBIT 4 (P. 13)
 - 6. EXHIBIT 5 (P. 14)
 - 7. EXHIBIT 6 (P. 15)
 - 8. EXHIBIT 7 (P. 16)
 - 9. EXHIBIT 8 (P. 17)
 - 10. EXHIBIT 9 (P. 18)
 - 11. EXHIBIT 10 (P. 19)
 - 12. EXHIBIT 11 (P. 20)
 - 13. EXHIBIT 12 (P. 21)
 - 14. EXHIBIT 13 (P. 22)
 - 15. EXHIBIT 14 (P. 23)
 - 16. EXHIBIT 15 (P. 24)
 - 17. EXHIBIT 16 (P. 25)
 - 18. EXHIBIT 17 (P. 26)
 - 19. EXHIBIT 18 (P. 27)
 - 20. EXHIBIT 19 (P. 28)
 - 21. EXHIBIT 20 (P. 29)
 - 22. EXHIBIT 21 (P. 30)
 - 23. EXHIBIT 22 (P. 31)
 - 24. EXHIBIT 23 (P. 32)
 - 25. EXHIBIT 24 (P. 33)
 - 26. EXHIBIT 25 (P. 34)
 - 27. EXHIBIT 26 (P. 35)
 - 28. EXHIBIT 27 (P. 36)
 - 29. EXHIBIT 28 (P. 37)
 - 30. EXHIBIT 29 (P. 38)
 - 31. EXHIBIT 30 (P. 39)

S.I.P. NO. 4.000
 REVISION 9
 DATE 7-26-82
 PAGE 40 OF 54

QUALITY ASSURANCE PROGRAM
 SITE IMPLEMENTATION PROCEDURE



HUNTER CORPORATION

STEP No. _____ REPLACEMENT/MODIFICATION MATERIALS USED

DES. ITEM NO.	DESC. OF MATERIAL	PL. NO. & FIG. NO.	ENTRIES BY & DATE	DES. ITEM NO.	DESC. OF MATERIAL	PL. NO. & FIG. NO.	ENTRIES BY & DATE

NOTE: THE INSPECTION SUPERVISOR IS RESPONSIBLE FOR COMPLETION OF ALL NON-INSPECTION FIELD ENTRIES ON THIS FORM IN THE SAME MANNER AS PRESCRIBED IN FORM HQ-114. THE REPLACEMENT/MODIFICATION MATERIALS USED CHART SHALL BE COMPLETED WHEN MATERIALS ARE REPLACED OR ADDED AS A SUPPORT CLASS I (PRIMARY PLATE, SHELL OR LINER) ELEMENTS. FOR CLASSIFICATION, REFER TO DRAWING LABELS OF MATERIALS.

WELD RECORD

WELD NO(S)	TYPE	SIZE	WELD MATERIAL HEAT/LOT NO.	WPSR NO.	PERFORMED BY & DATE	WPS & REV. NO.	ENTRIES BY & DATE

COMPONENT SUPPORT INSPECTION CHECKLIST

INSPECTION REQUIREMENTS VERIFY THE FOLLOWING FOR SUPPORT TYPE IN QUESTION	SUPPORT TYPE						
	A	C	G	R	S	V	W
1. SUPPORT IDENTIFICATION							
2. CONFIGURATION AND ASSEMBLY PER CONST. DRAWING AND/OR REPORTED AS-BUILT							
3. ALL WELDING COMPLETE AND ALL SPEAR							
4. ANY ADMITTED BOLTS ARE FULLY WELDED							
5. DIRECT DIMENSIONS PER CONST. DRAWING ARE CORRECT							
6. ALL THROUGH CONNECTIONS ARE LOCKED							
7. MINIMUM OF ONE NAIL SHALL BE ADAPPLIED ON IMPROVED CONNECTION							
8. THE NAIL ARE VISIBLE THROUGH THE HOLE TO SHOW THREAD ENGAGEMENT							
9. ALL PROTECTIVE DEVICES WITH LOCKING DEVICES							
10. ALL SUPPORT BASE BUSHINGS HAVE THROUGH WINDERS (NO SIDE S)							
11. CLEARANCE COMPLETE BY INSTALLATION EMPLOYEES							
12. BUSHINGS ARE UNOBTAINED AND FREE TO FUNCTION PROPERLY							
13. BRACKET SECURELY AND STRENGTH							
14. BRACKET IS PARALLEL TO NAILS WITHIN 5"							
15. EXISTENCE OF ANCHOR BUSHINGS OR ANCHORING BRACKET							
16. EXISTENCE OF ANCHOR BUSHINGS OR ANCHORING BRACKET							
17. CONNECTIONS ARE CORRECT							

INSPECTED BY _____ DATE _____ INSPECTED TO DES. REV. NO. _____

DATA FOR REV. CONTROL AND INSPECTION PURPOSES. NOT USED BY _____

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM

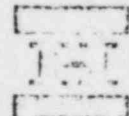
REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 41 OF 54

HUNTER CORPORATION



CONSTRUCTION COPY

CATEGORY I
PIPE WHIP RESTRAINT
PROCESS SHEET

HUNTER CORPORATION

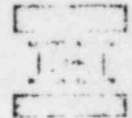
J.T.P. NO. _____ WELD NO. _____

CUSTOMER	CECO	PROJECT	<input type="checkbox"/> 4301 <input type="checkbox"/> 4302	LOCATION	324	JOB NO.	C-751006
RECORD MATERIAL MK NOS <input type="checkbox"/> N/A <input type="checkbox"/> REQUIRED	JOINT TYPE	<input type="checkbox"/> PARTIAL PENETRATION <input type="checkbox"/> FULL PENETRATION <input type="checkbox"/> BACKING STRIP <input type="checkbox"/> FILLET <input type="checkbox"/> SINGLE BEVEL GROOVE <input type="checkbox"/> DOUBLE BEVEL GROOVE					
PREHEAT TEMP	*F TO	*F	MAXIMUM INTER PASS TEMP	*F	WELDING PROCESS & FILLER METALS	<input type="checkbox"/> GTAW <input type="checkbox"/> SMAW AWS#	
ROOT PASS N/D/E	MT <input type="checkbox"/> PT <input type="checkbox"/> NA <input type="checkbox"/>	FINAL N/D/E	MT <input type="checkbox"/> PT <input type="checkbox"/> RT <input type="checkbox"/> UT <input type="checkbox"/>	POST WELD HEAT TREATMENT	<input type="checkbox"/> NOT REQUIRED <input type="checkbox"/> REQUIRED		
DRAWING NO.	PROCESS SHEET ISSUED UNDER REV.				LINE NO.		
MATERIAL TO BE USED							
COMPONENT #1							
SPEC & GRADE							
NOMINAL THICKNESS							
MK. NO.							
OTHER							
COMPONENT #2							
SPEC & GRADE							
NOMINAL THICKNESS							
MK. NO.							
OTHER							
BACKING STRIP (WHEN REQ.)							
SEQ NO.	CRAFT	OPERATING DESCRIPTION INCLUDE INSPECTION AND NDE	HOLD POINT	PROCESS SPEC NO.	REV	PERFORMED/INSPECTED BY & DATE	
1	O.C.	COMPONENTS INSPECTION <input type="checkbox"/> IDENTIFICATION <input type="checkbox"/> DAMAGE <input type="checkbox"/> PROPER WELD PREPS					
2	P.F.	FIT-UP AND TACK PER WELD PROCEDURE					ENTER WELDING DATA ON REVERSE SIDE
	O.C.	<input type="checkbox"/> PROPER FIT-UP <input type="checkbox"/>					
	P.F.F.	RECORD MAT'L MK. NOS (IF REQUIRED)					
3	P.F.	ROOT PASS PER WELD PROCEDURE					ENTER WELDING DATA ON REVERSE SIDE
— FOR FILLET OR SINGLE BEVEL WELDS, PROCEED TO SEQ. NO. 4 —							
3A	O.C.	INSPECT SECOND SIDE (FOR DOUBLE BEVEL) <input type="checkbox"/> VISUAL		PER PROCESS SPEC. NO. 1 PER ROOT PASS			
3B	P.F.	SECOND SIDE ROOT PASS PER WELD PROCEDURE					ENTER WELDING DATA ON REVERSE SIDE
4	O.C.	<input type="checkbox"/> VISUAL <input type="checkbox"/> ROOT SIDE NDE					
5	O.C.	RECORD BODY PASS N/A				SEE NDE REPORT	SEE NDE REPORT
	O.C.	ENTER ACCEPTABLE NDE REPORT #					
	P.F.	REMAINING PASSES PER WELD PROCEDURE					ENTER WELDING DATA ON REVERSE SIDE
6	O.C.	FINISHED WELD INSPECTION <input type="checkbox"/> IDENTIFICATION <input type="checkbox"/> CONTOUR					
7	O.C.	ENTER ACCEPTABLE NDE REPORT #					
8	P.F.	EXTERNAL WELD (IF REQUIRED)					ENTER WELDING DATA ON REVERSE SIDE
	O.C.	CHECK SET UP PER PROC. AND INST.					

