

ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Audio Interview of: Frank Faust

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Interviewed by: Ann Boutwell

Ann Boutwell

Mr. Faust, it has been stated that you are considered by many to be the father of modern residential air conditioning. What is the story behind this statement?

Frank Faust

Since the Carrier Corporation has long considered Willis Carrier to be the father of air conditioning. Some of the members of our organization would probably consider it presumptive for me to be labeled father of modern residential air conditioning. Actually, the term was coined by a public relations man in the General Electric Company, but there is some substance to the statement. First, in 1928 I designed and installed a central air conditioning system in an apartment in New York City. This was not intended to be a commercial product, but rather a proof of concept to show the feasibility of adapting air conditioning, commercial air conditioning equipment, to residential use. Second, in 1929 and 1930 I designed a room air conditioner, a self-contained room air conditioner for residential use. In the first year, two such units were made. One was installed in my apartment in Fort Wayne, Indiana. The other was used in the test laboratory of the General Electric Company. In the following year, 25 such units were manufactured and installed in various places throughout the United States. Subsequently, the General Electric Company as a result of these two developments and other developments decided to enter the air conditioning business and started commercial sales May 1, 1932.

A.B.

Mr. Faust, who was Dr. Alexander R. Stevenson, Jr. and what was your professional relationship with him?

F.F.

Dr. Alexander Stevenson was one of three assistants to the chief engineer of General Electric Company. He was also president of the American Society of Refrigerating Engineers in the early 1930s. He guided the development of the G.E. monitor top refrigerator and the formation of the refrigerator department of General Electric. He proposed the development of a room air conditioner based on principles similar to the monitor top refrigerator and I was assigned to work under his guidance to develop such a unit. He also was responsible for helping form the air conditioning department of General Electric Company.

A.B.

How did air-conditioning affect the railroad industry in the 1930s and what role did you play in providing human comfort to the railroad transportation?

F.F.

In 1930 or 1931, the Baltimore and Ohio Railroad installed air-conditioning on its trains between New York City and Baltimore and Washington. These units used a gas engine drive and they were so popular that the service practically took all the business away from the Pennsylvania Railroad, which had more convenient terminal facilities than the Baltimore and Ohio. Pennsylvania had to respond by air-conditioning its cars and initially it used ice for this purpose. Steam ejector systems were extensively used also and the Pullman Company installed air-conditioning in Pullman cars using a dual motor drive. One motor for terminal use at 230 volts and one motor to be driven by a large 6 volt battery suspended under the cars. The General Electric Transportation Department in 1931 developed an axel driven generator. This made it unnecessary to connect to the electric supplies in terminals and made it possible to generate electricity from the movement of the train. I was assigned to work with the Transportation Department and designed the air-conditioning system for use with this axel driven generator and it was used extensively by a number of railroads including the Illinois Central, and the New York, New Haven, and Hartford and others.

A.B.

During World War II, you were very much involved with the refrigeration units in the Victory ships. Could you tell me something about the Victory ships and your part?

F.F.

Victory ships were originally called Liberty ships and were part of the Merchant Marine operated by the U.S. Navy during World War II. The significance of their operation was that this was the first time that fresh food was supplied for use of troops overseas. Therefore, all food carried in Victory ships had to be in refrigerated cargo as in the Victory ships also were supplements for troop transfer in addition to the troop liners that were used. The General Electric condensing units were selected in the contest with the three companies General Electric, York, and Carrier and were the first relatively high speed condensing units using Freon refrigerant rather than ammonia in Marine service.

A.B.

During the war you also served as a consultant to the Quartermaster General on food refrigeration and served as a member of the board of several war production boards and was also a member of several war production board advisory committees. What were some of your responsibilities?

F.F.

I was asked to be a consultant on the development of mobile food warehouses and trailers equipped with food refrigeration systems. In the case of the war production board, industry advisory committees were established to assist the government in developing regulations for channeling refrigeration and air-conditioning products to essential war use. My position was to represent General Electric Company in these various advisory committees and in addition I was put in charge of the GE office in Washington, DC with the responsibility to guide General Electric Company to adapt refrigeration and air-conditioning products to war use. Including water coolers for use on the US Navy ships, ice cream cabinets, frozen food cabinets, and food refrigerator cabinets for officers' mess on warships and air-conditioning of ready rooms for aviators on battleships.

A.B.

