

**ENERGY CONSERVATION OPPORTUNITIES IN COMMERCIAL BUILDINGS --
TRAINING AND SERVICES FOR IMPROVED O/M**

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INTRODUCTION

The implementation of proper O/M procedures in commercial buildings has been recognized as not only cost-effective, but also as an essential prelude to additional and more costly conservation retrofit actions.

OBJECTIVES

This study had the following major objectives:

- to determine the scope and nature of resources of O/M training and services for commercial building HVAC systems;
- to determine the types of barriers that prevent or reduce the application of appropriate O/M procedures;
- to assess the potential for increased penetration of O/M services in the commercial building sector; and
- to propose efforts that integrate and leverage program elements of the DOE Commercial Building Energy Retrofit research program with private sector initiatives.

APPROACH

The primary approach used in this study was to use telephone interviews of various organizations considered to be representative of the particular segment of the private sector involved in commercial building O/M retrofit activities.

CONCLUSIONS

Training and Education Resources

1. There is a wide diversity of formats and sponsors for training and educational programs on O/M practices for HVAC systems.

2. Many operations personnel have insufficient training for the modern HVAC and control systems installed in newer commercial buildings.
3. In spite of the plethora of existing training and educational programs, there appear to be opportunities for additional cost-competitive training programs, especially for those that utilize generic terminology for new technological features.

Barriers to Adequate O/M Practices

1. Maintainability needs to be emphasized in HVAC system design and control component specification and installation.
2. The importance of proper system commissioning needs to be communicated to owners and managers of new buildings to realize efficiency improvements designed into new buildings and prevent O/M from becoming an immediate problem.
3. For building owners and/or managers to commit attention to O/M practices, savings must be documented and presented by credible sources.
4. An increased number of qualified and experienced consulting engineers and HVAC service personnel are required to adequately serve the large market for O/M services and retrofit applications in commercial buildings.

Potential for Increased Penetration of O/M Services

Major factors among several major building types with respect to the potential for increased penetration of O/M services are as follows.

1. Corporate-owned-and-operated buildings - the best market because of centralized decision-making, long holding period, and corresponding higher level of acceptable risk for investments.
2. Investor-owned buildings - a difficult market because of short-term holding period and relatively little interest in operating efficiency; creates important market for O/M services and retrofits.
3. Small commercial buildings without HVAC system operators - a difficult market to penetrate because of higher fixed costs to service, hence, often ignored by O/M service companies.

RECOMMENDATIONS

Specific recommendations are presented for the DOE Buildings and Community System's Program on Commercial Retrofit Research.

Credibility of O/M Savings

1. Develop a catalog of case studies of O/M energy and cost savings, paybacks, and ROI's, when appropriate, for various commercial building types and HVAC equipment types.
2. Develop a catalog of case studies investigating the effect of O/M practices on other retrofit, i.e. control system, options.

Market Development

The following recommendations address the need for targeted market development of O/M services within the commercial building sector.

1. Work through the Small Business Administration, the Chamber of Commerce, or other national organizations to promote interest in cost savings from improved O/M practices for HVAC systems.
2. Work with state and local community and business groups to promote O/M diagnostics and checkup procedures for small commercial buildings. Investigate cooperative development of diagnostic and checkup procedures with a technical society, i.e., ASHRAE.
3. Develop an information program and materials targeted at small commercial building owners and tenants on O/M cost savings.

Improvement in Quality of O/M Service

The following recommendations are suggested to develop increased confidence in and, therefore, use of O/M service companies and engineering consultants in commercial buildings.

1. Explore the development of an annual DOE award for documented energy and cost savings from building O/M practices.
2. Investigate the feasibility of developing a voluntary, industry-sponsored certification program for equipment service personnel to be applied initially in major metropolitan centers.