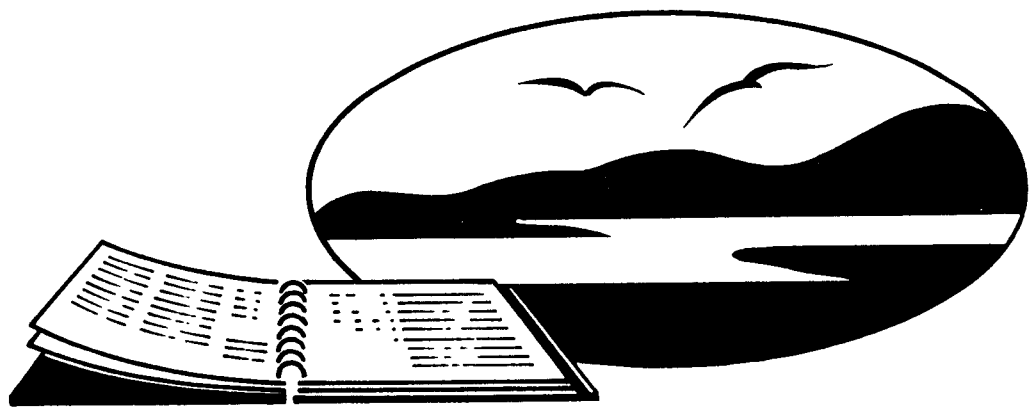




How Can The Building Professions Best Obtain Information And Training On Indoor Air?

#90-1108



Question 90-1108
How Can the Building Professions Best Obtain
Information and Training on Indoor Air?

For

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Introduction

The Clean Air Act was passed twenty years ago and outdoor air pollution has been a major issue for many decades. However, indoor air pollution is a much more recent concern as is shown by Congress' current work on the Indoor Air Quality Act of 1990. However, because we spend so much of our time indoors (some studies indicate over 90%)¹ and with some pollutants existing at greater levels indoors than outdoors,² indoor air pollution also promises to be an important health and environmental concern. Moreover, episodes of "sick building" syndrome have increased public awareness of the potential health and comfort consequences of poor indoor air quality.

Indoor air pollution problems can be influenced by the presence of indoor contaminant sources (e.g., combustion generated pollutants, formaldehyde in building materials, biogenic particles such as mold and pesticides) the rate of exchange between indoor and outdoor air, and the air movement patterns within the structure. Indoor air pollution problems can be prevented or mitigated through the control of polluting sources, the control of ventilation and air exchange rates in the building, or through various air cleaning technologies. Many of the causes and controls are affected by members of the building professions through the design, operation, and maintenance of buildings. This study attempts to identify effective ways to educate individuals in the

¹Report to Congress on Indoor Air Quality Volume II: Assessment and Control of Indoor Air Pollution, EPA/400/1-89/001C, Office of Air and Radiation (ANR-445): August 1989

²Godish, Thad. Indoor Air Pollution Control, Chelsea, Michigan: Lewis Publishers, 1989. pp. 2-3.

building professions about effective methods of control. Because indoor air quality is such a new issue, many building designers, builders, operating engineers and maintenance persons do not have sufficient knowledge to significantly improve indoor air quality. It is hoped that this study will assist the EPA in developing more effective information dissemination and training programs for building professionals.

Methodology and Constraints

This study was conducted in the Provo/Salt Lake City, Utah area. Building designers, builders, and maintainers were contacted to find out which sources they usually consult when they want to obtain technical information in their fields. Faced with the time, money and resource limitations of a graduate student, the author contacted these individuals somewhat at random by using the telephone yellow pages to identify individuals in the area and then contacting individuals in each profession.

Because this study was an attempt to generate new ways to more effectively disseminate information, it was decided that open-ended questions in interviews with individuals in the building professions would be more appropriate than a set of survey questions that would be rigid and uniform. This was not a statistically valid survey and thus the results of this study are not necessarily representative of the building professionals throughout the United States.

One difficulty encountered during the study was that some individuals were more helpful than others; some had more ideas about different ways the EPA could improve its information dissemination programs than others. Consequently, leading questions

were asked of those who did not volunteer much information to see how they responded to a variety of possibilities suggested. Because of this situation not everyone responded to the same questions.