Mr. Faust, do you hold any patents and if so if you would describe them, what they are and tell us something about that?

F.F.

I hold no patents myself. However, Dr. Alexander Stevenson for whom I worked had several patents including an important one on the use of air cooling of condensers which made the room air conditioner a practical device. Prior to air cooling they were water-cooled of course.

A.B.

How would you describe the HVAC&R industry during the late 1920s and 1930s?

F.F.

In the 20s Carrier, York, and others extensively developed air-conditioning in theaters, department stores, and large commercial applications. In the 30's Freon was developed by the DuPont company and there was extensive development of the market for small commercial air-conditioning, especially with self-contained so-called store coolers. There was also the extensive use of room air-conditioners in offices and beginning in residences.

A.B.

You worked for General Electric Company for nearly 44 years, approximately from 1926 until 1970. What do you consider your most outstanding achievements?

F.F.

Well, first, the pioneering and development of a room air conditioning and residential air-conditioning as previously discussed. Second, product planning for all of the modern air-conditioning and heating products of the General Electric Company and the heating, air-conditioning, and commercial refrigeration markets. And third, recognition of contributions made to ASHRAE and its predecessor societies culminating in my election as president of ASHRAE.

A.B.

In the 1950s you served as chairman of the joint committee which initiated the merger of the American Society of Heating and Ventilation Engineers and the American Society of Refrigerating Engineers. Could you give us a little insight on what was the spirit of the two societies going into this merger?

F.F.

Well, the background was that ASHVE had an initial interest in the combustion of fuel, heating of buildings with steam and hot water and ventilation in industrial and commercial occupancies. ASRE had an initial interest in the ammonia refrigeration for the preservation of food and production of ice later expanded to include domestic refrigeration. With extensive development of air-conditioning in the 20s, 30s, and 40s interest began to overlap. Greater cooperation was needed to avoid overlapping in technical programs and to reduce the burden of attendance by air-conditioning engineers at meetings of the two societies. A survey at that time indicated an overlap of about 60 percent in the technical programs of the two societies. The effect of the merger on the heating, ventilating, air-conditioning and refrigeration industry was that it helps in the explosive growth of technology. It opened up new fields such as the quality of the environment, the use of non-depletable energy sources, such as solar and the control of noise and other applications. The effect of the merger on worldwide human comfort was first, US companies have led in the development of products and applications of products and ASHRAE has provided the facilities and staff for exchange of technological information. Two, ASHRAE, through its international members and affiliation with similar societies throughout the world has widely disseminated technical data and, three, ASHRAE has insisted the US delegations to standards organizations and provide the secretariat for several. Also, ASHRAE's standards have formed an important base.

A.B.

Mr. Faust, you were President of ASHRAE during 1963-64. What was the focus of your administration and do you recall some of the society's accomplishments during that year?

F.F.

When the merger took place in 1959, there was some dissension in both of the predecessor societies. Some of the people in cold storage industry weren't interested in air-conditioning and some people in the heating field weren't interested in refrigeration. It was a difficult job to unify the organization and I think great progress was made in that year. Many of the bylaws were changed to eliminate the special interests and to make the society broader in its focus. Thus, the term "exhibit of unity". Another accomplishment was the development of a sound financial base. Between 1959 in 1963, the society operated on a deficit basis. It lost some of its members due to overlapping membership and it was only in 1963 and 64 that we were able to plan our financial affairs in a way to have a surplus rather than a deficit. A third major accomplishment was the sale of the societies research laboratory in Cleveland and the reorientation of the research program so that research was accomplished henceforth in a number of university and other laboratories, usually 25 or 30 such laboratories contributing at any one time.

A.B.

Well let's see you retired from GE in about 1970 right? And it was about this time that ASHRAE recognized a need to promote collaboration with the other professional societies, foundations, and government agencies in planning major research studies. What role did you play in this and...well what role did you play in this?

F.F.