REMARKS _____

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 0

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 43 OF 54

HUNTER CORPORATION

(FOR FIELD CONTINUATION)

PIPING SOCKET WELD

HUNTER CORPORATION



JTP NO _____

PROCESS SHEET

SEQ #	DEPT.	OPERATION DESCRIPTION	HOLD PT.		PERFORMED/INSPECTED BY & DATE	A N I & DATE	
			O.C.	ANI			
1	PROD	WELD NO _____			ENTER WELDING DATA ON REVERSE SIDE		
	O.C.	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input checked="" type="checkbox"/>				
	O.C.	INTERMEDIATE INSPEC <input type="checkbox"/>					
PROD		POST WELD HEAT TREAT					
	O.C.	FWHT INSPEC SET UP <input type="checkbox"/> TEMP <input type="checkbox"/>					
	O.C.	FINISHED WELD INSPEC IDENT <input type="checkbox"/> DAMAGE <input type="checkbox"/>	<input checked="" type="checkbox"/>				
		<input type="checkbox"/> GAP <input type="checkbox"/> CONTOUR & SIZE					
		<input type="checkbox"/> SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NDE					
3	O.C.	ENTER ACCEPTABLE NDE REPORT NO _____					
		<input type="checkbox"/> INDICATES MANDATORY WELD POINT IF WITNESS TOOL METHOD FOR FIT-UP VERIFICATION IS NOT EMPLOYED					
1	PROD	WELD NO _____			ENTER WELDING DATA ON REVERSE SIDE		
	O.C.	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input checked="" type="checkbox"/>				
	O.C.	INTERMEDIATE INSPEC <input type="checkbox"/>					
PROD		POST WELD HEAT TREAT					
	O.C.	FWHT INSPEC SET UP <input type="checkbox"/> TEMP <input type="checkbox"/>					
	O.C.	FINISHED WELD INSPEC IDENT <input type="checkbox"/> DAMAGE <input type="checkbox"/>	<input checked="" type="checkbox"/>				
		<input type="checkbox"/> GAP <input type="checkbox"/> CONTOUR & SIZE					
		<input type="checkbox"/> SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NDE					
3	O.C.	ENTER ACCEPTABLE NDE REPORT NO _____					
1	PROD	WELD NO _____			ENTER WELDING DATA ON REVERSE SIDE		
	O.C.	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input checked="" type="checkbox"/>				
	O.C.	INTERMEDIATE INSPEC <input type="checkbox"/>					
PROD		POST WELD HEAT TREAT					
	O.C.	FWHT INSPEC SET UP <input type="checkbox"/> TEMP <input type="checkbox"/>					
	O.C.	FINISHED WELD INSPEC IDENT <input type="checkbox"/> DAMAGE <input type="checkbox"/>	<input checked="" type="checkbox"/>				
		<input type="checkbox"/> GAP <input type="checkbox"/> CONTOUR & SIZE					
		<input type="checkbox"/> SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NDE					
3	O.C.	ENTER ACCEPTABLE NDE REPORT NO _____					
1	PROD	WELD NO _____			ENTER WELDING DATA ON REVERSE SIDE		
	O.C.	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input checked="" type="checkbox"/>				
	O.C.	INTERMEDIATE INSPEC <input type="checkbox"/>					
PROD		POST WELD HEAT TREAT					
	O.C.	FWHT INSPEC SET UP <input type="checkbox"/> TEMP <input type="checkbox"/>					
	O.C.	FINISHED WELD INSPEC IDENT <input type="checkbox"/> DAMAGE <input type="checkbox"/>	<input checked="" type="checkbox"/>				
		<input type="checkbox"/> GAP <input type="checkbox"/> CONTOUR & SIZE					
		<input type="checkbox"/> SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NDE					
3	O.C.	ENTER ACCEPTABLE NDE REPORT NO _____					
1	PROD	WELD NO _____			ENTER WELDING DATA ON REVERSE SIDE		
	O.C.	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input checked="" type="checkbox"/>				
	O.C.	INTERMEDIATE INSPEC <input type="checkbox"/>					
PROD		POST WELD HEAT TREAT					
	O.C.	FWHT INSPEC SET UP <input type="checkbox"/> TEMP <input type="checkbox"/>					
	O.C.	FINISHED WELD INSPEC IDENT <input type="checkbox"/> DAMAGE <input type="checkbox"/>	<input checked="" type="checkbox"/>				
		<input type="checkbox"/> GAP <input type="checkbox"/> CONTOUR & SIZE					
		<input type="checkbox"/> SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NDE					
3	O.C.	ENTER ACCEPTABLE NDE REPORT NO _____					
1	PROD	WELD NO _____			ENTER WELDING DATA ON REVERSE SIDE		
	O.C.	INITIAL INSPECTION <input type="checkbox"/> FIT UP GAP <input type="checkbox"/>	<input checked="" type="checkbox"/>				
	O.C.	INTERMEDIATE INSPEC <input type="checkbox"/>					
PROD		POST WELD HEAT TREAT					
	O.C.	FWHT INSPEC SET UP <input type="checkbox"/> TEMP <input type="checkbox"/>					
	O.C.	FINISHED WELD INSPEC IDENT <input type="checkbox"/> DAMAGE <input type="checkbox"/>	<input checked="" type="checkbox"/>				
		<input type="checkbox"/> GAP <input type="checkbox"/> CONTOUR & SIZE					
		<input type="checkbox"/> SURFACE DISCONTINUITIES <input type="checkbox"/> REQUEST NDE					
3	O.C.	ENTER ACCEPTABLE NDE REPORT NO _____					

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 44 OF 54

HUNTER CORPORATION

PIPE BENDING
PROCESS SHEET
(FOR FIELD CONTINUATION)



HUNTER CORPORATION

J.T.P. NO. _____

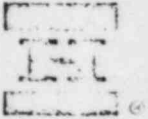
SEQ NO	DEPT	OPERATION DESCRIPTION	HOLD PT.		PROCESS SPEC REV. NO.	PERFORMED/INSPECTED BY & DATE	ANI & DATE
			CC	ANI			
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					
1	PROD.	BEND NO.			↓		
2	O.C.	BEND INSPECTION					
		BEND RADIUS ACCEPTABLE <input type="checkbox"/>		<input checked="" type="checkbox"/>			
		OVALITY ACCEPTABLE <input type="checkbox"/>					
		SURFACE DISCONTINUITIES ACCEPTABLE <input type="checkbox"/>					

PRODUCTION NOTE: ALL MATERIAL MARK NUMBERS TO BE RECORDED ON THE PROCESS SHEETS FOR THE POWERING WELDS. THE PROCESS SPEC REV. NO. MUST BE RECORDED FOR EACH BEND MUST BE RECORDED SIMULTANEOUSLY WITH PERFORMANCE OF THE WORK.

APPLIED BY _____ DATE _____

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

HUNTER CORPORATION

PAGE 47 OF 54

REWORK REQUEST

HUNTER CORPORATION

REWORK REQUEST NO. _____ CUSTOMER: COMMONWEALTH EDISON CO. JOB NO. C-751006

DRAWING NO. _____ REV. _____ PROCESS SHEET NO. _____ REV. _____

TYPE OF REWORK _____

PREPARED BY FIELD ENGINEER FIELD ENGINEER DATE _____ APPROVED BY QUALITY ASSURANCE DATE _____

ACCEPTED BY AUTHORIZED NUCLEAR INSPECTOR DATE _____

INSTRUCTIONS: (SKETCH WHERE NECESSARY)

REMOVED BY _____ DATE _____

APPROVED BY _____ DATE _____

100-10-00-000

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM

REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 48 OF 54

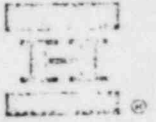
HUNTER CORPORATION

WELD RECORD
FOR FEMOX REQUEST NO.
HUNTER CORPORATION

SQ. NO.	WELD DESCRIPTION	WELDED BY		TYPE	SIZE	HEAT OR LOT NO.	WELD REQ. NO.	WELD PROCED. REV. NO.	ENTRY BY	
		DATE							DATE	