Individuals Contacted

To determine useful ways to inform and train individuals in the building professions, individuals from these professions were contacted. Many individuals in different occupations were interviewed in an attempt to get a diverse sample of individuals (see Appendix A for a complete list of individuals interviewed and Figure 1 for the number of individuals interviewed from each category):

- **Architects**
One interesting item about architects was that when they were asked about where they would go to find out about indoor air quality many of them said they would consult the mechanical engineers who they worked with on projects.
- **Engineers**
HVAC engineers and mechanical engineers were contacted because of their involvement in the design and maintenance of building systems.
- **Physical Facility Managers**
Physical facility managers for Corporations, Universities, Hotels, Hospitals and Large Office and Retail Buildings were contacted.
- **City Building Inspectors**
Many building inspectors expressed concern that they only did what was required by the state and local building codes and therefore they would only be interested in indoor air quality as it became a part of the building code.
- **Builders**
Companies involved in commercial and residential building were contacted.

- **Industrial Hygienist**

There were very few industrial hygienists in the area and consequently only one was interviewed.

Architects	5
Engineers	6
Physical Facility Managers	16
Building Inspectors	4
Builders	4
Industrial Hygienist	1

Figure 1—Number of Individuals Interviewed by Category

Questions

During the interviews the building professionals were asked open-ended questions to allow them to generate ways and vehicles through which to inform and train them in their particular situations. Although a single set of questions was not used with every individual, many similar questions were used with everyone. Those areas that seemed particularly fruitful were pursued. These are some of the kinds of questions that were asked:

- How could the EPA improve its training and information dissemination programs?
- What would convince you of the importance of indoor air pollution control? (Laws, Information, Fines, Law Suits)
- Who do you believe? (The EPA, the Federal Government, trade journals, newspapers, National Trade organizations)
- Which professional organizations do you belong to?
- Which organizations' seminars/conferences do you currently attend or have you attended?

- Which professional journals/periodicals do you read?
- How do you keep up with the state of the art in your profession?
- Where would you go to find out about current requirements (with regards to asbestos, heating/air conditioning, # of air changes per hour etc.)?

Summary of Findings

As the study progressed, a wide variety of ideas and concerns were expressed (summaries of each interview can be found in Appendix B). Some individuals were consistent readers of building profession journals and periodicals while others did not read any on a consistent basis. Figure 2 represents the publications that were mentioned by the individuals who do read them. They are separated by category of respondent (e.g., architects, builders, etc.). As the chart indicates, ASHRAE Journal was by far the most frequently read publication. Heating, Piping and Air Conditioning and Consulting Specifying Engineer were also publications that are worth noting. The other publications have about an even number of readers. However, there were not any publications that were read by all the categories of respondents.

	Architects	Building Inspectors	Builders	Engineers	Industrial Hygienist	Physical Facilities Managers	Total
Architecture	2						2
Architectural Record	2						2
ASHRAE Journal				5		6	11
Builder Magazine			1				1
Building Design and Construction						1	1
Building Maintenance						1	1
Building Operation Management						2	2
Buildings						3	3
Building Standards Magazine		1					1
City and State		1					1
Cleaning Management						1	1
Consulting and Specifying Engineer						2	4
Contractor Magazine	1						1
Custom Builder			1				1
Engineering						1	1
Engineering Digest						1	1
Engineering News			1				1
Facilities Design and Maintenance						1	1
Governing		1					1
Heating, Piping and Air Conditioning				2		2	4
Hotel/Motel Management						1	1
Hotel and Resort Industry						1	1
Industrial Hygiene						1	1
Industrial Maintenance and Plant Operations						1	1
Maintenance Technology						1	1
Professional Builder			2				2
Progressive Architecture	2						2

Figure 2--Publications Mentioned

Another idea that arose was the use of conferences or seminars that would explain indoor air quality issues. Some really liked the idea while others felt that there could be some benefit to such conferences but they felt like there would need to be some specific purpose if they were going to send a representative to the meetings. Of those individuals who addressed the possibility of conferences, 100% (21/21) said that there could be some potential value to a conference.

