



Career Profiles

*In Heating, Ventilating, Air-Conditioning
and Refrigeration (HVAC&R)*



American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
www.ashrae.org

OUR INDUSTRY

The Heating, Ventilating, Air Conditioning and Refrigeration industry offers engineers and technicians many and varied career opportunities.

Through the design and development of machines and systems, we in the HVAC&R industry have created comfortable and healthy indoor environments at home and at work, in our schools, hospitals, automobiles and even space capsules. Refrigeration systems allow us to keep seasonal foods for enjoyment year-long, store vital materials, and even ice skate in Florida. About one-third of all energy used in the United States is for heating, ventilating, air conditioning and refrigeration. With energy supplies both scarce and costly, our industry constantly strives to design systems that are both efficient and effective.

Rapid advancements in technology require that HVAC&R professionals constantly update their knowledge and skills. We do so partly through conferences and seminars, technical journals, and participation in professional and technical societies. ASHRAE, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. was founded in 1894 and is an international organization with more than 50,000 members. Through its mission of "advancing the arts and sciences of heating, refrigeration, air conditioning and ventilation, the allied arts and sciences, and related human factors for the benefit of the public," ASHRAE, offers continuous opportunities for self-development and the sharing of ideas.

As members of ASHRAE, we are proud to share with you our industry and its people. We hope you are challenged to explore careers in our profession.



Consulting

Consulting engineers in the HVAC&R industry design systems for new facilities and apply energy conservation principles in existing facilities. The consulting engineer prepares specifications and drawings, estimates costs, supervises the installation of equipment and systems and approves the project at completion. Frequently, they face the special challenges of ensuring environmental health and safety and designing complex systems for specific industries.

Consulting engineering firms are, for the most part, independent companies, and their engineering professionals generally hold degrees in mechanical, electrical or chemical engineering. The consulting engineering firm requires not only graduate engineers but engineering technicians as well, who serve as designers and draftsmen.

Teaching and Research

Faculty at colleges, universities, vocational and technical schools develop and teach the courses that the engineer and technician will need to gain the knowledge and skills to succeed in an HVAC&R career.

Research is an important role for HVAC&R faculty. They are constantly engaged in the research necessary to develop new technologies and to test and improve existing systems. Much of the emphasis in research today involves using computers to simulate and model systems to determine optimum efficiency and using computers to assist in the design process. Research is also conducted in independent research laboratories as well as the research and development units of large companies.

In order to benefit from this research, it is vital for HVAC&R professionals to continue their education throughout their career. Through the ASHRAE Learning Institute (ALI), Society meetings, technical committees and publications, ASHRAE provides many opportunities for cutting-edge knowledge.

Utilities

Our industry is responsible for using almost 1/3 of the total energy consumed in the United States. Utility companies are involved in generating and distributing the energy that operates heating, ventilating, air-conditioning and refrigeration systems. Without this energy being available on a continuous and uninterrupted basis, most systems could not operate. In addition, health would be impaired and food would spoil.

While the utility industry's main function is to provide the energy required by the public, they also share with the rest of the industry the responsibility for seeing that this energy is used wisely and without waste. Engineers and technicians in utility companies provide many related services: energy evaluations of existing systems and buildings, energy surveys, life cycle cost studies, advice to customers and continued development of programs that will assist the user in wise use of the energy provided by the utility company.

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Contracting and Service

After plans and specifications for new or renovated projects are completed, the HVAC&R contractor provides the skills necessary for assembling, building, testing, and making operational the various systems. Contracting companies throughout the industry employ graduate mechanical and electrical engineers to provide the link between the actual construction and the design engineer. Contracting firms also require the services of draftsmen and other technicians who will assist in the preparation and assembly of shop drawings, construction drawings, construction details, estimating, and the actual supervision and monitoring of the construction process. Engineers and technicians in the contracting business must have a working knowledge of the various mechanical systems and their components.

Servicing and maintaining heating, ventilating, air-conditioning and refrigeration systems and equipment are very important functions provided by companies that often are branches of contracting companies. Engineers and technicians involved in this work guarantee that the systems will operate properly to achieve the objectives of the designer and of the user. All mechanical systems are subject to failure; therefore, technicians that understand the principles of air conditioning, the laws of thermodynamics, the principles of controls and the operation of HVAC&R equipment represent a vital part of our industry.

Manufacturing

Since manufacturers develop and produce the equipment and systems we use, the manufacturing industry is an important segment of the heating, air-conditioning, ventilating and refrigeration industry.