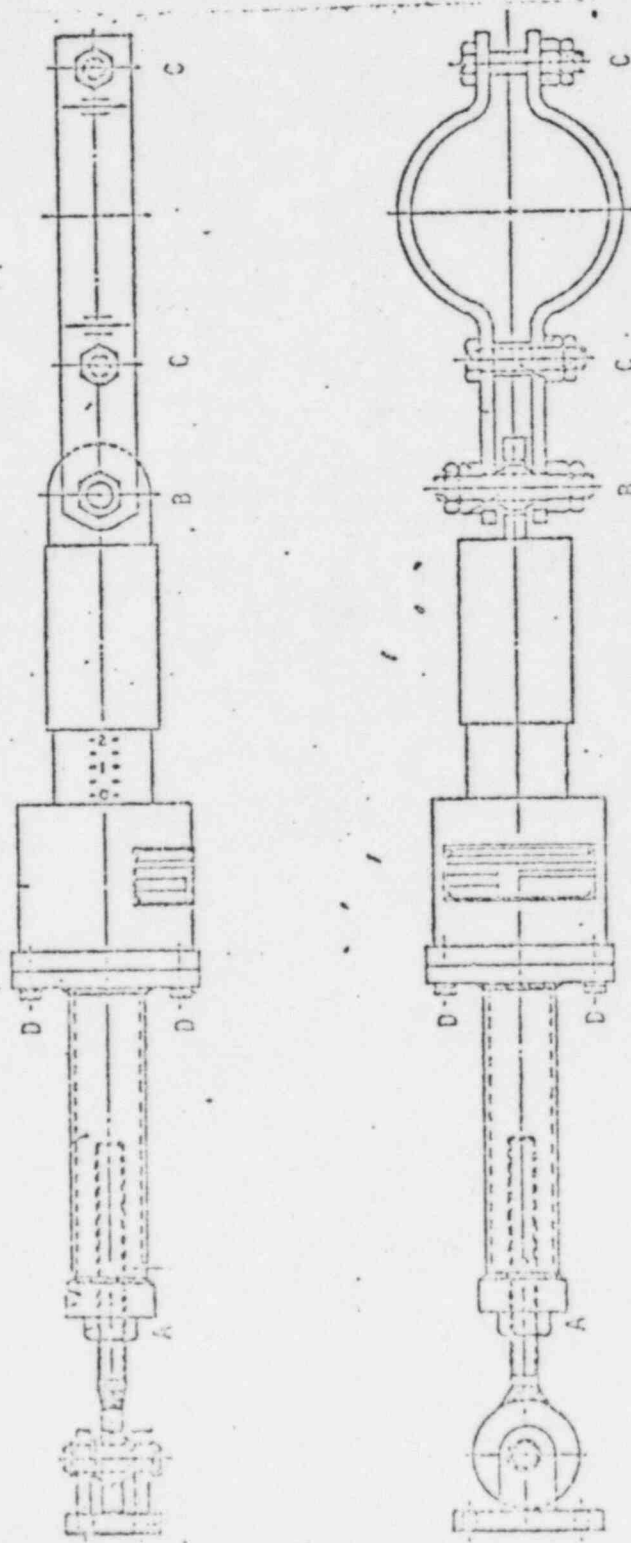
J.T.F. NO. _____ WELD NO. _____ WELD RECORD APPROVED BY _____ G.C.W.I. _____ DATE _____

Form HN-158 (8/81)



MECHANICAL SNUBBER CONNECTION CODE KEY

- A = EXTENSION PIECE JAW NUT
- B = LOAD STEM JAW NUT
- C = BOLT JAW NUT
- D = EXTENSION PIECE/PIVOT MOUNT ASSEMBLY SCREWS



THIS ILLUSTRATION IS NOT REFERENCED IN THE CONTEXT OF THE SIP. IT IS PROVIDED TO ASSIST IN PREPARATION OF PROCESS SHEETS.

ADDITIONAL BEAR BRACKET

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

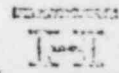
SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 52 OF 54

HUNTER CORPORATION

HARDWARE REMOVAL/ALTERATION REPORT



Number _____ HUNTER CORPORATION _____

Aux. Cont. RSH Turb. ST _____ Unit 1 2

JTP or Dwg. No. _____ OOS No. _____

Hardware is - Safety Related (Cat. 1) Non-Safety Related (Cat. 2)

Reason for Alteration, Impact on Previous Inspections/Assembly Details Affected _____

Reported By & Date _____ Prod. QA/QC Date sent to Engineering & QA _____

Engineering Disposition _____

By & Date _____

QA Approval of Disposition - By & Date _____ (Safety Related Hardware Only)

Remarks _____

By & Date _____

CECo Rep. (optional) Cleanliness _____ By & Date _____

Hardware Reinstated - By & Date _____

QC Concurrence - By & Date _____ (Safety Related Hardware Only)

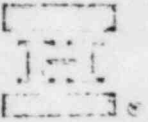
Remarks _____

By & Date _____

White - Action Copy Pink - QA Green - Engineering Blue - Production-160 R/1 (7-82)

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 53 OF 54

HUNTER CORPORATION

Revision Prepared by

Robert Fry

Date 8-16-82

Reviewed by

R.L. Morrison

Date 8-17-82

R.L. Morrison
Project Engineer

A.T. Simon

Date 8-18-82

A.T. Simon
QA Administrative Supervisor

L. Hill

Date 8-20-82

L. Hill
Field Superintendent

R. Lindsay

Date 8-18-82

R. Lindsay
Field Superintendent

C. Berryman

Date 8-20-82

C. Berryman
Field Superintendent

H. Cory

Date 8-17-82

H. Cory
Field Superintendent

Robert Fry

Date 8-16-82

R. Fry
QA Lead Auditor - In Training

L.E. Hadick

Date 8-20-82

L.E. Hadick
Inspection Supervisor

S.I.P. NO. 4.000

QUALITY ASSURANCE PROGRAM



REVISION 9

SITE IMPLEMENTATION PROCEDURE

DATE 7-26-82

PAGE 54 OF 54

HUNTER CORPORATION

Concurrence by

B. Krasawski

Date 8-25-82

B. Krasawski
Project Manager

Approved by

M.L. Soinsag

Date 8/25/82

M.L. Soinsag
QA Supervisor

Accepted by

H.E. Richardson

Date _____

H.E. Richardson
Authorized Nuclear Inspector

J.L. Hendricks

Date 9/30/82

J.L. Hendricks
Authorized Nuclear Inspector



Commonwealth Edison
Byron Generating Station
P.O. Box 8
Byron, Illinois 61010

Date 9-29-82

TO: *HUNTER Corp / M.L. SOMSAG*
FROM: G. Sorensen
SPECIFICATION: F2739

The Commonwealth Edison Company has reviewed the following procedure(s) and found them acceptable for use:

PROCEDURE #	REVISION/DATE
<i>SIP 4.201</i>	<i>Rev. 5 8/30/82</i>
<i>SIP 2.201</i>	<i>Rev. 8 7/29/82</i>
<i>SIP 4.000</i>	<i>Rev. 9 7/26/82</i>
<i>HC-WPS-8</i>	<i>Rev. 9 8/2/82</i>
<i>HC-WPS-13</i>	<i>Rev. 7 7/27/82</i>
<i>HC-WPS-5</i>	<i>Rev. 9 7/27/82</i>



SEP 30 1982

HUNTER CORP.
BYRON PROJECT

Very truly yours,
COMMONWEALTH EDISON
J. T. Patten
for
G. Sorensen
Project Superintendent
Byron Station

GS/kl
cc: Site File MALCOLM LEO SOMSAG
Site CA Supervisor EXHIBIT No. 6

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SARGENT & LUNDY
ENGINEERS
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603
TELEPHONE 312-269-2000

ALE
JTP

September 20, 1982
Project No. 4391-05

Commonwealth Edison Company
Byron - Units 1&2

Piping System Installation
S&L Specification: F-2739

Mr. M. A. Stanish
Byron QA Superintendent
Commonwealth Edison Company
Byron Station

Dear Mr. Stanish:

Enclosed is a copy of the following Hunter Corp. procedure
which has been reviewed and accepted.

Procedure: S.I.P. 4.201 Rev. 5 8/30/82

Yours very truly,

FRANK A. KOSIK / ANITA MILLER

F. A. Kosik
Senior Quality Control Coordinator

FAK:AMM:pje
In duplicate
Enclosure
Copies:

J. T. Westermeyer	(1/1)
G. Sorensen	(1/1)
C. W. Fruche	(1/0)
D. L. Leone/W. C. Cleff	(1/0)
R. J. Rakowski/K. J. Green	(1/1)

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QUALITY CONTROL PROCEDURES REVIEW REPORT

Client Commonwealth Edison Company Project Byron

Contractor Hunter Corp. Project No. 4391-05 Unit 1&

S&L Specification No. _____

PROCEDURE TITLE Installation Verification

Procedure No. SIP 4.201 Rev. 5 Date 8/30/82

GL-Number N/A

Reviewed & Accepted

Revise as noted and resubmit
Hold fabrication.

Revise as noted and resubmit.
Contractor can proceed based
on making revisions noted

Results do not meet specifi-
cation requirements.

COMMENTS:

Distribution:

Reviewed by F. A. Kosik
~~XXXXXXXXXXXXXXXXXXXX~~

Date September 20, 1982

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SIP NO. 4.201

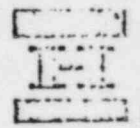
QUALITY ASSURANCE PROGRAM

REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 1 OF 26



HUNTER CORPORATION

INSTALLATION VERIFICATION

1.0 PURPOSE

1.1 To provide the method to assure that inspections required to verify the adequacy of the work have been successfully performed.

2.0 SCOPE

2.1 This SIP is applicable to all Safety Related (ASME Section III/ Category 1) work performed by Hunter Corporation.

3.0 ASSIGNMENT OF RESPONSIBILITIES

3.1 The Project Manager, through the Project Engineer and the Field Superintendents, shall be responsible for scheduling and obtaining the inspections specified in this SIP.

3.2 The Quality Assurance Supervisor, through the Administrative Supervisors and Inspection Supervisors shall be responsible for the performance and documentation of the inspections specified in this SIP.

.1 The Quality Assurance Supervisor, through the Lead Auditors, shall also be responsible for monitoring the implementation of this SIP relative to activities outside of the Quality Assurance Department.

4.0 INSPECTION CLASSIFICATIONS

4.1 Verification of the adequacy of the work shall be accomplished employing a combination of inspection classifications. Due to the nature of the work and scheduling considerations, all types of work will not be subjected to all classifications of inspections. However, all work must successfully complete each required inspection classification in sequence to reach completion.