A toll-free indoor air quality "hotline" was also suggested and it received high marks; 100% (21/21) of those who addressed the issue felt that this would be of some use. The possibility of the EPA producing a video also seems like a good idea because 87% (27/31) of those who addressed the issue felt that videos could be useful training aids.

Figure 3 illustrates the organizations that people would consult for technical information such as indoor air quality issues. Again, ASHRAE was the most frequently mentioned organization. Every category except "Builders" had at least one individual who mentioned ASHRAE while the other organizations were more category specific.

	Architects	Building Inspectors	Builders	Engineers	Industrial Hygienist	Physical Facilities Managers	Total
American Industrial Hygienists Association (AIHA)					1	1	2
American Public Health Association (APHA)					1		1
Architects Institute of American (AIA)	3						3
American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)	1	1		6	1	5	14
American Society of Hospital Engineers (ASHE)						1	1
American Society of Mechanical Engineers (ASME)				2		1	3
Association of Energy Engineers (AEE)				1			1
Building Operations Management Association (BOMA)						4	4
Consulting Engineering Council (CEC)				2			2
Hotel/Motel Associations						1	1
Intermountain Facilities Maintenance Association (IFMA)						1	1
International Council of Building Inspectors (ICBI)		3					3
National Association of Home Builders (NAHB)			2				2
Products Council (PC)	1			1			2
Sheet Metal and Air-Conditioning Contractors National Association (SMACCNA)				2			2
State and Local Agencies	1					2	3

Figure 3--Organizations Mentioned
(See Appendix A for a list of the complete names of these organizations)

With so many different responses there probably is not any single way that information and training should be passed on to the building professionals.

Possible Approaches

Because of the wide variety of different responses, it is recommend that the EPA use a multi-faceted approach to improve its information dissemination programs. The EPA could:

- Sponsor conferences either alone or with Professional Organizations (see Figure 3 for a list of organizations). When these conferences are advertized there needs to be enough information given out so that individuals will know if they are interested or not.

Advantages

- Human contact can be made
- Questions can be answered
- The support of recognized and respected organizations can be gained

Disadvantages

- Expense
- Have to coordinate efforts with another organization
- Time and location won't be good for all
- Travel can be a problem for some

- Publish a training book to be used in conjunction with the above mentioned conferences. It is important that such a document have a good table of contents and be well indexed so that individuals can find areas of interest easily.

Advantages

- Can use very specific and technical language
- Can be used as a reference later
- Can be "skimmed" and marked by the reader

Disadvantages

- Tends to be boring and "inhuman"

- Set up a toll-free telephone line that building professionals could use to get

answers to specific questions they have. One concern that was expressed about this option was that the individuals manning such a phone line need to have sufficient technical knowledge and expertise. Additionally, the concern was expressed that this telephone system should not have too much automatic transferring because that frequently leads to people getting disconnected and to frustrated callers.

Advantages

Human contact

Specific questions can be answered

Disadvantages

Expense

- **Channel information through Professional Organizations (see Figure 3 for a list of organizations). If national organizations are given the information then they can pass it down to the local areas.**

Advantages

Gain the support and legitimacy of organizations that individuals in the professions trust

Wider audience than just putting out information in general

Disadvantages

EPA has less control over final product

Have to coordinate efforts with another organization

- **Channel information through state health and energy agencies**

Advantages

Information will be where many will be looking

Will have the cooperation of local people

Disadvantages

Have to coordinate efforts with another organization

- **Work with Trade Journals and Periodicals to include articles about Indoor Air Quality (see Figure 2 for a list of publications). A concern expressed about this option is that frequently these publications have articles written by people who are trying to sell their product rather than just give information about an issues. Therefore, it is important that it be clear that the EPA is involved with the article so that people will believe it.**

Advantages

Reach a greater audience

Gain the wide readership that some publication have

Disadvantages

**EPA would have less control over final product
Have to coordinate efforts with another organization**

- **Develop multi-media training materials (video or audio instruction).**

Advantages

**Can be consulted at any time
Gets the individuals attention better than written word
Can be less sophisticated than a document for those who have a less technical background**

