

NYCHA Smith House DSOM[®] Installation Excerpts from CY 2001 Annual Report



One of the apartment buildings at NYCHA's Smith House Complex

Background: On October 13, 1999 the New York City Housing Authority (NYCHA) and Battelle Memorial Institute entered into an agreement to install a Decision Support for Operations and Maintenance[®] (DSOM[®]) system at the Governor Smith Housing Project in Manhattan, New York.

Per contract requirements, Battelle conducted an initial assessment of the energy site and supporting infrastructure from November 29 through December 3, 1999. The major conclusions, issued in the characterization report dated March 7, 2000, were:

1. There is a major opportunity to improve the steam production efficiency of the boiler plant.
2. The steam distribution and condensate return systems were in good condition.
3. A second major improvement was identified in building energy management. Implementing an automatic feedback and control system to better regulate heat delivery to the apartments could dramatically reduce building steam demand.

4. By utilizing condition-based maintenance principles and advanced machinery diagnostics, a significant reduction in maintenance cost and improvement in life-cycle economics could be obtained.

NYCHA accepted Battelle's characterization report and authorized Battelle to proceed with the installation of DSOM[®] at Smith House.

In support of the system installation, Battelle entered into subcontracts for instrument installation and electrical wiring for the installation and commissioning of the boiler controls system.

Project implementation proceeded in accordance with the installation plan. Initial functionality of the system was achieved early in 2001. This was followed during the balance of the year by fine-tuning of the boiler controls system, customization of the software to meet the operational requirements of the Housing Authority, and the commissioning of the building control systems to achieve the building energy management strategies identified during the characterization process.

System Performance: Overall system performance has exceeded original expectations. During the year and normalized for weather variations, a 20% reduction in overall energy consumed (as measured in thermal units) was achieved when compared to the baseline years. This achievement is significant considering that: 1) during much of 2001 the system was still being tuned to achieve the most efficient operations, and 2) the building control functionality of the system had not been enabled. Early data gathered in 2002 indicate that active building control will achieve an additional 10 to 15% reduction in energy consumption.

The stability of the DSOM[®] system and associated boiler controls has improved significantly following the initial commissioning and expected fine-tuning/troubleshooting. Through the combination of improved system reliability and increased knowledge of the system by the operations staff, the reports of problems have decreased dramatically.

The physical energy plant and distribution system have performed as designed to meet the residents' needs with no unplanned outages caused by equipment failure. One demonstrated benefit of the DSOM[®] system is that it was able to recognize failing components that would be difficult to identify with normal diagnostic techniques. One specific failure discovered was a faulty heating coil in a hot water heat exchanger.

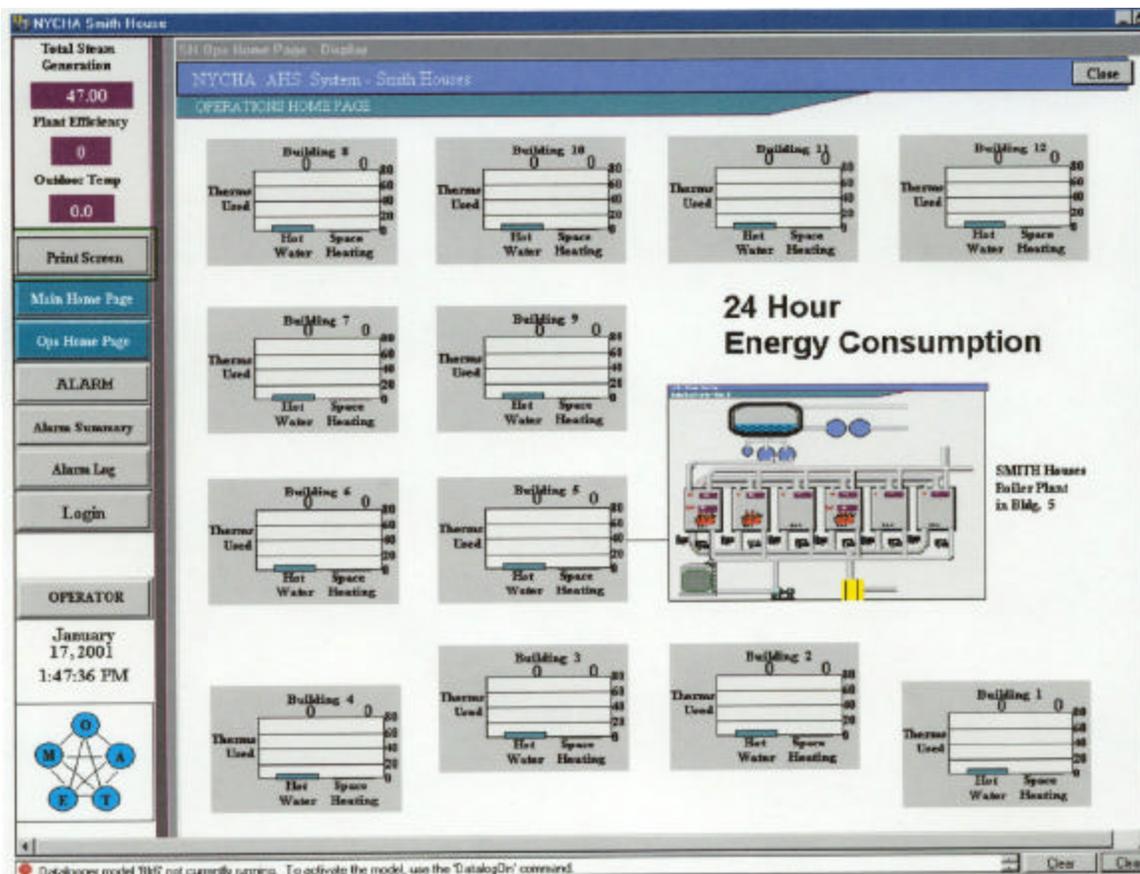
Total Savings: Per the contractual agreement between NYCHA and Battelle, the total savings generated as a result of the DSOM[®] system installation, and its supporting infrastructure, would be determined annually and the savings would be "shared" based on a pre-agreed formula. The total savings would be the sum of fuel savings, personnel savings, and maintenance savings compared to the baseline and normalized for variables

