

Acme Coke  
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Ammonia Still Inspection  
Dated: November 1989

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November 21, 1989



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Mr. R. Walters  
Manager of Engineering  
Acme Steel Company  
Riverdale, Illinois 60627

Attention: Mr. R. Martello

Subject: Acme Steel - Chicago Plant  
Coke Plant  
Ammonia Still  
1989 Structural Inspection

Project No. W-6058  
Acme P.O. 21-56636-89

Gentlemen:

In reference to the above subject, we are submitting this letter report to present the results of our detailed structural inspection of the ammonia still. The inspection was conducted in cooperation with Acme Steel's Coke Plant Maintenance Department, during a scheduled downturn at which time the still was purged, the internal trays were removed and the inside surface was cleaned by water blasting.

#### INTENT/SCOPE OF WORK

The intent of this project was to determine the present structural condition of the ammonia still's interior surface and associated tray support rings to determine if repairs may be required to maintain or reinstate the structural integrity of the still based on the anticipated corrosion of the shell plate due to the process vapors passed thru the system.

The scope of work for this project was to conduct a detailed interior inspection of the ammonia still's shell plate and elliptical heads. Ultrasonic thickness testing was conducted on the shell plates at 90 degree intervals, between each tray and on each individual elliptical head. A visual inspection of the tray support members was also included. (NOTE: The lower 25'-0" of the still is a skirt assembly and was excluded from the scope of work.)

#### HISTORY/GENERAL DESCRIPTION

The ammonia still was originally designed and manufactured by Dravo Still in 1985 under the ASME Boiler & Pressure Code Section VIII Division I. The ammonia still is located at Acme Steel Company's, Coke Plant in Chicago, Illinois. The subject Still is 4'-0" in diameter and approximately 75'-0" in height and is constructed of 1/2" thick shell plates and three (3) ASME 2:1 elliptical heads of various thickness.

Reference Drawings: C-6673-1, Sheets 1 thru 4

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### DETAILED FINDINGS AND RECOMMENDATIONS

The following is a list of Inspection Findings (F) and corresponding Repair Recommendations for all deficiencies which were encountered during the September 29th, 1989 structural inspection. The Repair Recommendations are accompanied by Suggested Repair Priority (P) designations. Also, where applicable, the recommendations refer to Standard Repair Procedures. For descriptions of the Repair Priorities and the Standard Repair Procedures, refer to Appendix "A" of this report. For specific locations of the deficiencies, refer to Inspection Drawing W-6058-1, located in Appendix "B".

#### Vertical Shell Plate

F1) Random ultrasonic thickness readings taken on the shell plate at 90 degree intervals between each tray ranged from .50" to .54" (original thickness = .50" = 1/2")

R1)(P5) No repair required. Noted for customers record only.

#### ASME 2:1 Elliptical Heads

F2) Random ultrasonic thickness readings taken on the top and bottom 2:1 elliptical heads ranged from .54" to .62" (original thickness = .50" = 1/2")

R2)(P5) No repair required. Noted for customers record only.

F3) Random ultrasonic readings taken on the intermediate 2:1 elliptical head ranged from .78" to .81" (original thickness = .75" = 3/4")

R3)(P5) No repair required. Noted for customers record only.

#### Tray Support Rings

F4) The tray support rings were found to be in good condition with no obvious deficiencies present.

R4)(P5) No repair required. Noted for customers record only.





Acme Steel Company  
November 21, 1989

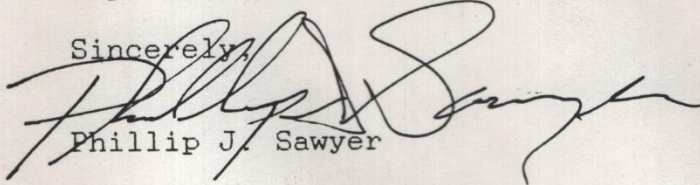
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OVERVIEW

Upon compiling and analyzing all of the 1989 field inspection data, the overall structural integrity of the ammonia still is judged to be "good". There were no obvious deficiencies present such as gouges or worn areas throughout the entire ammonia still structure that would prohibit safe and reliable operation at the present time.

Should you have any questions concerning any aspect of this letter report, please contact our office.

Sincerely,



Phillip J. Sawyer



## SUGGESTED REPAIR PRIORITIES

The following suggested repair priorities are intended to be a guideline for scheduling of an overall repair effort required to reinstate the subject structure to its original load bearing capacity. These priorities do not guarantee that any individual deficiency, or combination of deficiencies, will not propagate to a higher priority before the problem is properly addressed.

- (P1) Emergency condition. Immediate repair required for structural stability. Do not operate in this area until repair is completed.
- (P2) Primary deficiency. Repair is required as soon as possible, but in no event later than thirty (30) days, to maintain structural stability and/or to prevent potential failure.
- (P3) Primary deficiency that does not constitute failure or instability at this time, but may propagate to a state of instability in the near future. Repair or reinspect within six (6) months.
- (P4) Secondary deficiency that should be addressed as routine maintenance; however, if neglected for any great length of time may cause or contribute to future damage and/or structural instability. Repair or reinspect within one (1) year.
- (P5) Secondary deficiency - No repair required at this time. Monitor during routine maintenance down time and reinspect no later than one (1) year.

The above suggested priorities are judgments based partially on prior experience with similar conditions in similar structures. These judgments also consider operating and loading conditions, location of the deficiency, potential ramifications in the event of failure, plus other associated criteria that directly affect the individual structure in question.

Any unusual or unforeseen operating and loading conditions which cannot normally be anticipated are not considered in prioritizing of the repair effort, unless pre-determined and specified by the Owner.