Disadvantages

**Added expense
Not "skimmable" or "markable" like the written word
Does not lend itself to technical information
Many people do not have the video capabilities in their offices
Sometimes it can be too passive and people will not pay attention to them**

- **Have local EPA consultants to assist building professionals in their individual needs**

Advantages

**Human contact
Individual questions and concerns can be asked
Enforcement can be included in the education process**

Disadvantages

Expense

- **Educate local Building Inspectors to ensure that buildings are constructed and remodeled according to EPA standards. If this is done the local administrators such as mayors and city managers need to be notified so the building inspectors have the support they need to be involved in a new project.**

Advantages

**Local building inspectors can act as substitute EPA inspectors thereby saving the EPA money
Buildings will be built in accordance with EPA standards
Local building inspectors have a much better knowledge of their areas**

Disadvantages

Have to coordinate efforts with another organization

Other Factors to Consider

In addition to the information gathered from the building professionals themselves, there are a number of other factors that need to be considered to determine the best way to inform and train.³

- How much money is available?
- What are the time constraints?
- How many need to be taught?
- How large is the geographic area to be covered?
- What kind of information is being transferred?
- Why do the building professionals need to know this information?
- What are the teaching objectives?

Recommendations

As was mentioned previously, the best way to reach as many building professionals as possible is to use as many of the different approaches as possible. Nevertheless, there are some approaches that stand out. These approaches involve

³These issues have to do with aspects of Instructional Science--a field of knowledge about which the author is not an expert. Consequently, it is recommended that in addition to taking into consideration the brief material presented in this report an instructional scientist be consulted when the training program is actually being developed. See the short bibliography for some books about different instructional media.

coordinating the EPA's efforts with professional organizations and journals. By far the most frequently mentioned organization and publication were ASHRAE and ASHRAE Journal. These two sources are highly recommended for use in the information dissemination and training process. It would also be useful to work with the other organizations and publications listed.

Additionally, some formats are more appropriate for some groups than are others. For example, given that the information can be quite technical and that the audience will be varied with regard to technical expertise, the training should be tailored to the needs of the groups being taught. For example, the architects and engineers will have a technical background whereas some of the building managers and their employees will have less of a technical background and therefore the information could be more complex for the architects than for the building managers and employees. The more complex information would work well in written documents and the less technical information would work well in a video format.

If these alternate methods are used in addition to the traditional publishing of a training book, it is believed that information and training will be more effectively transferred to the building professionals.

Appendix A--List of Individuals Contacted⁴

Architects at:

Architectural Coalition, Provo
Brixen and Christopher Architects, Salt Lake City
Deseret Architects and Engineers, Salt Lake City
Edwards and Daniels Associates, Salt Lake City
Holland Pasker and Associates, Salt Lake City

Building Inspectors in:

Murry City
Orem City
Provo City
Sandy City

Builders at:

Boswell and Elder Construction Inc., Orem
Bruce Nelson Construction, Springville
Vista Enterprises, Orem
Tri-West Contractors Inc., Provo

Engineers at:

Colvin Engineering Associates, Salt Lake City
Cowley and Evans Consulting Engineers, Salt Lake City
Engineering Consulting Resources, Salt Lake City
Heath Engineering Co., Salt Lake City
Olsen and Peterson Consulting Engineer Inc., Salt Lake City
Van Becrum and Frank Associates Inc., Salt Lake City

An Industrial Hygienist at:

Industrial Health Inc., Salt Lake City

Physical Facilities Managers/Engineers at:

American Express, Salt Lake City
Beneficial Life Tower, Salt Lake City
Brigham Young University, Provo
Church Office Building, Church of Jesus Christ of Latter-day Saints, Salt Lake City
Cottonwood Mall, Salt Lake City
Crossroads Mall, Salt Lake City
Excelsior Hotel, Provo
Hilton Hotel, Salt Lake City

⁴Individuals' names are not used because they did not give permission for their use.