.1 Required inspection classifications for each work category are detailed in Chart 1 - Inspection Classifications, Implementation Points and Documentation.

.A For the purpose of this SIP, the term "work category" shall encompass such activities as equipment installation, component support installation, piping installation and etc.

SARGENT & LUNDY

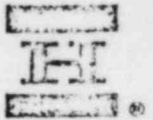
1. REVIEWED & ACCEPTED

ACTION SHOWN DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE CONTRACT.

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E. W. KOSIUSKI

SPEC. 44189 PROJ. 120105



4.2 Inspection classification, descriptions, implementation points, documentation and objectives shall be as stated in this Article and Chart 1.

.1, Type 1 Inspection

- .A This type of inspection is designed to identify any items/activities that have not been documented by the Production forces as required by the established Quality Assurance Program.
- .B This type of inspection is performed along with any other type of inspection that is associated with data acquisition.
- .C This type of inspection shall be evidenced on the procedural document that governs the activity.
- .D The objective of this type of inspection is to measure and evaluate the performance of the Production forces relative to documentation of activities not involving direct inspection.

.2 Type 2 Inspection

- .A This type of inspection is designed to identify any items where the work is not in compliance to the criteria specified for joining of individual items (job segments) in an overall assembly. Overall assemblies are defined on the Construction Copy Drawings (CCD).
- .B The implementation points for this classification are identified by the presence of Quality Control/Authorized Nuclear Inspector hold/witness points or worded inspection directives on the documents that make up the in-process Job Traveler Package (JTP).
- .C This type of inspection shall be recorded on the documents that initiate them in the in-process JTP. These documents include but are not limited to Process Sheets, Rework Requests, Reports of Nondestructive Examination Defects and in some cases Nonconformance Reports.
- .D The objective of this type of inspection is to provide for identification and analysis of trends adverse to quality through evaluation of the implementation of the criteria specified for accomplishing the work.

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.3 Type 3 Inspection

- /5
- .A This type of inspection is designed to identify any completed overall assemblies that are not in accordance with the configuration details of the corresponding JTP and those which display structural damage.
 - .B The implementation point for this classification is the occurrence of the event specified on Chart 1.
 - .C This type of inspection shall be recorded on the document specified on Chart 1 for each generic activity addressed.
 - .D The objective of this type of inspection is to assure that corresponding documentation is complete, the installation configuration is as specified by the corresponding JTP and the installation has not incurred any structural damage during the time frame which has elapsed since previous inspections.

/5

.4 Type 4 Inspection

- /5
- .A This type of inspection is designed to identify any installations not remaining in place, intact or those sustaining structural damage during the time lapse since completion of previous inspections.
 - .B The implementation point for this classification is the occurrence of the event specified on Chart 1.
 - .C This type of inspection shall be recorded on the document specified on Chart 1.
 - .D The objective of this type of inspection is to assure that even though considerable time may have elapsed since performance of previous inspections, the subject overall assemblies are in place, intact and undamaged.

.5 Type 5 Inspection

- .A This type of inspection is designed to identify any individual installation/assembly that is not in place, intact and undamaged just prior to final turnover of the nuclear plant or any portion thereof for processing before commercial operation.

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 4 OF 26

HUNTER CORPORATION

- .B The implementation point for this classification shall be direction from the Owner to mobilize for system turnover to their operating group.
- .C This type of inspection shall be recorded on the documents specified on Chart 1.
- .D The objective of this type of inspection is to assure that all installations necessary to complete a piping system have been successfully performed.

CHART 1			
ACTIVITY	INSPECTION TYPES REQUIRED	IMPLEMENTATION POINTS	DOCUMENTS ON WHICH INSPECTIONS ARE RECORDED
EQUIPMENT INSTALLATION	TYPE 2, 3, 4, and 5	<p><u>TYPE 2</u> - During the release for grouting process. See Note 1.</p> <p><u>TYPE 3</u> - During Type 3 inspection of the associated process piping. See Note 2 also.</p> <p><u>TYPE 4</u> - During Type 4 inspection of the associated process piping.</p> <p><u>TYPE 5</u> - During Type 5 inspection of the associated process piping.</p>	<p><u>TYPE 2 and 3</u> - On the Equipment Inspection Checklists Form HC-159.</p> <p><u>TYPE 4 and 5</u> - On the Final Inspection Reports. (F.I.R.s) for the associated process piping.</p>
COMPONENT SUPPORT FABRICATION	TYPE 2	<p><u>TYPE 2</u> - As indicated by the presence of QC/ANI Hold/Witness Points or worded inspection directives on the documents that make up the in-process JTP.</p>	<p><u>TYPE 2</u> - On the in-process JTP document that specifies the inspection requirement.</p>
COMPONENT SUPPORT INSTALLATION	TYPE 2, 3, 4 and 5	<p><u>TYPE 3</u> - Once the support is connected to the supported item, and as indicated on the documents that make up the in-process JTP.</p> <p><u>TYPE 4</u> - Once all supports in the subsystem are installed and through TYPE 3 inspection. See Note 3.</p> <p><u>TYPE 5</u> - Once final turnover to the Owner's operating group is directed by SCD.</p>	<p><u>TYPE 3</u> - On the in-process JTP document that specifies the inspection requirement.</p> <p><u>TYPE 4</u> - On the FIR (Form HN-198) for each support in the subsystem.</p> <p><u>TYPE 5</u> - On the F.I.R.s for the corresponding piping installation JTP.</p>
PIPING SUB-ASSEMBLY/REWORK	TYPE 2 and 3	<p><u>TYPE 2</u> - As indicated by the presence of QC/ANI Hold/Witness Points or worded inspection directives on the documents that make up the in-process JTP.</p>	<p><u>TYPE 2</u> - On the in-process JTP document that specifies the inspection requirement.</p>
PIPING SUB-ASSEMBLY INSTALLATION	TYPE 2, 3, 4 and 5	<p><u>TYPE 3</u> - Once installation of the hardware is accomplished.</p> <p><u>TYPE 4</u> - Just prior to heat tracing/insulation as, and if directed by the Owner's SCD.</p> <p><u>TYPE 5</u> - Once final turnover to the Owner's operating group is directed by SCD.</p>	<p><u>TYPE 3</u> - On the FIR (Form HN-19A) for the JTP that governs the hardware.</p> <p><u>TYPE 4</u> - On the FIR for the JTP that governs the hardware. See Note 4. For performance of inspection, the Inspection Type 4 Checklist (Form HC-146) shall be used.</p> <p><u>TYPE 5</u> - On the FIR for the JTP that governs the hardware.</p>
FAULTED CONDITION RESTRAINTS AND JLT DEFLECTORS	TYPE 2, 3 and 5	<p><u>TYPE 2</u> - As indicated by the presence of QC Hold/Witness Points or worded inspection directives on the in-process JTP documents.</p> <p><u>TYPE 3</u> - Once all the restraints/deflectors for the corresponding piping system are installed and through TYPE 2 inspection.</p> <p><u>TYPE 5</u> - Once final turnover to the Owner's operating group is directed by SCD.</p>	<p><u>TYPE 2</u> - On the in-process document that specifies the inspection requirement.</p> <p><u>TYPE 3</u> - On the FIR (Form HN-198) for the JTP that governs the hardware.</p> <p><u>TYPE 5</u> - On the FIR for the JTP that governs the hardware.</p>

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 NOTE: As work is performed, Checklists for Inspection Types may be developed. All such checklists shall be included in the corresponding J.T.P.s

S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM

REVISION 5

SITE IMPLEMENTATION PROCEDURE



DATE 8-30-82

PAGE 5 OF 26

HUNTER CORPORATION

- NOTE 1 - Inspection Item 1 on the Equipment Inspection Checklist (Form HC-159) will be performed when the Owner decides to grout the equipment. (He will notify the Inspection Supervisor to perform the foundation bolt inspections. The outcome of the inspections shall be communicated to the Project Construction Department. (PCD).
- NOTE 2 - If Inspection Item 2 on the Equipment Inspection Checklist can not be completed during Type 3 Inspection of the associated process piping, it shall be necessary to complete the inspection prior to pressure test of the piping. The inspection must be completed prior to turn over for preoperational testing.
- NOTE 3 - Component support installations may occur in a more accelerated fashion as the project nears completion. Therefore, if it is known that supports being installed at that time are the last in the subsystem, completion of those supports through TYPE 3 Inspection shall result in automatic completion of TYPE 4 Inspection. The FIRs shall be marked up to document the circumstances when this provision is invoked.
- NOTE 4 - As the Owner directs implementation of TYPE 4 Inspections on piping systems, the Inspection Supervisor shall schedule performance in the field. In the event the Owner elects to delete or limit implementation, the Inspection Supervisor shall direct the mark up of FIRs to document the circumstances of invoking this provision.

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5.0 INSPECTION IMPLEMENTATION

5.1 All fabrication/installation work shall be performed under the direction of the Craft Supervisors in accordance with the requirements and procedures specified in the corresponding JTPs and related Site Implementation Procedures (SIPs).

.1 All inspections required by the JTP documents and Chart 1 shall be performed by Quality Control Welding Inspectors and shall be administered in accordance with the criteria specified on the JTP documents, referenced procedures, pertinent work/inspection instructions and special Owner directives.

