A boiler is a thermal device. However, I am uneasy with the authors' contention that a boiler is thermally limited and that there is a maximum thermal rating for a boiler that can be neatly pinpointed as displayed on their Fig. 1.

The more heat released in the boiler, the more steam generated within reasonable limits. This is why the boilers in the Nashville Thermal Plant could be sold for 360 TPD, rerated at 530 TPD and on occasion operated at 590 TPD.

On a short-term basis, a boiler is limited by such factors as the ability to charge refuse, furnish combustion air, draft the furnace or maintain the drum level. Of course, long-term detriment can occur with extended over-capacity operation. Long-term detriment can be manifested in such forms as corrosion, erosion, and grate wear.

Remember. A boiler should be expected to burn a wide range of material, but a boiler can not be expected to generate the same quantity of steam regardless of refuse heating value.

Any acceptance test program that relies on knowing the heating value of the waste burned during the test could be very difficult to resolve.

I found the authors’ paper to be interesting, informative, and perhaps the best summary of ASTM specifications I have seen.

However, I do not fully agree with their approach for using performance specifications as a means of procurement for a resource recovery system.

It is difficult to determine performance with a feedstock such as MSW which, as the authors state, is time-varying and not well defined. The performance will also be time varying and not well defined.

While I do not advocate elimination of performance specifications, I certainly feel that they cannot be substituted for strong hardware specifications. The engineering community, myself included, have made the mistake of relying on performance specifications in lieu of specifying hardware with a proven track record based on prior experience. Engineers have gone too far in writing broad performance specifications which encourage maximum competition without sufficient hardware restrictions. Unfortunately, most engineers do not know what hardware is required for solid waste projects and thus are afraid to be specific due to the liability which may accrue to them or their company. As a result they try to pass
their performance risk down to the vendor, who often
knows less than the engineer about the performance of
his equipment on solid waste, but "promises the world."

By the time you find out there is a deficiency in a
system performance specification, the plant is built and
it is too late to do much about it. What are the remedies
for non-performance? Replace the entire plant, as in
Bridgeport? Build an additional processing line? If such
substantial deficiencies are not observed until construc­
tion is complete and the operator is in the middle of this
final acceptance test, remedies are so very expensive that
only litigation results — not system performance.

I think the performance approach recommended is
good in theory, but not in practice given the variation of
feed material, the complexity of the test methods, and the
difficulty in obtaining statistical data necessary to uphold
a claim in litigation. I am in favor of engineers specifying
hardware which they know will achieve the desired per­
formance objectives, holding vendors to their materials
and workmanship guarantees, and testing the performance
of equipment on R&D projects before installing them in
production facilities.

The authors are very knowledgable on the subject of
performance testing and many of the points which they
make are good. I agree that if performance is specified, it
should be done correctly with knowledge of the param­
ters, and restrictions on quality as well as throughput. My
concern here is that many vendors of solid waste equip­
ment are unable to provide equipment which works mech­
anically, let alone performs its intended function. Thus to
argue over separation performance is of secondary impor­
tance and often a futile exercise.

I wholeheartedly endorse the authors’ discussion of the
need to conduct performance tests on a “component-by-
component” (e.g., paper, plastic, cans, glass, etc.) basis.
This type of testing is expensive, but is the only mean­ing­
ful way to conduct a performance test.

With all of the test specifications floating around, and
with all of the very sophisticated measurements that some
require, it is easy to get everyone’s feet stuck in fly paper.
In other words, it is easy to lose sight of the forest while
inspecting a gnat on a tree.

The fundamental fact of life is that the plant has got to
work! The real purpose of the test program is not to pass
or to fail some test specification dreamed up before the
plant was even designed. The purpose of the test program
is to discover design defects as soon as possible — AND
THEN TO FIX THEM.

In testing new RDF Plants or RDF equipment, I be­
lieve that one should feed input waste at the highest
possible rate — in an effort to find out what jams, and
why. Then one should spend whatever is necessary to cure
the problems that are uncovered. A dollar spent early in
such a program will probably save a hundred dollars worth
of lost time, and lost production over the plant’s lifetime.

In other words, I believe that in early testing one
should brutalize the plant and its equipment. Find out
what jams and what breaks under punishment! Then install
a permanent (and probably expensive) fix.

For example, when we first tested the old New Castle
Plant in Delaware in 1972, we succeeded in breaking all
grate bars in one of the shredders within the first week
of testing — a lucky break for us. One day later we had
designed rugged cast grate bars. The local foundry broke
all records making a pattern, and something like 10 days
after the grate bars broke, we had installed a complete set
of new grate bars in each of the four shredders. The
$150,000 that we spend on that fiasco saved the plant,
saved our reputations, and saved the company. I hated to
spend the money, but there was no choice. It would have
been stupid and counter-productive to have tried to get
the shredder manufacturer to give us the heavy grates. His
specification has carefully noted that large solid metal
objects had to be excluded from his equipment. We were
honest enough to tell him that a 100 lb piece of forged
shaft had caused the broken grates. We could have wasted
perhaps six months by suing the manufacturer — and we
certainly could have spent the cost of the new grates in
legal fees. The result would have been another failed pant.

We used the same tactic in Albany, and got the Albany
Plant through its acceptance test in 2.5 months, during
which time — and since — we have retrofitted some 400
changes to improve the plant’s operability, maintainability
and safety. We reported this startup to ASME two years
ago.

I believe that sophisticated measurements of such
things as the amount of paper in the Heavy Fraction of
an air classifier should be done only after the entire plant
can be operated at very high rate without jams — and
without breaking equipment.