In 1969, just prior to my retirement from General Electric Company, Paul Reese Auchenbach, who is in the Bureau of Standards in the Federal Government, proposed, as Chairman of the Research and Technical Committee of ASHRAE, that ASHRAE investigate collaboration with government agencies and other outside organizations. This came to the board in the form of a motion in early in 1970 a committee called Committee on Technical and Financial Outreach was established and I was asked to be its chairman. We met and I was authorized on behalf of the committee to make investigative interviews with government agencies and others to see what possibilities existed to provide a technical and financial outreach. This review seemed to indicate that there were advantages to a formal organization to do this, but it seemed to be more than a committee, or the chairman of a committee could accomplish on a volunteer basis. Therefore, the committee suggested that I resign as chairman and the committee would then recommend to the board that I be retained as a consultant and spend an extensive amount of time developing this role. So, the committee, so the position of ASHRAE Consultant for Special Projects was established in 1972 and I undertook this responsibility on a contractual basis from June 1972 until June 30 of 1983.

A.B.

What were some of your accomplishments, the society's accomplishments? What projects did you work on during these years that seemed the most outstanding?

F.F.

There was a great deal of change taking place in the government due to the energy shortage that developed in 1973 and 74 and new agencies were formed, including the Environmental Protection Agency and an agency that preceded the US Department of Energy. We worked with a number of these

agencies, for instance, we worked on a project for environmental air quality with the Environmental Protection Agency. We worked on a handbook for solar energy for the National Science Foundation and the Housing and Urban Development Department. We worked on the evaluation of solar energy systems and commercial buildings and we help the Department of Energy to develop energy conservation standards. In the period we also worked with other organizations. For instance, we worked with the American, or rather the Gas Suppliers Manufacturers Association and the US Department of Energy on the development of warm air systems for residential use. In this period of some 11 years as ASHRAE consultant we developed financial assistance from outside of ASHRAE in an amount well in excess of \$8 million.

A.B.

How do you see during the 11 years these projects were a benefit to the general public?

F.F.

Well, we develop standards and guidelines for economical use of energy and for use of non-depletable energy sources. We have helped the development of good environmental conditions better than what had been in the case otherwise. And i'm sure there were other benefits which could occur to me on further study.

A.B.

You're still active in ASHRAE, correct?

F.F.

In the society fiscal year ending in June 1984, I was a member of the ASHRAE government Affairs Committee. I was also a member of Technical Committee 6.7 on "solar energy utilization." In June and July 1984, I participated as one of the authors in forecasting what the air-conditioning industry might be like 25 years from now. Currently, I am Vice Chairman of the light members club and in the coming fiscal year I hope to be active on another ASHRAE committee.

A.B.

If you had to write a message to engineers in 2010, what do you think you'd tell them? What would you say?

F.F.

You've asked me to state what a brief message to engineers would be in the year 2010. I think I made such a statement in the series of articles entitled "Looking Ahead 25 Years" which appeared in the ASHRAE Journal of June 1984. I indicated that the future size and characteristics of the HVAC industry depend upon market needs, the economics of energy production and the extent to which technological developments in building, enclosures, processes, systems, and products economically satisfy market needs. Taking these three subjects individually, market needs were forecast to be the production of products and services for replacement, multiple replacement in a market of 234 to 280 million, excuse me, in a market of 234 million people and in addition providing new services for a 20% addition to this market. The economics at times seems to be clouded by the availability of energy. However, I concluded from research that I undertook that there were vast supplies of gas at great depths and that whereas energy reserves have previously been forecasted to last less than 25 years, currently, as a result of exploration at that below 15,000 feet the forecast of research has been increased to 75 years. Furthermore, if you conclude that it is feasible to explore to depths of 20,000 feet you

will find that there are large geo-pressured gas and hot water reserves and that there probably is enough energy to last many hundred years. The third element, technological development, depends on results, research and long-range research plans. There appears to be three trends. One is to improve comfort and reduce load requirements of building thermal envelopes including further development and increased use of passive solar features. The second is to select equipment and operate systems with new applications of microcomputers for dynamic response to cyclical change including climate during occupancy, industrial loads and thermal storage of the building and a storage elements when used in systems. There is also the continued development of lower cost and more reliable systems using non-depletable energy sources such as solar. In conclusion, then, the next 25 years will provide very large and varied markets, a continued availability of energy sources at cost not excessively higher than today's costs in many opportunities for innovative products and systems to satisfy market needs and to enhance comfort, health, and safety.

A.B.

Is there anything that you'd like to add to this interview that we did not cover?

F.F.

You asked me in one of your questions what I consider to be the top three accomplishments during the 44 years I worked for General Electric Company. I also consider it to be a major accomplishment that I was able to continue to work as independent consulting engineer and as a consultant to ASHRAE for the past 15 years during which the system of special projects was developed for the society.

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