



TYRONE C. FAHNER  
ATTORNEY GENERAL  
STATE OF ILLINOIS  
160 NORTH LA SALLE STREET  
CHICAGO 60601

TELEPHONE  
793-3500

September 7, 1982

PRINCIPAL STAFF			
RA	Klas	OL	
D/RA		ENF	
A/RA		SP	
DP&RP		PAO	
DEP&OS		SLO	
VE&TP			
ML			
OL			
		FILE	Klas

James G. Keppler, Regional Administrator  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Re: La Salle Nuclear Station, Dkt. No. 50-373 and 50-374

Dear Mr. Keppler:

At a meeting in your office on July 19, 1982, you asked Commonwealth Edison to provide a complete list of the results of detailed calculations on rebar damage for 647 concrete elements affecting Unit 1 operation at La Salle. The public record which grew out of the request of this office under 10 C.F.R. 2.206 contained the results of only 9 of the 647 structural elements, although Edison represented in its Final Report of May 7, 1982 that calculations of all of the elements had been made and that all had shown design margins greater than 1.0. Because 4 of the 9 calculations shown on Table 2.7-1 of Edison's Final Report show margins of less than 1.1 after accounting for rebar damage, it is particularly important that a complete public record on the rebar damage be available. It was our understanding that Table 2.7-1 would be expanded to include all the concrete elements for which detailed calculations were made.

Although I have personally inquired of your staff on more than one occasion concerning the whereabouts of the additional rebar damage information, I have been unable to learn whether or not Edison has submitted it. Please advise when copies of the complete results will be provided to the public.

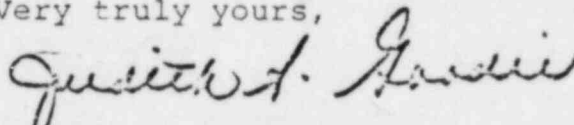
Also, at a meeting in your office on August 24, 1982, you stated that copies of Edison's final proposal for the scope and procedure of the independent HVAC review would be provided to all interested parties after approval by the office of Nuclear Reactor Regulation. Edison was expected to submit its final proposal, incorporating changes suggested by you and your staff, shortly after the August 24 meeting. We have not yet received the copies promised, and are therefore without any information as to the final scope of the HVAC review. Nor have we received

James G. Keppler, Regional Administrator  
U.S. Nuclear Regulatory Commission  
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September 7, 1982

a response to our comments on the Request for Proposal, although it was apparent from your remarks of August 24 that some of our suggestions were shared by you and your staff. Kindly provide copies of the approved plan for the Braun study at your earliest convenience.

As the target date for completion of the study is only a week away, may I also take this opportunity to request notification as to its findings and disposition as early as possible. We appreciate the courtesy and cooperation extended to this office by Region III concerning the many last minute problems associated with the licensing of La Salle Unit 1. I trust that the lines of communication will continue to be open during the next round of decision-making. The information is requested to enable our consultant to consider the safety implications of the problems you are investigating and the decisions being made by the NRC.

Very truly yours,



JUDITH S. GOODIE  
Assistant Attorney General  
Environmental Control Division  
188 West Randolph, Suite 2315  
Chicago, IL 60601 (312-793-2491)

JSG:bp

cc: Harold Denton, Director of Nuclear Reactor Regulation  
C. E. Norelius, NRC Region III  
Thomas Devine

ZACK PER HOWARD/GAP CHRONOLOGY

A 114 4

1920's Zack founded

1970's Zack bid on nuclear plants

6/79 P.O. lacks "required" 10CFR50<sup>21</sup> clause.

8/80 Harry Geyer replaced as QC Mgr. by C. Richards.

11/05/80 Bechtel letter: stop sending nonconforming material.

★ 11/6/80 19+ P.O.'s have stickers added to them.

1/6/81 many letters to vendors sent from Zack.

2/4/81 Delta Screw P.O. C-4286

6/81 Calkins hired as QA Manager.

8/26/81 Delta Screw P.O. C-4473

★ 8/28/81 Letter to Midland from Zack. ~~from~~ Potential source

8/31/81 C. DeZutel formally qualified (one hour training).

9/81 Calkins contacts Howard.

9/11/81 Delta Screw P.O. C-4484.

9/14/81 Internal Zack audit identifies vendor audit problem.

9/22/81 Edgecomb Materials rated unacceptable vendor.

9/23/81 Audit of Edgecomb Materials.

9/22/81 Nonconformance Report on Delta Screw P.O. C-4484

★ 9/25/81 Letter from Zack to LaSalle. (Calkins). Potential source

★ 9/25/81 Corrective Action Report (CAR) to Clinton. " "

10/81 Howard accepts QAE/Document position.

10/2/81 McGrane findings -Clinton purchases.

10/9/81 LETTERS TO UTILITIES FROM CALKINS.

10/9/81 CECc sends surveillance team to Zack.

10/19/81 Howard starts work at Zack.

Late/81 Howard and six others hired by Zack.

10/23/81 Third interim report (?).

10/30/81 Memo: LaSalle super. advises of 10/23/81 report.

11/2/81 letter from CECc (Donaldson) need additional information.

11/3/81 Meeting at Midland . (response to 10/23/81 letter).

L

11/5/81 Howard a( inted super. of documents. (

11/11/81 Howard posts notice re: alterations of documents.

11/12/81 C. Z. DeZutel letter to J. Cook , CPCo (misleading).

11/18/81 McGrane has Howard & Marelllo sign training form.

11/30/81 Calkins gives Howard series of documents, including 10/9/81 letter, 10/23/81 letter.

12/14/81 Calkins tells Howard C.Z. DeZeutl wants to fixe S. Marelllo.

12/17/81 Eichsteadt gets Delta Screw to agree to return of material (??).

12/21/81 Bechtel letter to Zack.

12/22/81 "Change number 1" to Delta Screw PO.

12/30/81 Eichsteadt closes out Nonconformance on Delta Screw.

1/4/82 Howard talks to Calkins re: 12/21/81 letter.

1/4/82 R. Perry, Howard, Calkins meet re: 4th report (LaSalle).

1/5/82 "harrassment" begins.

1/ /82 Howard reads minutes of 11/3/81 meeting at Midland.

1/23/82 Request to U.S. Steel for certifications, test reports.

1/ /82 LaSalle sends sureveillance report to Zack.

1/22/82 Letter sent to RMC requesting certificate of conformance (Copied).

2/ /82 Howard, Perry discuss seriousness of QA breakdown.

2/ /82 Audit by Shaeffer(Zack) identifies Seas Corp. doc. problem.

2/ /82 R. Perry contacts Shewski with concerns.

2, 16-18/82 Baldwin audit of Zack

2/19/82 R. Perry's contract expires, he is let go.

2/22/82 Howard called to president's office and is questioned.  
2/10/82 - per CEC

2/82 Delta Screw reinstated to AVL listing.

2/14/82 3/1/82 Updated report for LaSalle complied by Howard.

3/1/82 A. Crawley (Clinton) brought in to help, stays one week.

3/4/82 Calkins shows Howard collection of Zack documents.

3/4/82 Calkins contacts H. Leonard.

3/8/82 Calkins meets C. DeZuetel, gets \$12,000 raise.

3/8/82 S. Marelllo hospitalized.

3/13/82 Howard meets with Calkins.

2/14/82  
Howard letter  
to LaSalle



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3/24/82 Howard interviews for position at Midland. (with H. Leonard).  
4/5/82 Meeting (Calkins) Howard asked to lead SDDR writing group.  
4/7/82 Howard discussion with Calkins.  
4/13/82 Howard calls H. Leonard.  
\* 4/15/82 Howard calls H. Leonard, makes formal allegation.  
4/16/82 Calkins calls Howard into office says he has betrayed him.  
\* 4/17/82 Leonard & 2 others audit Zack, question personnel. ( 2 days).  
4/21/82 Leonard meets with Howard at Holiday Inn.  
4/27/82 Basiaga gives QA training.  
4/28/82 CAR#20 written, training needed.  
4/29/82 Howard responds to CAR #20 with training outline.  
4/30/82 Howard Fired.  
\* 5/3/82 Howard to RIII.  
\* 6/26/82 Howard affidavit.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

OFFICE OF THE  
DIRECTOR OF NUCLEAR  
REACTOR REGULATION

James Keppler -

Lets discuss this on Tuesday, Nov. 23, after you  
have had a chance to look it over.

Harold Denton  
Nov. 22, 1982

8303090517

# GOVERNMENT ACCOUNTABILITY PROJECT

Institute for Policy Studies  
1901 Que Street, N.W., Washington, D.C. 20009

(202) 234-9382

November 19, 1982

Mr. Harold P. Denton  
Office of Nuclear Reactor Regulation  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Re: C. F. Braun Independent Audit  
LaSalle Nuclear Power Plant

Dear Mr. Denton:

On November 9, 1982, we received a four-volume report of the C. F. Braun Company's independent analysis of the heating, ventilation, air conditioning system (HVAC system) at the LaSalle Nuclear Power Station in Illinois.

Although we are submitting a report to your office today, we must point out that it is an interim report. We have detailed our concerns, and in some cases provided some detailed justification for those concerns. We were not able to get back to the two Zack witnesses, Mr. Terry Howard and Ms. Sharon Mareello, whose input into this analysis is critical.

Our final report will contain those comments, a review of the Commonwealth Edison Company's (CECO) failures to identify the HVAC quality assurance violations, and a more detailed justification of the items highlighted in this report.

Within the context of this interim report by the Government Accountability Project (GAP) is a request for further specific information not included or discovered within the C. F. Braun four-volume report.

It is imperative for our consultants and staff to have this additional information in order to draw final conclusions about the reliability of this audit and the implications of the findings affecting the safety of the public and of the site employees.

Our interim findings follow.

8212020230 XA

The C.F. Braun independent review of the safety-related and seismic supported non-safety related systems at LaSalle comes to the conclusion that the "installation by the Zack Company is in accordance with the Sargent and Lundy design and the workmanship to be of adequate quality."

The Government Accountability Project takes general and specific exception to this conclusion. We urge the Nuclear Regulatory Commission Office of Nuclear Reactor Regulation to take a number of specific actions in response to this audit:

- 1) Require Commonwealth Edison to recall C.F. Braun; modify the terms of Brawn's contract, and continue with the probe at the La Salle facility. The scope of their work simply must include a more comprehensive view of the safety systems at the facility.
- 2) Restrict the La Salle license to 48% power until there is further work done to identify the Zack errors that need to be repaired, replaced, or reworked, and that required repairs are completed.
- 3) Request Region III to consider enforcement action against Commonwealth Edison for failing to adequately supervise subcontractor in their procurement and supply of materials to be used in the plant.
- 4) Assign a Region IV vendor inspector to audit/review these conclusions in the light of specific C.F. Braun statements which disregard 10 CFR 50, Appendix B.
- 5) To consider this letter as an interim report, prepared for your immediate consideration. A more detailed analysis of the specific Zack allegations, as well as review by Zack Nuclear witnesses will follow this report by a few days.

As you are aware we are specifically engaged in both the Midland and the Zimmer plants--both of which are in intensely active stages of NRC involvement. At the William H. Zimmer plant in Ohio, GAP Legal Director Tom Devine is working with officers of the Federal Bureau of Investigations to review the massive amounts of evidence and talk to nuclear witnesses. His comprehensive knowledge of the Zimmer plant is irreplaceable and therefore he has been delayed from finishing the significant portions of his analysis.

Bille Garde, Director of GAPs Citizens Clinic has been equally as involved in the investigation of the Midland Nuclear Plant in Midland, Michigan. The GAP investigation on the Midland site has become a full scale probe, and as you are aware this is a particularly critical time period at Midland.



Nov 9.

Mr. Harold P. Denton

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November 19, 1982

Further, those experts and analysts who have made their services available to GAP have had only a very short time period to deal with an incredible amount of almost totally unorganized raw data.

The first opportunity that was provided for us to review this four-volume report came last Tuesday, after GAP had contacted the NRC to receive a copy of the C.F. Braun study. We understand that there was a September 5th interim report provided to the NRC, of which we did not receive a copy; and that other individuals in the press and Illinois received copies as much as ten days prior to our receipt of the final copy. This oversight unfortunately has caused unnecessary delay and expense for all parties.

However, the most significant delay in finishing our analysis has come from the shocking conclusions reached by the C.F. Braun audit team. It has left us no option but to go back into the raw data of the report --almost item by item -- to scrutinize each conclusion reached by Braun. The NRR staff can expect our final analysis no later than Tuesday, November 23, 1982.

#### Critique of C.F. Braun Summary

The following comments summarize the major flaws that GAP analysts have found to date in the C. F. Braun audit of Zack's work at the LaSalle Nuclear Power Station near LaSalle, Illinois. Further development of each item will follow in our expanded response to the C. F. Braun assessment.

1. The methodology employed by C. F. Braun in selecting the hangers, ducts, and other pieces of equipment invalidate the conclusions.

During the August 24, 1982 Region III meeting, and in his September 4, 1982 letter, GAP warned that the criteria to select items for the audit could prejudice the project. Unfortunately, our concerns were realized.

In our opinion, it is clear that the study's conclusions were biased by the sample. Expert industrial quality control analysts contacted by GAP reiterate that for any sample to validly reflect the entire population (in this case total number of hardware items), that sample must be randomly selected from the entire range of possibilities. C. F. Braun did not employ this basic industry quality assurance standard. The "Summary of Work" is clear; the selection process is subjective:

These selections for inspection were made based on their own engineering knowledge and experience in conjunction with some basic guidelines as follows.



If Braun intended to limit its review to less than a 100% inspection effort, it should have employed a random selection process for all pieces of equipment reviewed -- not for just a few systems.

The consequences of Braun's risk are extremely serious. The NRC and the public are left with only two options:

- 1) Reject the Braun report because of a basic generic flaw in its methodology; or
- 2) Accept the Braun report, pretend that it was a valid assessment and do an analysis of the conclusions based on the mythical assumption.

After several consultations with nuclear power analysts, statisticians, and industrial quality control professionals, it became clear that the only option available to the NRC is to reject this report's general conclusions. In fact, it was the unanimous opinion of the analysts we contacted that without a random sample the conclusions are meaningless. As one person put it: "Virtually all of the techniques used to analyze data require that this data be obtained in accordance with well-specified rules of random sampling."

Although it would have been reasonable to conclude our review with a rejection of the Braun assessment purely on the grounds of a flawed methodology, we nevertheless proceeded with our own assessment. Our review, however, should not imply that we accept the 335 selected pieces of HVAC equipment as a valid sample.

Despite the conclusions, the substance of the Braun report confirms Mr. Howard's and Ms. Morello's concerns. It demonstrates that GAP's initial reservations about the weaknesses of the audit were well-founded. In fact, each unresolved concern raised by GAP in the series of meetings and correspondence surrounding the beginning of Braun's work has proved to be a forewarning.

2. Of the 335 pieces of equipment reviewed, Braun concluded that 34% (117 items) had discrepancies of varying significance.

The extrapolation of a 34% error rate to the entire HVAC system at the LaSalle plant is frightening. What remains even more frightening is the significance that this error rate has for the rest of the HVAC system. If the Braun sample truly is representative, clearly one-third of the HVAC system at LaSalle is in a discrepant condition.

One NRC inspector estimated that there are 45,000 potential pieces of HVAC equipment (safety and non-safety) on the LaSalle site. Because it has been impossible to turn up more realistic data, that number is offered merely to illustrate the significance of Braun's audit findings. A 100% review of the 45,000 pieces could

predictably produce 900 "findings," 30,600 observations, and only 12,150 non-discrepant conditions. Given that the 335 pieces actually used reflected a biased sample, it is probable that the actual review would produce even worse results.

In order to produce a more accurate assessment, GAP analysts need significant additional information missing from the current version of the report --

- 1) The total number of pieces of HVAC equipment on the LaSalle site, broken down by safety or non-safety related functions;
- 2) The total number of pieces in each system, rather than just the percentage of hangers in the system that were reviewed;
- 3) The total number of possible "finding" if all potential safety-related defects were actualized; and
- 4) In each instance, the variance for acceptable limits of error as specified by the approved design.

The most dramatic example of C. F. Braun's disrespect for NRC regulations is evident in the study's conclusions on welder qualifications:

The Zack welding performance qualification records (PQR) were reviewed. Although some PQRs are incomplete, Braun does not feel that this degrades the welding program since Zack was not required to conform to a specific code or standard. It has been determined that the weld quality is consistent on all supports regardless of who performed the welding.

Clearly, the Nuclear Regulatory Commission cannot accept Zack's willingness to waive nuclear safety laws. First, Braun's observation that "Zack was not required to conform to a specific code or standard" is simply wrong. The Atomic Energy Act requires welders to be qualified. Regardless of Braun's conclusion that "all is well" despite an inability to prove welder qualifications, 10 C.F.R. 50, Appendix B, Criterion II is clear that personnel participating in a quality assurance program must be properly trained and qualified. The only way to avoid this requirement would be to remove safety-related HVAC welding from QA coverage -- an illegal loophole that Braun tacitly accepts.

At Zimmer the problem of welders whose qualifications could not be verified has led to severe enforcement action, including a massive recertification program. Continuing doubts about proof of welder qualifications played a major role in the

Commission's November 12, 1982 shutdown of the facility.

In the documentation provided in the Braun report there is little room for doubt about the qualification of Zack's welders.

In the September 14, 1982 review, of the 111 welders tested 42 failed the test; in the second round of tests given in early October, 24 of 123 failed to qualify. Even in the final qualification review on October 26, 1982, there were 12 unqualified welders from the 52 tested.

Braun's "feeling" that the lack of qualification for Zack's welders does not degrade the welding program casts serious doubt on all of Braun's assessments. It should not be necessary to debate that weld quality has a significant relationship to the verifiable qualifications of individual welders.

Other examples of major flaws that we have discovered within the Braun assessment are highlighted below:

1) It is apparent that numerous design changes, designer justifications, and changes in the drawings resulted from the errors found.

It is not clear that the initially approved NRC design was significantly changed as a result of hundreds of changes, revisions, and resolutions. Further, in most cases, Braun did not analyze the Sargent & Lundy justification; Braun merely accepted at face value whatever S&L concluded.

2) A review of the Inspection Report log reveals that out of 335 alleged system inspections 7 pieces that were covered by the sample did not receive full inspections.

The comment, "Hanger could not be inspected due to location," was noted for S-978, S-964, S-987, S-986, S-973, S-1327 and S-1332. So even the number 335 is not an accurate reflection of what was inspected.

3) There are numerous examples of Braun conclusions based on CECO's regularly scheduled tests or start-up tests.

As we had feared, the Braun audit appears to amount to little more than an industry rubber stamp.

4) It is not clear how many findings were reported to the Braun Internal Review Committee and Commonwealth Edison Company from the site team.



We do know that eventually three were reported to the NRC; however, since there were two levels of review prior to NRC notification, it is impossible to determine whether more of the observations were being considered as findings.

5) On page 23 of the summary there is an interesting but significant typographical error.

The second paragraph has obviously been "doctored." It is unclear by whom the changes were made. The purpose of the doctoring appears to be to remove certain statements about the Zack non-conformance reporting system. We would like to request that the NRC review the initial page 23 -- prior to doctoring -- and make a determination of what was removed, why and by whom. This unfortunate slip-up reveals last-minute company changes in the Braun report and undermines the credibility which it is supposed to guarantee.