Marriott Hotel, Salt Lake City
Novell, Provo
University Hospital, Salt Lake City
University of Utah, Salt Lake City
Utah Valley Regional Medical Center, Provo
Word Perfect, Orem
ZCMI Center, Salt Lake City

Appendix B--Summaries of Interviews

Architects

Name: Desert Architects and Engineers
Location: Salt Lake City
Organizations Mentioned: Products Council
Publications Mentioned: Contractors Magazine
Conference Useful?: Yes
Toll-free Hotline Useful?: Yes
Video Useful?: No, no VCR in office
Other ideas:

Name: Edwards and Daniels Associates
Location: Salt Lake City
Organizations Mentioned: Products Council, State Agencies,
Publications Mentioned: Progressive Architecture
Architectural Record
Conference Useful?: Yes, would probably be good
Video: Good for introduction but books are better for long term
Toll-free Hotline Useful?:
Other ideas: Doesn't pay attention to Architects Institute of America

Name: Brixen and Christopher Architects
Location: Salt Lake City
Organizations Mentioned: Architects Institute of America
Publications Mentioned: Architectural Record
Architecture
Conference Useful?: Yes
Video: Wouldn't look at it, no VCR in office
Toll-free Hotline Useful?:
Other ideas: Would work with Mechanical Engineers on indoor air quality
Newsletters would be OK if they are catchy

Name: Architectural Coalition
Location: Provo
Organizations Mentioned: Architects Institute of America
Publications Mentioned
Conference Useful?:
Toll-free Hotline Useful?:
Video: Would be useful because they are flexible
Other ideas: Would work with Mechanical Engineers
Written material should be well referenced and indexed

Name: Holland, Pasker and Associates

Location: Salt Lake City

Organizations Mentioned: ASHRAE
Architects Institute of America
Products Council

Publications Mentioned: Progressive Architecture

Conference Useful?: Yes

Toll-free Hotline Useful?:

Video: Great, they have monthly training meetings that they would use it in

Other ideas:

Builders

Name: Boswell and Elder Construction, Inc.

Location: Provo

Organizations Mentioned: National Association of Home Builders
Utah Valley Home Builders Association

Publications Mentioned: Custom Builder
Professional Builder

Conference Useful?: Yes

Toll-free Hotline Useful?: Might be useful

Video: Would be useful

Other ideas:

Name: Bruce Nelson Construction

Location: Springville

Organizations Mentioned:

Publications Mentioned: Engineering News
Professional Builder

Conference Useful?:

Video: Would be useful

Toll-free Hotline Useful?: Would be useful

Other ideas:

Name: Vista Enterprises

Location: Orem

Organizations Mentioned: National Association of Home Builders

Publications Mentioned: Builder Magazine

Conference Useful?:

Toll-free Hotline Useful?: Yes

Video: Useful because it is easy to use but people would need to have video equipment

Other ideas:

Name: Tri-West Contractors, Inc.
Location: Provo
Organizations Mentioned:
Publications Mentioned:
Conference Useful?:
Toll-free Hotline Useful?: Yes
Video: Maybe useful, depends on the job
Other ideas:

Building Inspectors

Name: Sandy City
Location: Sandy
Organizations Mentioned: Utah Building Inspectors Association
International Council of Building Inspectors
Publications Mentioned: Building Inspectors' Magazine
Conference Useful?:
Video: Excellent, Sandy has a video library and they use it
Toll-free Hotline Useful?: Only useful if there is expertise on the other end
Other ideas:

Name: Murry City
Location: Murry
Organizations Mentioned: ASHRAE
International Council of Building Inspectors
Publications Mentioned
Conference Useful?: Yes
Toll-free Hotline Useful?:
Other ideas:

Name: Provo City
Location: Provo
Organizations Mentioned:
Publications Mentioned
Conference Useful?:
Toll-free Hotline Useful?:
Other ideas: Many inspectors feel like they are too busy doing their current jobs to take on new tasks.

Name: Orem City

Location: Orem

Organizations Mentioned: Utah Building Inspectors Association

Publications Mentioned: City and State
Governing

Conference Useful?: Yes

Video: Would be useful if well done
Can watch more than once
Can't ask questions

Toll-free Hotline Useful?:

Other ideas: Send a letter to Mayors to go through the proper channels saying that the local people should attend the conference to be trained

HVAC Engineers

Name: Heath Engineering Co.