such as weather. Because the initial functionality of the system was achieved early in 2001, NYCHA and Battelle agreed to use CY 2001 as the first year of shared savings for Smith House.

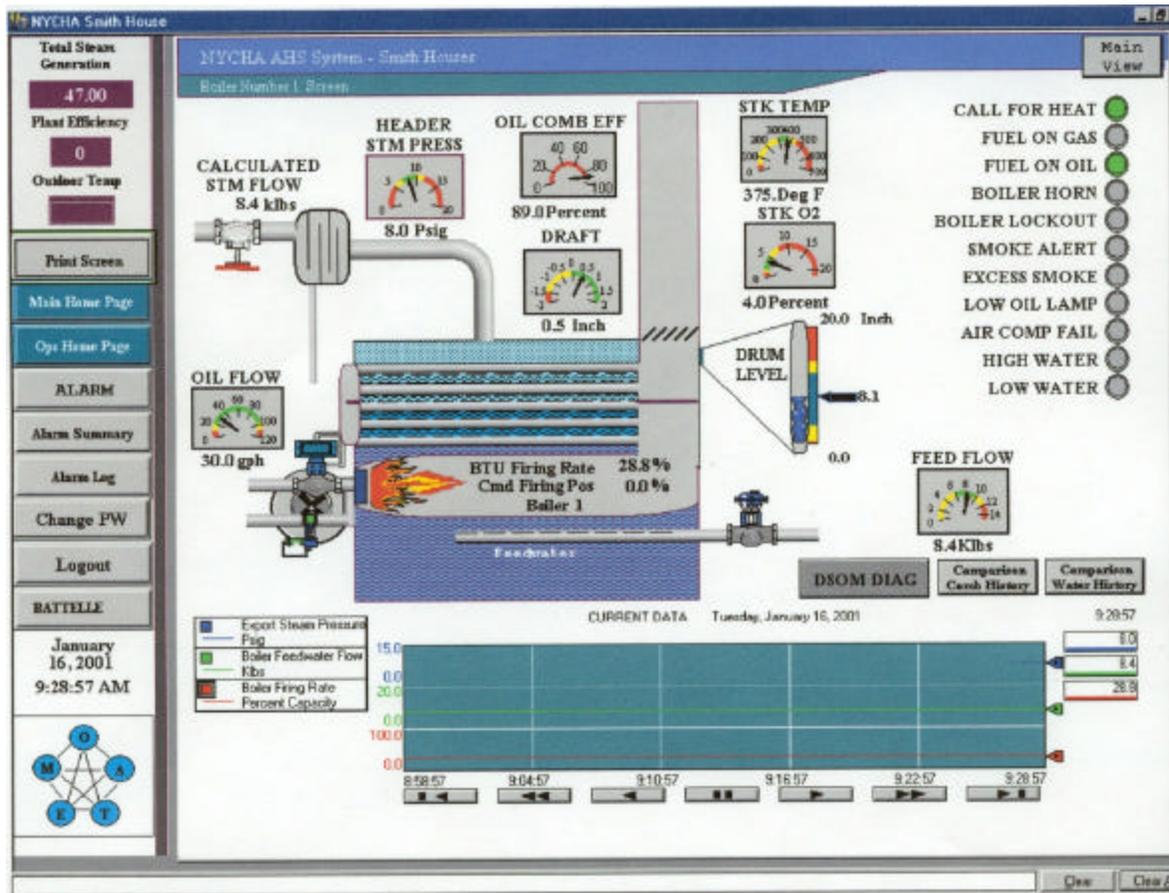
The total savings during 2001 were \$299,913. These savings did not include the life extension cost savings. Life extension cost savings are a calculated value that will be determined at the completion of the 10-year performance period. A value for the life extension of the capital assets will be calculated at the completion of the project and will be fully credited to the Housing Authority.