The substance of Braun's comments suggests that the numerous Zack nonconformance reports should have been Quality Control Inspection Reports. Our experience with duplicate NR forms leads us to strongly disagree with this Braun conclusion. (At Zimmer, there was a similar change made to undermine the NR procedure. This replacement procedure contributed significantly to the plant's condition being "indeterminate.")

6) Other observations that our staff has made that will be further developed in our final report are listed below:

- The lack of organizational independence of C.F. Braun from CECO.
- The lack of informational independence of C.F. Braun from CECO.
- The failure of C.F. Braun to make independent evaluations of CECO and S&L judgement.
- The failure of C.F. Braun to extend the size of the sample after discovering critical problems.
- The failure of C.F. Braun to follow through with disposition of their findings.
- The failure to cite relevant professional code requirements to justify their procedures.
- The failure to justify their conclusions with relevant professional code requirements.
- The absence of hardware tests.
- The non-specific quantification of the numbers reviewed.

-- The reliance of C.F. Braun on Zack, S&L, and CECO tests and analysis.

#### FAILURE TO ADDRESS SPECIFIC ISSUES RAISED BY THE WHISTLEBLOWERS

The extraordinary remedy that created Braun's review is the direct result of whistleblowing disclosures from Mr. Howard, Ms. Mareello, Mr. Ronald Perry and other former employees of the Zack Corporation. If subjective assessments are to replace standard statistical sampling techniques, no opinions come with better credentials than theirs. Unfortunately, Braun chose not to even attempt token communication with the whistleblowers, despite their announced eagerness to assist. As a result, Braun's report does not even report to address the specific concerns targeted by those responsible for the probe.

To illustrate, the report failed to --

1) guarantee that all relevant Nonconformance Reports ("NCR") were reviewed. Although the report discussed a review of 1756 NCR's; fewer than Mr. Howard and Ms. Mareello estimated were included in the scope of their equivalent effort, and fewer than the 2200 figure that Braun concedes it received.

2) review and establish current HVAC site specifications at Lasalle, which were unknown to Zack when certain materials were originally purchased.

3) items never reached by the still-incomplete Zack internal document review.

4) target items covered in the suspect February 1982 CECO audit which Mr. Perry challenged.

5) all site records generated after January 1982, when Sargent and Lundy ceased independent reviews of Zack site documentation.

6) purchase orders from unapproved vendors, either because they never qualified for or were removed from the Approved Vendors List.

7) purchase orders where there is evidence of questionable records alteration or forgery.

#### CONCLUSION

To some extent the explanation for the flaws in the Braun



Mr. Harold P. Denton

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report is that the NRC exercised only token oversight. While CECO audited the "independent" reviewers, NRC site supervision was limited to one visit by one inspector. While staff priorities are understandable, the net result is that this third party report cannot legitimately serve as the basis for any final regulatory decision on Lasalle. The necessary facts will not be in until the staff releases its own reports.

If anything, the substance of the Braun findings are both ominous and understated in the extreme. Despite its mandate, Braun produced a paperwork review of a paperwork breakdown. It relied extensively on factfinding from the targets of the inquiry. It accepted at face value the suspect design changes approved without question by Sargent and Lundy, which rewrote the design requirements as needed to "legalize" Zack's violations. To approve full power for Lasalle on the basis of this report would represent a regulatory decision in spite of the facts.

Sincerely,

Thomas Devine  
Legal Director

Billie Garde  
Citizens Clinic Director

cc: Mr. Thomas Novak

TD:BG/my

CHICAGO  
ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

A 111

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650  
Telephone:  
Bishop 2-3434

TRANSMITTAL NO. 648

Date: Nov. 24, 1982

TO: U.S.N.R.C. Region IV  
611 Ryan Plaza Dr., Suite 1100  
ARLINGTON, TEXAS 76011

RE: DOCKET NO. 99900785/82-01

ATTN: MR. JOHN T. COLLINS  
Regional Administrator

File # \_\_\_\_\_

Gentlemen:

We are Sending to you SEE BELOW

of the  
Following

- ☐ Drawings
- ☐ Approved Dwgs.
- ☐ Certified Prints
- ☐ Approved Cert. Prints
- ☐ Specifications
- ☐ Details

☒ NONCONFORMANCE RESPONSE

☒ Herewith ONE Copy  
☐ Under Separate Cover \_\_\_\_\_ Copies

- For
- ☒ Approval
  - ☐ Approval & Comment
  - ☐ Correction
  - ☐ Your files
  - ☐ Your files & Distribution
  - ☐ Final Approval
  - ☐ Release for Production
  - ☐ For use on Job
  - ☐ Release for immediate Production
  - ☐ Your Estimate for \_\_\_\_\_ work
  - ☐ See Description Below

Description RESPONSE TO NONCONFORMANCES ONE (1) THROUGH FOURTEEN (14)

AS LISTED IN DOCKET NO. 99900785/82-01.

Remarks \_\_\_\_\_

☒ Please Acknowledge

C.C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

Sent By: Mail ☒ Messenger \_\_\_\_\_

Kindly return ONE Copy(s) ~~XXXX~~ of Transmittal

M. L. Skates  
Martin L. Skates  
Q.A. Manager

Note: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.

CHICAGO  
ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

TRANSMITTAL NO. 648

Date: Nov. 24, 1982

TO: U.S.N.R.C. Region IV  
611 Ryan Plaza Dr., Suite 1100  
ARLINGTON, TEXAS 76011

RE: DOCKET NO. 99900785/82-01

ATTN: MR. JOHN T. COLLINS  
Regional Administrator

File # \_\_\_\_\_

Gentlemen:

We are Sending to you SEE BELOW

X Herewith ONE Copy  
Under Separate Cover \_\_\_\_\_ Copies

of the  
Following

- ☐ Drawings
- ☐ Approved Dwgs.
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- ☐ Approved Cert. Prints
- ☐ Specifications
- ☐ Details

X NONCONFORMANCE RESPONSE

For

- ☒ Approval
- ☐ Approval & Comment
- ☐ Correction
- ☐ Your files
- ☐ Your files & Distribution
- ☐ Final Approval
- ☐ Release for Production
- ☐ For use on Job
- ☐ Release for immediate Production
- ☐ Your Estimate for \_\_\_\_\_ work
- ☐ See Description Below

Description RESPONSE TO NONCONFORMANCES ONE (1) THROUGH FOURTEEN (14)

AS LISTED IN DOCKET NO. 99900785/82-01.

Remarks \_\_\_\_\_

☒ Please Acknowledge

C.C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

Sent By: Mail X Messenger \_\_\_\_\_

Kindly return ONE Copy(s) ~~100000~~ X of Transmittal

M. L. Skates  
Martin L. Skates  
Q.A. Manager

Note: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.

the **ZACK** co.

CUSTOM METAL FABRICATION

November 24, 1982

U.S.N.R.C., Region IV  
611 Ryan Plaza Drive  
Suite 1000  
Arlington, Texas 76011

Att: MR. JOHN T. COLLINS  
Regional Administrator

Mr. Collins,

Attached is the Zack Company response to NRC REPORT NO.  
99900785/82-01 NONCONFORMANCES B-1 THROUGH B-14.

Included in our response is a description of corrective  
action taken, actions to prevent recurrence and projected  
or actual completion dates for corrective actions.

All backup documentation not attached as part of this re-  
port is on file within the Zack Company and open for re-  
view at any time.

Any questions concerning this report are welcome and  
should be directed to this office.

We would like to thank those of the U.S.N.R.C. involved  
in this investigation for their cooperation, courtesy and  
professionalism in the handling of this matter. We would  
also like to reaffirm the Zack Company position of com-  
plete cooperation in resolving this matter.

Very truly yours,  
THE ZACK COMPANY

Martin L. Skates  
Martin L. Skates  
Quality Assurance Manager

MLS/lf  
Encl.

CC: CZDZ

JCDZ

D. Malzahn

D. Calkins

Q.A. File

8301130185



SECTION B  
NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section 10, and AWS D1.1-79, the NRC Inspector observed deviations being permitted and changes to essential variables being made without the procedure being requalified during gas metal arc welding (GMAW) of duct rings for the Midland Plant, in which the welder was using 0.035 inch diameter weld wire, 125 amps, and a gas flow rate of 30 CFH. The procedure requires the use of 0.045 inch diameter weld wire, 195 amps, and gas flow of 20 CFH. This was the only in-process welding observed by the NRC Inspector during his inspection.

The Zack Company Corrective Action:

All in-process welding of angle rings was halted and all welds were identified (in-process and previous) under the Zack Company nonconformance system. Nonconformance Reports (405, 406 and 407) dispositioned to remove all welds in their entirety. This action was performed and verified by QC.

Welding Procedure (WPS-1 Rev. 11) being utilized at the time is in the process of being requalified to incorporate the use of 0.035 diameter weld wire and essential variables as required by AWS D1.1-79.

Action to Prevent Recurrence:

On-going weekly surveillance is being performed and documented by the Quality Control Department of in-process welding. Training sessions are being conducted and documented as to the requirements of Procedures, AWS Standards, Quality Assurance Manual Program, and 10 CFR 50 Appendix B.

Corrective Action Completion:

- a. Weld Procedure requalification, anticipated completion by mid-November 1982.
- b. On-going training will continue as deemed necessary by Quality Assurance.
- c. On-going surveillance activity has been incorporated into the Quality Assurance Program and shall continue indefinitely.



SECTION B  
NONCONFORMANCES:

- 2A Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Procedure QCP-29, the following conditions were identified:

Electrodes (bare wire on spools) were not being protected, in that three spools of stainless steel electrodes, each of a different type, were observed under a work bench in an uncovered condition. Further, two spools had been issued on December 17, 1981, and the other on April 16, 1982.

- b. Traceability of these electrodes would be precluded when used at a time later than the issue date, in that the date of issue as shown on the weld material control sheet would not coincide with the date of actual welding on a specific Zack Company Traveler.

The Zack Corrective Action:

Zack implemented a new weld filler metal control system on November 2, 1982 precluding the repetition all aspects of the above nonconformance. These changes are documented in Procedure PQCP-6 (attached). The procedure was transmitted for approval for use on the Clinton and Midland projects on November 5, 1982 (Transmittals attached).

As the projected completion date for all Zack activity at the LaSalle project is December 20, 1982, Procedure QCP-29 will not be revised and PQCP-6 will not be submitted to LaSalle for approval. Any remaining shop welding for LaSalle will be done with wire issued per the requirements of the revised PQCP-6.

Action to Prevent Recurrence:

The requirements of revised Procedure PQCP-6 will prevent recurrence of the above nonconforming activities in that it allows the welder to be in possession of one spool of wire at a time. It also requires the welder to return his spool daily or lock his spool to the machine at the end of the shift. The new Procedure also requires daily issue and return of Issue Documentation and requires the welder to record Traveler and piece part information on the Issue Document. Issue Documentation is forwarded to Q.A. on a monthly basis for review and filing.

Corrective Action Completion:

All aspects of the new Procedure were implemented as an addition to current approved procedure requirements on November 2, 1982. Normal procedure approval turnaround is approximately six weeks.

CHICAGO  
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CZC # 593

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

Date: Nov. 5<sup>th</sup> 1982

TO: Sargent & Lundy  
55 E. Monroe.  
Chicago Ill. 60603  
ATTN: Mr. H. M. Sroka

RE: Illinois Power Co.  
Clinton Power Station  
K 2910  
File # 2900

Gentlemen:

We are Sending to you CB-PQCP-6 REV.0  
CB-PQCP-7 REV.0

of the  
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- ☐ Approved Dwgs.
- ☐ Certified Prints
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- ☐ Your files & Distribution
- ☒ Final Approval
- ☐ Release for Production
- ☐ For use on Job
- ☐ Release for immediate Production
- ☐ Your Estimate for        work
- ☐ See Description Below

Description WELD Filler Metal Control & Welding Surveillance  
inspection,  
Design/Document Control

Remarks       

☒ Please Acknowledge

C.C.       

Yours very truly,

THE ZACK CO.

Sent By: Mail ☒ Messenger       

Kindly return 1 Copy(s) to us

Note: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.

R. J. Bruneau

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ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

CZC\* 595

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60630

Telephone:  
Blshop 2-3434

Date: Nov. 5, 1982

TO: Baldurni Associates  
P.O. Box 306  
Clinton, Ill. 61727  
ATTN: Mr. Jim Smart

RE: Illinois Power Co.  
Clinton Power Station  
K 2910  
File # 2900

Gentlemen:

We are Sending to you CB-PQCP-6 Rev.0  
CB-PQCP-7 Rev.0

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| <input type="checkbox"/>            | Approved Dwgs.        |
| <input type="checkbox"/>            | Certified Prints      |
| <input type="checkbox"/>            | Approved Cert. Prints |
| <input checked="" type="checkbox"/> | Specifications        |
| <input type="checkbox"/>            | Details               |

INFORMATION ONLY

- |                                     |                                  |
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| <input type="checkbox"/>            | Approval & Comment               |
| <input type="checkbox"/>            | Correction                       |
| <input type="checkbox"/>            | Your files                       |
| <input type="checkbox"/>            | Your files & Distribution        |
| <input checked="" type="checkbox"/> | Final Approval                   |
| <input type="checkbox"/>            | Release for Production           |
| <input type="checkbox"/>            | For use on Job                   |
| <input type="checkbox"/>            | Release for immediate Production |
| <input type="checkbox"/>            | Your Estimate for _____ work     |
| <input type="checkbox"/>            | See Description Below            |

Description Weld. Filler Metal Control & Welding  
Surveillance inspection,  
Design / Document Control

Remarks \_\_\_\_\_

☒ Please Acknowledge

C.C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

sent By: Mail X Messenger \_\_\_\_\_

Kindly return 1 Copy(s) to us

Note: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.

RJ Branga

**INFORMATION ONLY**

BY

*RJB*

DATE

*11/5/82*

CB-PQCP-6, REV.0  
SECOND EDITION  
Page 1 of 6

THE ZACK COMPANY

Procedure for:

WELD FILLER METAL CONTROL

and

WELDING SURVEILLANCE INSPECTION

CB-PQCP - 6

SECOND EDITION

REV. 0

C

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THE ZACK COMPANY

*Martin R. Shater*  
CORPORATE Q.A. MANAGER

*Nov. 4, 1982*  
DATE

*David E. Calkins*  
CORPORATE PROJECT MANAGER

*11-5-82*  
DATE

*8301130188*



**INFORMATION ONLY**

CB-PQCP-6, REV.0  
SECOND EDITION  
Page 2 of 6

**1.0 PURPOSE**

1.1 The purpose of this Procedure is to define the system used by the Zack Company to control weld filler metal, and to prescribe and document surveillance inspections of welding operations.

**2.0 SCOPE**

2.1 This Procedure applies to the handling, storage, issuance, use and return of weld filler metal.

**3.0 DEFINITIONS**

3.1 Weld Filler Metal: The metal to be added in making a welded, brazed or soldered joint.

3.2 Terms used in this Procedure are defined in ANSI N45.2.10, Quality Assurance Terms and Definitions.

**4.0 REFERENCES**

4.1 K2910 Specification

4.2 The Zack Company Quality Assurance Manual (ZQAM)

4.3 ANSI N45.2.10-1973, Quality Assurance Terms and Definitions

4.4 AWS D1.1-79 Structural Welding Code, Steel

**5.0 RESPONSIBILITIES**



**5.1 Corporate Project Manager (CPM)**

Responsible for the proper handling, storage, issuance, use and return of weld filler metal.

**5.2 Plant Superintendent (PS) - General Foreman (GF)**

Responsible for the control of weld filler metal per the requirements of this Procedure.



**5.3 Quality Control Supervisor (QCS)**

Responsible for the verification, that weld filler metal is handled, stored, issued, used and returned in accordance with this Procedure. Responsible for verification of QCI's welding surveillance.

**5.4 Quality Control Inspector (QCI)**

Responsible for performing inspections per this Procedure as assigned. Responsible for performing welding surveillance inspection per this Procedure.



**INFORMATION ONLY**

CB-PQCP-6, REV.0  
SECOND EDITION  
Page 3 of 6

**6.0 GENERAL**

- 6.1 Weld filler metal is receipt inspected per PQCP-1 latest Revision.

**7.0 PROCEDURE**

- 7.1 Upon completion of receipt inspection, the QA/QC releases acceptable weld filler metal to the PS for storage.
- 7.2 The PS provides for the storage of accepted weld filler metal such that it is safe from damage and unauthorized issuance, i.e., clean, dry, and with controlled access.
- △ 7.3 Materials released are transported to the weld material issue station, where it is removed from the shipping containers, or the containers are placed on shelves in preparation for issuance. Low-hydrogen electrode, when removed from its hermetically sealed shipping container, is immediately placed in a holding oven.
- 7.4 Each shelf, within the weld rod issue station which contains weld filler metal, including the shelves inside the rod holding ovens, are marked as to the type of weld filler metal contained thereon. Holding oven shelf marking, due to heat, is applied to the exterior of the door.
- △ 7.5 Access to the weld rod storage is limited to CPM, PS, GF, and QA/QC Department Personnel.
- △ 7.6 The PS, GF, and QCI are the only Plant Personnel authorized to issue, for use and accept returned weld filler metal.
- △ 7.7 Issuance and return of weld filler metal is controlled through the use of a Weld Material Control Form (Attachment #1). This Form is initiated and maintained with issued material for the entire shift. WMCF's are maintained in the QC file following the return of unused weld filler material or upon use of all issued weld filler material. WMCF's are forwarded to the Q.A. Manager for filing on the last working day of each month.
- △ 7.7.1 The PS, GF, and/or QCI shall fill out the portion of the WMCF pertinent to wire size, type, weld procedure, heat or lot number, control number, amount issued, amount returned and welder I.D. They shall also date and sign the form as appropriate.

**INFORMATION ONLY**

CB-PQCP-6, REV.0  
SECOND EDITION  
Page 4 of 6

△ 7.7.2 The welder shall be responsible for maintaining the form for the entire shift, and filling in Traveler and Part Identification as required. He shall also be responsible for returning the form at the end of each shift with any weld material to be returned or the key for his particular welding machine.

7.8 Low Hydrogen electrodes are issued in portable rod warmer caddies. Each caddy is energized (i.e., plugged in) at all times, except when in transit to and from the location in which welding is performed.

△ 7.9 Returned weld filler metal is examined. Damaged or wet items are discarded in locked disposal containers. Re-usable items are stored at the weld rod issue station. PS/GF/QCI annotates the amount returned on the WMCF.

△ 7.9.1 When low-hydrogen electrode is returned, PS, GF, or QCI removes it from the portable rod warmer caddies and returns it to the holding oven, if it is warm to the touch. Otherwise he discards it. Discarded low-hydrogen electrode is placed in locked disposal containers to prevent its use.

7.10 Weld filler metal, other than wire spools, is issued and returned on a daily basis.

△ 7.10.1 Wire spools may be issued for daily return or for locked storage on the welding machine. Wire spools returned on a daily basis are returned to the weld material issue station and the returned weight is recorded on the WMCF. Wire spools to be stored locked on the welding machine are to be locked at the end of each shift as to make the machine inoperable and prevent removal of the weld material. In this case the key is to be returned with the WMCF to the issue station. Keys are to be maintained with the same controlled access as weld material and issued with the WMCF at the start of the next shift the same as weld material. At the time of return of wire spools previously locked on the welding machine, the returned weight is recorded on the WMCF.

△ 7.10.2 A welder is allowed to be in possession of only one wire spool at any time. If for any reason a different wire spool is needed, the one already issued must be returned and processed as any other returned spool and the new spool issued per the requirements above.

