Acme Coke
11236 S. Torrence Ave.
Chicago IL 60617

acmecoke.com

Document archive

Wilputte Battery Inspection
Dated: August 1994

Recovered from site on Jan 30 2021

PRELIMINARY REPORT

ACME STEEL BATTERY INSPECTION

KWC REFERENCE: 8384

1.0 Acme is in the process of planning short-term capital expenditures. Jack Garzella has requested a preliminary evaluation of the battery inspection of August 22-30, 1994.

The data collected has not been analyzed and for this reason the following are the impressions remembered by the inspectors and it should be realized that they may be modified in the final report.

2.0 The following comments apply to the oven wall inspection.

a. Virtually all clay/silica jamb joints are open.

b. Oven B10, coke side has a severe deflection outward into B9 & B11 from oven floor to just below the coal line over 2 to 3 flues of about 3-4" at the floor to zero at the perimeter.

c. About 10% of the oven walls on the C.S. have bulges into the oven of about one and two and one-half inches and are of varying size. These bulges are either overweld or weld pushed out by carbon deposition between the weld and the original silica.

d. The mail boxes in most cases are carbon covered on the coke side, but less so on the pusher side in C & D sections.

e. The area under the standpipe is generally rough.

f. The oven entry is generally rough and spalled on the coke side with some vertical and step cracks, up to 3 flues deep. The pusher side is in much better shape.

g. Only three (3) leaks were observed between the jamb casting and the clay jamb brickwork.

h. Very few ovens showed any green coke but the tops of most were dark particularly on the coke side.

i. Roof carbon is beginning to build and the upper thru-wall construction joint is not noticeable on most ovens.

3.0 The following comments apply to the flue inspection.

a. Only 3 or 4 flues showed leaks from the mail boxes.

b. Approximately 1/2 of the flues had carbon deposits at the horizontal flue.

c. About 10% showed oven to flue leakage at the horizontal flue.

d. More than half of the burner blocks are tipped and fuel is burning at the lower joint rather than at the top of the port.

e. A large number of burner ports have carbon deposits varying from fringe to essentially blocked.

f. No black flues were observed but some were on the cool side.

g. Jamb leaks into the No. 1 flue were almost universal.

h. Charging hole oven to flue leaks were widespread with the center charging hole showing almost 100% leaks into the adjacent flues at the oven top.

i. A small number of flues showed rubble in the bottom.

j. A small number of flues showed damage at the air port due to rodding.

4.0 The above observations may seem to indicate that failure is imminent and indeed wide spread failure could occur if either poor coal blends or improper operating practices, or both, were allowed to happen. On the other hand, with a vigorous patching program, careful attention to heating and good operating practices, the battery can provide good service for quite a number of years. Assuming the buckstays and steelwork

remains in its present good condition, a limited expectation of 3-5 years at say 20 hr. C.T. before major wall repairs is considered to be achievable and could be longer depending on the success of the maintenance program.

5.0 The following is suggested for the immediate future.

a. Patch all clay/silica jamb joints to reduce oven to flue leakage.

b. Patch small spalls - particularly on the coke side.

c. Remove excessive patching material at bulged areas and reweld in order to restore the oven taper.

d. Repair both walls of oven B10.

Three (3) options are open.

1. Panel patch with zero expansion brick.

2. Perform an end flue repair - about five (5) flues on both walls.

3. Do a thru repair on both walls.

This wall repair should be expedited in order to avoid damage to the next walls on either side since the brickwork is now extended laterally into both B9 and B11 ovens. The options are listed in ascending cost.

e. Increase the decarb air flow to the flues in order to burn out some of the burner carbon and improve fuel distribution.

f. Patch charging holes to reduce oven to flue leakage.

g. Continue cleaning the underjet system to improve heat distribution.

6.0 **PATCHING PROGRAM**

A battery at another North American plant was estimated in the late 60's to have about two (2) years of residual life. A patching program, using dry gunning was put into place. This program involved a patching time limit of 1/2 hour following the push and doing only what could be done in that time. The ovens then remained in series. The program ran initially seven (7) days a week, day turn only, and was continuous. After a period of about one (1) year, the patching was reduced to a five (5) day/week. Every week.

Fifteen years later, the battery was shut down because of the need for a collecting main and a coke side bench. The brickwork was still in relatively good condition.

The above method is suggested for Acme, coupled with welding of large spalled areas.

7.0 ESTIMATED COSTS

KWC will prepare estimate for the proposed work once Acme directs KWC to proceed.

8.0 COAL SUPPLY

In order to minimize pushing stresses in the ovens, the coal blend should be designed to produce a relatively large size (more than 50% 2" x 3" in the B.F. coke), high strength (60 stability min. and 62-64 average or higher), a shrinkage (sole heated oven) of 8-10% and a 12" test oven (Russel spec.) pressure of less than 0.9 psi.

This coke will present a strong face to the ram (unless grossly overheated) and retain its coherence while being pushed out and hence reduce lateral pressure on oven walls.

Control of bulk density by consistent grind at 80% -1/8 min. or 82-84 average is important in order to develop these properties.

Improved mixing (now spotty) will also stabilize coke properties and avoid high B-D variability in the oven charge.

It is also true that this type of coking operation will not only benefit the battery but will also improve the stability of B.F. operation, and based on the experience of others, will result in an increase in B.F. production that will more than pay for the costs of achieving the aims directed at extending oven life.

KRUPP WILPUTTE CORPORATION
Division of Krupp USA Inc.

9.0 RECOMMENDATIONS

The Acme batteries' steelwork is in good condition and the key to extending battery life is dependent on the following:

a) The repair of BIO oven coke side walls as quickly a possible to avoid damaging the adjacent walls.

b) A vigorous and intensive patching program that will maintain the integrity of th first 203 flues on both the pusher side and coke side of the batteries.

c) Continue the cleaning repair and adjustment of the heating system in order to provide the best possible carbonization conditions in the ovens so that stickers and hard pushes may be minimized.

These preliminary recommendations may be modified or others made in the final report. Detailed field observations will have been analyzed in a comprehensive way at that time.

A. Cameron/cw
Al Cameron

cc: W. P. Getty
R. V. Ramani
G. J. Emish

c:\files\8384Acme.AC