.A Acceptance of the work shall be indicated by the Inspector's initials and the date of acceptance on the document that initiated the inspection.

.2 The Production Supervisors shall contact Quality Control at the earliest possible time (when inspection is required) so that the work is inspected in a timely manner.

5.2 The individual Inspectors shall document the specifics of each inspection on their Daily Inspection Reports. The reports shall be turned in to the Inspection Supervisor at the end of each shift.

.1 The Inspection Supervisor shall review each report for evidence of abnormal/adverse trends and possible trouble areas.

.A The Inspection Supervisor shall notify the Quality Assurance Supervisor of suspected problem areas so that they can be analyzed and corrective action administered if necessary.

.2 The Quality Assurance Supervisor shall direct the performance of surveillances to assure compliance to the established Quality Assurance Program in day to day and special process operations.

.A The frequency and magnitude of these surveillances shall be as directed by the Quality Assurance Supervisor. Determination of need shall be based upon trends in each area where the work is being performed.

.B Additional and special surveillances shall be as directed by the Owner.

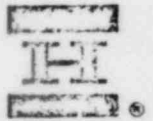
.3 The Lead Auditors shall direct the follow-up on identified discrepancies to assure that they are corrected.

.A Necessary follow-ups should occur within five working days.

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 7 OF 26

HUNTER CORPORATION

- .B If corrective action has not been implemented at the time of follow-up, the Quality Assurance Supervisor shall be notified.
 - .C The Quality Assurance Supervisor shall notify the Project Manager of the difficulty to determine what further action is necessary.
 - .D If resolution to the problem is not under way within five additional working days, the Quality Assurance Supervisor shall notify the Corporate Quality Assurance Manager.
- 5.3 All inspection types shall include some measure of documentation review to complete the inspection successfully.
- .1 Type 1 Inspections are primarily document review inspections. The individual inspections shall include a physical review of associated hardware to assure that the installation status indicated on the corresponding checklist is essentially correct.
 - .A If the installation status noted on the checklist is found to be in error, the Inspectors shall notify the responsible Production Supervisor for resolution. The inspection shall not be finalized nor signed off until resolution is completed to the satisfaction of the Inspector.
 - .2 Type 2 Inspections are primarily hardware inspections. The individual inspections shall include a review of corresponding Process Sheets, Rework Requests and etc. to assure that as-built data is complete and correct to the point of the inspection.
 - .A If the hardware or documentation is found to be incomplete/incorrect, the provisions of Paragraph 5.3.1.A shall apply.
 - .3 Type 3 Inspections are primarily hardware inspections. The individual inspections shall include a review of corresponding JTPs to assure that all Type 2 Inspections and reviews have been completed.
 - .A If the review discloses that Type 2 Inspections/reviews are incomplete, the provisions of Paragraph 5.3.1.A shall apply.
 - .4 Type 4 Inspections are specifically hardware inspections that are intended to assure sustained installation adequacy.
 - .A If the completed installations are found to be inadequate, the provisions of 5.3.1.A apply.

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/5

.B Quality Control shall follow-up all acceptable Type 4 inspections on piping every 45 days, until insulated, to assure compliance with the requirements of this procedure. The results of said surveillances shall be indicated on the applicable remarks section of the FIR (Form HN-19A).

/5

.1 If the completed installations are found to be inadequate, the QCWI shall initiate a Discrepancy Report in the same manner as described in Article 6.2.2.A through D, such that a timely disposition of and questionable items may take place.

.5 Type 5 Inspections are specifically hardware inspections that are intended to assure that all required individual assemblies have been installed successfully and are in adequate condition.

.A If any required assemblies are not installed or installed assemblies are not in adequate condition, the provisions of 5.3.1.A apply.

5.4 The Field Superintendents shall assure that the data acquisition requirements of the checklists are complied with in a timely fashion so as to assure minimum interference between the Production and Inspection efforts.

.1 The Field Superintendents shall direct Production reviews of the JTPs to provide assurance that:

.A All operations, inspections and tests required by the JTP documents have been performed successfully.

.B All material traceability data is correct and complete.

.C All special processes, such as welding and heat treatment, that require personnel certifications have been performed by qualified individuals and the JTP documents reflect it.

.D As-built drawings are legible and disclose all required data.

.E No incorrect data entries are apparent.

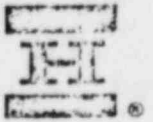
6.0 TRANSFER OF AS-BUILT JTPs FROM THE FIELD TO QA

6.1 When installation of small bore piping (< 2", Class B and C) has been completed in accordance with the marked-up drawing produced in the manner described in the Process Control procedure, the as-built dimensions and configuration shall be confirmed by the Quality Control Welding Inspector. The Inspector shall signify his confirmation by initialing the CCD near any dimension which has been changed by the Production forces.

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 9 OF 26

HUNTER CORPORATION

.1 The marked-up CCD, with the Inspector's confirming initials, shall be forwarded to the Project Engineer who shall cause the original reproducible of the CCD to be formally revised to reflect all as-built information. The revision block of the drawing shall be marked to denote the incorporation of as-built information and the revision status of the drawing shall be advanced.

.A Alternately, small bore CCDs may be forwarded to the Quality Assurance Administrative Supervisor with the corresponding JTP to perform completion of inspection Type 3. Once the Type 3 inspection is concluded, the CCD will be sent to the Project Engineer.

.2 A copy of the revised original shall be made, stamped "As-Built - For Records Only," and shall be forwarded by the Project Engineer to the Owner to report as-built conditions.

.3 When A&E approval of the as-built conditions has been received by Hunter Corporation, the Project Engineer shall forward copies of the approval documents to the Quality Assurance Administrative Supervisor.

/5 6.2 Once all Type 3 Inspections are successfully completed on any given JTP a Final Inspection Report shall be initiated and included in the JTP.

/5 .1 If the JTP contains open items, the Inspector shall notify the appropriate Field Superintendent for resolution.

.A The portion of the Final Inspection Report (FIR) that the open items relates to shall not be signed off until the matter is resolved.

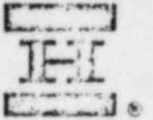
/5 .2 If resolution is not under way within five working days, the Inspector shall document the specifics of the problem on a Discrepancy Report (Form HC-144).

.A The Discrepancy Report (DR) shall be assigned a controlling number through the QC Inspector contacting the QA Record Maintenance Personnel.

/5 .B The controlling number shall be assigned from the DR Log (Form HC-144A) by communicating the next open number to the Inspector. The Inspector shall at this time communicate the information necessary to mark-up the DR Log to reflect the number assignment.

/5 .C The original DR shall be included in the corresponding JTP by the Inspector. A copy of each DR shall be forwarded to the appropriate Field Superintendent, and a copy shall be retained by the initiator.

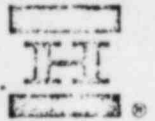
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.D DRs may result in the preparation of Nonconformance Reports according to the Nonconformance Control SIP.



6.3 The reviewed JTPs (with Final Inspection Reports and DRs if applicable) shall be transmitted to the Quality Assurance Administrative Supervisor (QAAS) or a designee.

- /5
- .1 Subsequent to receipt in Quality Assurance, the individual JTPs shall be logged in the Inspection Status Log (Form HC-93 for pipe, HC-93A for supports) and Documentation Log (HC-21) as appropriate.
 - .A The Project Manager shall receive reports from QA relative to DRs requiring resolution.
 - .2 Once logging is completed, JTPs that report changes in routing/configuration shall be transferred to Engineering for generating as-built drawings.
 - .A Any transfers of JTPs or portions thereof, shall be in accordance with an informal schedule developed by the Project Engineer.
 - .B As JTPs or portions thereof are transferred to Engineering, the Documentation Log shall be appropriately marked.
 - .3 As formal as-built drawings are completed in Engineering, they shall be transmitted to the A&E (Architect and Engineer) in the manner specified in the Design Control SIP.
 - .A A copy of the formal as-builts and the corresponding CCDs shall be placed in the JTP by Engineering.
 - .4 As as-builts are completed, the corresponding JTPs shall be returned to Quality Assurance for review by the Authorized Nuclear Inspector (ANI).
 - .A Prior to presentation of the JTPs to the ANI, the Documentation Log shall be appropriately marked up to indicate the location of the JTPs. All DRs shall be resolved prior to presentation of the JTPs to the ANI.
 - .B Once the ANI has reviewed and accepted the JTPs as evidenced by the ANI signatures on the Final Inspection Report, the JTPs shall be returned to Quality Assurance for record retention.
- 6.4 As reviewed and accepted JTPs are received by Quality Assurance, the Documentation Log shall again be marked up to indicate location.