**INFORMATION ONLY**

CB-PQCP-6, REV.0  
SECOND EDITION  
Page 5 of 6

7.11 Holding ovens and portable rod warmer caddies are maintained at the temperatures specified in AWS D1.1-79, Section 4, paragraph 4.5. Each is serialized, and their temperature is checked by the QCI every two months and documented in accordance with the provisions of PQCP-10, latest Revision. Holding ovens are maintained at a minimum of 250 F. Caddies shall be functional.

7.12 Weld rod control verification and welding surveillance inspection.

△ 7.12.1 On a monthly basis, or as deemed necessary, the QCI performs verification activities on weld rod control and in-process welding. The QCI visits all work stations. During the performance of this inspection, the QCI verifies through observation that:

7.12.1.1 The welder is qualified.

7.12.1.2 The procedure used is that which is noted on the Traveler.

7.12.1.3 Welding parameters (i.e. current, voltage, polarity and gas flow) are within the limits required by the applicable WPS.

7.12.1.4 That filler metal i.e. size, type and position is as prescribed by the weld procedure and that the welder has a properly completed Weld Material Control Form in his possession.

7.12.1.5 Preheat is as detailed in the applicable WPS latest Revision.

7.12.1.6 If low-hydrogen rod is used, then a portable rod warmer caddy is used and is energized.

7.12.1.7 Observe the issuance and return of weld filler metal, and the condition of issue station for compliance to the provisions of 7.2 through 7.11.

7.12.1.8 Welding equipment conforms to paragraph 3.1.2 of AWS D1.1-79.

7.12.1.9 The welders technique and performance meet the applicable requirements of Section 4, AWS D1.1-79.

**INFORMATION ONLY**

CB-PQCP-6, REV.0  
SECOND EDITION  
Page 6 of 6

- △ 7.12.2 The QCI documents his surveillance action on QC Inspection Report, Special Inspection, (Attachment #2), and transmits it to the QCS. The QCS files the original in the QC File. Problems noted during the surveillance actions are processed in accordance with PQCP-8, latest Revision.

8.0 DOCUMENTATION

- 8.1 Documentation that is generated by the use of this Procedure is maintained in the QA/QC Files.

9.0 FORMS

- 9.1 Weld Material Control Form, Attachment #1.  
9.2 QC Inspection Report, Special Inspection, Attachment #2.



**INFORMATION ONLY**

CB-PQCP-6, REV.0  
SECOND EDITION,  
ATTACHMENT #1

WELD MATERIAL CONTROL						
CLINTON FAB TICKET(S) :						
MIDLAND FAB TICKET(S) :						
LaSALLE FAB TICKET(S) :						
SIZE	TYPE	PROCEDURE	HEAT OR LOT NO.	CONTROL NO.	AMOUNT ISSUED	AMOUNT RETURNED
DATE		FOREMAN		WELDER		Q.C.I.

SAMPLE → ACTUAL FORM IN USE MAY  
VARY — THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
— THE SAME



CB-PQCP-6, REV. 0  
SECOND EDITION  
ATTACHMENT #2

QC INSPECTION REPORT  
SPECIAL INSPECTION

PAGE \_\_\_\_ OF \_\_\_\_

1. DATE: \_\_\_\_\_

INFORMATION ONLY

2. INSPECTOR: \_\_\_\_\_

3. ITEM INSPECTED: \_\_\_\_\_

4. DESCRIPTION OF INSPECTION: \_\_\_\_\_

5. RESULTS OF INSPECTION: \_\_\_\_\_

6. LEVEL I/II QC INSPECTOR \_\_\_\_\_ DATE \_\_\_\_\_

7. Q.A. / Q.C. \_\_\_\_\_ DATE \_\_\_\_\_

NOTE - ACTUAL FORM IN USE MAY  
VARY - THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME

CHICAGO  
ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

CZC# 592

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

Date: Nov. 5, 1982.

TO: Zack Company  
P.O. Box 489  
Midland Mich. 48640  
ATTN: Russ Mc Carley

RE: Consumer Power Co.  
Midland Power Station  
7220 - M 151 (A)  
File # 7400

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MB PQCP-19 REV. 0

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- ☐ Release for Production
- ☐ For use on Job
- ☐ Release for immediate Production
- ☐ Your Estimate for \_\_\_\_\_ work
- ☐ See Description Below

Description Weld Filler Metal Control & Welding  
Surveillance Inspection  
Plant Visual Weld. Inspection

Remarks \_\_\_\_\_

☒ Please Acknowledge

C.C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

By: Mail ☒ Messenger \_\_\_\_\_

Kindly return 1 Copy(s) to us

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RJ Bassaga

**INFORMATION ONLY**

BY RJB DATE 11/5/82

THE ZACK COMPANY

Procedure for:

WELD FILLER METAL CONTROL

and

WELDING SURVEILLANCE INSPECTION

MB-PQCP - 6

REV. 4

Martin E. Skates 11/5/82  
CORPORATE Q.A. MANAGER DATE

Thomas E. DeLafont for D.E.C. 11/5/82  
CORPORATE PROJECT MANAGER DATE

C

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THE ZACK COMPANY

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**INFORMATION ONLY**

1.0 PURPOSE

- 1.1 The purpose of this Procedure is to define the system used by the Zack Company to control weld filler metal, and to prescribe and document surveillance inspections of welding operations.

2.0 SCOPE

- 2.1 This Procedure applies to the handling, storage, issuance, use and return of weld filler metal.

3.0 DEFINITIONS

- 3.1 Weld Filler Metal: The metal to be added in making a welded, brazed or soldered joint.
- 3.2 Terms used in this Procedure are defined in ANSI N45.2.10, Quality Assurance Terms and Definitions.

4.0 REFERENCES

- 4.1 Specification 7220-M-151
- 4.2 The Zack Company Quality Assurance Manual (ZQAM)
- 4.3 ANSI N45.2.10-1973, Quality Assurance Terms and Definitions
- 4.4 AWS D1.1-79 Structural Welding Code, Steel

5.0 RESPONSIBILITIES



5.1 Corporate Project Manager (CPM)

Responsible for the proper handling, storage, issuance, use and return of weld filler metal.

5.2 Plant Superintendent (PS) - General Foreman (GF)

Responsible for the control of weld filler metal per the requirements of this Procedure.



5.3 Quality Control Supervisor (QCS)

Responsible for the verification, that weld filler metal is handled, stored, issued, used and returned in accordance with this Procedure. Responsible for verification of QCI's welding surveillance.



5.4 Quality Control Inspector (QCI)

Responsible for performing inspections per this Procedure as assigned. Responsible for performing welding surveillance inspection per this Procedure.

INFORMATION ONLY

6.0 GENERAL

- △ 6.1 Weld filler metal is receipt inspected per PQCP-1 latest revision.

7.0 PROCEDURE

- 7.1 Upon completion of receipt inspection, the QA/QC releases acceptable weld filler metal to the PS for storage.
- 7.2 The PS provides for the storage of accepted weld filler metal such that it is safe from damage and unauthorized issuance, i.e., clean, dry, and with controlled access.
- △ 7.3 Materials released are transported to the weld material issue station, where it is removed from the shipping containers, or the containers are placed on shelves in preparation for issuance. Low-hydrogen electrode, when removed from its hermetically sealed shipping container, is immediately placed in a holding oven.
- 7.4 Each shelf, within the weld rod issue station which contains weld filler metal, including the shelves inside the rod holding ovens, are marked as to the type of weld filler metal contained thereon. Holding oven shelf marking, due to heat, is applied to the exterior of the door.
- △ 7.5 Access to the weld rod storage is limited to CPM, PS, GF, and QA/QC Department Personnel.
- △ 7.6 The PS, GF, and QCI are the only Plant Personnel authorized to issue, for use and accept returned weld filler metal.
- △ 7.7 Issuance and return of weld filler metal is controlled through the use of a Weld Material Control Form (Attachment #1). This Form is initiated and maintained with issued material for the entire shift. WMCF's are maintained in the QC file following the return of unused weld filler material or upon use of all issued weld filler material. WMCF's are forwarded to the Q.A. Manager for filing on the last working day of each month.
- △ 7.7.1 The PS, GF, and/or QCI shall fill out the portion of the WMCF pertinent to wire size, type, weld procedure, heat or lot number, control number, amount issued, amount returned and welder I.D. They shall also date and sign the form as appropriate.

**INFORMATION ONLY**

4 7.7.2

The welder shall be responsible for maintaining the form for the entire shift, and filling in Traveler and Part Identification as required. He shall also be responsible for returning the form at the end of each shift with any weld material to be returned or the key for his particular welding machine.

7.8 Low Hydrogen electrodes are issued in portable rod warmer caddies. Each caddy is energized (i.e., plugged in) at all times, except when in transit to and from the location in which welding is performed.

4 7.9

Returned weld filler metal is examined. Damaged or wet items are discarded in locked disposal containers. Re-usable items are stored at the weld rod issue station. PS/GF/QCI annotates the amount returned on the WMCF.

4 7.9.1

When low-Hydrogen electrode is returned, PS, GF, or QCI removes it from the portable rod warmer caddies and returns it to the holding oven, if it is warm to the touch. Otherwise he discards it. Discarded low-hydrogen electrode is placed in locked disposal containers to prevent its use.

7.10 Weld filler metal, other than wire spools, is issued and returned on a daily basis.

4 7.10.1

Wire spools may be issued for daily return or for locked storage on the welding machine. Wire spools returned on a daily basis are returned to the weld material issue station and the returned weight is recorded on the WMCF. Wire spools to be stored locked on the welding machine are to be locked at the end of each shift as to make the machine inoperable and prevent removal of the weld material. In this case the key is to be returned with the WMCF to the issue station. Keys are to be maintained with the same controlled access as weld material and issued with the WMCF at the start of the next shift the same as weld material. At the time of return of wire spools previously locked on the welding machine, the returned weight is recorded on the WMCF.

4 7.10.2

A welder is allowed to be in possession of only one wire spool at any time. If for any reason a different wire spool is needed, the one already issued must be returned and processed as any other returned spool and the new spool issued per the requirements above.

7.11 Holding ovens and portable rod warmer caddies are maintained at the temperatures specified in AWS DI-1-79, Section 4, Paragraph 4.5. Each is serialized, and their temperature is checked by the QCI every two months and documented in accordance with the provisions of PQCP-10, latest Revision. Holding ovens are maintained at a minimum of 250 F. Caddies shall be functional.

7.12 Weld rod control verification and welding surveillance inspection.

△ 7.12.1 On a monthly basis, or as deemed necessary, the QCI performs verification activities on weld rod control and in-process welding. The QCI visits all work stations. During the performance of this inspection, the QCI verifies through observation that:

7.12.1.1 The welder is qualified.

7.12.1.2 The procedure used is that which is noted on the Traveler.

△ 7.12.1.3 Welding parameters (i.e. current, voltage, polarity and gas flow) are within the limits required by the applicable WPS.

△ 7.12.1.4 That filler metal i.e. size, type and position is as prescribed by the weld procedure and that the welder has a properly completed Weld Material Control Form in his possession.

△ 7.12.1.5 Preheat is as detailed in the applicable WPS latest Revision.

7.12.1.6 If low-hydrogen rod is used, then a portable rod warmer caddy is used and is energized.

7.12.1.7 Observe the issuance and return of weld filler metal, and the condition of issue station for compliance to the provisions of 7.2 through 7.11.

△ 7.12.1.8 Welding equipment conforms to Paragraph 3.1.2 of AWS DI-1-79.

△ 7.12.1.9 The welders technique and performance meet the applicable requirements of Section 4, AWS DI-1.1-79



**INFORMATION ONLY**

MB-PQCP-6, REV.4  
Page 6 of 6

- △ 7.12.2 The QCI documents his surveillance action on QC Inspection Report, Special Inspection, (Attachment #2), and transmits it to the QCS. The QCS files the original in the QC File. Problems noted during the surveillance actions are processed in accordance with PQCP-8, latest Revision.

8.0 DOCUMENTATION

- 8.1 Documentation that is generated by the use of this Procedure is maintained in the QA/QC Files.

9.0 FORMS

- △ 9.1 Weld Material Control Form, Attachment #1.  
△ 9.2 QC Inspection Report, Special Inspection, Attachment #2.

INFORMATION ONLY

WELD MATERIAL CONTROL						
CLINTON FAB TICKET(S):						
MIDLAND FAB TICKET(S):						
LaSALLE FAB TICKET(S):						
SIZE	TYPE	PROCEDURE	HEAT OR LOT NO.	CONTROL NO.	AMOUNT ISSUED	AMOUNT RETURNED
DATE		FOREMAN		WELDER		Q.C.I.

SAMPLE - ACTUAL FORM IN USE MAY  
VARY - THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME



MB-PQCP-6, REV. 4  
ATTACHMENT #2

**INFORMATION ONLY**

**QC INSPECTION REPORT  
SPECIAL INSPECTION**

PAGE \_\_\_\_ OF \_\_\_\_

1. DATE: \_\_\_\_\_

2. INSPECTOR: \_\_\_\_\_

3. ITEM INSPECTED: \_\_\_\_\_

4. DESCRIPTION OF INSPECTION: \_\_\_\_\_

SAMPLE - ACTUAL FORM IN USE MAY  
VARY - THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
- THE SAME

5. RESULTS OF INSPECTION: \_\_\_\_\_

6. LEVEL I/II QC INSPECTOR \_\_\_\_\_ DATE \_\_\_\_\_

7. Q.A. / Q.C. \_\_\_\_\_ DATE \_\_\_\_\_

SECTION B  
NONCONFORMANCES:

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section 6, and AWS D1.1-79, full and complete information requiring location, type, size, and extent of welds, weld joints, and material preparation, was not shown on shop travelers/detail drawings provided to shop personnel. The only information provided is the welding procedure specification number, which does not delineate the above information.

The Zack Company Corrective Action:

Zack believes that Shop Travelers provide sufficient welding information through reference to "C" and "M" drawings, but realizes that at times incorrect drawing references were included on the Travelers. To correct this situation and to avoid a total restructuring of the Traveler System which would add confusion during the changeover, and consume an inordinate amount of time to implement, the Zack Company has taken the action below.

Action to Prevent Recurrence:

In order to better assure proper drawing reference on the Traveler, Zack has instituted a checker system under the direction of an assistant project engineer to check Travelers for proper drawing reference prior to transmittal of said Travelers to Chicago for fabrication. With proper drawing reference, a direct line to all available welding information, this system also eliminates the possibility of mistakes being made transferring the welding information from drawing to Traveler.

Corrective Action Completion:

This system was instituted at the Midland site on November 15, 1982 and will be implemented at the Clinton site after the lifting of the current stop-work orders.



SECTION B  
NONCONFORMANCES:

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 10, instructions, procedures, or drawings did not include appropriate qualitative acceptance criteria for welds. Therefore, without acceptance criteria being stipulated, specific inspection requirements were not set forth in welding procedures.

The Zack Corrective Action:

Specific inspection criteria are included in Procedure PQCP-19 (attached). This Procedure was approved for use on the Clinton project, has been revised and was resubmitted to both the Clinton and Midland projects for approval on November 5, 1982.

As the projected completion date for all Zack activity on the LaSalle project is December 20, 1982, this Procedure will not be submitted to LaSalle for approval.

Action to Prevent Recurrence:

With the approval of PQCP-19 latest revision for use on both remaining projects, there will no longer be a lack of documented acceptance criteria. Training will be provided to inspectors, welders, Q.A. and shop supervisory personnel upon approval of the revised PQCP-19.

Corrective Action Completion:

Average Procedure approval time is approximately six (6) weeks. Training will take place at that time.

CHICAGO  
ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

CZC # 594

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

Date: Nov. 5<sup>th</sup> 1982

TO: Sargent & Lundy  
55 E. Monroe  
Chicago Ill 60603  
ATTN: Mrs. H. M. Broka

RE: Illinois Power Co.  
Clinton Power Station  
K 2910  
File # 2900

Gentlemen:

We are Sending to you CB-PQCP-19 Reo.

X

Herewith

1

Copy

Under Separate Cover

Copies

of the  
Following

- |                                     |                       |
|-------------------------------------|-----------------------|
| <input type="checkbox"/>            | Drawings              |
| <input type="checkbox"/>            | Approved Dwgs.        |
| <input type="checkbox"/>            | Certified Prints      |
| <input type="checkbox"/>            | Approved Cert. Prints |
| <input checked="" type="checkbox"/> | Specifications        |
| <input type="checkbox"/>            | Details               |

INFORMATION ONLY

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| <input type="checkbox"/>            | Approval                         |
| <input type="checkbox"/>            | Approval & Comment               |
| <input type="checkbox"/>            | Correction                       |
| <input type="checkbox"/>            | Your files                       |
| <input type="checkbox"/>            | Your files & Distribution        |
| <input checked="" type="checkbox"/> | Final Approval                   |
| <input type="checkbox"/>            | Release for Production           |
| <input type="checkbox"/>            | For use on Job                   |
| <input type="checkbox"/>            | Release for immediate Production |
| <input type="checkbox"/>            | Your Estimate for _____ work     |
| <input type="checkbox"/>            | See Description Below            |

Description Plant Visual Weld. Inspection

Remarks \_\_\_\_\_

☒ Please Acknowledge

C.C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

sent By: Mail X Messenger \_\_\_\_\_

Kindly return 1 Copy(s) to us

Note: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.

A. Baraga

C2C # 596

# THE ZACK CO.

MIAMI  
FLORIDA

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

Date:

Nov. 5, 1982

TO:

Baltini Associates

P.O. Box 306

Clinton Ill. 61727

ATTN:

Mr. Jim Smart

RE:

Illinois Power & Co.

Clinton Power Station

K 2910

File #

2900

Gentlemen:

We are Sending to you

CB-PQCP-19 Rev.0

X

Herewith

Under Separate Cover

Copy

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of the  
Following

- ☐ Drawings
- ☐ Approved Dwgs.
- ☐ Certified Prints
- ☐ Approved Cert. Prints
- ☐ Specifications
- ☐ Details

INFORMATION ONLY

- ☐ Approval
- ☐ Approval & Comment
- ☐ Correction
- ☐ Your files
- ☐ Your files & Distribution
- ☒ Final Approval
- ☐ Release for Production
- ☐ For use on Job
- ☐ Release for immediate Production
- ☐ Your Estimate for \_\_\_\_\_ work
- ☐ See Description Below

Description

Plant visual Weld inspection

Remarks

☒ Please Acknowledge

C.C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

sent By: Mail ☒ Messenger \_\_\_\_\_

Kindly return 1 Copy(s) to us

Note: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy.

**INFORMATION ONLY**

BY R/B DATE 11/5/82

THE ZACK COMPANY

Procedure for:

PLANT VISUAL WELD INSPECTION

PQCP-19

SECOND EDITION REV. 0

Martino E. Shates 11/5/82  
CORPORATE Q.A. MANAGER DATE

Thomas E. DeLeon for D.E.C. 11/5/82  
CORPORATE PROJECT MANAGER DATE

C

COPYRIGHT 1980  
THE ZACK COMPANY

8301130194



**INFORMATION ONLY**

1.0 PURPOSE

- △ 1.1 To detail the Zack Company's Visual Inspection Procedure for HVAC components and related fabrication.

2.0 SCOPE

- △ 2.1 This Procedure applies to all visual welding inspection at the Zack Company Chicago and Cicero facilities.

3.0 DEFINITIONS

- △ 3.1 Terms used in this Procedure are defined in ANSI N45.2.10, Quality Assurance Terms and Definitions.

