ANACONDA Aluminum Divisi

Internal Correspond

ATTACHMENT

ANACONDA Industries

Date: November 29, 1982

Subject: ARCO Petroleum Coke

From/Location: T. F. Payne

To/Location: C. E. Fisher

I. BACKGROUND:

In late June, 1982, it was recommended that ARCO coke be tried as the sole supply of Columbia Falls for a four month period. The first shipment arrived in late July; the four-month test period is complete.

A major concern in recommending the test was the intermittent anode problems during the initial ARCO test phases. Now that ARCO coke is at the anode face plantwide, there has been an increase in the amount of anode dust skimmed from the bath. Discussions with Mitsubishi and Tucson staff reveal that the ARCO coke's high real density may be a significant factor in the increase in dusting.

II. RECOMMENDATIONS:

1) That real density of ARCO coke which currently runs from 2.06 to 2.08, be lowered to 2.02 to 2.04.
2) That the ARCO coke continues to contain no dedust oil and has a minimum 35% plus 4 mesh.
3) That the ARCO test continues another 4 months at Columbia Falls with ARCO the sole supplier.

III. DISCUSSION:

Past Problems with ARCO Coke - In past tests phases with ARCO coke at Columbia Falls, there were four potential problems isolated:

Problem 1 - Pitch segregation caused by dedust oil on the coke.
Problem 2 - Insufficient coarse particles.
Problem 3 - Coke handling problems caused by the fine dust contained in the coke.
Problem 4 - A tendency for ARCO coke anodes to give more operating problems.

Solutions - Problem 1, the dedust oil problem, was eliminated by removal of the dedust oil. Problem 2, the size problem, was eliminated by Cherry Point's segregating the green coke piles to make sure Columbia Falls gets the largest coke.

Problem 3, the fines problem, was aggravated by eliminating the dedust oil. This problem can be overcome quite readily, but will require some capital expenditures in the coke dust control systems at Columbia Falls.

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Problem 4, the tendency for anode problems with ARCO coke, has been extremely hard to identify. Eliminating the dedust oil problem and the coarse particle problem minimized it, but still the tendency exists. Recent discussions with Mitsubishi Light Metals in Japan, and with Dr. S. S. Jones of the Tucson R & D facility have suggested a possible culprit: real density.

The theory is this:
When binder pitch cokes out in a Soderberg anode, it forms a coke with a real density of about 1.97. Generally speaking, the lower a coke's real density, the more rapidly oxidation of the coke can take place. ARCO coke, with its high density and low impurity level resists oxidation, according to this theory, much more readily than does the pitch coke, As the pitch coke selectively oxidizes, it releases unreacted coke particles into the bath. As a result of past experience with this phenomenon, Mitsubishi and Dr. Jones have strongly recommended a reduction in the coke real density to a 2.02 to 2.04 range. This will bring the petroleum coke and pitch coke oxidation rates much closer together.

Ken Hill at Cherry Point believes they can meet this requirement. Their first coke shipment in December will attempt to meet the recommended real density of 2.02 - 2.04.

It is hoped that this change will solve the last remaining major problem of ARCO coke's use in a dry Soderberg anode.

T. F. Payne

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