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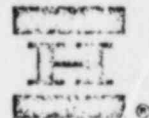


- .1 Accepted JTPs for piping fabrication shall be used to generate NPP-1 Data Reports or to describe "field fabrication" on revised Fabrication Data Reports, at the direction of the QAAS.
 - .A As the NPP-1 Data Reports are generated or updated, they shall be presented to the ANI for signature. The corresponding Final Inspection Report shall accompany the Data Report submittal.
 - .2 Accepted JTPs for piping and component support installation shall remain on file in the QA Records Vault until such time that the A&E notifies the Project Engineer of as-built configuration acceptability.
 - .A Once A&E acceptance/approval of as-built configuration is received, the Project Engineer shall transmit copies (marked "Approved As-Built") of Hunter Corporation drawings that correspond to the approved as-builts to the QAAS.
 - .B Upon receipt of the approved drawings, the QAAS shall direct the preparation of N-5 Installation Data Reports.
 - .C The prepared N-5 Data Reports shall be submitted to the ANI for signature. The corresponding Final Inspection Reports and approved drawings shall accompany the Data Report submittals (N-5 Package).
 - .D After the N-5 package has been forwarded to the QAAS by the ANI, the package shall be held for retention. When the Owner deems necessary, they shall direct the forwarding of the N-5 package.
 - .E The N-5 package shall be forwarded to the Owner's Station Construction Department using the N-5 Transmittal (Exhibit B). The QAAS shall retain a copy of the Data Report form and transmittal.
 - .F Once processing of the N-5 package has been completed, a copy of the completed original Data Report form will be forwarded to the QAAS for retention.
 - .3 JTPs for Category 1 Non-ASME work shall be tabulated on an Installation Report at the direction of the QAAS once A&E approval of as-built configurations is received through the Project Engineer.
- 6.5 Completed Data Reports and Installation Reports shall remain on file in the QA Records Vault until such time as turnover is directed by the Owner.

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 12 OF 26

HUNTER CORPORATION

- .1 One copy of each Data Report/Installation Report shall be retained by Hunter Corporation.

7.0 TRAINING REQUIREMENTS

- 7.1 All Engineering Department, Production Department, Quality Assurance and Quality Control Department Supervisors shall receive training to this SIP.

- .1 Each Supervisor shall then assure that their personnel are performing their duties as specified in this SIP.

- 7.2 Individuals participating in the preparation or review process need not receive documented training.

- 7.3 Production Department personnel previously trained to the last revision of this procedure need not receive documented training.

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QUALITY ASSURANCE PROGRAM



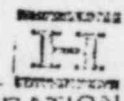
REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 13 OF 26

HUNTER CORPORATION



HUNTER CORPORATION

EQUIPMENT INSPECTION CHECKLIST

ASSOCIATED PIPING J.T.P. _____

EQUIPMENT NO. _____ S&L W MANUFACTURER _____

EQUIPMENT NAME _____

S&L SPECIFICATION NO. _____ W SHOP ORDER NO. _____

CECO PURCHASE ORDER NO. _____ LOCATION OF EQUIPMENT _____

EQUIPMENT SERIAL NUMBER _____

PREPARED BY AND DATE _____
Quality Control

QUALITY CONTROL CHECKLIST FOR ROTATING EQUIPMENT (PUMPS)

<u>Inspection Item</u>	<u>Inspector and Date</u>
1. -FOUNDATION BOLTS ARE NOT BENT OR WELDED ON AND HAVE FULL NUT ENGAGEMENT.	<input type="checkbox"/> ACCEPT _____
2. -EQUIPMENT IS IN PLACE, INTACT, AND UNDAMAGED.	<input type="checkbox"/> ACCEPT _____
-HOLD DOWN BOLTS OR NUTS ARE IN PLACE, NOT LOOSE, AND HAVE FULL NUT ENGAGEMENT.	<input type="checkbox"/> ACCEPT _____
-GROUTING IS COMPLETED.	<input type="checkbox"/> ACCEPT _____
-LUBE OIL AND COOLING WATER PIPING IS CONNECTED.	<input type="checkbox"/> ACCEPT _____
-ALIGNMENT DOCUMENTATION IS COMPLETED.	<input type="checkbox"/> ACCEPT _____

QUALITY CONTROL CHECKLIST FOR NONROTATING EQUIPMENT

<u>Inspection Item</u>	<u>Inspector and Date</u>
1. -FOUNDATION BOLTS ARE NOT BENT OR WELDED ON AND HAVE FULL NUT ENGAGEMENT.	<input type="checkbox"/> ACCEPT _____
2. -EQUIPMENT IS IN PLACE, INTACT, AND UNDAMAGED.	<input type="checkbox"/> ACCEPT _____
-HOLD DOWN BOLTS ARE IN PLACE, NOT LOOSE, AND HAVE FULL NUT ENGAGEMENT.	<input type="checkbox"/> ACCEPT _____
-GROUTING IS COMPLETED.	<input type="checkbox"/> ACCEPT _____

REMARKS _____

INSPECTOR AND DATE _____

HC-159 (1/82)
R/2

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QUALITY ASSURANCE PROGRAM



REVISION 5

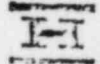
SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

HUNTER CORPORATION

PAGE 14 OF 26

PIPING SYSTEM/SUBSYSTEM FINAL INSPECTION REPORT



Job No. C-751006 Customer Commonwealth Edison HUNTER CORPORATION

JTP/Drawing No. _____ ISO. Revision No. _____

INSPECTION TYPE 3 - REVIEW OF INSTALLATION

- | <u>QC Inspector/Date</u> | <u>QC Inspector/Date</u> |
|------------------------------------|---|
| 1. System Identified..... _____ | 4. Flow Sensitive Devices
Installed Correctly..... _____ |
| 2. Installation per CCD..... _____ | 5. No Hold Tags Attached..... _____ |
| 3. Components Undamaged... _____ | |

Walkdown documents reviewed and approved by _____
QC Level II/Date _____

Comments _____

REVIEW OF INSPECTION TYPE 2 - DOCUMENTATION

- | | <u>QA Inspector/Date</u> | <u>QC Inspector/Date</u> | <u>API/Date</u> |
|--|--------------------------|--------------------------|-----------------|
| 1. Process Sheets and Weld Records Complete,
(Inspection Hold/Witness Points Completed,
Material Traceability Data Complete, NDE
Performed and Referenced When Required)..... | _____ | _____ | _____ |
| 2. Field Order and Material Requisitions Complete..... | _____ | _____ | _____ |
| 3. Rework Requests Referenced and Closed Out.. | _____ | _____ | _____ |
| 4. RFDs Referenced and Closed Out..... | _____ | _____ | _____ |
| 5. NRS Referenced and Closed Out..... | _____ | _____ | _____ |
| 6. Discrepancy Reports Closed..... | _____ | _____ | _____ |

Comments _____

INSPECTION TYPE 4

- | | <u>QA Inspector/Date</u> | <u>ISO. Rev No.</u> |
|--|--------------------------|---------------------|
| 1. Type 4 Checklist complete per QCWI/Date _____ | _____ | _____ |
| 2. Discrepancy Reports Closed..... | _____ | _____ |
| 3. Pressure Test Complete..... | _____ | _____ |

Comments _____

INSPECTION TYPE 5 - FINAL ACCEPTANCE

- | | <u>QC Inspector/Date</u> | <u>QA Inspector/Date</u> |
|--|--------------------------|--------------------------|
| 1. Installation Accepted | | |
| A) Piping..... _____ | | |
| B) Component Supports..... _____ | | |
| C) Whip Restraints/
Jet Deflectors..... _____ | | |
| D) Mech. Equipment
Adjustment Complete..... _____ | | |
| 2. No Hold Tags Attached.. _____ | | |
| 3. Documentation Accepted | | |
| A) Piping..... _____ | | |
| B) Component Supports.. _____ | | |
| C) Whip Restraints/
Jet Deflectors..... _____ | | |
| D) Mech. Equipment
Adjustment..... _____ | | |

Comments _____

FIELD SUPERINTENDENT/PROJECT ENGINEER Approval and Date _____

CUSTOMER REPRESENTATIVE'S Acceptance and Date _____

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

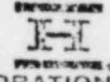
SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

HUNTER CORPORATION

PAGE 16 OF 26

COMPONENT SUPPORT/WHIP RESTRAINT/JET DEFLECTOR
FINAL INSPECTION REPORT



Job No. C-751006 Customer Commonwealth Edison

HUNTER CORPORATION

Hunter CCD _____

Revision No. Used for Initiation of FIR: Hunter _____ A & E _____

A & E Revision Change -
Installation Not Affected

Hunter Revision Change -
Installation Not Affected

New Revision	Entered By	Date of Entry

New Revision	Entered By	Date of Entry

REVIEW OF INSPECTION TYPE 2 DOCUMENTATION AND TYPE 3 INSPECTION

Note: Items 1 through 3 are the documentation of INSPECTION TYPE 3 for Faulted Condition Restraints and Jet Deflectors when applicable.