4.0 REFERENCES

- 4.1 The Zack Company Quality Assurance Manual.
- 4.2 ANSI N45.2.10-1973, Quality Assurance Terms and Definitions.
- 4.3 Customer's Specifications.
- 4.4 The Zack Company Duct Standards and Construction Details.
- 4.5 AWS 3.0-76, Welding Terms and Definitions.
- 4.6 AWS D1.1-79, Structural Welding Codes - Steel.
- 4.7 AWS D1.3-78, Specification for Welding Sheet Steel in Structures, Paragraph 4.4d and 4.5.

5.0 GENERAL

- △ 5.1 Quality Control individuals who perform visual examination per this Procedure shall be trained, qualified, and certified in accordance with the Written Practice, latest revision.
- △ 5.2 Visual examination shall be performed only by authorized personnel who maintain current qualification in visual examination and have passed an annual visual examination to assure natural or corrected near distance acuity such that they are capable of reading standard J-I letters on standard Jaeger Test Type Charts for near vision or equivalent methods.

6.0 PROCEDURE

- △ 6.1 When notified by the General Foreman to inspect welded components, the Quality Control Inspector, Level II, shall perform the inspection per this Procedure.

**INFORMATION ONLY**

CB-PQCP-19, REV.0  
SECOND EDITION  
Page 3 of 4

- △ 6.2 Visual weld inspection of sheet to sheet, and sheet to structural shall be completed per AWS D1.3-78.
- △ 6.3 Visual weld inspection of structural to structural shall be completed per AWS D1.1-79.

**7.0 ACCEPTANCE CRITERIA**

- △ 7.1 The following paragraphs detail the acceptance criteria of this Procedure.
  - △ 7.1.1 The weldment and adjoining area to be inspected shall be clean and free to loose scale, rust, grease or any other foreign material.
  - 7.1.2 Arc strikes located in the weldment are unacceptable and shall be considered cause for rejection.
  - 7.1.3 Undercuts in excess of 1/32" shall be cause for rejection when identified in material 3/8" or greater. Undercuts in excess of 0.010" shall be cause for rejection in material less than 3/8" thick.
  - 7.1.4 Any crack is cause for rejection.
  - 7.1.5 Craters shall not encroach on the specified section thickness or theoretical throat size.
  - 7.1.6 Welds shall be inspected for fusion. Non-fusion shall be cause for rejection.
  - 7.1.7 Weld profiles shall be in accordance with Attachments Number 1 and 2.
  - 7.1.8 Location size and length of each weld shall be per the latest applicable approved design document.
  - 7.1.9 The sum of diameters of piping porosity in fillet welds shall not exceed 3/8" in any linear inch of weld and shall not exceed 3/4" in any 12 inch length of weld.
  - △ 7.1.10 Weld repairs shall be accomplished, using approved weld repair procedures.

**8.0 REJECTABLE WELDMENTS**

- △ 8.1 Rejected welds shall be reported and documented per CB-PQCP-8, latest revision.

**9.0 FORMS**

- △ 9.1 Acceptable weldment shall be reported and documented on the following forms as applicable.

**INFORMATION ONLY**

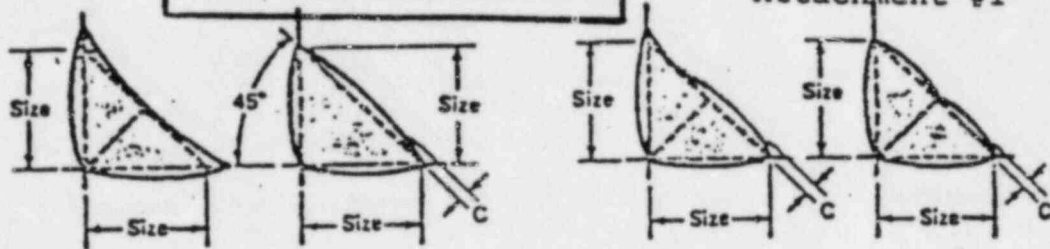
CB-PQCP-19, REV.0  
SECOND EDITION  
Page 4 of 4

- △ 9.1.1 Fab Ticket Form, Attachment Number 3.
- △ 9.1.2 Fabrication QC Inspection Checklist, Attachment #4.
- △ 9.1.3 Nonconformance Report Form, for Conditional Release, Attachment Number 5.

- △ 9.2 The Inspectors may identify with a distinguishing mark all parts or weldments that he or she has inspected and accepted. Total traceability of acceptable weldment shall be documented on the applicable Inspection Form.
- △ 9.3 All inspection report documentation shall be forwarded to the Document Control File for eventual implementation into the final turnover package.

# INFORMATION ONLY

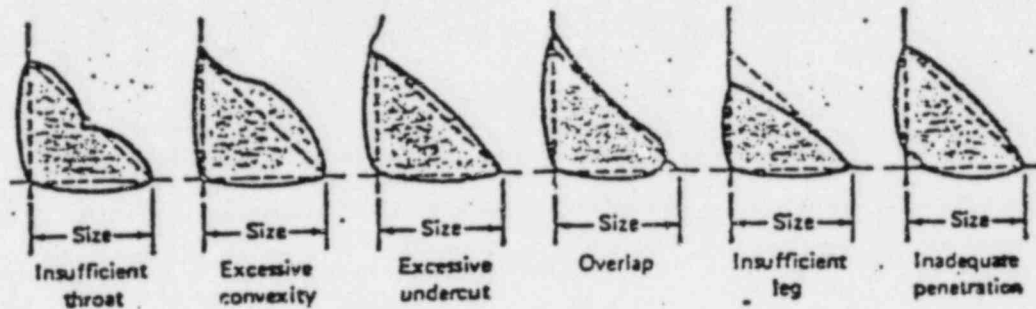
CB-PQCP-19, REV.0  
SECOND EDITION  
Attachment #1



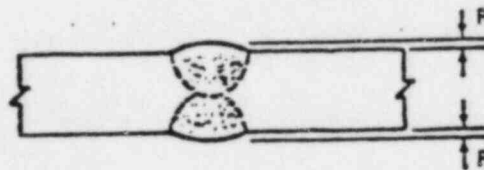
Note: Convexity C shall not exceed 0.1 actual size + 0.03 in.

(A) Desirable fillet weld profiles

(B) Acceptable fillet weld profiles

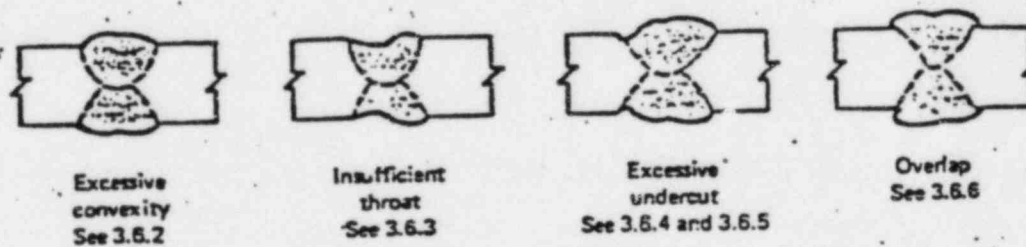


(C) Unacceptable fillet weld profiles



Note: Reinforcement R shall not exceed 1/8 in. See 3.6.2.

(D) Acceptable butt weld profile



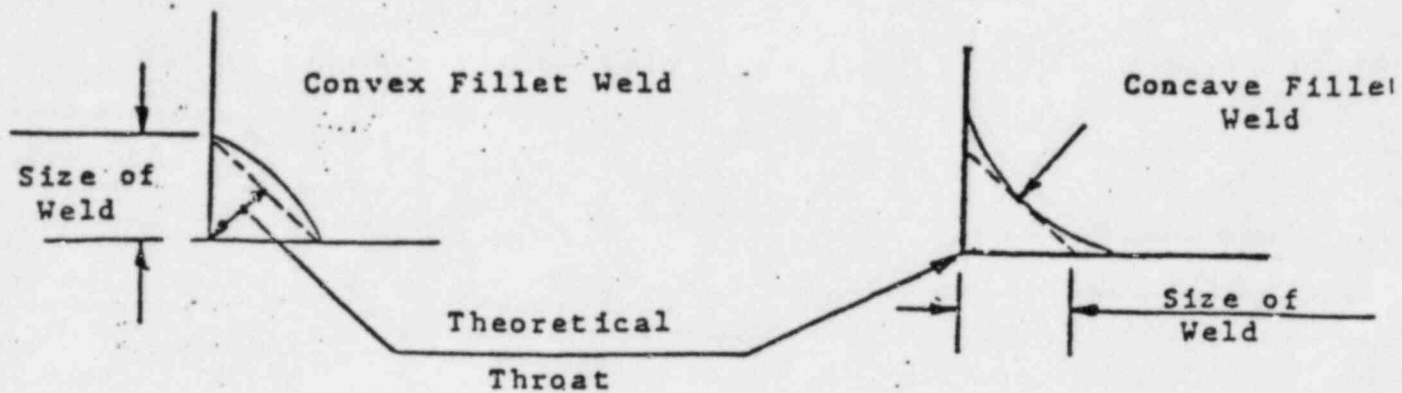
(E) Unacceptable butt weld profiles

Acceptable and unacceptable weld profiles



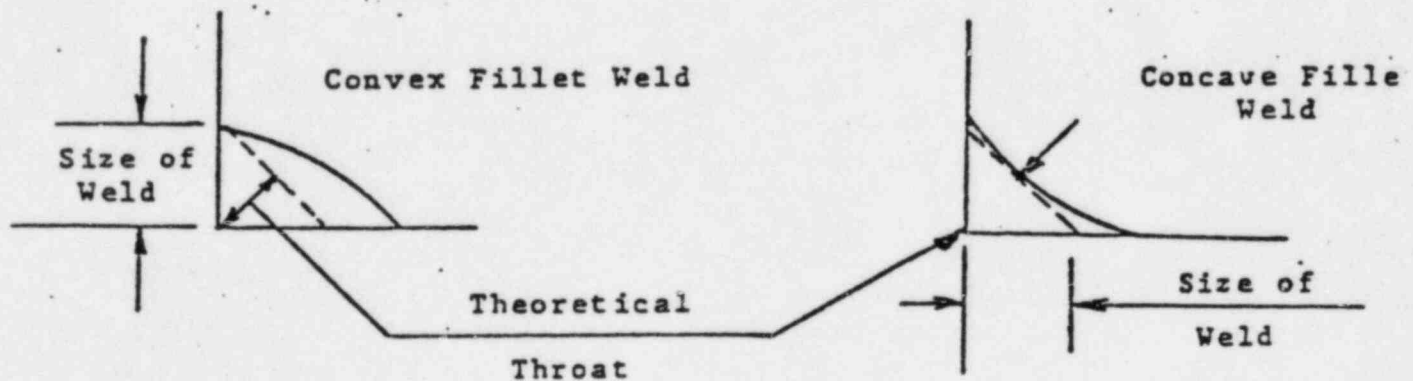
**INFORMATION ONLY**

CB-PQCP-19, REV.0  
SECOND EDITION  
Attachment #2



EQUAL LEG FILLET WELD

NOTE: The size of a fillet weld is the leg length of the largest right triangle that can be inscribed within the weld.



UNEQUAL LEG FILLET WELD

SUBJECT: 4536-00

SPECIFICATION: K 2910

JOB NO: 2900

WG. NO.	MARK	CUST. HOLD POINTS
VISION	GAUGE	WELD PROCEDURE QCP
	NO. REQ.	DIM. TOLERANCES
/EL	SYSTEM	APPROVE/DATE
TAILER/DATE	REVIEW/DATE	

INFORMATION ONLY

CB-PQCP-19, REV.0  
SECOND EDITION  
Attachment #3

SAMPLE - ACTUAL FORM IN USE MAY  
VARY - THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME

CUTTING LIST

QUALITY ASSURANCE

MATERIAL USED

IP TICKET APPROVED/DATE

CONTROL NUMBER

LE IRON CONTROL NUMBER

I.D. INSPECTOR/DATE

PING FINAL INSPECTION/DATE

SITE RECEIVING/DATE

**INFORMATION ONLY**

CB-PQCP-19, REV.0  
SECOND EDITION  
Attachment #4

Fabrication QC Inspection Checklist			
	Accept	Reject	N/A
1. Material Control Numbers Recorded			
2. Welder ID No.			
3. Welding Qualification			
4. Welding Inspection (Configuration, size and visual characteristics)			
5. Duct Dimensions			
6. Hanger Dimensions			
7. Gage of Sheet Steel			
8. Size of Steel Shapes			
9. Vanes			
10. Cleanliness			
11. Internal Duct Reinforcement			
12. Sealants			
13. Coating of Welds			
14. Paint Condition			
15. Item, ID No. (Mark No.)			
QC Sign	Level	Date	Level II QC Review Date

**SAMPLE — ACTUAL FORM IN USE MAY  
VARY — THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME**

REPORT NUMBER: \_\_\_\_\_ NCR CODE: \_\_\_\_\_

DATE: \_\_\_\_\_ PROJECT: \_\_\_\_\_

**INFORMATION ONLY**

ITEM/PART NUMBER \_\_\_\_\_ AREA/LOCATION \_\_\_\_\_ TRAVELER NUMBER \_\_\_\_\_ DRAWING NUMBER \_\_\_\_\_

OWNER FURNISHED MATERIAL/EQUIPMENT YES ☐ NO ☐ SAFETY ☒ NON-SAFETY ☐

DESCRIPTION ON NONCONFORMANCE: \_\_\_\_\_

**SAMPLE - ACTUAL FORM IN USE MAY  
VARY - THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME**

Q.C. INSPECTOR/DATE \_\_\_\_\_

RECOMMENDED REMEDIAL ACTION: \_\_\_\_\_

USE - AS - IS ☐ REWORK ☐ REPAIR ☐ SCRAP ☐

PROJECT MANAGER/DATE \_\_\_\_\_

APPROVED BY: Q.A. MANAGER/DATE \_\_\_\_\_

CONDITIONAL RELEASE REQUEST: \_\_\_\_\_

PROJECT MANAGER/DATE \_\_\_\_\_

APPROVED BY: Q.A. MANAGER/DATE \_\_\_\_\_

REMEDIAL ACTION TAKEN: \_\_\_\_\_

PROJECT MANAGER/DATE \_\_\_\_\_

VERIFICATION OF REMEDIAL ACTION: \_\_\_\_\_

ACCEPTED ☐

REJECTED ☐

Q.C. INSPECTOR/DATE \_\_\_\_\_

Q.A. MANAGER/DATE \_\_\_\_\_



CHICAGO  
ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

CZC# 592

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

Date: Nov. 5, 1982.

To: Zack Company  
P.O. Box 489  
Midland Mich. 48640  
ATTN: Russ Mc Carley

RE: Consumer Power Co.  
Midland Power Station  
7220 - M 151 (A)  
File # 7400

entlemen:

We are Sending to you MB-PQCP-6 REV. 4 X Herewith 5 Copy  
MB PQCP-19 REV. 0. Under Separate Cover 5 Copies

Following

- ☐ Drawings
- ☐ Approved Dwg.
- ☐ Certified Prints
- ☐ Approved Cert. Prints
- ☒ Specifications
- ☐ Details

INFORMATION ONLY

- ☐ Approval
- ☐ Approval & Comment
- ☐ Correction
- ☐ Your files
- ☐ Your files & Distribution
- ☒ Final Approval
- ☐ Release for Production
- ☐ For use on Job
- ☐ Release for immediate Production
- ☐ Your Estimate for \_\_\_\_\_ work
- ☐ See Description Below

Description WELD Filler Metal Control & Welding  
Surveillance Inspection  
Plant Visual Weld. Inspection

Remarks

☒ Please Acknowledge

C. \_\_\_\_\_

Yours very truly,

THE ZACK CO.

By: Mail X Messenger \_\_\_\_\_

Indly return 1 Copy(s) to us

ote: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.

RJ Beranger

**INFORMATION ONLY**

BY

*R/B*

DATE

*11/5/82*

THE ZACK COMPANY

Procedure for:

PLANT VISUAL WELD INSPECTION

MB-PQCP-19

REV. 0

*Martino R. Shates*  
CORPORATE Q.A. MANAGER

*11/5/82*  
DATE

*Thomas E. DeLeon for D.E.C.*  
CORPORATE PROJECT MANAGER

*11/5/82*  
DATE

C

COPYRIGHT 1980  
THE ZACK COMPANY

*8301130195*

**INFORMATION ONLY**

MB-PQCP-19, REV.0  
Page 2 of 4

1.0 PURPOSE

- 1.1 To detail the Zack Company's Visual Inspection Procedure for HVAC components and related fabrication.

2.0 SCOPE

- 2.1 This Procedure applies to all visual welding inspection at the Zack Company Chicago and Cicero facilities.

3.0 DEFINITIONS

- 3.1 Terms used in this Procedure are defined in ANSI N45.2.10, Quality Assurance Terms and Definitions.

4.0 REFERENCES

- 4.1 The Zack Company Quality Assurance Manual.  
4.2 ANSI N45.2.10-1973, Quality Assurance Terms and Definitions.  
4.3 Customer's Specifications - 7220-M-151.  
4.4 The Zack Company Duct Standards and Construction Details.  
4.5 AWS 3.0-76, Welding Terms and Definitions.  
4.6 AWS D1.1-79, Structural Welding Codes - Steel.  
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## 8.0 REJECTABLE WELDMENTS

8.1 Rejected welds shall be reported and documented per CB-PQCP-8, latest revision.

## 9.0 FORMS

9.1 Acceptable weldment shall be reported and documented on the following forms as applicable.



**INFORMATION ONLY**

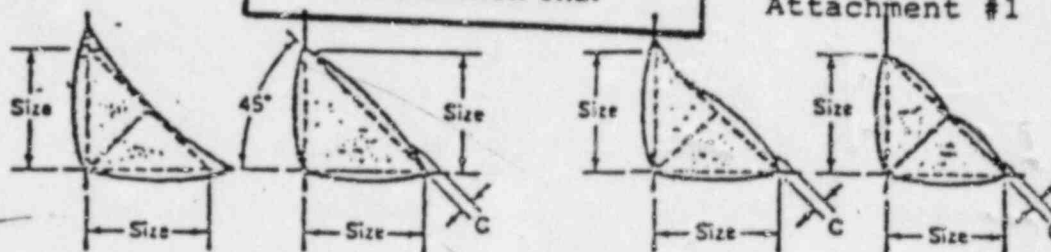
MB-PQCP-19, REV.0  
Page 4 of 4

- 9.1.1 Feb Ticket Form, Attachment #3.
  - 9.1.2 Fabrication QC Inspection Checklist, Attachment #4.
  - 9.1.3 Nonconformance Report Form, for Conditional Release, Attachment #5.
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# **INFORMATION ONLY**

MB- PQCP-19, REV.0

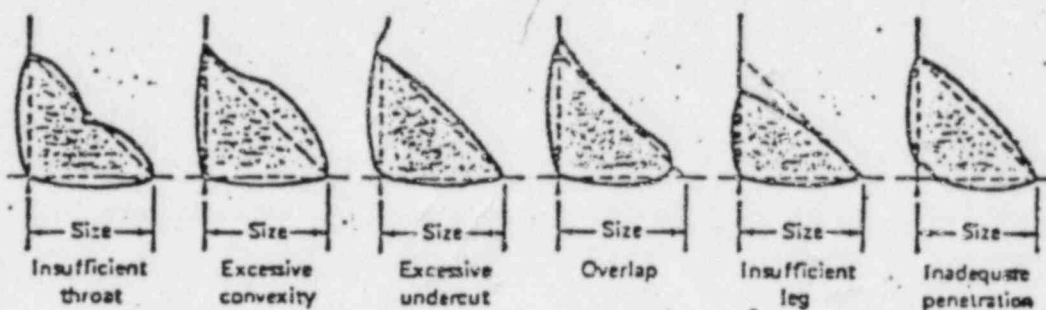
Attachment #1



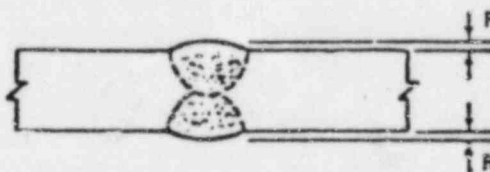
Note: Convexity C shall not exceed 0.1 actual size + 0.03 in.

