A PERFORMANCE UPDATE FOR THE COLUMBUS PROJECT

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Discussion by

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This is a fascinating and obviously honest paper by three of the people who made a fundamentally-flawed plant operate satisfactorily. These people deserve a great deal of credit.

Two years ago I made a thorough inspection of the Columbus facilities, and I've known some of the Columbus players for many years. These comments should be taken as comments of love, and are not meant to be negative.

The basic problems with this plant were that it was designed by people without experience in the RDF field, and that a number of equipment vendors oversold their equipment. Another problem was that there were no reserves set aside to modify the plant.

For example, in 1981 several representatives of the City of Columbus visited Albany, where surge bins identical to those used in Columbus were installed. The State of New York had devised and tested modifications to the surge bins which made them satisfactory, and the New York people advised the Columbus people that they should immediately spend in the order of $150,000 to modify the surge bins. The Columbus people said that it was then politically impossible to put any extra money into the plant, owing to unfavorable press coverage that existed at that time. An outspoken New York employee remarked, "It's like the automobile engine filter ad, 'you pay me now, or you pay me later!' "

Two years ago a visit to the ash-handling area was like a visit to Hell. Now this is fixed. Did the city of Columbus sue anyone over the initial ash-handling fiasco?

The problems with the vertical shredders with their nondeterministic method of producing particles of a given size were known to most of us in the industry by about 1979. Columbus had done wonders with these machines, but it's now obvious that they should be replaced with horizontal hammermills with grate bars of a known size. According to the paper, the vertical mills produced particle size distribution that met the specifications, but the small fraction of material that was greater than 4 in. consisted of huge particles. During my visit, I saw a somewhat mangled complete mattress pass through these mills.

It appears that the disc screen, retrofitted following one of the shredders, did not meet its specifications. Yet the authors contemplate using these screens after horizontal hammermills replace the vertical mills. One wonders why.

The fact that the feed chutes wear badly is common in systems that make no attempt to remove glass either by screening or by air-classification. Again this prob-

lem was discussed with Columbus people in Albany in 1981, but no money was available to fix the problem before the plant was forced into premature operation.

It was interesting that the ash bed has been evened out by the retrofit of the vibrating feed conveyors. This has allowed the authors to slow the grate, and thus decrease its wear. The speed of the grate could be slowed further if the glass and grit were removed from the RDF prior to burning. Surely the ash could be reduced to 50% of what it now is, thus allowing the grate speed to be reduced by 50%, which might reduce the grate wear by a factor of four.

It would be interesting to know the exact amount of steam produced by a known quantity of RDF over some long period. Perhaps the authors can provide this information in their closure.

One nit-picking point: I cannot see the economic wisdom of retipping hammers, nor can I see the economic justification of using a full compliment of hammers in a horizontal hammermill. Economic details are available free on request.

This is a major RDF plant with dedicated boilers. What is the authors' opinion of RDF vs mass-burn?

There are major lessons to be learned from this plant:

(a) Such plants should be designed by, or the design reviewed by, people with real experience in RDF preparation and handling.

(b) Much tighter specifications should be devised to insure that all items of equipment function for their intended purpose.

(c) A generous allowance should be made for plant retrofit, and for plant shakedown and start-up.

(d) The industry is fortunately endowed with highly-dedicated people who seem to achieve miracles in rescuing fundamentally-flawed plants.

Discussion by

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I have several comments and questions regarding the solid waste processing system for fuel preparation.

The authors comment that early in the operation of the main shredder plant it became evident that the vertical shredders were prone to producing oversize materials. Due to the fact that the plant startup was in August 1983, I find it almost unbelievable that this was not discovered until after plant startup. Operating characteristics of vertical versus horizontal shredders have been documented since the mid-1970s. This characteristic should have been recognized at the time of plant design and equipment specification, not during facility startup.

A test disc screen was purchased. The unit was 6 ft wide and 26 ft long (26 rolls long). What was the basis for equipment specification? Why was the unit so long? What were the disc spacing specifications?

It was very interesting to note the comment "it was observed by plant personnel that the commercial/light industrial waste was processed more easily by the satellite shredder stations than by the main plant shredder station. The reason for these operating characteristics are not known, but it appears that the vertical shredders have difficulty in processing material with low density." Again, I would comment that the differences in operating characteristics including particle size control and ability to shred more difficult materials has been known since the mid-1970s. The plant designers and equipment specifiers should have been aware of this.

Another comment which astounds me is the comment regarding potential replacement of the vertical shredder/disc screen combination with a horizontal shredder. It appears that this is another attempt to reinvent the wheel.

Please describe the ash conditioning systems. What are the additives and quantities? Also, what is the EP Toxicity analyses of the ash? What is the method of ash disposal?

I am certainly pleased to learn that the plant performance has improved significantly as a result of the major modification program. However, I recognize the need for additional improvements and would certainly hope that more effort is made to learn from mistakes of others to avoid the expense of having to make them and learn on your own.