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Building Program Annual Operating Budget For A Centralized Campus Boiler Retrofit To A Decentralized Boiler Plant

For a building program to be successful and sustainable, it is imperative that the program include an operating budget as well as a construction budget. Approximately 15% to 20% of the cost of a building is first cost, and that remaining 80% or more is in the operation of the building over its life. The following is a sample conceptual-phase HVAC annual operating budget for a campus central boiler plant retrofit to decentralized, building-by-building boiler plants. The building program will implement a five-phase decommissioning of the central steam plant and associated underground distribution, and will furnish and install one high-efficiency condensing boiler per building.

When designing a deferred maintenance and energy retrofitted boiler plan application, the engineer should refresh her memory relative to this Basis of Design by first going to ASHRAE *Handbook 2012 HVAC Systems and Equipment Handbook*, chapter 1 (HVAC system analysis) and selection along with chapter 2 (decentralized cooling and heating), chapter 3 (central heating and cooling), and chapter 32 on boilers. In addition, the *2015 HVAC Applications* review should include reading chapters 27 on power plants, chapters 36 through 43 relative to building operation and management, chapter 49 on water treatment, chapter 55 on seismic and wind resistant design, chapter 59 on HVAC security, and chapter 63 on codes and standards.

Choosing to outsource some or all of the O&M requirements via third-party companies for the day-to-day requirements, and/or using HVAC service companies for the planned maintenance of the primary equipment, is a decision building owners may consider rather than take ownership for the O&M of multiple boilers per campus. Based on the Back2Basics September test, we are using the example of an owner who has decided to limit his operating staff to a select few while contracting out the boiler startup and shutdown per building. In-house technicians will complete day-to-day operation and simple maintenance requirements. The conceptual design phase annual operating budget is as follows.

Administrative (pro-rated for one condensing boiler)		
SALARIES, WAGES & BENEFITS		
• Employee salaries & wages	(1) Manager (0) Supervisor (1) Technician	\$ 40,000
• Taxes, health care, etc.		\$ 6,000
• Retirement & benefits		\$ 2,000
OUTSOURCE OPERATION & MAINTENANCE		
• Project management	(1) Part-time	\$ 1,000
• Service technicians	(1) Technician twice a year	\$ 3,600
• Vendor salaries & wages		\$ 0
• Supplies		\$ 500
IN-HOUSE MAINTENANCE MATERIAL		
• Heating equipment	None	\$ 0
• Emergency generator	None	\$ 0
CONSULTANTS		
• CAD	None	\$ 0
• Energy	None	\$ 0
• Information technology	None	\$ 0
INFORMATION TECHNOLOGY		
• CMMS	None	\$ 0
• Handheld devices	(1) Cell phone + monthly fee	\$ 500
EXPENSES		
• Education	(1) Training class	\$ 1,000
• Conferences	None	\$ 1,200
• Office supplies	\$25.00 per month	\$ 300
UTILITIES		
• Electricity	(boiler & circulator)	\$ 3,000
• Chilled water		\$ 0
• Gas		\$ 30,000
• Oil		\$ 0
• Propane		\$ 0
• District/campus steam		\$ 0
• District/campus chilled water	Not included in building operating budget	\$ 0
• District/campus hot water	Not included in building operating budget	\$ 0
DOCUMENTATION		
• Printing		\$ 0
TOTAL ANNUAL OPERATING COST		\$ 89,100
TOTAL ANNUAL OPERATING COST/Sq Ft		\$ 5.94

As the project design goes through the design development and construction document phases, this Building Program annual operating budget should be kept current with the construction budget and coordinated by the design team to incorporate the required system and equipment training, as well as the O&M manuals and CMMS program for equipment maintenance and asset management.