Manufacturing companies are of all sizes and are the source of many innovations in technology. Many have extensive investments in facilities for product development, testing and production. Manufacturers are an important source of technical know-how, which they frequently share through ASHRAE publications and meetings. As the manufacturing process becomes more computer based, those interested in careers in this segment of the industry will need to understand computer-controlled production, flexible manufacturing systems and robotics. Many careers are available in HVAC&R manufacturing for engineers, technicians, draftsmen and production personnel.

Merchandising and Sales

An important link among the equipment manufacturers, the consulting engineer and the contractor are those in our industry who are involved in the merchandising and sale of HVAC&R technology. To be successful in this aspect of the industry requires not only engineering know how, but excellent communication skills as well.

Engineers and technicians involved in merchandising and sales provide technical support that the consulting and contracting industries need to properly apply the latest technology and systems concepts.

Merchandising and sales are sometimes completed directly by larger companies with their own sales force. There are also many independent manufacturer representatives who offer the smaller manufacturers an opportunity to present their products to the industry.

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Facilities

The management of facilities today requires a wide range of engineering and management skills to achieve the best utilization of an organization's investment. The Facilities Engineer may select a chiller, review a design from a consulting engineer, plan an energy management program and negotiate a construction contract on a building addition . . . all in the same week.

Often the Facilities Engineer is the only technical person available to assist the building owner and occupants on building operations problems. This engineer works on a wide range of projects, more so than most engineers. For example, the Facilities Engineer manages the planning and construction of new buildings and oversees the modernization of existing buildings.

Some of the more challenging problems for the Facilities Engineer are of an environmental nature; indoor air quality problems, toxic waste from a manufacturing process and CFC refrigerant replacement in chillers.

Facilities Engineers also get involved with the management of the operation staff, such as Central Plant Operators, HVAC Technicians and Preventive Maintenance projects.

In essence, this person knows how to solve the day to day problems, such as keeping a hospital's temperature and humidity under control, while planning the budgets and manpower for the long range requirements of the facility.

Government Agencies

Government agencies of the city, state and federal government develop policy and regulations that affect the design and construction of buildings. The engineers who work in these agencies are the vital technical link between the elected officials and the construction industry.

An engineer working in an inspection agency, such as the Fire Marshall's Office, ensures that sound engineering principles are applied to the life safety codes that the agency enforces. The regulatory agencies of a city or state present the engineer with demanding opportunities such as the evaluation of energy management programs for a public utility commission or development of building requirements for public schools. Knowledgeable and capable engineers review the construction and operation of hospitals, jails and any other facilities that are used by or for the public.

In addition to the regulation and inspection functions, the government agency engineer is often involved with policy development and assessment. Policy analysis requires an analytical review for important work such as state energy policy, emissions policy and Board of Health Policy on building indoor air quality.

The government agency engineer often interacts with city councils and state legislatures, as well as other elected officials in the development of public policy and those having wide-ranging effects in the building and construction industry.

OUR PEOPLE

ASHRAE is unique because its membership is drawn from a wide range of disciplines relating to the HVAC&R field. Consulting engineers, mechanical contractors, building owners and employees of manufacturing companies, educational institutions, research organizations, government or any organization concerned with environmental control make up the membership of the Society. Members also include longtime engineers and professionals in other related disciplines such as architecture and medical research.

The following are profiles of current ASHRAE members, who in their own words, describe their thoughts about our industry and the role that ASHRAE serves both personally and professionally.

Brian and Gina Langel Two mechanical engineers in the same family may not seem unusual, but my wife Gina and I have had some interesting experiences as a result of being in the same profession. Most of the jobs we interviewed for had some type of HVAC&R link because we were very interested in thermal sciences and the energy industry. Therefore, both of our careers have been in organizations related to the energy field.



There are many ways to use energy and many solutions to the same problem, and we both could offer competing energy solutions. Fortunately, the building owner ultimately decides the best way to use energy in their facility. As engineers, we are challenged to design and evaluate innovative ways to provide energy solutions to building owners. Utility companies are also very interested in the ongoing battle building owners face between energy conservation and IAQ buildings.

It is an exciting and challenging time to be involved in the energy and HVAC&R industries. ASHRAE offers many opportunities to gain the technical knowledge required for the HVAC&R industry.

Participation in this society gives engineers the opportunity to network with other professionals in the industry and to enhance communication skills. Gina and I have been involved in ASHRAE for several years, and the Society has been very beneficial to our same-profession household.