- | | QA
Inspector/Date | QC
Inspector/Date | ANI/Date |
|--|----------------------|----------------------|----------|
| 1. Process Sheets and Weld Records Complete (Inspection Hold/Witness Points Completed, Material Traceability Data Complete, NDE Performed and Referenced When Required, PWHT Charts Complete and Referenced When Required) | _____ | _____ | _____ |
| 2. Installation matches CCD and/or as-built data supplied..... | _____ | _____ | _____ |
| 3. Field Orders Included and Complete | _____ | _____ | _____ |
| 4. Verify Type III Inspection Is Complete for Component Supports | _____ | _____ | _____ |
| 5. Rework Requests Referenced and Closed Out ... | _____ | _____ | _____ |
| 6. RNDs Referenced and Closed Out | _____ | _____ | _____ |
| 7. NRs Referenced and Closed Out | _____ | _____ | _____ |
| 8. Discrepancy Reports Closed | _____ | _____ | _____ |

Comments _____

Inspector and Date _____

INSPECTION TYPE 4 (COMPONENT SUPPORTS ONLY)

Drawing Revision No. _____

QC
Inspector/Date

1. Installation in Place, Intact and Undamaged
2. No Hold Tags Attached
3. Travel Stops Removed

Comments _____

Inspector and Date _____

INSPECTION TYPE 5 (RESTRAINTS AND DEFLECTORS ONLY)

Drawing Revision No. _____

QC
Inspector/Date

1. Installation in Place, Intact and Undamaged
2. No Hold Tags Attached

Comments _____

FIELD SUPERINTENDENT/PROJECT ENGINEER Approval and Date _____

CUSTOMER REPRESENTATIVE Acceptance and Date _____

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

HUNTER CORPORATION

PAGE 17 OF 26

INSPECTION TYPE 4 CHECKLIST



Drawing No. _____ Rev. No. _____ HUNTER CORPORATION
Used for Inspection

INSTRUCTION:

1. The drawing used for inspection must accompany this Checklist during and upon completion of the inspection. If more than one Inspector is assigned work under one drawing, each Inspector must complete a Checklist and attach a marked-up drawing indicating the portion of the installation inspected.
2. The purpose of this Inspection Type is to assure that subject installations have remained installed at the locations specified (IN PLACE); that all of the specified parts have remained installed in the overall assembly (INTACT); and that the installation is undamaged. The STRUCTURAL DAMAGE portion of the inspection is concerned with indications such as arc burns, dents, deformation, rust, and gouges. The limits of acceptable indications are specified on Chart 1.

INSPECTION:

1. The installation has been inspected for being
IN PLACE and is Acceptable _____ Inspected By/Date _____ Level _____
 Unacceptable _____

Remarks _____

Disposition _____ Inspector/Date _____ Level _____

2. The installation has been inspected for being
INTACT and is Acceptable _____ Inspected By/Date _____ Level _____
 Unacceptable _____

Remarks _____

Disposition _____ Inspector/Date _____ Level _____

3. The installation has been inspected for
STRUCTURAL DAMAGE and is Acceptable _____ Inspected By/Date _____ Level _____
 Unacceptable _____

Remarks _____

Disposition _____ Inspector/Date _____ Level _____

Completed Checklist Reviewed and Approved by _____ Inspector/Date _____ Level _____

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 18 OF 26

HUNTER CORPORATION

CHART 1

1. The following nonuniform imperfections require no corrective action.
 - 1.1 Mechanical marks, abrasions and pits which are 1/16" or less in depth, and DO NOT encroach on manufacturer's minimum thickness (12.5% of nominal pipe size). Marks/abrasions are defined as cable marks, nicks, guide marks, roll marks, ball scratches, scores, die marks, etc.
 - 1.2 Visual imperfections commonly referred to as scabs, seams, laps, tears, slivers or dents found to be 5% or less of the nominal thickness in depth.
2. The following surface imperfections shall be evaluated and dispositioned by a Level II Inspector.
 - 2.1 Surface imperfections which exceed Paragraphs 1.1 AND 1.2.
 - 2.2 Arc burns, when removed, that have resulted in depressions greater than 1/16", or have encroached on manufacturer's minimum thickness (12.5% of nominal pipe size).
 - 2.3 Rust (which cannot be removed by rubbing, hand brushing, or has pits which exceed paragraph 1.1).
3. The installed pipe shall be reasonably straight. For metal arc welded and seamless pipe, the maximum deviation from a 10' straight edge placed so that both ends are in contact with the pipe shall be 1/8". Deviations exceeding 1/8" shall be evaluated and dispositioned by a Level II Inspector.

NOMINAL THICKNESS TOLERANCES

NOMINAL THICKNESS	5% OF NOMINAL THICKNESS	12.5% OF NOMINAL THICKNESS	NOMINAL THICKNESS	5% OF NOMINAL THICKNESS	12.5% OF NOMINAL THICKNESS	NOMINAL THICKNESS	5% OF NOMINAL THICKNESS	12.5% OF NOMINAL THICKNESS
0.068	0.003	0.008	0.294	0.015	0.037	0.750	0.037	0.094
0.088	0.004	0.011	0.300	0.015	0.038	0.812	0.041	0.102
0.091	0.005	0.011	0.307	0.015	0.038	0.843	0.042	0.105
0.095	0.005	0.012	0.308	0.015	0.038	0.864	0.043	0.108
0.113	0.006	0.014	0.312	0.016	0.039	0.875	0.044	0.109
0.199	0.006	0.015	0.318	0.016	0.040	0.906	0.045	0.113
0.125	0.006	0.016	0.322	0.016	0.040	0.937	0.047	0.117
0.126	0.005	0.016	0.330	0.016	0.041	0.968	0.048	0.121
0.133	0.007	0.017	0.337	0.017	0.042	1.000	0.050	0.125
0.140	0.007	0.018	0.343	0.017	0.043	1.031	0.052	0.129
0.145	0.007	0.018	0.344	0.017	0.043	1.062	0.053	0.133
0.147	0.007	0.018	0.358	0.018	0.045	1.093	0.055	0.137
0.154	0.008	0.019	0.365	0.018	0.046	1.125	0.056	0.141
0.156	0.008	0.020	0.375	0.019	0.047	1.156	0.058	0.144
0.179	0.009	0.022	0.382	0.019	0.048	1.218	0.061	0.152
0.187	0.009	0.023	0.400	0.020	0.050	1.250	0.062	0.156
0.188	0.009	0.024	0.406	0.020	0.051	1.281	0.064	0.160
0.191	0.010	0.024	0.432	0.022	0.054	1.312	0.066	0.164
0.200	0.010	0.025	0.436	0.022	0.054	1.343	0.067	0.168
0.203	0.010	0.025	0.437	0.022	0.055	1.375	0.069	0.172
0.216	0.011	0.027	0.438	0.022	0.055	1.406	0.070	0.176
0.218	0.011	0.027	0.500	0.024	0.062	1.438	0.072	0.180
0.219	0.011	0.027	0.531	0.027	0.066	1.500	0.075	0.188
0.226	0.011	0.028	0.552	0.028	0.069	1.531	0.077	0.191
0.237	0.012	0.030	0.562	0.028	0.070	1.562	0.078	0.195
0.250	0.012	0.031	0.593	0.030	0.074	1.593	0.080	0.199
0.258	0.013	0.032	0.660	0.030	0.075	1.750	0.088	0.219
0.276	0.014	0.034	0.625	0.031	0.078	1.781	0.089	0.223
0.277	0.014	0.035	0.656	0.033	0.083	1.812	0.091	0.226
0.279	0.014	0.035	0.674	0.034	0.084	1.968	0.098	0.245
0.280	0.014	0.035	0.687	0.034	0.086	2.062	0.103	0.258
0.281	0.014	0.035	0.718	0.036	0.089	2.343	0.117	0.293

COMMENTS

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 REVISION 5
 DATE 8-30-82
 PAGE 24 OF 26

QUALITY ASSURANCE PROGRAM



SITE IMPLEMENTATION PROCEDURE

HUNTER CORPORATION

FORM N-5 DATA REPORT FOR FIELD INSTALLATION OF NUCLEAR POWER PLANT
 COMPONENTS, COMPONENT SUPPORTS, AND APPURTENANCES*
 As Required by the Provisions of the ASME Code Rules, Section III, Division 1

1. Installed by _____
(Name and address of installer of component, component supports or appurtenances)
2. Installed for _____
(Name and address of purchaser or owner)
3. Location of Installation _____
4. System Identification _____
(Mfr's Serial No.) (CRN) (Drawing No.) Nat'l Bd. No. Year Installed
5. Nuclear Components and Appurtenances Installed in the Field by Welding (List each item and attach copies of Manufacturers' Data Reports and Manufacturers' Partial Data Reports)

(a) Components, or Appurtenances	(b) Name of Manufacturer	(c) Mfr's Serial No.	(d) Canadian Reg. No.	(e) National Bd. No.	(f) Year Built

Piping System Installation

(a) Piping Subassembly	(b) Name of Manufacturer	(c) Mfr's Serial No.	(d) Canadian Reg. No.	(e) National Bd. No.	(f) Year Built

Component Support Installation

(a) Component Support No.	(b) Name of Manufacturer	(c) Mfr's Serial No.	(d) Stress Rept. Load Capac. Data Sheet	(e) Canadian Reg. No.	(f) National Bd. No.	(g) Year Built

Additional Material Excluding Welding Material

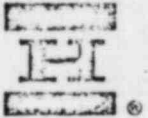
(a) Name of Manufacturer	(b) Material Specification	(c) Dimensions

* Supplemental sheets in form of lists, sketches, or drawings may be used provided (1) size is 8-1/2 in. x 11 in., (2) information in items 1 through 3 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

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S.I.P. NO. 4.201

QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 25 OF 26

HUNTER CORPORATION

FORM N-5 (Back)

6. (a) Installation in Accordance with:

Procedure or Drawing No.

Prepared by

_____	_____
_____	_____
_____	_____

(b) Description of Installation Performed:

(c) Hydrostatic Test _____ psi. System Working Pressure _____ psi and Temp. _____ F.