Location: Salt Lake City

Organizations Mentioned: ASHRAE
Association of Mechanical Engineers
Association of Energy Engineers
Consulting Engineers Council

Publications Mentioned: ASHRAE Journal
Heating, Piping and Air Conditioning
Consulting Specifying Engineer

Conference Useful?: Yes

Toll-free Hotline Useful?: Depends on who is on the other end

Video: More effective if done as part of a seminar
Can be viewed at one's own leisure

Other ideas:

Name: Olsen and Peterson Consulting Engineers, Inc.

Location: Salt Lake City

Organizations Mentioned: ASHRAE
SMACCNA

Publications Mentioned: ASHRAE Journal

Conference Useful?:

Toll-free Hotline Useful?: Useful if there are people on the other end who have sufficient expertise

Video: Would be useful; Have a VCR in office and use it

Other ideas:

Name: Van Becrum and Frank Associates, Inc.
Location: Salt Lake City
Organizations Mentioned: ASHRAE
Consulting Engineering Council
Publications Mentioned: ASHRAE Journal
Conference Useful?: Yes
Toll-free Hotline Useful?: Good if people know about it
Video: Not absorbed; Can't refer to it later
Other ideas:

Name: Colvin Engineering Associates
Location: Salt Lake City
Organizations Mentioned: ASHRAE
Publications Mentioned: ASHRAE Journal
Heating, Piping and Air Conditioning
Consulting Specifying Engineer
Conference Useful?: Yes, more than one would be useful
Toll-free Hotline Useful?: Very useful
Video?: Useful in the interface between engineer and building operating personnel
Other ideas:

Name: Cowley and Evans Consulting Engineers
Location: Salt Lake City
Organizations Mentioned: ASHRAE
Products Council
Publications Mentioned: ASHRAE Journal
Conference Useful?: Yes, in conjunction with a well indexed and referenced training manual
Toll-free Hotline Useful?:
Video: Useful in an office meeting in conjunction with written material
Other ideas:

Name: Engineering Consulting Resources
Location: Salt Lake City
Organizations Mentioned: ASHRAE
Association of Mechanical Engineers
SMACCNA
Publications Mentioned: ASHRAE Journal
Conference Useful?:
Toll-free Hotline Useful?: Useful if the necessary expertise is on the other end of the line
Video: Videos are shown a couple times a year at local ASHRAE meetings
Other ideas: Discounts some trade journals and publications because they frequently publish unsolicited articles that are mainly out to promote a product

Industrial Hygienist

Name: Industrial Health, Inc.

Location: Salt Lake City

Organizations Mentioned: American Industrial Hygienists Association
ASHRAE
American Public Health Association

Publications Mentioned:

Conference Useful?: Yes, they recently sent a person to an indoor air quality conference in Toronto

Toll-free Hotline Useful?: Not useful to them, would be more useful for building occupants

Video: Useful to train employers and employees

Other ideas: Printed bulletins are very useful

Physical Facilities Managers

Name: University Hospital

Location: Salt Lake City

Organizations Mentioned: ASHRAE

Publications Mentioned: ASHRAE Journal

Conference Useful?: Yes

Toll-free Hotline Useful?: Yes, if people knew of its existence

Video: They would use them

Other ideas: Newsletters would be useful

Name: Excelsior Hotel

Location: Provo

Organizations Mentioned: National and Local Hotel/Motel Associations

Publications Mentioned: Industrial Maintenance and Plant Operations
Heating, Piping and Air Conditioning

Conference Useful?: Yes, because there is human contact and people can ask questions

Toll-free Hotline Useful?:

Video: Useful for staff because of its format, should be used in conjunction with written material

Other ideas: Monthly bulletins and direct mailings would be useful
Spread information as widely as possible

Name: Utah Valley Regional Medical Center

Location: Provo

Organizations Mentioned: American Society of Hospital Engineers
State Department of Health
Denver EPA Office

