

September 22, 1992

UNR-Leavitt

Mr. Steven W. Andrews
Quality Assurance Manager
Consolidated Power Supply
3556 Mary Taylor Road
Birmingham, AL 35235



Manufacturers of
Electric Welded Steel Tubing

Division of UNR, Inc.

1717 West 115th Street
Chicago, Illinois 60643

(312) 239-7700
(800) LEAVITT

FAX (312) 239-1023
FAX (312) 239-8289

Dear Mr. Andrews:

- REF: 1. Your letter to me dated September 1, 1992
2. Draft report dated August 19, 1992 regarding examination of 4 x 4 x 1/2" ASTM-500 Grade B tubing by John Fox, Metallurgical Engineer
Restart Eng. Mechanical/Nuclear Department

This report covers the evaluation of a 4" x 4" x 1/2" wall section of ASTM A-500 Grade B steel tubing heat number T42510 from coil number 924544. This sample was found to have a cracked weld by your customer, TVA/Bechtel at the Browns Ferry Nuclear Plant in Alabama. This tubing was supplied to Consolidated Power Supply on P.O. #S65-17742.

Visual examination of the sample showed a crack in the weld seam on one end of the sample. The other end of the 12" long sample did not show a crack. Photograph #1 shows the as-received condition of the tube. A six inch scale was placed on the sample near the end with the cracked weld. To determine the cause of the crack, a microanalysis was done on each end of the sample. Photomicrograph 1 shows the cracked end at 100X at a point near the outside diameter. It appears the edges did not come in contact to form a weld. Photomicrograph 2 shows the other end of the tube at 100X. The arrow on the photomicrograph indicates the weld line and complete fusion was observed. The end with the crack showed fusion only near the tube inside diameter. In fact, only the bottom 25% of the tube was welded. This indicates that the strips bottom edges came into contact at the point of weld but not enough or no contact was made near the tube outside diameter to fuse these edges together. Photomicrograph 2 does not show this condition. It can be concluded that a mill set-up adjustment was in the process and that this sample represents the piece of tubing which adjustments were made.

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Page two

A history of mill production of 4" x 4" x 1/2" tubing was examined. In the last year and a half UNR-Leavitt produced 152,830 feet of this size and thickness. The internal scrap rate was 15,816 feet or 9.4%. A five and a half year history of claims for poor weld was examined for this size and wall. The results show a customer rejection rate of 0.65% on 423,121 feet of tubing shipped.

An examination of Quality Control reports for the date this tubing was produced (11/5/91) shows a weld test was performed on coil 924544. Results were acceptable, however, the inspector noted the inside diameter weld flash was not normal. No action was taken on this.

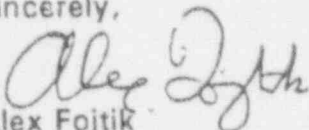
An examination of other nuclear customers' shipping records shows no tubing was shipped to them on this size, wall and heat number.

The sample represents a portion of a defective tube which in turn represents a portion of the overall 0.65% customer rejection rate due to poor weld for this size and thickness of tubing. The lack of fusion was due to incorrect mill set-up and is not heat or material related.

The corrective action requested by your letter will take the form of re-instructing the mill operator, mill foreman and other mill personnel on the importance of weld quality. If the operator is making an adjustment which could affect weld quality, he is to immediately advise the Quality Control inspector so that weld quality can be examined. This meeting will take place within the next 30 days.

Regarding reportability with respect to 10CFR Part 21, UNR-Leavitt cannot assess that this defect, if went unnoticed would create a substantial safety hazard. UNR-Leavitt, however, will report this defect to the NRC using this and the reference report and letter as the evaluation.