CERTIFICATION OF DESIGN FOR PIPING SYSTEM INSTALLATION

Design information on file at _____

Stress analysis report on file at _____

Design specifications certified by (1) _____ PE State _____

Reg. No. _____

Stress analysis report certified by (1) _____ PE State _____

Reg. No. _____

(1) Signature not required. List name only.

Design Conditions of Piping _____ Pressure _____ psi _____ Temperature _____ F.

CERTIFICATE OF COMPLIANCE

We certify that the statements made in this report are correct and that this installation conforms to the rules of construction of the ASME Code for Nuclear Power Plant Components, Section III, Division 1, _____ Edition, Addenda _____, Code Case No. _____ Class _____ and was performed in accordance with the documents listed in 5(a), above.

Date _____ Signed _____ by _____

Our ASME Certificate of Authorization No. _____ to use the _____ (N, NA) Symbol expires _____ (Date)

CERTIFICATE OF INSPECTION

I, the undersigned holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of _____ and employed by _____ of _____ have inspected the piping described in this Data Report on _____ 19 _____ and state that to the best of my knowledge and belief, the Manufacturer/Installer has constructed this installation in accordance with the ASME Code for Nuclear Power Plant Components.

By signing this certificate, neither the Inspector nor his employer make any warranty, express or implied, concerning the piping described in this Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ 19 _____

Signed _____ (Inspector) _____ Commissions _____ (Nat'l Board, State, Province and No.)

Following completion of the above, the Certificate of Authorization holder accepting overall responsibility for the system shall complete the following statement.

We certify the statements made by this report are correct and that the system conforms to the rules of construction of the ASME Code Section III, Division 1.

Date _____ Signed _____ (Installer or eng'g org.) By _____

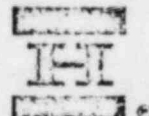
Certificate of Authorization Expires _____

Certificate of Authorization No. _____

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QUALITY ASSURANCE PROGRAM



REVISION 5

SITE IMPLEMENTATION PROCEDURE

DATE 8-30-82

PAGE 26 OF 26

HUNTER CORPORATION

Revision prepared by

Robert Fry

date 8-30-82

Robert Fry
QA Lead Auditor-In Training

Revision reviewed by

R.L. Morrison

date 8-30-82

R.L. Morrison
Project Engineer

A.T. Simon

date 8-30-82

A.T. Simon
QA Administrative Supervisor

L.E. Hadick

date 8-30-82

L.E. Hadick
Quality Control Supervisor

Concurrence by

B. Krasawski

date 8-30-82

B. Krasawski
Project Manager

Approved by

M.L. Somsag

date 8/30/82

M.L. Somsag
QA Supervisor

Accepted by

J. L. Hendricks

date 9/30/82

J. Hendricks
Authorized Nuclear Inspector

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Field Office
Post Office Box 674
Byron, Illinois 61010

HUNTER CORPORATION

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HC-B-571

June 3, 1980

Commonwealth Edison Company
Post Office Box "B"
Byron, Illinois 61010

To: R. P. Tuetken

From: L. E. Jones, Jr./M. L. Somsag

Subj: Retroactive performance of "Phase 1" and "Phase 2"
Inspections of Hangers installed prior to May 1, 1980.

Ref: Letters HC-B-543 (dated 3/28/80) and HC-B-543A (dated 4/1/80).

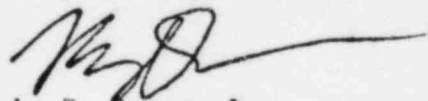
In response to your request for a program outline which defines the methods to be employed in implementation of "Phase 1" and "Phase 2" inspections of hangers installed prior to the issuance of SIP 4.000 R/3, the following is offered.

1. An inspection checklist covering all the required inspections has been prepared. See attached Form HN-15F.
2. The field installation foremen have been directed to request, by speed letter, additional inspections of all previously installed hangers. These speed letters will be addressed to the Hanger Engineer, and for the sake of convenience, will list no more than 20 hangers per request, and will be limited to a single system. Sequencing will follow previously established installation priorities.
3. The Hanger Engineer, when he receives the request for additional inspections, will prepare a Form HN-15F for each hanger on the list, and transmit these forms together with a copy of the request, to the QA/QC Department.
4. The QA/QC Department will assign personnel to perform the inspections. The field installation superintendents will provide whatever craft assistance is required.
5. When a hanger is inspected and found to be acceptable in accordance with the hanger detail drawing, the HN-15F Form will be signed, dated and inserted in the JTP for that hanger.

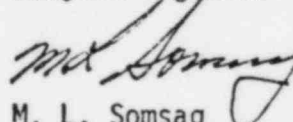
MALCOLM LEO SOMSAG
EXHIBIT No. 7

6. When a hanger is inspected and found to be acceptable in accordance with the hanger detail drawing, plus the latitude and tolerances allowed by Drawing M-916, the HN-15F Form will be signed, dated and transmitted to the Hanger Engineer. The Hanger Engineer is then responsible to assure that correct "As-Built" data has been or will be transmitted to S&L. The Hanger Engineer shall then cause the HN-15F Form to be marked "As-Built Info to S&L as of (Date) ", and inserted in the JTP for that hanger.
7. When a hanger is inspected and found unacceptable due to incorrect hardware installation or adjustment, the deficiency shall be corrected on the spot and the HN-15F Form will be signed, dated and inserted in the JTP for that hanger.
8. When a hanger is inspected and found unacceptable due to incorrect location, or incorrect application of M-916 latitudes, a "Hold Tag" and a Nonconformance Report shall be initiated by the inspector. Disposition of the NR shall be handled as follows:
- A. If there appears to be a valid explanation for the nonconforming condition of the hanger, such as an obvious interference, the NR shall be dispositioned "Use As Is," and shall be presented to CECO, with an "As-Built" drawing, for their approval. If approval is granted, the HN-15F Form shall be signed, dated and transmitted to the Hanger Engineer, with a copy of the NR attached. The Hanger Engineer shall assure that correct "As-Built" data is transmitted to S&L, and shall cause the HN-15F Form to be marked "As-Built Info to S&L as of (Date) ", and inserted into the JTP for that hanger. If approval of the "Use As Is" disposition is not granted, an acceptable disposition shall be furnished by CECO or S&L. The hanger shall be reworked and/or relocated accordingly, and reinspected until it is acceptable. Once it is found to be acceptable, the HN-15F Form will be signed, dated and inserted in the JTP, along with copies of all other pertinent supporting data.
- B. If there is no obvious valid explanation for the nonconforming condition of the hanger, the NR shall be dispositioned "Rework/Repair" and the hanger shall indeed be reworked or relocated to comply with the design location and/or configuration. The installation shall then be reinspected, and the HN-15F Form shall be signed, dated and inserted in the JTP along with copies of all other pertinent supporting data.

Very truly yours,



L. E. Jones, Jr.
Project Engineer

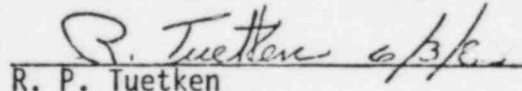


M. L. Somsag
Site Quality Assurance Supervisor

R. P. TUETKEN
B. KRASAWSKI

cc: L. E. Jones, Jr.
M. L. Somsag
File

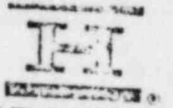
Approved



R. P. Tuetken

LJ/MS aw

Dwg: No. _____



HUNTER CORPORATION

COMPONENT SUPPORT INSPECTION CHECKLIST

INSPECTION REQUIREMENTS VERIFY THE FOLLOWING FOR SUPPORT TYPE IN QUESTION	SUPPORT TYPE					
	A	C	G	R	S	V
1. SUPPORT IDENTIFICATION AND LOCATION PER CONST. DRAWING						
2. CONFIGURATION AND ASSEMBLY PER CONST. DRAWING AND/OR REPORTED AS-BUILT						
3. ALL WELDING COMPLETE AND ACCEPTABLE						
4. ANY ABANDONED HOLES ARE PLUG WELDED						
5. OFFSET DIMENSIONS PER CONST. DRAWING ARE CORRECT						
6. ALL THREADED CONNECTIONS ARE LOCKED						
7. MINIMUM OF ONE FULL THREAD EXPOSED ON THREADED CONNECTION						
8. THREADS ARE VISIBLE THRU SIGHT HOLE TO SHOW THREAD ENGAGEMENT						
9. ALL PIVOT PINS SECURED WITH LOCKING DEVICES						
10. ALL SPHERICAL BALL BUSHINGS HAVE THRUST WASHERS (BOTH SIDES)						
11. CEA TRAVELLER COMPLETE (IF INSTALLATION EMPLOYS CEAs)						
12. MOVING PARTS ARE UNOBSTRUCTED (HGR FREE TO FUNCTION PROPERLY)						
13. TRAVEL STOPS IN AND SECURED						
14. REAR BRACKET PARALLEL TO PIPING LUGS WITHIN 5°						
15. EXTENSION PIECE AND LOAD STEM WITHIN 5° OF MOUNTING BRACKET						
16. PIVOT PIN TO PIN DIMENSION PER CONSTRUCTION DRAWING						
17. COLD POSITION SETTING CORRECT						

INSPECTED BY _____ DATE _____

COMMENTS _____

INSPECTED TO CONST. DRAWING REV. NO. _____

COMPLETED PROCESS SHEET AND WELD RECORD APPROVED BY _____ DATE _____