(A) Desirable fillet weld profiles

(B) Acceptable fillet weld profiles

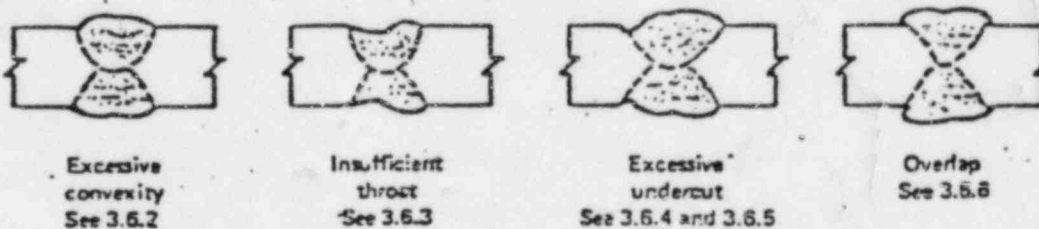


(C) Unacceptable fillet weld profiles



Note: Reinforcement R shall not exceed 1/8 in. See 3.6.2.

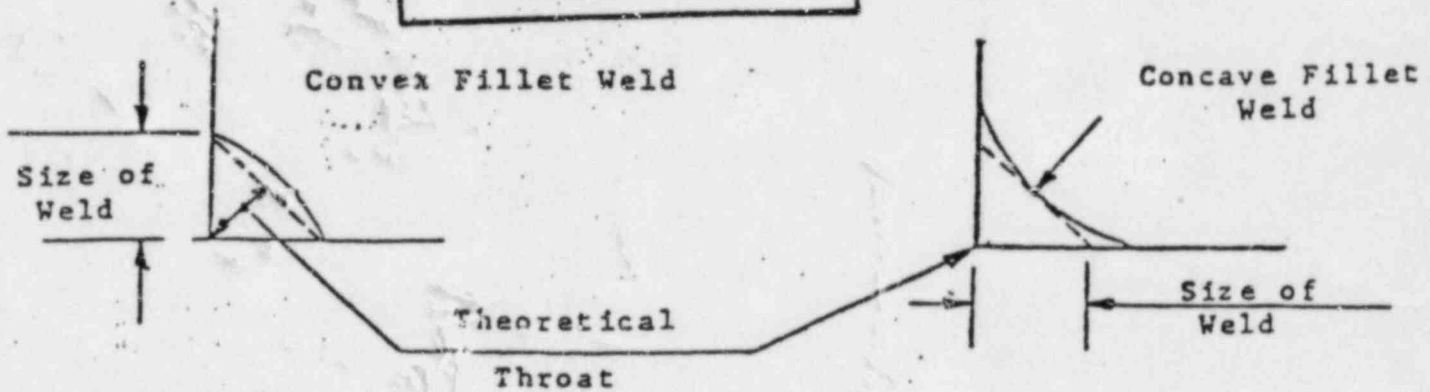
(D) Acceptable butt weld profile



(E) Unacceptable butt weld profiles

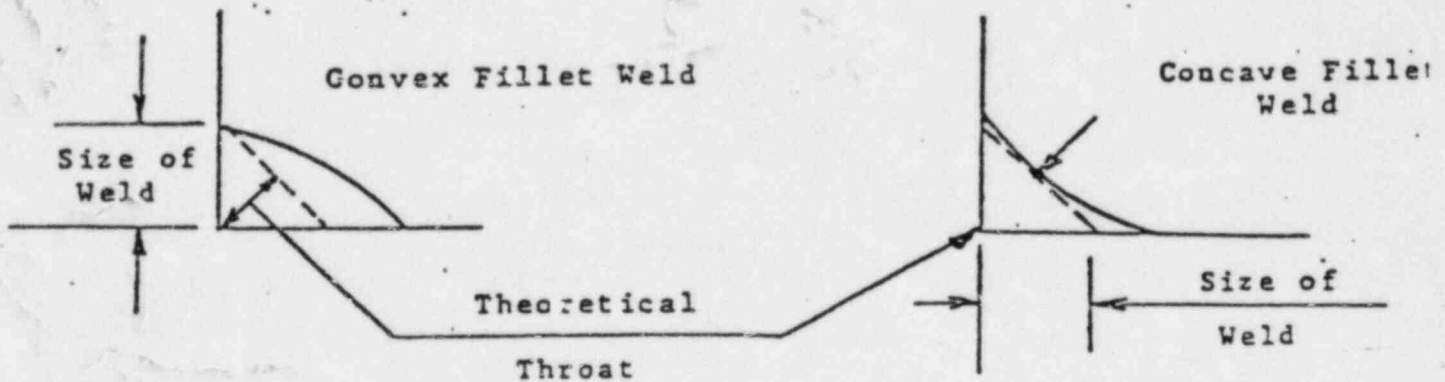
Acceptable and unacceptable weld profiles

**INFORMATION ONLY**



EQUAL LEG FILLET WELD

NOTE: The size of a fillet weld is the leg length of the largest right triangle that can be inscribed within the weld.



UNEQUAL LEG FILLET WELD

MIDLANE VITS 1 &amp; 2

MB-PQCP-19, REV.0 - ATTACHMENT #3

JOB NO.

TICKET NO. F22362

SHIP: ASSEMBLED - KNOCKED DOWN | CHECKER: \_\_\_\_\_ DATE: \_\_\_\_\_ DRAWN BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CUTTING LIST				QUANTITIES			
				SHEET	ANGLE		
Arch _____	Seismic Class _____	Bldg. _____	System _____				
Usage _____	Pressure Class _____	Level _____	Item _____				
o. Req. _____		Area _____	Face Area _____				
CUSTOMER _____							
HOLD POINTS _____							
DIMENSIONAL TOLERANCES: $\pm 1/4$ _____							
WELDING PROCEDURE(S): WPS _____							
<div>INFORMATION ONLY</div>							

## QUALITY ASSURANCE

## OFFICE USE ONLY

IOP TICKET PROVED	DESCRIPTION	QUANTITY	WEIGHT	FABRICATION		ERECTION	
				PRICE	AMOUNT	PRICE	AMOUNT
CONTROL NO.							
ANGLE IRON CONTROL NO.							
ELDER							
SPECTOR							
IPPING, FINAL SPECTION							
QUANTITY - MS THIS TICKET							
B SITE CEIVING							
TOTALS				\$		\$	



**INFORMATION ONLY**

### Fabrication QC Inspection Checklist

	Accept	Reject	N/A
1. Material Control Numbers Recorded			
2. Welder ID No.			
3. Welding Qualification			
4. Welding Inspection (Configuration, size and visual characteristics)			
5. Duct Dimensions			
6. Hanger Dimensions			
7. Gage of Sheet Steel			
8. Size of Steel Shapes			
9. Vanes			
10. Cleanliness			
11. Internal Duct Reinforcement			
12. Sealants			
13. Coating of Welds			
14. Paint Condition			
15. Item. ID No. (Mark No.)			

OC Sign	Level	Date	Level II OC Review	Date
---------	-------	------	--------------------	------

1. REPORT NUMBER _____		N.G.R. CODE: _____	
2. DATE _____		PROJECT: _____	
3. ITEM / PART NUMBER _____		5. DRAWING NUMBER _____	
4. AREA / BUILDING _____			
6. OWNER FURNISHED MATERIAL OR EQUIPMENT <input type="checkbox"/> YES <input type="checkbox"/> NO		7. Q. LISTED <input type="checkbox"/> YES <input type="checkbox"/> NO	

8. DESCRIPTION OF NON CONFORMANCE: _____		
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">INFORMATION ONLY</div>		
9. REPORTED BY _____ DATE _____		
10. RECOMMENDED CORRECTIVE ACTION: _____		
11. QC INSPECTOR / DATE	12. QA/QC MANAGER / DATE	13. PROJECT MANAGER / DATE

<p>14. CORRECTIVE ACTION TAKEN: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>15. PROJECT ENGINEER / DATE _____</p> <p>16. PROJECT MANAGER / DATE _____</p>
---	--

17. VERIFICATION OF CORRECTIVE ACTION TAKEN: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. ACCEPTED ☐ REJECTED ☐ \_\_\_\_\_

19. QC INSPECTOR / DATE \_\_\_\_\_ 20. MANAGER / DATE \_\_\_\_\_

SECTION B  
NONCONFORMANCES:

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 7, shop fabrication tickets were not complete in all respects, in that they did not address certain fabrication methods/operations, and their sequencing; e.g., rolling or forming and galvanizing.

The Zack Company Corrective Action:

It is the position of the Zack Company that due to the limited number of variable operations used in the sheet metal industry, there is no need for detailed sequencing on the Shop Travelers. In addition, sufficient design documents exist ("C" and "M" drawings and duct standards) and are in use to preclude incorrect fabrication of any given duct piece fitting or hanger.

Action to Prevent Recurrence:

The Zack Company QA Manual has been rewritten, submitted for approval at Midland and is currently approved for use at Clinton. The new QA Manual does not address the specifics of the Traveler System. Those specifics are contained in PQCP-3. Shop personnel have been trained in the applicable portions of the new QA Manual and plant fabrication procedures to assure compliance.

Corrective Action Completion:

All submittals and approvals and all training of shop personnel was complete as of November 19, 1982.

SECTION B  
NONCONFORMANCES:

6A Contrary to Criterion V of Appendix B to 10 CFR 50 and QA Manual Section 8, the following conditions were identified:

- a. The Zack Company placed purchase order (PO) number C-4199 with Central West Machinery Company in November 1980 for 152 gallons of Hardcast FTA-20. This material was received and accepted.

Subsequently, a verbal order for additional 24 gallons was placed and received in November 1980, and as of the date of this inspection, no written confirmation has been made.

The Zack Company Corrective Action:

Training has been conducted with the Purchasing Agent as to the requirements of follow-up action to be taken on verbal confirmations to the purchase order.

An internal supplement change has been issued to PO No. C-4199. Due to the time span involved, this supplement change order will not be issued to our supplier, but has been incorporated in Zack's PO file.

Action to Prevent Recurrence:

The Zack Company Quality Assurance Manual Program, Procedures, and Training Sessions have been upgraded to incorporate a complete review of all purchase requisitions, purchase orders, and supplement change orders, by the Quality Assurance Department.

- 6B. The Zack Company placed PO No. C-874 with Griffiths-McKillen Steel Company on July 5, 1979, for 3000 lbs. of 14 gage ASTM A-240 Type 304-2B stainless steel and 600 feet of 1-1/2"x1-1/2"x1/8" stainless angles, ASTM A-276 Type 304, with certifications required.

The received and accepted certification, dated July 18, 1979, for the ASTM A-240 material showed the following: tensile strength-66,000 PSI, phosphorus-0.38; sulfur 0.06; and nitrogen content was not addressed. The ASTM A-240 standard requires 70,000 PSI tensile strength (minimum), 0.045 maximum phosphorus, 0.03 maximum sulfur, and 0.10 maximum nitrogen. (NOTE: This material was ordered for non-safety related applications.

SECTION B  
NONCONFORMANCES:

The Zack Company Corrective Action:

The material was purchased for use on the Midland Project only. At the time of placement of this purchase order there were no requirements established for Zack Quality Assurance to review material certifications (nonsafety-related) for compliance.

The material certification was submitted to our client on a supplier deviation disposition request (SDDR-2500) on May 10, 1982 and accepted by our client on August 16, 1982.

Action to Prevent Recurrence:

The requirement for Zack Quality Assurance to review all material certifications for compliance was established in August 1981. This requirement has been incorporated into our Quality Assurance Program Manual and Procedures.

On-going review of all purchase orders and material certifications is being performed by Zack Quality Assurance Department.

Revalidation of all history certifications is being performed by Q.A., and all discrepancies will be identified under the Zack Company nonconformance system. Anticipated completion of history documentation revalidation is July 1, 1983.

- 6C The Zack Company placed P.O. Number C-4458 dated July 30, 1981, with Hobart North for 30 lbs. stainless steel weld rod 3/32" Type 308. The P.O. stated "actual or typical chemistry, RT (radiography), mechanicals, Charpy V notch tests."

The Certified Material Test Report (CMTE) was received and accepted by Zack Company, but did not address RT or Charpy V Notch tests. (NOTE: The material specification does not require RT or Charpy's; however, it is still a P.O. requirement.

The Zack Company Corrective Action:

On August 11, 1982, a supplement change order #1 was issued for P.O. Number C-4458 to delete the requirements of RT (radiography) and Charpy V. notch. All other requirements remain the same.



SECTION B  
NONCONFORMANCES:

Action to Prevent Recurrence:

All purchase orders for nuclear are being reviewed by Quality Assurance for compliance with the requirements of the specification.

- 6D The Zack Company placed P.O. Number C-9433, dated August 4, 1976, with Vincent Brass & Aluminum Company for 4000 lbs. of 20 gage and 2000 lbs. of 22 gage stainless coils, Type 316, ASTM A-240, with mill certifications required.

The material was received with certification, dated August 9, 1976. The 20 gage material was returned to Vincent due to damage. However, the 22 gage material was accepted, although the certification did not list a heat number and did not provide the actual chemistry. The chemistry stated on the certification was simply a reiteration on the chemistry requirements stated on ASTM A-240. (NOTE: This material was ordered as nonsafety related.

The Zack Company Corrective Action:

The Zack Company obtained mill certification for 22 gage ASTM A-240 material from the supplier. This material was identified on Zack Nonconformance Report Number L297, and submitted to the client. The nonconformance was closed March 19, 1982.

Action to Prevent Recurrence:

All purchase orders and mill certifications (where required) are being revalidated and any discrepancy's will be identified under Zack's nonconformance system.

Anticipated completion for revalidation is July 1, 1983.

- 6E The Zack Company placed PO Number C-739, dated September 29, 1978, with US Steel Company for 20 tons of ASTM A-527, A-525 galvanized coils. Certifications were required.

The material and certifications were received and accepted showing the heat numbers as J 74531 and J 74278.

The certifications did not provide physical test reports for Heat J 74531. (NOTE: The ASTM material standard does not require physical properties to be reported; however, this material was purchased for use at Clinton Power Station and the Clinton specification did require physical properties to be reported).

REPORT NO. 99900785/82-01

SECTION B  
NONCONFORMANCES:

The Zack Company Corrective Action:

The Zack Company obtained samples of material from Heat J 74531 (Coil #402) and sent the samples to P.T.L. for physical properties analysis. Certification is on file in the purchase order package.

SUMMARY OF ITEM NO. 6

All purchase orders for nuclear safety-related and nonsafety-related materials are being reviewed by Quality Assurance for compliance to the required program. All Mill Certification Reports are being reviewed by Quality Assurance and where required, (1) corrected certifications are being pursued, (2) material samples are being sent to test labs for analysis and/or (3) identified under Zack's nonconformance system and forwarded to the Design Engineers for disposition.

SECTION B  
NONCONFORMANCES:

7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 9.1 of Sargent & Lundy Engineers, Chicago, Illinois, Standard Specification J2590 for HVAC ductwork (Form 320), unapproved materials (Hardcast FTA-20 adhesive and DT tape) were used in sealing HVAC systems at LaSalle.

The Zack Corrective Action:

The Zack Company had revised Class I (Safety Related (Seismic)) duct plate D1-02 to include Hardcast FTA-20 with DT tape on December 9, 1981 and transmitted it for approval as part of a group of duct plates to Sargent & Lundy on January 14, 1982 (duct plate and transmittal attached). Sargent & Lundy approved duct plate D1-02 on August 27, 1982 making Hardcast FTA-20 with DT tape acceptable for use.

Action to Prevent Recurrence:

For approximately the past 13 months, part of the Zack Company Q.A. Manual of purchase orders is a review of applicable technical Specifications to verify that the product being ordered is an approved product for use on the applicable project. No purchase order for unapproved products will be approved by Q.A. thereby making purchase impossible.

Corrective Action Completion:

Corrective action is complete.

# INFORMATION ONLY

BY

RJB

DATE

11/5/82

## DUCT SEALANTS (SAFETY-RELATED DUCTWORK)

- 1) SILICON CONSTRUCTION SEALANT, #SCS 1200, AS MANUFACTURED BY THE GENERAL ELECTRIC COMPANY.
- 2) SILICONE RUBBER SEALANT #732 - RTV, AS MANUFACTURED BY DOW CORNING CORPORATION.
- 3) "Dukseal" as manufactured by Johns-Manville (used only under ends of drive shaft "knock-over" of low pressure duct connections)
- 4) Hardest PTH-20 adhesive with DT tape

### GASKET

- 1) Weatherban - #1202T, as manufactured by Minnesota Mining & Mfg. Co.
- 2) In drywell use of gasket material is optional

### ZINC RICH COATING

- 1) ZRC cold galvanizing compound as manufactured by ZRC Chemical Products Co.
- 2) LPS instant cold galvanize and/or galvanox #1 for repair work inside drywell & containment building.

SUPERSEDES PRINT  
REVIEWED 9-28-79

SUP LTR. T-060479

## CLASS I - SAFETY - RELATED (SEISMIC) DUCTWORK SEALANTS & GASKETS

Scale:	Approved By:	Drawn By: L. J. J.
Date: 4-9-76		Rev. 12/9/81
THE ZACK CO.		JOB NO:
CHICAGO, ILLINOIS		3100
JOB LA SALLE COUNTY STATION COMMONWEALTH EDISON COMPANY		Drawing No. 11-02

REV.2 J-2590 T-011482

REVIEWED FOR  
LA SALLE COUNTY STATION  
UNITS 1 & 2  
COMMONWEALTH EDISON CO.  
SARGENT & LUNDY  
ENGINEERS

1 ☒ NO EXCEPTION TAKEN CONTRACT  
MAY PROCEED WITH FABRICATION OR  
CONSTRUCTION IN ACCORDANCE  
WITH SPECIFICATION

2 ☐ CONTRACTOR MAY PROCEED  
WITH FABRICATION OR CONSTRUCTION  
BASED ON JAILING REVISION,  
AS NOTED AND RECORDED.