Sincerely,

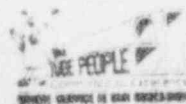


Alex Fojtik
Director, Quality Assurance

/s

attachment

cc: R. Herman, President
R. Hunt, Senior Vice President
P. Katsafanas, Regional Sales Manager



UNR-Leavitt

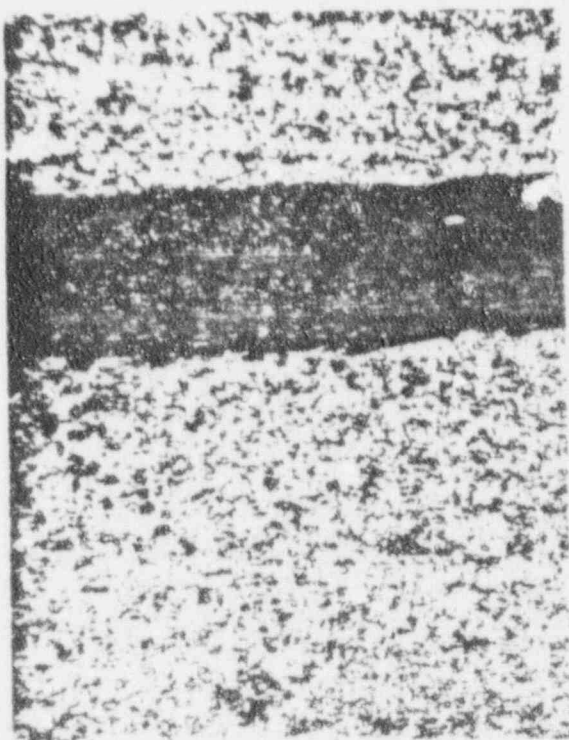
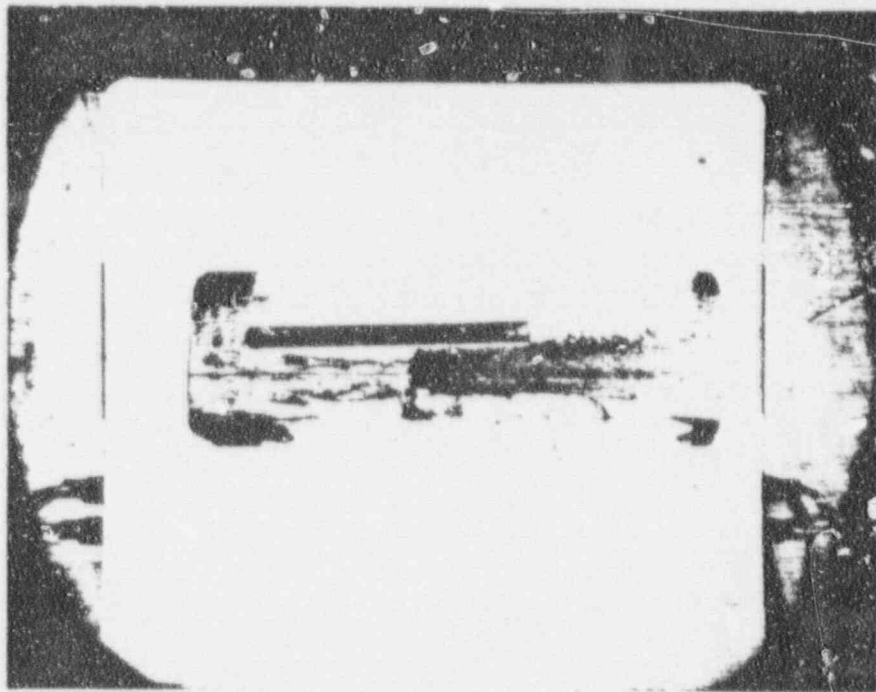
a UNR Industries Company