It is expected that future years will exceed the performance accomplished during 2001 for the following reasons:

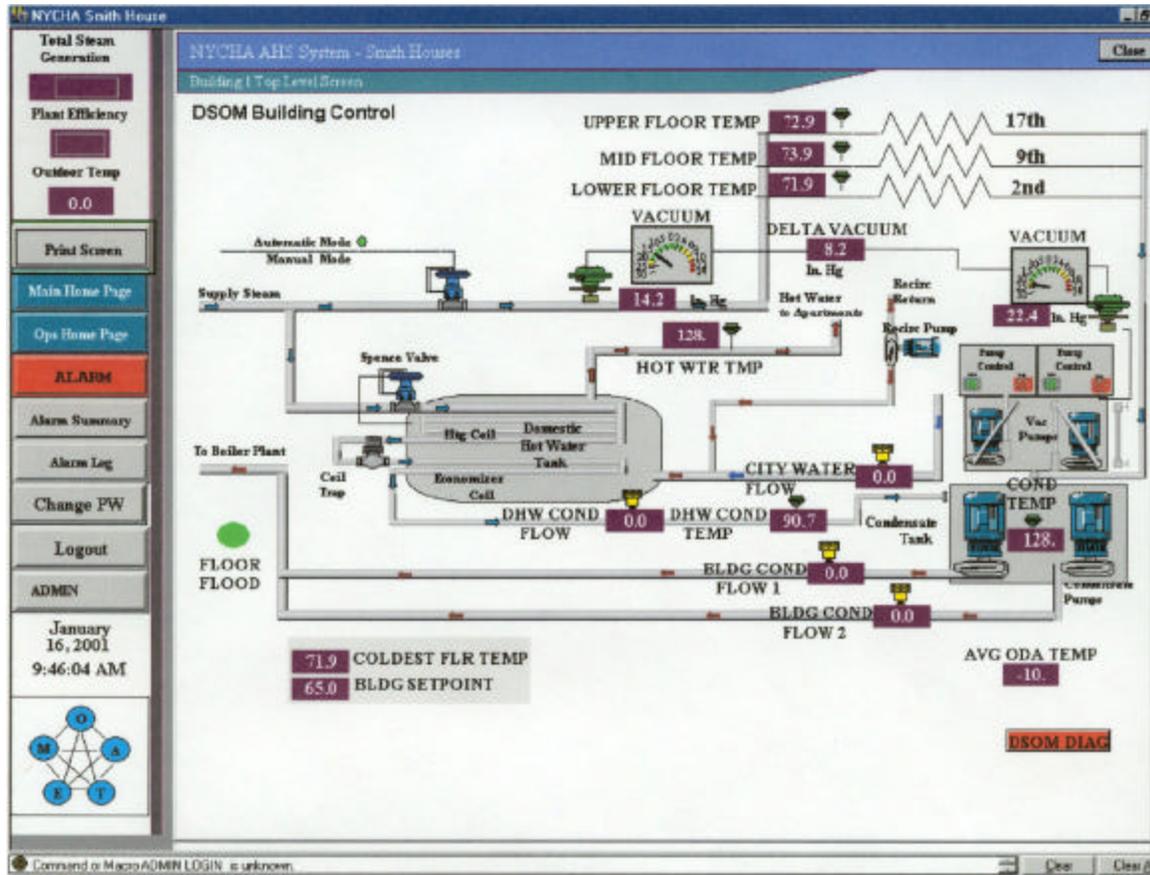
- 1) During much of 2001, the system was still being tuned to achieve the most efficient operations
- 2) The building controls functionality of the system had not been enabled
- 3) 2001 was a relatively mild year from a heating season perspective (4,249 heating degree-days compared to 4,732 during the baseline years), offering additional savings opportunities given years that more closely resemble the baseline.



Smith House DSOM[®] Building Energy Consumption Display



Typical Smith House DSOM[®] Boiler Display Screen



Typical Smith DSOM[®] House Tank Room Display

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