3 ☐ REVIEWED AND APPROVED  
BY: [Signature]

FOR ACTING SUPERVISOR ABOVE  
SUBJECT TO THE TERMS OF THE  
CONTRACT AND THE FOLLOWING  
CONTRACTOR SHALL BE OBLIGATED  
TO THE CONTRACT, INCLUDING  
INCLUDING DESIGN AND DETAILING  
FOR HVAC DUCTWORK  
EQUIPMENT NO  
BY: J. J. J. DATE 8-27-82  
SPEC. NO. J-2590-ROJ NO. 4269



CHICAGO  
ILLINOIS

DETROIT  
MICHIGAN

FLINT  
MICHIGAN

GARY  
INDIANA

MIAMI  
FLORIDA

# THE ZACK CO.

4600 W. 12TH PLACE  
CHICAGO, ILL. 60650

Telephone:  
Bishop 2-3434

Date: 1/14/82

O: Sargent & Lundy  
55 E. Monroe St.  
Chicago, Ill. 60603  
TTN: E.P.Ricohermoso  
D.R.Spisak

RE: Commonwealth Edison Co.  
La Salle County Station  
HVAC/J-2590  
3300  
File #                     

entlemen:

e are Sending to you .....

the  
following

- ☐ Drawings
- ☐ Approved Dwgs.
- ☐ Certified Prints
- ☐ Approved Cert. Prints
- ☐ Specifications
- ☐ Details

X Aperture Cards

X Here with 1 Micro Copy  
Under Separate Cover 2 Xerox Copies

For

- ☐ Approval
- ☐ Approval & Comment
- ☐ Correction
- ☐ Your files
- ☐ Your files & Distribution
- ☐ Final Approval
- ☐ Release for Production
- ☐ For use on Job
- ☐ Release for immediate Production
- ☐ Your Estimate for \_\_\_\_\_ work
- ☒ See Description Below

escription We are submitting herewith aperture cards with revised and  
additional details required to complete Zack Co. duct construction  
brochure in accordance w/project requirements and as built conditions.

emarks See attached sheet for listing of Zack Plates.

☐ Please Acknowledge

C. L. P. Ricohermoso 1/14/82

## INFORMATION ONLY

BY

R/B

DATE

1/15/82

Yours very truly,

THE ZACK CO.

By: Mail \_\_\_\_\_ Messenger \_\_\_\_\_

indly return 1 Copy(s) to us

Louie R. Ochoa  
Louie R. Ochoa

ote: If two copies of this letter are enclosed, kindly acknowledge receipt by signing below and returning one copy to us.



4266/67

J-2590

3300 - DI-00

REV. 4

12/17/81

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ZACK

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SECTION B  
NONCONFORMANCES:

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and PQCP-7, "Plant Document Control", there was no documented evidence that a voided document file was maintained up-to-date for Q.A. Manual for Clinton and Welding Procedure WPS-1.

The Zack Corrective Action:

Research into site files and previously identified Chicago History Files has brought to light all previous revisions of the ZQAM for Clinton. All revisions of said manual are on file in the Chicago office.

WPS-1 is a Welding Procedure that superceded Procedure QCP-1 P9CS. QCP-1 P9CS went through four (4) approvals for use on the Clinton project, Revision 4 being the last. WPS-1, Rev. 4, was submitted for approval to supercede QCP-1 P9CS Rev. 4 while QCP-1 P9CS Rev. 4 was still pending approval. WPS-1 was submitted the first time as Rev. 4 to maintain continuity of revision level with the Procedure it was replacing.

When both Procedures were approved as Rev. 4, Zack personnel realized that WPS-1 should have been submitted as Rev. 5 to maintain continuity. The final error was submitting the next WPS-1 as Rev. 6 thus never issuing a Rev. 5 or changing Rev. 4 to Rev. 5. All copies of the affected Procedures are on file.

Action to Prevent Recurrence:

Training has been provided to Document Control Personnel stressing the requirements of maintaining a file of voided documents.

Corrective Action Completed:

A review of all history files is on-going with a projected completion date of March 1, 1983.

SECTION B .  
NONCONFORMANCES:

9. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 19, "Audits," of the QA Manuals for LaSalle and Clinton, and PQCP-17, "Training, Certification, and Evaluation of Quality Assurance Auditors - Performance of Audits and Vendor/Supplier Surveys," a review of internal audits conducted from 1979 through 1981 showed all sections of the QA Manuals were not audited on an annual basis, and 10 audit plans and 3 checklists were missing for the 17 internal audits performed.

The Zack Corrective Action:

As auditors involved with the audits in question are no longer with the Zack Company and conditions at the time of the actual audit cannot be recreated, audit plans and checklists cannot be generated at this time. Action to prevent recurrence is the only applicable corrective action.

Action to Prevent Recurrence:

Auditor training has been upgraded and is now documented in the Zack Written Practice for Auditor/Lead Auditor training. All audits conducted since October of 1981 are complete in all respects. Training of Auditors/Lead Auditors in the new Written Practice will take place as time allows.

Corrective Action Completed:

Training of Auditors/Lead Auditors should be complete by January 15, 1982.

## TABLE OF CONTENTS

1. WHAT IS AN AUDIT?
2. WHY AUDIT?
3. WHO AUDITS?
4. HOW TO AUDIT (TECHNIQUES)
5. WHEN TO AUDIT & RE-AUDIT
6. AUDIT FORMS

### **INFORMATION ONLY**

BY

*RJB*

DATE

*11/9/92*

INFORMATION ONLY

SECTION 1

WHAT IS AN AUDIT?

GLOSSARY  
DEFINITIONS  
CLASSIFICATIONS  
AND  
DESCRIPTIONS



## GLOSSARY

### AUDIT

An evaluation of the effectiveness of the quality program. It may be performed as a product, process, system or operational audit.

### AUDITOR

Individual performing audit. Usually a member of the Quality Assurance Department, but also includes other members of audit team not part of QA.

### CHARACTERISTIC

#### **INFORMATION ONLY**

Any property or attribute of an item, process, or service that is distinct, describable and measurable, as conforming or nonconforming to specified quality requirements. Quality characteristics are generally identified in specifications and drawings which describe the item, process, or service.

### DOCUMENTATION

Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results.

### NONCONFORMANCE

A deficiency in characteristics, documentation, or procedure which renders the quality of an item unacceptable or indeterminate. Examples of nonconformance include: physical defects, test failures, incorrect or inadequate documentation, or deviations from prescribed processing, inspection or test procedures.

OBJECTIVE EVIDENCE

Any statement of fact, information, or record, either quantitative or qualitative, pertaining to the quality of an item or service based on observations, measurements, or tests which can be verified.

PROCESS AUDIT

In-process check of an operation or series of operations to assure that the process consistently produces items of good quality.

PRODUCT AUDIT

Random sample of final product, checked to determine quality of the output of the system and used to judge the effectiveness of the quality system.

SURVILLANCE

The continuing analysis and evaluation of records, methods, and procedures including the act of verification to assure conformance with technical requirements.

**INFORMATION ONLY**

A system whereby supplies and equipment in storage are subjected to, but not limited to, cyclic, scheduled, and special inspection and continuous action to assure that material is maintained in a ready-for-use condition.

SYSTEM AUDIT

An evaluation of the existence, awardness and implementation of the Quality Assurance system.

VERIFICATION

A combination of monitoring actions, inspection or both for the purpose of determining compliance of the contractor with the provisions of the contract and evaluating the effectiveness of propriety of his inspection or quality control system.

Auditor - Any individual who performs any portion of an audit, including Lead Auditors, technical specialists and others such as management representatives and auditors-in-training.

Lead Auditor - An individual qualified to organize and direct an audit, report audit findings and evaluate corrective action.

Audit - A documented activity performed in accordance with written procedures or checklists to verify, by examination and evaluation of objective evidence, that applicable elements of the Quality Assurance Program have been developed, documented and effectively implemented in accordance with specified requirements. An audit should not be confused with surveillance or inspection for the sole purpose of process control or product acceptance.

Referenced Documents

Documents that are referenced in this standard are identified at the point of reference and described in Section 6 of this standard.

INFORMATION ONLY

There are a number of different classifications and types of audits that may be utilized to evaluate a Quality Assurance Program. In this Chapter, the various classifications and types of audits are discussed. In Chapter 5, the plan and sequence of events of an audit are covered; Chapter 6 and Appendix B provide typical methods of evaluating a Quality Assurance Program while the criteria for acceptance is covered in Chapter 7.

#### CLASSIFICATION OF AUDITS

Audits may be classified by the organizational location (where) of the audit or by the sequence in time (when) of the activity to be evaluated. Some typical classifications of audits are:

##### Internal

Audits of a Quality Assurance Program under an organization's direct control and within its organizational structure.

##### External

Audits of a Quality Assurance Program not under an organization's direct control, and not within its organizational structure, such as a supplier.

**INFORMATION ONLY**

##### Pre-Award

Audit of the Quality Assurance Program of a potential supplier of a product or service prior to the placement of the purchase order or contract.

##### Post-Award

Audit of the Quality Assurance Program of a supplier of a product or service after the placement of a purchase order or contract and before or during the production activities on the specific purchase order or contract.

##### Supplemental

Special audits, in addition to regularly scheduled audits, which are performed due to significant changes in the Quality Assurance Program, the organizational structure or the product or service quality.

Pre-award, post-award and supplemental audits may be either internal or external audits.

Subclassification of audits may be made by the activities to be covered, (what) which then determines the specific form of the evaluation process.

Program

Evaluation of the existence, documentation, compliance with and effectiveness of a Quality Assurance Program that meets the customer requirements and company policy.

Product

Evaluation of the effectiveness of the Quality Assurance Program through the assessment of the output of the plant, facility, or manufacturing process.

Process

Evaluation of the effectiveness of the Quality Assurance Program through evaluation of the knowledge of, adherence to and adequacy of specific production methods.

System

Evaluation of effectiveness of the Quality Assurance Program through the determination and evaluation of the existence, personnel awareness and the actual practices of the individual functional systems that comprise the Quality Assurance Program.

INFORMATION ONLY

Accounting (Operational)

A review and appraisal of the effectiveness of the operational elements of control of an organization such as organizational structure, authority and responsibility, policies and procedures, and documentation.

Partial

An examination of a Quality Assurance Program that embraces a brief observation of only a portion of the organizations activities at one time.

Follow-up

A reinvestigation of some previously known weak area or situation of the Quality Assurance Program or a determination if previously committed corrective action was taken and is effective.

The areas of process, product, and system audits are really subsets of the program audit. The process audit evaluates existence of and compliance with specific operating (manufacturing, test, etc.) instructions. The product audit is an item evaluation of the results of the systems of operations and controls, and the systems audit is a detailed examination of systems and procedures for adequacy and compliance thereto. These three types of audits provide an in-depth analysis of the entire Quality Assurance Program.



Depending upon the particular portion of the program being investigated, partial or follow-up audits are nothing more than limited (by the area of concern to be evaluated) product, process or system audits.

**INFORMATION ONLY**

Other Audit-Type Activities

There are other activities that are often confused with auditing, but they are not the same as auditing as defined in this test. For example:

Survey

A comprehensive review, analysis and evaluation of the facilities, financial resources, personnel, and technical capability as well as the Quality Assurance Program of a supplier or contractor is called a survey. It is an overall assessment of a supplier's capability to deliver a product or service on time at the specified price and in compliance with contract requirements. It is used to evaluate and assist in selecting potential suppliers and contractors. The techniques employed in performing audits are applicable to surveys.

Surveillance

Witnessing or monitoring, on a statistically sound basis, processes, systems and operations is called surveillance and is similar to process audits except that it is usually performed by supervision rather than by inspectors or auditors.

Inspection

The act of verifying by examination and testing conformance of a product or service to predetermined requirements for purposes of acceptance or rejection is called inspection.

Management Audit

Periodic and planned witnessing or monitoring of processes, systems, and operations by supervision directly or indirectly responsible for the quality-related activities being observed is called Management Auditing and should be performed using sound statistical techniques. Management Auditing is practically the same as surveillance.

AUDIT ACTIVITIES

Introduction

The types and kinds of audits as well as activities similar to audits have been clarified. We will now discuss in more detail the activities involved in the principal mechanics of the auditing function.

**INFORMATION ONLY**

SECTION 2

WHY AUDIT?

NUCLEAR INDUSTRY REQUIREMENT

# MATRIX OF RELATIONSHIP BETWEEN SURVEY AND QUALITY ASSURANCE REQUIREMENTS

<u>SURVEY SECTION</u>	<u>ANSI N45.2</u>	<u>10CFR50 APP.B</u>	<u>ASME-NA 4000</u>
A. Administrative	1,2,3	I,II	4100,4200,4300
B. Procurement Control	5,8	IV,VII	4441
C. Receiving Control	5	VIII	4442
D. Material Storage and Handling	9,14	VII, XIV	4442,4460,4540
E. In-Process Control	6,9,15,18	V,VII,XIV,XVII	4420,4442,4450,4460,4540,4900
F. Final Inspection Acceptance and/or Test	11,12,15,18	X,XI,XIV,XVII	4442,4510,4520,4530,4900
G. Packaging and Shipping	6,14	V,XIII	4420,4442,4460
H. Drawing and Change Control	4,7	III,VI	4410,4430
I. Tool and Gage Control	13	XII	4600
J. Non-Conforming Material Control	6,16	V,XV	4550
K. Sampling Inspection	18	XVII	4900
L. Corrective Action	17	XVI	4800
M. Conformance Specification	2	II	4100
N. Control of Special Processes	10	IX	4450
O. Audits (Covered in Chapter III)	19	XVIII	4700

INFORMATION ONLY

A comprehensive system of planned and periodic audits shall be carried out by the Manufacturer's or Installer's organization to assure compliance with all aspects of the Quality Assurance Program and to determine the effectiveness of the Program. The audits shall be performed in accordance with written procedures or checklists by personnel not having direct responsibilities in the areas being audited. Audit results shall be documented by the auditing personnel for review by management having responsibility in the area audited. Follow-up action, including re-audit of deficient areas, shall be taken where indicated. Results of audits shall be made available to the Inspector.

**INFORMATION ONLY**

XVIII. Audits (Per, 10CFR50 Appendix B)

A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the Quality Assurance Program. The audits shall be performed in accordance with the written procedures or checklists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audit results shall be documented and reviewed by Management having responsibility in the area audited. Follow-up action, including re-audit of deficient areas, shall be taken where indicated.

NA-3720 QUALITY SYSTEM CERTIFICATE  
(MATERIALS)

(a) A Material Manufacturer shall hold a Quality System Certificate (Materials) verifying the adequacy of the Material Manufacturer's Quality System Program, or alternatively the Material Manufacturer shall have his Quality System Program surveyed and qualified by the Materials Supplier or by the Manufacturer or Installer of items (NA-3361 or NA-3451).

(b) A Materials Supplier shall hold a Quality System Certificate (Materials) verifying the adequacy of the Material Supplier's Identification and Verification Program or Quality System Program. Alternatively, the Material Supplier shall have his Identification and Verification Program of Quality System Program surveyed and qualified by the Manufacturer or Installer of items (NA-3361 or NA-3451).

(c) A Material Manufacturer or a Material Supplier may obtain from the Society a Quality System Certificate (Materials) for the manufacture or supplying of materials which are to be in compliance with this Section. The information to be supplied by the Material Manufacturer or Material Supplier when making application is given in Forms N-70A, N-70B, and N-70C.



## **XIX. Audits (Per, ANSI N45.2)**

A comprehensive system of planned and documented audits shall be carried out to verify compliance with all aspects of the Quality Assurance Program. The audits shall be performed in accordance with written procedures or checklists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audit results shall be documented and reviewed by Management having responsibility in the area audited. Responsible Management shall take necessary action to correct the deficiencies revealed by the audit.

### **INFORMATION ONLY**

#### **Audits should be performed:**

- (1) to provide an objective evaluation compliance with established requirements, methods and procedures;
- (2) to assess progress in assigned tasks;
- (3) to determine adequacy of Quality Assurance Program performance; and
- (4) to verify implementation of recommended corrective action.

Deficient areas should be re-audited until corrections have been accomplished.

Audits should include an evaluation of quality assurance practices, procedures and instructions; the effectiveness of implementation; and conformance with policy directives. In performing this evaluation, the audits should include evaluation of work areas, activities, process, and items, and review of documents and record.

An audit plan should be developed to provide information about the audit, such as the functional areas to be audited, the names and assignments of those who will perform the audit, the scheduling arrangements, and the method of reporting findings and recommendations.

Audits should be conducted periodically or on a random, unscheduled basis, or both. It is desirable to conduct audits when one or more of the following conditions exists:

- (1) When it is necessary to determine the capability of a subcontractor's Quality Assurance Program prior to awarding of contract or purchase order.
- (2) When, after award of contract, sufficient time has elapsed for the implementation of the Quality Assurance Program, and it is appropriate to determine that the organization is performing the functions as defined in the Quality Assurance Program description, codes, standards, and other contract documents.
- (3) When significant changes are made in functional areas of the Quality Assurance Program, including significant reorganizations and procedure revisions.



- (4) When it is suspected that safety, performance, or reliability of the item is in jeopardy due to deficiencies and non-conformances in the Quality Assurance Program.
- (5) When a systematic, independent assessment of program effectiveness or item quality or both is considered necessary.
- (6) When it is considered necessary to verify implementation of required corrective actions.

**INFORMATION ONLY**

INFORMATION ONLY

SECTION 3

WHO AUDITS?

ANSI N45.2.23

DEFINITIONS & REQUIREMENTS

**INFORMATION ONLY**

BECAUSE QUALITY PEOPLE ARE MANY TIMES  
INVOLVED IN DIFFERENT FUNCTIONS THEY  
MUST BE VERY CAREFUL THAT THEY ARE  
AWARE OF WHICH FUNCTION THEY ARE IN  
AT A GIVEN TIME.

SUMMARY - ANSI N45.2.23

QUALIFICATION OF QUALITY ASSURANCE PROGRAM  
AUDIT PERSONNEL FOR NUCLEAR FACILITIES

Covers Auditors and Lead Auditors  
Both must have:

INFORMATION ONLY

Experience and training in scope and subject.  
Understanding of ANSI N45.2 and other standards.  
Training/orientation in auditing procedures of organization  
Training - general, specialized and on-the-job.

Lead Auditor must have at least ten (10) points:

Education	- up to 4
Experience	- up to 9
Professional Credentials	- up to 2
Rights of Management	- up to 2
	- 17 maximum

Lead Auditor must also have attested to:

Elements of

Communication skills		
Training in: Codes	QA Programs	Audit Techniques
Regulation	QA Costs	Audit Planning
Standards	QA Information Feed Back	

On-the job training per 45.2.12 elements  
Audit participation - 5 minimum, one (1) in past year  
Examination - ORAL, WRITTEN, PRACTICAL, or COMBINATION

Both require qualification maintained and documented:

Active participation  
Update review of governing requirements  
Training  
Annual evaluation

Regualification of Lead Auditor possible by:  
(If inactive for two (2) years....

Retraining  
Re-examination  
One audit as Auditor

**INFORMATION ONLY**

Certification is transferable

Appendix B to 45.2.23 provides form for Lead Auditor

Responsibilities:

Employer - training, examination, documentation  
Auditing organization - personnel selection & assignment  
Lead Auditor - concur in adequacy of personnel

Examination:

Can delegate development and administration  
Maintain integrity by confidential files and proctoring  
examinations  
Must keep copies of type and content  
Must maintain results



SUMMARY

ANSI N45.2.12

INFORMATION ONLY

"AUDITING OF QUALITY ASSURANCE PROGRAMS"

Provides definitions of audit, internal and external audits, auditor, lead auditor, program deficiencies.

Covers personnel qualifications, training and maintenance of proficiency.

Provides details of audit system content, methods of implementing and performing audits, follow-up audits, corrective action and records.

Applies to both internal and external audits performed by or for the plant owner, contractor, and other organizations participating in activities affecting the quality of structures, systems, and components of nuclear power plants.

Does not apply to surveillance or inspection for the purpose of process control or product acceptance.

Requires responsibility and authority for auditing implementation to be defined and documented.

Requires documentation of organization structure, functional responsibilities, levels of authority, and lines of internal and external communication for management direction of audits of the quality assurance program.