Richard Danks

Right out of college I joined the Austin Company as a mechanical engineer and began on the job training in designing mechanical systems – HVAC, plumbing and piping. The college exposure to fluid dynamics, thermodynamics and heat transfer were helpful in understanding the physics behind the practical applications used in the building design process for industrial, commercial and health care facilities. During this period I attended a local ASHRAE chapter meeting and enjoyed the opportunity for socializing with fellow professionals and the exchange of technical information at these meetings. Shortly thereafter, I joined ASHRAE.

Currently I am Deputy Chief, Facilities and Test Engineering Division at the NASA Glenn Research Center in Cleveland, Ohio. Having been with NASA since 1990, I have used my experiences and knowledge gained through ASHRAE to improve operations at this field center.

Mark Brummette

In grade school I excelled in math and science and became interested in the HVAC field. Consequently, I decided to study Mechanical Engineering at the University of Tennessee.

In 1991, I began working for the Public Building Authority (PBA) in Knoxville, Tennessee as the manager of the property management team. I am now the Director of Engineering in the Property Management division of PBA.

ASHRAE provides me with invaluable resources. I often refer to the ASHRAE Handbooks when preparing design specifications and/or verifying compliance with our existing systems. Moreover, ASHRAE keeps me abreast of the emerging technologies/trends to keep me in line with the latest information essential to the successful completion of my job duties.

I would encourage anyone who excels in mathematics and science to consider engineering as a career choice. I would specifically recommend the HVAC industry as a particularly interesting and challenging field.

Mark Morris

Prior to graduation, I interviewed with a temperature control contractor and discovered a whole new opportunity in the HVAC field. I was intrigued enough to take the job with them as an Application Engineer. This job evolved into a long-term career with progression into Project Management, Service Sales, Construction Sales, Branch Manager, Multi-State Sales Manager and Performance Contracting Manager.

In 1997, a past relationship resulted in an opportunity to become co-owner of a Manufacturers Representative Firm. This company sells engineered HVAC systems and equipment as well as providing start-up and operational support.

I strongly urge students to view their entry into the HVAC industry as a wonderful place to develop technical and inter-personal skills for continued growth. Professional societies like ASHRAE are an excellent place to hone technical expertise, develop relationships and work with HVAC professionals to give something back to the industry.

Ken Stoppel



My original attraction to this industry was its relatively good financial compensation, all things considered. Eventually I developed a real passion and fascination for temperature controls system design and installation. This passion has provided me opportunities to speak to various groups as well as teach several classes on this subject over the last several years.

In 1985, primarily due to the timing of computerized control systems revolutionizing the industry and the acceptance of Direct Digital Control (DDC) in the local marketplace, I started my own business, Building Controls and Services, Inc. specializing in new DDC systems as well as balance of HVAC services and retrofits.

I first became involved with ASHRAE in 1995 at the urging of a friend and associate, who was serving as our local Chapter President at the time. I strongly feel that ASHRAE is definitely crucial to industry growth. It is the glue that holds things together. It remains the literal bearer of standards, if you will. I have experienced most fortunate exposure to key people in our industry during my involvement with ASHRAE. I would highly recommend to any young person to consider a career in this industry, especially if they like changes and the ongoing technical evolution.

Jose A. Reig



I became a consulting engineer because I wanted a career that offered the opportunity to combine engineering with business, was financially rewarding, and included a high degree of personal satisfaction.

Consulting engineers involved in the design of HVAC systems must be skillful in analyzing requirements and translating these requirements into a system that fulfills all expectations.

ASHRAE has a great deal to offer to anyone involved in the HVAC&R industry. My involvement with ASHRAE has allowed me to use the organization as a technical resource of printed material, and more importantly, as a source of human knowledge not found in text books or anywhere else.

Gail S. Brager



I wanted to make a difference. I needed to know my work was improving the quality of life for people and contributing, in some small way, to making the world a better place. Has my work in the HVAC&R field enabled me to work towards this goal? Absolutely. As an engineer teaching in a school of architecture, I enjoy the challenge of integrating engineering technology into design application. I find the HVAC&R field exciting, dynamic, extremely satisfying, and strongly interdisciplinary.

I first began attending ASHRAE meetings as a student, and have benefitted tremendously from my continued participation at both the Society and local chapter levels. Through ASHRAE, I have made important professional contacts that have helped me in teaching, led to collaboration in both research and service, and overall served as an important national support network.

For more information on Careers in HVAC&R or Membership in ASHRAE, contact:

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