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Latent Defects in a 24-Year Old Waste-to-Energy Facility – Fact or Fiction? Pinellas County Case Study

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Introduction

This paper presents the preliminary results of one of the key financial liability issues raised by the operating companies during the competitive procurement process for the long-term operation and maintenance of the 24-year old Pinellas County 3,000 tpd waste-to-energy facility.

Pinellas County (County), through the Pinellas County Utilities-Department of Solid Waste Operations, manages over one million tons of municipal solid waste generated by residential and commercial sources within the County each year. One of the primary components of the County's integrated waste management system is its waste-to-energy facility (WTE Facility).

The WTE Facility is used to reduce the volume and weight of non-recyclable solid wastes by approximately 90 and 70 percent, respectively, and to generate up to 75 megawatts (MW) of electrical power. The WTE Facility is located at the County's 705-acre Bridgeway Acres site off of 28th Street North in St. Petersburg, FL.

Two of the three units in the WTE Facility was designed and constructed under a Construction Agreement with the County

dated July 17, 1980 and began commercial operations in 1983, with a nominal processing capacity of 2,000 tons per day (tpd). A third combustion unit was brought on line in 1986 increasing the nominal capacity to its current nominal processing capacity of 3,000 tpd. The WTE Facility consists of three similar, mass burn type combustion units designed to process municipal solid waste. Each unit has a nominal processing capacity of 1,000 tpd based on a refuse higher heating value of 4,800 British thermal units per pound (Btu/lb). The WTE Facility recovers heat in the form of steam and produces approximately 75 MW of electrical power using two steam turbines and electrical generators. Approximately 15 percent of the gross electrical power generated is used to operate the WTE Facility and the remainder is sold to Progress Energy Florida.

Since 1983, the WTE Facility had been operated and maintained by a contractor under an operating agreement with the County and the CMA was set to expire in May, 2007. In 2004 the County initiated a process to competitively procure a contract operator to operate and maintain the WTE Facility on a long term basis upon expiration of the existing operating

agreement (operator reprourement process).

Issue of Latent Defects

From the operating companies perspective, operating and maintaining publicly owned waste-to-energy facilities has traditionally been a lower profit margin endeavor compared to operating and maintaining waste-to-energy facilities that are owned by the operating company. This raises the concern, especially with older publicly owned facilities, that extremely high cost maintenance needs could be found after the takeover of operations in areas that could not be reasonably assessed prior to the takeover (sometimes termed “latent defects”). For certain items, if such repairs needs were required, the cost could easily be greater than three or more years of expected profits and therefore poses significant risk to the operator. Pinellas County’s new service agreement includes provisions to reduce the operator’s risk in this regard, which ensured that the owner received a service fee that was not burdened with excessive contingency.

During negotiations of the service agreement, the prospective operators raised the issue of potential latent defects given the age of the WTE Facility, which issue was not dealt with in the County’s initial draft of the service agreement. The County accepted that this issue needed to be addressed in order for the County to obtain the most favorable pricing. Below is how these risks were allocated in the final service agreement.

Risk Allocation, Inspection and Testing for Latent Defects

In order to deal with the issue of potential latent defects, the operator is provided an opportunity to inspect and test certain components at the WTE Facility within a limited timeframe after taking over the

operations. Any deficiencies found during such inspections and testing would be eligible for inclusion on a so-called “Extended Punch List” and paid for by the County. The details of these inspections and tests were incorporated into a schedule to the new Pinellas County service agreement.

Table 1 presents the systems set forth in the schedule to be tested and Figure 1 presents an example of the schedule contents.

**Table 1
Systems to be Tested for Latent Defects**

1. Surface Condensers
2. Bypass Condensers
3. Steam Turbine-Generators
4. Feedwater Heaters
5. Deaerators
6. Steam Drums
7. Boiler Tubing
8. Spray Dry Absorbers
9. Fabric Filter Baghouses
10. Electrical Transformers
11. 480V Motor Control Centers and Refuse Crane Control Panels
12. 13.8kV Switchgear, 4.16kV Motor Control Centers, and 480V Switchgear
13. 230kV Circuit Breakers and Switches in Main Switchyard
14. Lightning Protection System
15. Electrical Power Systems Documentation and Analysis

The specific provision addressing latent defects is as follows:

- Not later than twelve billing months following the Commencement Date, the Contractor, if it elects to test or inspect any or all of the Potential Extended Punch List Items contained in Schedule 19, shall (a) retain one or more qualified

**Figure 1
Sample of Schedule 19**

Steam Drums

The following nondestructive tests, criteria or standards and repair or replacement guidelines have been established for steam drum No. 1, steam drum No. 2 and steam drum No. 3:

Test/Inspection Requirements	Criteria or Standards	Repair or Replacement Guidelines
a) Ultrasonic thickness testing of the shell and end caps. Test points shall be located at a maximum of two (2) linear feet along the length of the shell and at a minimum of eight (8) locations circumferentially, with a minimum of eight (8) points being tested on each end cap and equidistant to the extent practical. The Contractor shall strive to test at these locations to the extent practicable. If obstructions interfere at these locations, the closest available points should be tested.	Minimum wall thickness for the design pressure as calculated using the ASME Code for Boilers and Pressure Vessels and NBIC guidelines.	Any areas failing to meet the criteria or standard shall be subject to repair or replacement in accordance with ASME procedures as an Extended Punch List Item.
b) Visual inspection of the steam separators, vortex eliminators, drain lines and all other internal components.	Customary repairs or replacements as recommended by the independent qualified third party inspection firm consistent with Prudent Industry Practice.	Repair or replacement items identified by the independent qualified third party inspection firm shall be subject to repair as an Extended Punch List Item.
c) Magnetic particle testing of the shell and heads, and all weldments.	ASME Boiler and Pressure Vessel Code and NBIC requirements for the repair of cracks or replacement of shell and heads. Testing in accordance with NACE Recommended Practice 0590-96.	Any areas failing to meet the criteria or standard shall be subject to repair or replacement in accordance with ASME and NBIC procedures as an Extended Punch List Item.