Does not relieve audited organizations or contractors from auditing their portion of the Quality Assurance Program.

Elements of system to be considered:

- Resources
- Planning
- Scheduling
- Preparation
- Team Selection and Orientation
- Performance
- Pre-audit Conference
- Post-audit conference
- Reporting
- Follow-up Actions
- Records

SECTION 4

**INFORMATION ONLY**

HOW TO AUDIT (TECHNIQUES)

PLAN

ASK

LISTEN

WRITE REPORTS

RE-AUDIT

## Appendix A

### INFORMATION ONLY

An audit plan should be developed to provide information about the audit, such as the functional areas to be audited, the names and assignments of those who will perform the audit, the scheduling arrangements, and the method of reporting findings and recommendations.

Audits should be conducted periodically or on a random, unscheduled basis, or both. It is desirable to conduct audits when one or more of the following conditions exists:

1. When it is necessary to determine the capability of a subcontractor's Quality Assurance Program prior to awarding of contract or purchase order.
2. When, after award of contract, sufficient time has elapsed for the implementation of the Quality Assurance Program, and it is appropriate to determine that the organization is performing the functions as defined in the Quality Assurance Program description, codes, standards, and other contract documents.
3. When significant changes are made in functional areas of the Quality Assurance Program, including significant reorganizations and procedure revisions.
4. When it is suspected that safety, performance, or reliability of the item is in jeopardy due to deficiencies and nonconformances in the Quality Assurance Program.
5. When a systematic, independent assessment of program effectiveness or item quality or both is considered necessary.
6. When it is considered necessary to verify implementation of required corrective actions.

## AUDITING TECHNIQUES

INFORMATION ONLY

1. Written questions in audit procedure are intended to give the auditor a general idea of the subject. The auditor should phrase the questions in the best way for him. Seldom will questions be asked verbatim. It is the auditor's responsibility to obtain answers.
2. Ask open questions: why, when, how, who, what.
3. The auditor doesn't even ask some questions. Answers are obtained by observation.
4. The auditor may often have to go beyond the scope of the written questions and dig deeper into problem areas. Follow your nose.
5. The same question is often asked several times and of several different people. This uncovers problems in communication and allows the auditor to get the real answer or make a judgment on what the real answer is.
6. The auditor must be sure to get the response from the person being interviewed, not from the boss, a staff man, etc.
7. Tell me! Show me! - the by-word of operational audits. Verify and evaluate all findings. This technique quickly dispels any thoughts about not giving the auditor the true facts and also gets the auditor intimately involved in what is actually being done.
8. Separate levels of supervision when asking questions. This way the auditor gets the facts as they are - not as they should be.
9. Obtain copies of local practices - not Company plans which you are familiar with. This gives the auditor a chance to evaluate local practices at leisure.
10. Inform people that you will be writing notes in front of them. This is not for the purpose of taking down quotes - only to maintain accuracy. Make quick notes and go over notes each evening and fill in more detail while subject is fresh in your mind.
11. Each evening take time to figure out where you are in time schedule and what you have to go back to on the next day.
12. Don't be critical of an operation unless you have a constructive recommendation on how to improve it.

AUDITING TECHNIQUES (Cont'd)

13. Temper your recommendations according to the size of the operation. Be careful not to be too lenient. Recommend the best way, in your opinion, the responsible personnel can then take the pieces which they can best use.
14. Recommend concepts - not plans.
15. Don't make recommendations right off the bat. Make sure you have the facts first. Avoid early "junior" feedbacks and basket recommendations.
16. Emphasize weaknesses in the job or the administration of the job rather than personalities.
17. Don't comment on other organizations by name - especially negative comments.
18. Don't talk about the way you or your organization did it.
19. Start off fast. Take off your coat and blend into the group. Ask for copies, avoid long breaks and lunch hours. Make them know you're there with a job to do.
20. Don't reveal your opinion (good or bad) of the answers given through either comments or facial expressions. Instead, use the clues to develop further questions in order to get the whole story.
21. Learn as much as possible about your audience.
22. Keep promises - Don't make them.
23. Be prepared - Know subject material.
24. Compliment the contractor.
25. Always maintain control of the interview.
26. Provide assistance in areas where misinterpretation has occurred.
27. Be a good listener.
28. Cultivate a proper attitude.
29. Observe business ethics.
30. Be professional.

INFORMATION ONLY

LAIX-BLW



AUDITING TECHNIQUES (Cont'd)

31. Keep questions short and to the point.
32. Write the summary of results promptly after the audit.
33. Don't be sarcastic.
34. Don't drink before the interview.
35. Don't get into personalities.
36. Don't argue.
37. Do not criticize a contractor's efforts.
38. Recognize that your position may be an imposition.
39. Don't be late for interview.
40. Don't criticize people in front of the boss.
41. Don't be negative.
42. Don't question beyond your level of knowledge.
43. Don't name other companies where you have audited.
44. Don't discuss politics or Company policy.
45. Don't use Yes or No questions.
46. Don't use profane language.
47. Don't allow disagreement between team members during interview.
48. Don't make the audit too secret.

**INFORMATION ONLY**

## QUESTIONING TECHNIQUES

### PURPOSE OF QUESTIONING

The skillful use of meaningful questions provides a highly effective means of channeling the thinking toward the desired objectives of the session. And in process it can become your most effective "selling" tool.

### IMPORTANT FACTORS IN USING QUESTIONS

INFORMATION ONLY

The power of a question in developing constructive thinking lies in its requirement of an answer so that the individual is stimulated to think and motivated to discuss. There are three important factors within your control that affect the level of stimulation and motivation.

- Framing the question
- Choosing the right type of question
- Phrasing questions

### FRAMING THE QUESTION

Some general rules for framing a good question are:

1. Be brief.
2. Cover a single point.
3. Be directly related to the topic.
4. Develop thinking from a constructive point of view.
5. Use words that have meaning to participants.
6. Use words that are easy for you to use.
7. In most cases, be phrased to avoid "Yes - No" answers by using Why, Where, When, Who and How.

## CHOOSING THE RIGHT TYPE OF QUESTION

### INFORMATION ONLY

Types of questions most commonly used in discussions are listed below with some general guideposts for their effective use.

<u>TYPE</u>	<u>WHEN USED</u>	<u>EXAMPLES</u>
Factual Question	To get information or opinions. It can be used successfully to test for understanding or material presented or to start conversation. Good for discussion starters.	What is a factual question? What, where, why, when, how many, etc.
Leading Question	To broaden discussion and channel it along certain lines. In this case the instructor suggests an answer and the group analyzes the result. To introduce additional facts. To suggest an answer. (Since this type is often Yes-No-type, must be followed with additional factual or justifying question.)	Does efficiency enter this picture? Is time the only factor involved? What about the effects on the people involved? Would you agree that this is a leading question?
Justifying Question	To deepen the discussion by having others analyze and justify their reasoning. To challenge old ideas and develop new ones. To avoid snap judgments. To find the real causes or problems. In this type of questioning, the participants use the information they have learned to think out problems and draw conclusions or make decisions. (Most effectively used to follow up responses to all other types of questions.)	Why do you think it is important to know good questioning technique? How will your suggestions help? In what way will that solve the problem? Why can't we do that
Alternative Question	The participants must make decisions between two or more possible courses of action. In this case the participants must compare and evaluate suggested solutions and choose the one they like best.	Which would you prefer to use, open or closed questions? Which of these solutions is best? Can we all agree on this solution? (If necessary, justify decision. Why is <u>A</u> better than <u>B</u> ?)

TYPEWHEN USEDEXAMPLES**Hypothetical Question**

Makes a tentative assumption in order to draw out and test the consequences. It involves using what has been learned and applying it to a possible situation.

Suppose this was a class in mathematics, which types of questions would be most applicable and why?

**Rhetorical Question**

To address the entire group but no answer is required or expected. It is used to stimulate thinking, often at the beginning of a presentation.

We are all interested in how effective questions can aid us to be better trainers, aren't we?

**Direct Question**

To ask one specific person. This can be used to test their knowledge or to draw them into the conversation. In this type of question, the participant's name should be used at the end of the question.

What is a direct question, John?

**INFORMATION ONLY****General Question**

To ask the group at large. It is used to stimulate discussion, obtain feedback and give the participants a chance to ask questions.

Are there any questions?

**Controversial Question**

When two or more answers are possible. The participants must give reasons to back their position and yet understand the merits of both answers.

Which is more effective - an opened or closed question?

Phrasing Questions

Questions can be phrased in either of two (2) ways: As "Open" questions, or as "Closed" questions.

Open:

Questions are "Open" when phrased so that they cannot be answered "Yes" or "No".

For example: "How do you feel about this?"

What, When, How, Who, Where and Which

Closed:

Questions are "Closed" when phrased so that they can be answered "Yes" or "No".

For example: "Do you feel this is fair?"

Is, Do, Has, Can, Will and Shall

**INFORMATION ONLY**

As a final word on questioning. Above all, let your questions come as a natural part of the discussion. Ask questions because they are important to the development of the discussion. Never take the position of a school master with a list of questions that you must ask or die trying.



## THE USES OF QUESTIONS

<b>INFORMATION ONLY</b>
-------------------------

1. To open discussion.
  2. To stimulate interest.
  3. To provoke thinking.
  4. To accumulate data.
  5. To get individual participation.
  6. To develop subject matter.
  7. To determine a member's knowledge.
  8. To change the trend of discussion.
  9. To arrive at a conclusion.
  10. To terminate or limit a discussion.
- -

## KEY WORDS FOR QUESTIONS

### INFORMATION ONLY

CLASSIFY	Demands arrangement, assembling, or grouping of facts according to some common characteristic.
COMPARE	Requires detection of the resemblance and the differences among facts.
CRITICIZE	Exacts good judgement and careful analysis.
DEFINE	Determine the boundaries of a subject and fixing of a clear meaning.
DESCRIBE	Select and portray the characteristics of a subject.
DISCUSS	Present the pros and cons of a subject and come up with arguments supporting a position.
EXPLAIN	Clarify points which obscure a subject.
ILLUSTRATE	Calls for examples to clear up a discussion.
INTERPRET	Bring out the meaning of a subject as the person responding sees it.
JUSTIFY	Show that a thing is reasonable or warranted.
OUTLINE	Indicate the main points of a subject.
REVIEW	Compels going over a subject completely and giving it a critical examination.
SUMMARIZE	Asks for the presentation of a subject in a concise and compact manner.
TRACE	Follow in detail the development or progress of some subject.
VERIFY	Exacts proof that a thing is true.

## LISTENING TECHNIQUES

<u>TYPES</u>	<u>BASIC IDEA</u>	<u>PURPOSE</u>	<u>EXAMPLES</u>
<u>NEUTRAL</u> -----	Use non-committal words. Don't agree or disagree with person.	1. Convey ideas of interest. 2. Keep person talking.	1. "I see." 2. "Uh-huh." 3. "That's very interesting." 4. "I understand."
<u>EXPLORATORY</u> --	1. Who 2. What 3. Where 4. Why 5. When	1. Gather additional facts. 2. Help him explore all sides of a problem.	1. "Who was near the machine at the time of the accident?" 2. "What do you feel the real problem is?"
<u>RESTATEMENT</u> --	Re-state all or part of person's last sentence, or basic idea.	1. Show him you are listening and understand what he is saying. 2. Encourage him to talk.	1. "If I understand, your idea is..." 2. "This is your decision and the reasons are..."
<u>REFLECTIVE</u> ---	Similar to re-statement - but you reflect the feeling he has expressed.	1. Show you understand how he feels about what he is saying. 2. Encourage him to, and explore his problem.	1. "You feel that..." 2. "It was a shocking thing as you saw it." 3. "You felt you didn't get a fair shake."
<u>SUMMARIZING</u> --	Add up the ideas and/or feelings; and re-state and/or reflect.	1. Serves as a base line for further discussion. 2. Brings problem into perspective.	1. "These are the key ideas you have expressed." 2. "If I understand how you feel about the situation..."

INFORMATION ONLY

INFORMATION ONLY

SECTION 5

WHEN TO AUDIT & RE-AUDIT

## APPENDIX A

### INFORMATION ONLY

An audit plan should be developed to provide information about the audit, such as the functional areas to be audited, the names and assignments of those who will perform the audit, the scheduling arrangements, and the method of reporting findings and recommendations.

WHEN: Audits should be conducted periodically or on a random, unscheduled basis, or both. It is desirable to conduct audits when one or more of the following conditions exists:

1. When it is necessary to determine the capability of a sub-contractor's Quality Assurance Program prior to awarding of contract or purchase order.
2. When, after award of contract, sufficient time has elapsed for the implementation of the Quality Assurance Program, and it is appropriate to determine that the organization is performing the functions as defined in the Quality Assurance Program description, codes, standards, and other contract documents.
3. When significant changes are made in functional areas of the Quality Assurance Program, including significant reorganizations and procedure revisions.
4. When it is suspected that safety, performance, or reliability of the item is in jeopardy due to deficiencies and nonconformances in the Quality Assurance Program.
5. When a systematic, independent assessment of program effectiveness or item quality or both is considered necessary.
6. When it is considered necessary to verify implementation of required corrective actions.



**INFORMATION ONLY**

SECTION 6

AUDIT FORMS

## Q.A. AUDIT REPORT

4. AUDIT NO.

**5. AUDIT DATE(S)**

## 6. AUDITORS

**INFORMATION ONLY**

NAME

POSITION

PRE-AUDIT

ENTRANCE

EXIT

OTHER

### 9. AUDIT SUMMARY:

~~SAMPLE - ACTUAL FORM IN USE MAY~~  
~~VARY - THE ESSENTIAL CONTROL~~  
~~ELEMENTS OF THE FORM REMAIN~~  
~~THE SAME~~

## 10. LEAD AUDITOR

DATE \_\_\_\_\_

the **ZACK** co.

**AUDIT CHECKLIST**

☐ SURVEY

C/L NO. \_\_\_\_\_

SUPPLIER / DEPARTMENT

REPRESENTATIVES

☐ AUDIT

DATE \_\_\_\_\_

AUDITORS

S – SATISFACTORY  
CHARACTERISTICS

U – UNSATISFACTORY

FINDINGS SECT. NO.

N/A – NOT APPLICABLE

O – OPEN  
COMMENTS

INFORMATION ONLY

SAMPLE – ACTUAL FORM IN USE MAY  
VARY – THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME

the ZACK co.

QUALITY ASSURANCE FINDING

PAGE \_\_\_\_\_ OF \_\_\_\_\_

1. PROJECT/DEPARTMENT/SUPPLIER	2. TYPE OF AUDIT/SURVEILLANCE OFFICE <input type="checkbox"/> FIELD <input type="checkbox"/>	3. AUDIT IDENT.
4. AUDITOR	5. DATE OF FINDING	7. DISCUSSED WITH
6. CONTROLLING DOCUMENT, SECTION, PARAGRAPH, ETC.		

8. REQUIREMENTS

SAMPLE — ACTUAL FORM IN USE MAY  
VARY — THE ESSENTIAL CONTROL  
ELEMENTS OF THE FORM REMAIN  
THE SAME

9. FINDING

10. RECOMMENDED ACTION/S

11. SCHEDULED COMPLETION DATE	12. RESPONSIBILITY FOR CORRECTIVE ACTION
-------------------------------	--

13. CORRECTIVE ACTION TAKEN

14. DATE COMPLETED	15. SUBMITTED BY RESPONSIBLE AUTHORITY	16. CORRECTIVE ACTION ACCEPTED <input type="checkbox"/> NOT ACCEPTED <input type="checkbox"/>
--------------------	--	--

17. VERIFICATION ACTIONS

18. IMPLEMENTATION ACCEPTED <input type="checkbox"/> NOT ACCEPTED <input type="checkbox"/>	DATE
---	------

19. DISTRIBUTION

INFORMATION ONLY

SECTION B  
NONCONFORMANCES

10. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 2, "Quality Assurance Program," of the QA Manuals for LaSalle and Clinton, a review of the QA records files for both the LaSalle and Clinton projects indicated that there were no documented indoctrination and training records maintained for one shop welder and two auditors.

The Zack Corrective Action:

Training of shop personnel, including welders, has been started. Training is planned to include applicable portions of the Q.A. Manual, 10 CFR 50, 10 CFR 21, plant quality control procedures, and welding procedures. QA and Engineering personnel will likewise be trained as will shop supervisory personnel and corporate management.

Requests for training records from all sites have been made and some records have been received. At the LaSalle site the Q.C. Manager (also a qualified lead auditor) is responsible for providing training and is therefore considered trained by virtue of prior knowledge of the subject matter.

Other lead auditors are the corporate Q.A. Manager, Corporate Lead Q.A.E. (training Engineer) and a Clinton site Q.A.E. The Q.A. Manager and Lead Q.A.E. are considered trained by virtue of training given and prior knowledge of the material.

The Clinton site Q.A.E. has had on the job training in auditing, formalized training in auditing (documents) and has recently received training on site.

Action to Prevent Recurrence:

Zack has created and implemented a new training program. The new program details the requirements for training identifying personnel to be trained, lesson plan and scheduling requirements.

Corrective Action Completion:

Training is expected to be complete by February 1, 1983.



REPORT NO. 99900785/82-01

SECTION B  
NONCONFORMANCES:

11. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QCP-11, "Training Procedures for Personnel performing Quality Control Inspection;" PQCP-11, "Training, Certification, and Evaluation of Quality Control Inspectors;" and PQCP-16 "On-going Training," a review of the QA files for 13 QC Inspectors (LaSalle), 21 QC Inspectors (Clinton), and 4 Welders revealed a lack of documentation for the following items:
- a. Annual eye exam - 14 (Clinton) and 6 (LaSalle) Inspectors;
  - b. Certification Form - 13 (Clinton) and 1 (LaSalle) Inspectors;
  - c. Performance Evaluation - 16 (Clinton) Inspectors; and
  - d. On-going Training - 8 (Clinton) Inspectors and 4 Welders.

The Zack Corrective Action:

Requests have been made to both the Clinton and LaSalle jobsites for all available records pertaining to Inspectors. Information has been received for Inspectors at Clinton and for Inspectors at LaSalle. Training is on-going for all site personnel and for Chicago Shop and office personnel. Personnel files are being updated as new information is received.

Action to Prevent Recurrence:

Written instructions (letter attached) have been sent to all necessary site personnel detailing requirements for forwarding qualification/certification and Training Records to Chicago.

Personnel files for Chicago personnel, including welders, were audited on November 12, 1982 and deficiencies were noted and are scheduled for completion on December 12, 1982.

Annual audit will verify compliance to stated requirements.

Corrective Action Completed:

Completion of corrective action is anticipated December 12, 1982.

the **ZACK** co.

CUSTOM METAL FABRICATION

NOVEMBER 19, 1982

To: - DISTRIBUTION  
From: R. BASIAGA  
Re: PERSONNEL QUALIFICATION/CERTIFICATION & TRAINING RECORDS

Sirs,

It was noted during a recent audit that Chicago Personnel files are incomplete in content for Zack Site Personnel.

You have already been contacted and have supplied requested documentation for Site Inspectors pertinent to past records. This letter is to serve as a guideline for future documentation requirements.

You shall be required to forward the following Personnel Documents to the Chicago office as noted for the following personnel.