Publications Mentioned: Engineering Digest
American Society of Hospital Engineers Bulletin

Conference Useful?: Yes

Toll-free Hotline Useful?:

Video: Not useful, too time consuming

Other ideas: Articles are useful because they are "skimmable" and "markable"

Name: Brigham Young University

Location: Provo

Organizations Mentioned: ASHRAE

Publications Mentioned: Heating, Piping and Air Conditioning
Consulting Specifying Engineer

Conference Useful?: Yes

Toll-free Hotline Useful?:

Other ideas:

Name: Word Perfect

Location: Orem

Organizations Mentioned: Intermountain Facilities Management Association

Publications Mentioned

Conference Useful?: Yes, if there is some incentive to attend such as how the
conference would apply to the company

Toll-free Hotline Useful?:

Video: Useful because it gets your attention; keep it short

Other ideas: Material needs to be "human" and readable

Name: Novell

Location: Provo

Organizations Mentioned: ASHRAE
Association of Mechanical Engineers

Publications Mentioned: ASHRAE Journal
Engineering
Maintenance Technology

Conference Useful?: Yes

Toll-free Hotline Useful?:

Other ideas:

Name: Cottonwood Mall
Location: Salt Lake City
Organizations Mentioned:
Publications Mentioned: Building Operation Management
Cleaning Management
Conference Useful?:
Toll-free Hotline Useful?: Probably useful
Video: Would be educational
Other ideas: Would contact HVAC and Mechanical people to get information

Name: American Express
Location: Salt Lake City
Organizations Mentioned: Building Operations Management Association
Publications Mentioned: Building Operation Management
Buildings
Facilities Design and Management
Conference Useful?:
Toll-free Hotline Useful?: Depends on whether the technical expertise is there
Video: It could be useful depending on the content; general information--no; specific information--yes
Other ideas:

Name: Beneficial Life Tower
Location: Salt Lake City
Organizations Mentioned: Building Operations Management Association
Publications Mentioned: Building Maintenance
Buildings
Conference Useful?:
Toll-free Hotline Useful?: Yes
Video: Yes
Other ideas: Might contact local universities and colleges for information

Name: ZCMI Center
Location: Salt Lake City
Organizations Mentioned: ASHRAE
Building Operations Management Association
Publications Mentioned: ASHRAE Journal
Buildings
Conference Useful?:
Toll-free Hotline Useful?: Useful if people know about its existence
Video: Good because it is easy to schedule its use
Other ideas:

Name: Marriott Hotel
Location: Salt Lake City
Organizations Mentioned: Building Operations Management Association
Publications Mentioned: Doesn't pay attention to them
Conference Useful?: Yes
Toll-free Hotline Useful?: Depends if people know about it
Video: Depends on the content
Other ideas: Would contact HVAC and Mechanical Engineers and state and federal agencies

Name: Hilton Hotel
Location: Salt Lake City
Organizations Mentioned
Publications Mentioned: Hotel and Motel Management
Hotel and Resort Industry
Conference Useful?:
Toll-free Hotline Useful?: Would be somewhat useful
Video: Useful because they can use it in meetings
Other ideas:

Name: Cross Roads Mall
Location: Salt Lake City
Organizations Mentioned:
Publications Mentioned
Conference Useful?:
Toll-free Hotline Useful?: Yes
Video: Good because of the visual instruction capabilities
Other ideas:

Name: Church Office Building--The Church of Jesus Christ of Latter-day Saints
Location: Salt Lake City
Organizations Mentioned: ASHRAE
Publications Mentioned: ASHRAE Journal
Building Design and Construction
Consulting Specifying Engineer
Conference Useful?: Yes
Toll-free Hotline Useful?: Very useful
Video: Very useful; have VCR and use it
Other ideas: Would contact local university

Name: University of Utah

Location: Salt Lake City

**Organizations Mentioned: ASHRAE
American Industrial Hygienists Association**

**Publications Mentioned: ASHRAE Journal
Industrial Hygiene**

Conference Useful?: Yes

Toll-free Hotline Useful?: Yes

Video: Useful

Other ideas:

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