The Contractor shall be responsible for the first fifty thousand dollars (\$50,000) in repair or replacement costs for all of the Extended Punch List Items associated with steam drum Nos. 1, 2 and 3. The County shall be responsible for all repair or replacement costs in excess of such fifty thousand dollars (\$50,000) for all of the Extended Punch List Items associated with steam drum Nos. 1, 2 and 3. Repair or replacement costs shall be limited to outside contractor and material costs, exclusive of test and inspection costs which shall be the sole responsibility of the Contractor.

independent technical, testing, engineering or inspection firms to conduct the specified test or inspection on the Potential Extended Punch List Items set forth in Schedule 19 and (b) conduct and complete all such tests or inspections. The County shall have the right to witness all such tests and inspections. The Contractor agrees that the costs associated with retaining the independent technical, testing, engineering or inspection firms and the conduct of all such tests and inspections are included in the proposed operation and maintenance fee, including all lost revenues it could otherwise have earned under the terms of the service agreement.

- If the results of such tests or inspections evidence that a Potential Extended Punch List Item complies with the criteria or standards set forth in Schedule 19 or if such tests or inspections are not conducted within the twelve month period specified above, such Potential Extended Punch List Item shall be deemed accepted by the Contractor “as is” and the Contractor shall no longer be afforded relief recognized under the service agreement if such item shall fail, malfunction or breakdown.
- If the results of such tests or inspections evidence that a Potential Extended Punch List Item does not meet the criteria or standards set forth in Schedule 19 (the “Extended Punch List Item(s)”), the Contractor shall have the obligation, provided appropriate authorization and funding is provided by the County, to cure such Extended Punch List Item so that it complies with such criteria

or standards set forth in Schedule 19.

In summary, the County agreed to pay to cure latent defects that are revealed by objective tests performed by a qualified third party provided they are identified within one year of the takeover date.

Payment for Curing Latent Defects Found by Testing

A contingency fund of five million dollars was established within Pinellas County’s new service agreement for purposes of covering the cost of any latent defects found during the first 12 months of operation in accordance with Schedule 19. Following the receipt of the results of each test or inspection of a Potential Extended Punch List Item the result of which evidences an Extended Punch List Item, the Director of Solid Waste and the operator shall agree in writing as to (a) the fixed price to cure such Extended Punch List Item, (b) the payment milestones and the percentages of the fixed price applicable to each payment milestone or, as applicable, the Direct Costs payment milestones, (c) the timeframe for commencing and completing the Cures and (d) any modifications to the Performance Guarantees and the Work under the service agreement. Monies required in excess of such five million dollars for a cure of an Extended Punch List Item shall require an amendment to the Service Agreement that is subject to approval and execution by the Board of County Commissioners.

The County also has the right to direct the Contractor to make such Cures of any or all items on the Extended Punch List Items as the County deems necessary and advisable at the operator’s direct costs, inclusive of profit, subject to cost substantiation, inclusive of profit. The Contractor is required to comply with the County’s direction in a reasonably timely

manner provided appropriate authorization and funding is provided by the County.

As shown in Figure 1, Schedule 19 included a “deductible amount” of the first “x” dollars for the repair or replacement in order to account for the cost of normal maintenance that could reasonably be expected for this component given the age of the WTE Facility. The service agreement also required that the operator bear the costs of the inspections and testing (to be included in the base per ton operating fee) which also ensures that operator only tested those components for which he had reasonable concern. The service agreement also protects the operator if a piece of equipment specified in Schedule 19 fails prior to testing by classifying such an event as a Force Majeure event, and the County pays for curing Force Majeure events.

Current Status and Preliminary Results

When the abstract for this paper was submitted, it was hoped by the authors that at least some of the test results would have been submitted by the operator to the County in time for use in this paper. However, at the time this paper had to be submitted in order to appear in the conference proceedings, testing had just been performed on the majority of the systems contained in Schedule 19, but no written reports had yet been received from the independent third party test firms. If such reports are received by the time this paper is presented, the results will be presented at the conference.

Based upon preliminary results of 41 tests, most of the equipment tested passed the criteria, and most of the equipment that did not pass the criteria will require maintenance work that will cost less than the deductible amount stated in Schedule

19. A few items may require that the County expend additional funds for repairs.

Summary and Conclusions

The County’s new service agreement represents the next generation of service agreements for publicly owned waste-to-energy facilities. The County recognized the need to assume more of the risk for potential latent defects during the procurement process for a contract operator. Accepting this risk helped to preserve the pool of potential operating vendors and resulted in the County obtaining very competitive prices for the continued operation of their WTE Facility, which is a vital part of their integrated solid waste system.

While the preliminary findings from tests conducted at the Pinellas County WTE Facility appear favorable, similar concerns over potential latent defects can be expected to be a significant issue during the upcoming reprocurments of other publicly owned waste-to-energy facilities.