<u>PERSON</u>	<u>DOCUMENTS</u>
1. QCI	Qualification/Certification Forms Eye Exam Forms Training/Test Forms Performance Evaluation Forms On-Going Training Records Reading Lists Diplomas
2. QAE/QAM/QCM	Qualification/Certification Forms Training/Test Forms Performance Evaluation Forms On-Going Training Records Reading Lists Auditor Qualification/Certification Forms Auditor Evaluation Forms
3. WELDERS	Certification/Qualification Forms On-Going Training Forms
4. ALL OTHERS	On-Going Training Forms

(cont'd on page 2)

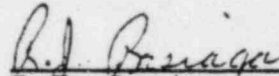
TQ: DISTRIBUTION (Brought Forward)

November 19, 1982

Please forward these records to the Chicago Quality Assurance Department as soon as possible after generation. Any deficiencies or inabilities to comply should be noted in writing and forwarded to this office.

Your cooperation in this matter will help eliminate the possibility of audit findings in this area in the future.

Very truly yours,  
THE ZACK COMPANY

  
\_\_\_\_\_  
R.J. Basiaga  
Lead Q.A. Engineer

RJB/lf

CC: CZDZ  
JCDZ  
D. Malzahn  
D. Calkins  
M. Skates  
N. Rosa  
B. Prim  
  
R. McCarley  
J. O'Connel  
  
R. Usinger  
G. Moseby  
G. Larkin  
  
C. Baumgardner  
H. Geyer  
Q.A. File

REPORT NO: 99900785/82-01

SECTION B  
NONCONFORMANCES:

17. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and Paragraph 4.1 of "The Zack Company Procedure for Compliance with 10 CFR Part 21", written 10 CFR Part 21 Evaluation Reports had not been prepared or submitted to supervision with respect to identified deviations.

The Zack Corrective Action:

The Zack Company in reporting of 10 CFR Part 21 met the intent of our Procedure to the extent of notifying responsible Zack management personnel. There is evidence of this action in file.

The Zack Company Procedure for compliance to 10 CFR Part 21 is in the process of being revised to incorporate the current organization structure.

Action to Prevent Recurrence:

Training session to be administered of reporting requirements of Zack's Procedure for compliance to 10 CFR Part 21, and revise Procedure to incorporate current organization structure.

Corrective Action Completed:

Completion date for training of personnel and revision to Procedure: January 14, 1983.

SECTION B  
NONCONFORMANCES:

13. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Paragraph 7.7 of QCP-8, three (3) NCR's (LaSalle) were initialled for the Project Engineer by an unidentified second party and one (1) NCR (LaSalle) was unsigned.

The Zack Company Corrective Action:

The Zack Company has performed a complete review of NCR's for correct signature. Corrective Action Request (CAR) was issued to correct this deviation from the Procedure. NCR's referenced in this Finding are on file at Zack Document Control Center.

Action to Prevent Recurrence:

Training session performed with personnel who are required to sign NCR's and a written directive to the Quality Control Manager to review all NCR's for compliance, prior to his sign-off.

Corrective Action Completed:

Training should be complete by December 15, 1982.



4600 W. 12TH PLACE • CHICAGO (CICERO) ILL 60650 • 312/242-3434

4401 WESTERN • FLINT MICHIGAN 48506 • 313/736-2040

the **ZACK** co.

CUSTOM METAL FABRICATION

November 22, 1982

To: H. GEYER  
From: R. BASIAGA  
Subject: NCR SIGN-OFF

Mr. Geyer,

In light of the recent NRC investigation and circumstances leading to the issuance of CAR 019 concerning NCR processing at the LaSalle Site, this memo is to serve as your directive to provide documented training to all persons involved in the NCR process in the requirements of QCP-8 latest revision. Documentation should be forwarded to Chicago Quality Assurance for filing.

This memo is also to serve as your directive to review all NCR's prior to final disposition for proper signatures and to correct all deficiencies.

All questions concerning this matter should be directed to this office.

Very truly yours,  
THE ZACK COMPANY

*R.J. Basiaga*

R.J. Basiaga  
Lead Q.A. Engineer

RJB/lf

SECTION B  
NONCONFORMANCES:

14. Contrary to Criterion V of Appendix B to 10 CFR Part 50, QA Manual Section 10, American Welding Society (AWS) Standards D1.3-1978, D1-1979, and Welding Procedure Specifications WPS-7 and WPS-1, inspection of records identified that a welder had been improperly certified to make groove and fillet welds using the GMAW process as evidenced by the following unqualified essential variable changes being made to the applicable welding procedure specification (WPS-1) for performance of welder qualification testing:

- a. Welder No. 34 made square groove welds in 10, 12, and 14 gage sheet metal test plates in accordance with the requirements of WPS-1 which are as follows:

Gage	Amperage	Wire Feed (IPM)	Melt Rate (lbs/hr)	Gas Flow (CFH)
10	145	204	3.3	25
12	120	190	3.1	20
14	100	182	2.9	23

On August 27, 1980, the test plates failed the required bend tests.

Subsequently, requalification test plates were made which were not in accordance with WPS-1 as shown by:

Gage	Amperage	Wire Feed (IPM)	Melt Rate (lbs/hr)	Gas Flow (CFH)
10	100	160	2.3	30
12	95	150	2.1	30
14	70	108	1.62	30

These test plates passed the bend tests on October 23, 1980, and the welder was certified as being qualified for GMAW groove welds.

Welder No. 34 made 2 T-joint fillet weld test plates in accordance with WPS-1 as follows:

Gage	Amperage	Wire Feed (IPM)	Melt Rate (lbs/hr)	Gas Flow (CFH)
22	90	105	1.73	20

One test plate failed on August 29, 1980. Subsequently, requalification test plates were made which were not in accordance with WPS-1 as shown by:

SECTION B  
NONCONFORMANCES:

Gage	Amperage	Wire Feed (IPM)	Melt Rate (lbs/hr)	Gas Flow (CFH)
22	50	105	1.73	20

The test plates passed the bend tests on September 19, 1980, and the welder was certified as being qualified for GMAW fillet welds.

The Zack Corrective Action:

Welder No. 34 was utilized to perform the 10, 12 and 14 gage square groove procedure qualification test welds when WPS-1 was being requalified. The PQR's are attached and indicate that all test welds were acceptable. By virtue of qualifying the procedure, the welder is considered qualified.

The structural fillet portion of WPS-1 is being requalified by Zack personnel on the Midland jobsite. Upon completion of this requalification, Welder No. 34 will be requalified for this joint configuration.

Action to Prevent Recurrence:

A weekly (monthly is current procedure requirement) surveillance of welding operations has been instituted to insure that welding parameters are being adhered to. This surveillance will continue on a weekly basis for an indefinite period.

Corrective Action completion:

Requalification of Welder No. 34 projected to be complete by January 25, 1983.

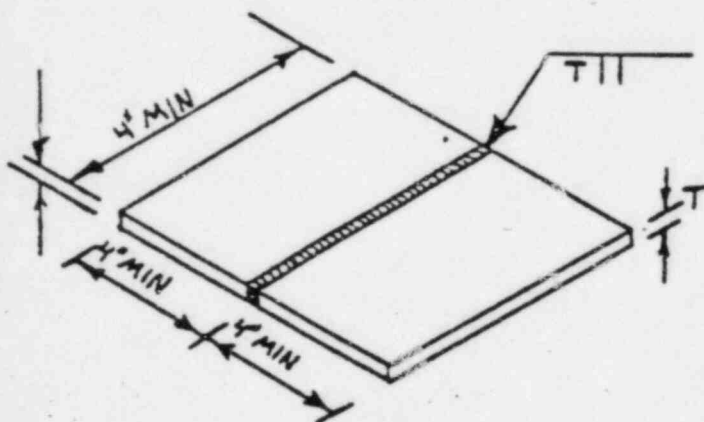
the ZACK co.

Procedure Qualification Record  
Test Specifications

WPS- 1  
PQR # 1

Mat'l. Spec.	<u>A 526/G90</u>	Single/Multi Pass	<u>Single</u>
Welded to	<u>Same</u>	Single/Multi Arc	<u>Single</u>
Thick. Thickness	<u>10 Ga.</u>	Current/Polarity	<u>DC/Reverse</u>
Welding Process	<u>GMAW</u>	Amperage Range	<u>65 (-5%)</u>
Equipment	<u>Semiautomatic</u>	Voltage Range	<u>16-23 (+10%)</u>
Position	<u>1G, 2G, 3G, 4G</u>	Travel Speed	<u>N/A</u>
Progression	<u>3G Up, 3G Dn</u>	Wire Feed Rate	<u>120 IPM (-5%)</u>
Samples per Posit.	<u>2</u>	Melt Rate	<u>1.80 Lbs/Hr (-5%)</u>
Filler Spec.	<u>A 5.18</u>	Ambient Temp.	<u>70°</u>
Filler Class	<u>E-70S-3</u>	Preheat Temp.	<u>N/A</u>
Electrode Dia.	<u>.035"</u>	Postheat Temp.	<u>N/A</u>
Flux	<u>N/A</u>	Welder Name	<u>T.J. Gonzales</u>
Shielding Gas	<u>CO<sub>2</sub></u>	Welder S.S. No.	<u>341-20-9961</u>
Flow Rate	<u>30 CFH</u>	Date	<u>8/7/82</u>

Joint Detail



Actual Welding Parameters

Pass #	Elect. Ø	Amps	Volts	Wire Feed	Melt Rate	Trav Spd	Gas Flow
1	.035"	70	17	140	2.10	N/A	30

INFORMATION ONLY

BY AB DATE 11/4/82

Test Results

Test Type	1	2	3UP	3DN	4	Test Type	1	2	3UP	3DN	4
Macroetch	1					Bend Test	1	A	A	A	A
	2						2	A	A	A	A
	3					Reduced Section 1					
	1					Tension (KSI)	2				
Guided Bend	2					Visual Exam	1	A	A	A	A
Test	3						2	A	A	A	A
	4										

A= Acceptable R= Rejected

Testing Org. PITTSBURGH TESTING LABORATORY  
LAB # 10850  
WH 5742

Inspector/Level [Signature]

Date 9-22-82

Date

[Signature] for M.L.S.

Quality Assurance Manager

Date 10/7/82

Date

I certify by signature above that the statements in this record are correct and that the welds were prepared, welded and tested in accordance with the requirements of AWS standard D \_\_\_\_\_ Section \_\_\_\_\_.



the ZACK co.

## Procedure Qualification Record

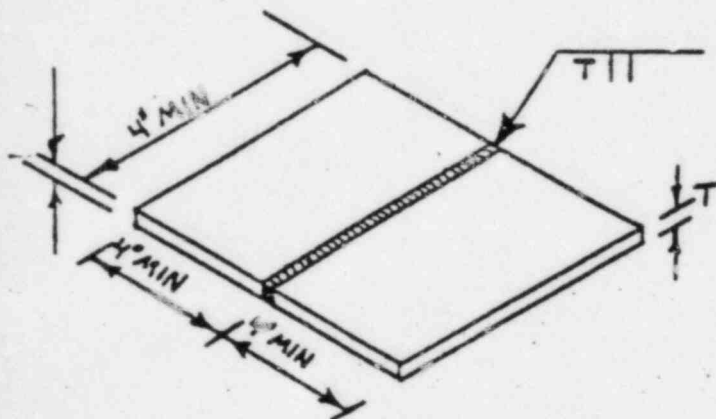
WPS- \_\_\_\_\_

## Test Specifications

POR # 2

Mat'l. Spec.	A 526/G90	Single/Multi Pass	Single
Welded to	Same	Single/Multi Arc	Single
Thickn.	10 Ga	Current/Polarity	DC/Reverse
Welding Process	GMAW	Amperage Range	90 (-5%)
Equipment	Semiautomatic	Voltage Range	17-23 ( $\pm 10\%$ )
Position	1G, 2G, 3G, 4G	Travel Speed	N/A
Progression	3G Up, 3G Dn	Wire Feed Rate	90 IPM (-5%)
Samples per Posit.	2	Melt Rate	2.40 Lbs/Hr (-5%)
Filler Spec.	A 5.18	Ambient Temp.	70°
Filler Class	E-70S-3	Preheat Temp.	N/A
Electrode Dia.	.045"	Postheat Temp.	N/A
Flux	N/A	Welder Name	T.J. Gonzales
Shielding Gas	CO <sub>2</sub>	Welder S.S. No.	341-20-9961
Flow Rate	30 CFH	Date	8/10/82

Joint Detail



Actual Welding Parameters

Pass #	Elect. Ø	Amps	Volts	Wire Feed	Melt Rate	Trav Spd	Gas Flow
1	.045"	100	17	105	2.80	N/A	30

**INFORMATION ONLY**

BY AB DATE 11/8/82

Test Results

Test Type	1	2	3UP	3DN	4	Test Type	1	2	3UP	3DN	4
Macroetch	1					Bend Test	1	A	A	A	A
	2						2	A	A	A	A
	3					Reduced Section 1					
	1					Tension (KSI)	2				
Guided Bend Test	2					Visual Exam	1	A	A	A	A
	3						2	A	A	A	A
	4					A= Acceptable R= Rejected					

Testing Org. PITTSBURGH TESTING LABORATORY

LAB #10851

9-22-82

CH 10851

Inspector/Level

Date

R. Paraga for M.L.S.  
 Quality Assurance Manager

10/7/82

Date

I certify by signature above that the statements in this record are correct and that the welds were prepared, welded and tested in accordance with the requirements of AWS Standard D \_\_\_\_\_ Section \_\_\_\_\_.



the ZACK co.

## Procedure Qualification Record

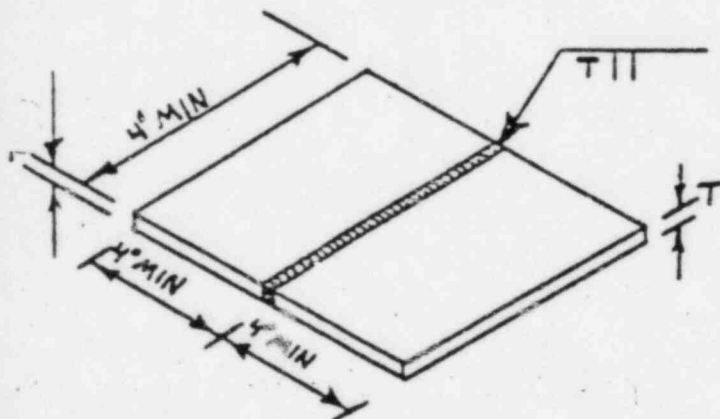
WPS- 1

## Test Specifications

POR # 3

Mat'l. Spec.	A 526/G90	Single/Multi Pass	Single
Welded to	Same	Single/Multi Arc	Single
Pl. Thickness	1/2" Ga.	Current/Polarity	DC/Reverse
Welding Process	GMAW	Amperage Range	60 (-5%)
Equipment	Semiautomatic	Voltage Range	16- 23 ( $\pm 10\%$ )
Position	1G, 2G, 3G, 4G	Travel Speed	N/A
Progression	3G Up, 3G Dn	Wire Feed Rate	100 IPM (-5%)
Samples per Posit.	2	Melt Rate	1.50 Lbs/Hr (-5%)
Filler Spec.	A 5.18	Ambient Temp.	70°
Filler Class	E-70S-3	Preheat Temp.	N/A
Electrode Dia.	.035	Postheat Temp.	N/A
Flux	N/A	Welder Name	T.J. Gonzales
Shielding Gas	CO <sub>2</sub>	Welder S.S. No.	341-20-9961
Flow Rate	30 CFH	Date	8/7/82

Joint Detail



Actual Welding Parameters

Pass #	Elect. Ø	Amps	Volts	Wire Feed	Melt Rate	Trav Spd	Gas Flow
1	.035"	65	16	104	1.56	N/A	30

INFORMATION ONLY

BY

JTB

DATE

11/8/82

Test Results

Test Type	1	2	3UP	3DN	4	Test Type	1	2	3UP	3DN	4
Macroetch	1					Bend Test	1	A	A	A	A
	2						2	A	A	A	A
	3					Reduced Section	1				
	1					Tension (KSI)	2				
Guided Bend Test	2					Visual Exam	1	A	A	A	A
	3						2	A	A	A	A
	4					A= Acceptable R= Rejected					

Testing Org. PITTSBURGH TESTING LABORATORY

LAB # 10849

9-22-82

5742

Inspector/Level

Date

Quality Assurance Manager

Date

I certify by signature above that the statements in this record are correct and that the welds were prepared, welded and tested in accordance with the requirements of AWS Standard D \_\_\_\_\_ Section \_\_\_\_\_.

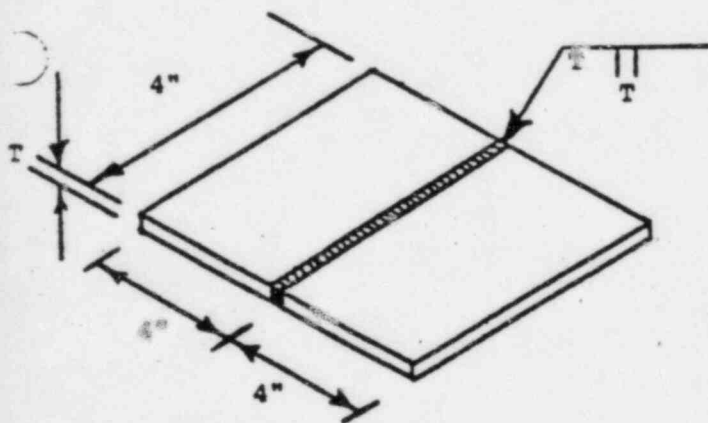
the ZACK co.

Procedure Qualification Record  
Test Specifications

WPS- 1  
POR # 4

1. Spec.	A 526/G90	Single/Multi Pass	Single
Welded to	Same	Single/Multi Arc	Single
at'l. Thickness	1/4 Ga	Current/Polarity	DC/Reverse
Welding Process	GMAW	Amperage Range	55 (-5%)
Equipment	Semiautomatic	Voltage Range	16-23 (+ 10%)
Position	1G, 2G, 3G, 4G	Travel Speed	N/A
Progression	3G Up, 3G Dn	Wire Feed Rate	90 IPM (-5%)
Amperes per Posit.	2	Melt Rate	1.35 Lbs/Hr (-5%)
Miller Spec.	A 5.18	Ambient Temp.	70°
Miller Class	E-70S-3	Preheat Temp.	N/A
Electrode Dia.	.035"	Postheat Temp.	N/A
Flux	N/A	Welder Name	T. J. Gonzales
Shielding Gas	CO <sub>2</sub>	Welder S.S. No.	341-20-9961
Flow Rate	30 CFH	Date	8-7-82

Joint Detail



Actual Welding Parameters

Pass #	Elect. Ø	Amps	Volts	Wire Feed Rate	Melt Rate	Trav Spd	Gas Flow
1	.035"	60	16	95	143	N/A	30

INFORMATION ONLY

BY

*RJB*

DATE

*10/7/82*

Test Results

Test Type	1	2	3UP	3DN	4	Test Type	1	2	3UP	3DN	4
Macroetch	1					Bend Test	1	A	A	A	A
	2						2	A	A	A	A
	3					Reduced Section 1	1				
Guided Bend Test	1					Tension (KSI)	2				
	2					Visual Exam	1	A	A	A	A
	3						2	A	A	A	A
	4					A= Acceptable R= Rejected					

Testing Org. PITTSBURGH TESTING LABORATORY  
LAB #10723  
CH 5742  
Inspector/Level *[Signature]* Date 8-17-82

*R.J. Baraga for M.L.S.* 10/7/82  
Quality Assurance Manager Date

I certify by signature above that the statements in this record are correct and that the welds were prepared, welded and tested in accordance with the requirements of AWS Standard D 1.3-78 Section 6.