1717 West 115th Street

Chicago, Illinois 60643-4399

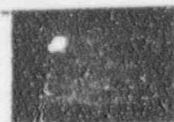
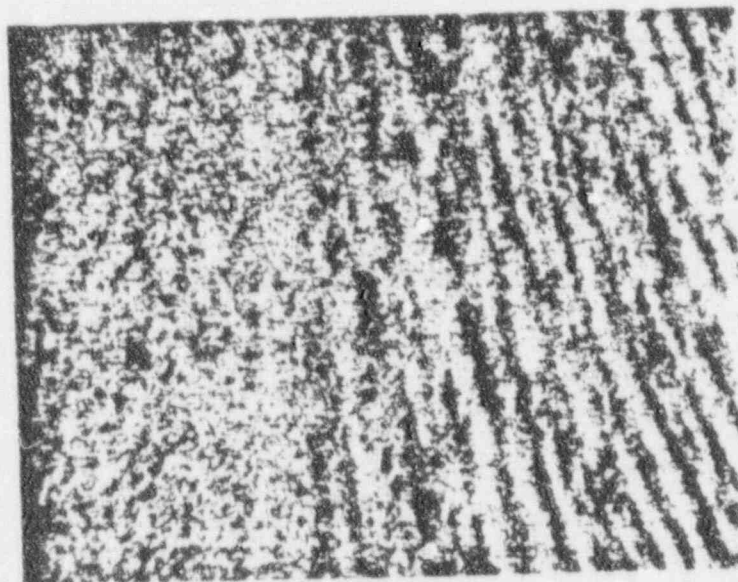
PHOTO
GRAPH

1



100X

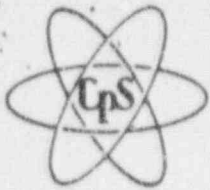
NEAR
O.D.



2

(WELDED
SECTION)

100X



Consolidated Power Supply

September 1, 1992

UNR Leavitt
1717 West 115th Street
Chicago, IL 60643

Attn: Mr. Alex Fojtik
Supervisor of Quality Assurance

Subject: Corrective Action Request on A500 Grade B Tubing

Dear Mr. Fojtik:

As discussed on August 28, 1992, please find attached Consolidated Power Supply (CPS) Corrective Action Request (CAR) #V92-98. The CAR is issued to document and track the deficiency with a 10CFR Part 21 evaluation being necessary under your program's evaluation and reporting measures. A written response to the deficiency is requested to be submitted to CPS no later than September 18, 1992. In addition, upon completion of your evaluation, a copy of any correspondence regarding a 10CFR Part 21 condition shall be submitted to CPS. Upon receipt of such information, CPS will in turn notify all customers affected by the report, which at the current time is limited to TVA/Bechtel, Browns Ferry Nuclear Plant, pending your evaluation.

I have enclosed a copy of TVA Significant Corrective Action Report #BFSCA920017, Rev. 0, for your information. Please note that the date of discovery is identified as 8/12/92 (SCAR Item 1L), which does not coincide with the dates conveyed during the meeting of 8/28/92. This has an impact on the interim evaluation deadline and the time allowed for reporting of a defect or failure to comply under the requirements of 10CFR Part 21.

The above requested response should include, as a minimum, the following information:

- 1) A statement regarding the root cause of the deficiency,
- 2) Measures that have been or will be taken to correct the deficiency,

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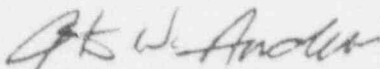
3556 Mary Taylor Road • Birmingham, Alabama 35235 • (205) 655-5515

UNR Leavitt CAR Response Letter Dated 9/1/92

- 3) Measures that have been or will be taken to prevent recurrence, and
- 4) The date your corrective actions and preventative measures were or will be completed

Please complete the applicable sections and return a copy of the CAR with your response. If you need any assistance in documenting your evaluation or post-evaluation correspondence please contact me at your earliest convenience.

Sincerely,



Steven W. Andrews
Quality Assurance Manager

Attachment - CAR V92-98

cc: G. Johnson, Gen. Mgr. - CPS
H. Kerr, President - CPS
C. Marr, Sales Mgr. - CPS
UNR Leavitt File - CPS QA

CORRECTIVE ACTION REQUEST

COMPANY/DEPARTMENT: UNR Leavitt

CAR NUMBER: V92-98

ISSUED TO: Alex Fojtik

DATE: 9/1/92

DATE RESPONSE IS REQUIRED: 9/18/92

DESCRIPTION OF DEFICIENCY:

See Attachment 1

☆ 9/1/92

CAUSE OF DEFICIENCY:

PROPOSED CORRECTIVE ACTION:

DATE CORRECTIVE ACTION WILL BE COMPLETED: _____

NAME OF PERSON RESPONSIBLE FOR CORRECTIVE ACTION: _____

SIGNATURE: _____ DATE: _____

TITLE: _____

☐ ACCEPTED ☐ REJECTED

MANAGER OF QUALITY ASSURANCE

FOLLOW-UP VERIFICATION:

Attachment 1 to CAR V92-98

9/1/92

CONSOLIDATED POWER SUPPLY
CORRECTIVE ACTION REQUEST #V92-98

DESCRIPTION OF DEFICIENCY: The end user (TVA/Bechtel Power Corporation - Browns Ferry Nuclear Plant) has identified a concern on one piece of 4" X 4" X 1/2" X 20' A500 Grade B square tubing, heat #T42510. The material was identified as having a crack in the weld seam, which was observed after receipt of the material by the end user from Consolidated Power Supply. The material was ordered by Consolidated Power Supply on Purchase Order #S65-17742, item #4. Approximately 240' of the subject heat was supplied by UNR Leavitt to Consolidated Power Supply. No indications were observed during inspection activities at Consolidated Power Supply. One piece (approximately 12" in length) of the subject material is being provided to UNR Leavitt for evaluation. The balance of the 20' piece is being retained by TVA/Bechtel in their QC Hold area. The deficiency is considered a violation of ASTM A500, paragraph 5.2, which states "the longitudinal butt joint of welded tubing shall be welded across its thickness in such a manner that the structural design strength of the tubing section is assured".

FAX TO UNR WORTH
ALEX (Q.A. DEPT)

DRAFT

To: Joe McCarthy

August 19, 1992

Subject: TRIP REPORT, EXAMINATION OF TUBE STEEL

Condition
Splitting of welded square tube steel. Heat # T42510.

Discussion:

I examined tube 4" X 4" X 1/4" tube steel at the request of Mods. The product form was ASTM A500 Gr. B welded tubing. A longitudinal split approximately 6" long in the seam weld was visible to the unaided eye. This piece of tubing had been welded to a semicircular wrapper plate and following welding the split was noticed. Another piece from the same joint of tube steel exhibited this similar splitting about 15" in length in the as-found condition.

The specifications for this material include very few requirements for the weld, which is a resistance (no filler metal) weld. ASTM A500 specifies that: *the longitudinal butt joint of welded tubing shall be welded across its thickness in such a manner that the structural design strength of the tubing section is assured.* No acceptance test, NDE or inspection criteria are imposed on the weld by the specification.

Further examination of the original piece consisted of flapper wheel surface preparation, etching with 2% nital, and examination with a stereo microscope. The primary focus of this additional examination was on the areas of the seam weld that did not appear to be cracked to determine the soundness of the weld. The weld appeared to be sound and fully fused in areas where splitting was not observed. No latent or subsurface defects were noted in areas of the tubing that were not split. Areas exhibiting splitting appeared to be the result of incomplete fusion of the adjoining sides of the weld joint, i.e., failure of the resistance welding process to produce a completely fused joint.

I performed visual examination of 200 additional feet of this heat of material in the impound area of MPC. No splitting of this tubing was noted in this examination. Magnetic particle testing was performed on both ends of three joints of this heat and no relevant indications were noted. Additionally both ends of two joints of heat T42500 were magnetic particle tested and no relevant indications were noted.

Conclusion

Splitting of the tubing is the result of incomplete fusion from the welding process

used in the manufacturing of the pipe. The splitting observed is an isolated occurrence. Lack of fusion defects are not unexpected in this product form in light of the lack of NDE or testing on the weld. Visual examination of the outside surface of the tubing is sufficient to detect the condition. The joint of tubing that exhibited splitting should be disposed as nonconforming. Sufficient additional joints have been visually examined to have confidence in the remaining material. The remainder of the material should be released for use.

John Fox
Metallurgical Engineer
Restart Engineering
Mechanical/Nuclear Department

cc:
Robert Phillips, EDB
George Clark, MOD-K
Derek Selva, SWEC, CFC-1B
Virgil Barton, SWEC, CFC-1B
Don Hernon, SWEC, CFC-1B
Leonard Madison, ATH3