ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Interview of: Roderick Kirkwood – History of ASHRAE Standard 90

Date of Interview:

Interviewed by: Bernard Nagengast

Note: (from 37:45 to 1:10:45 it repeats the interview from highlighted "But")
This interview is a history of the development of ASHRAE Standard 90.

Bernard Nagengast
This is a leadership recalled interview with Roderick Kirkwood, ASHRAE presidential member. Rod was one of the instrumental players in the development of ASHRAE standard 90 and Rod is here with us today to talk about his recollection of the development of that standard.

Roderick Kirkwood
Well this is a, it was a long time ago when this happened. I was president in '73-74. So it was at least 30 years ago. So my memory is going to have to be the best it can and it may not be perfect. Anyway, the events started, the need for this started when Press McNall, who'd been in the Bureau of Standards and he wrote me and said that the Bureau was working on an energy conservation standard and he thought ASHRAE ought to be involved. So I wrote, volunteered our assistance. And I didn't hear anything back for some time. Subsequently, Walt Spiegel mentioned, he was the president just before I was, he said he had had a meeting in his suite with the people from the Bureau of Standards and they had some discussions and he hadn't had any real response to that either and he had volunteered ASHRAE to help. So anyway, between the two of us we apparently touched a nerve within the Bureau of Standards and they came and they wrote me. It was in December, it would be December of '73. And they said that they would like to have us look at the standard that they had done and discuss it with them, and for our input. So they sent me, and with that letter they sent me what they had done. So I made copies of it. It was end of December and we had a meeting coming up in January. There wasn't much time to go through many channels so I simply sent copies to all the TC chairmen and the other committees that would be related to the standard for energy just to get them out as fast as I could so they could have a chance to look at it before that. And said we are going to have a meeting in Los Angeles, went down to Los Angeles to talk to the Bureau of Standards people and provide our input. By the time we got to that meeting in Los Angeles there was a big groundswell of concern that we were financing it, that somebody was funding it, that ASHRAE was funding it to rubberstamp what had been done. And it was an awful lot of unhappiness with what they had read and I didn't agree with it either. But anyways it wasn't what it was but the meeting had grown from maybe a small sized conference room to where we had to go rent a portion of the, what was the downtown convention area, convention hall at that time in downtown Los Angeles. It wasn't a big place but it was big enough for a few hundred people. We had a few hundred people. It was full. And the thing by this time was hot enough so that I went as president to chair it because I was afraid we were going to have a battle. We didn't want a war with Bureau of

Standards and we didn't want war with each other. So we had a discussion and the people made their feelings very clear to the Bureau of Standards. After it was over, and it lasted for several hours. It was a long meeting and a very intense meeting. And a lot of people that had input. They understood before we got through that we were not attempting to rubberstamp anything. We were trying to create something useful. Something that could be used effectively. And the general opinion of our membership is that what they had done that far was absolutely impossible to do. And from that standpoint the Bureau of Standards people laughed at that. And I remember who they were from that point in time. Some place in my record, I presume I have it but I haven't looked at it recently. But after it was over they came to me and we talked and they said well, it may be that it would be better if ASHRAE wrote the standard. Well I said we could consider doing that. We could take our standard and finish it. We couldn't do that because it had to be an ASHRAE standard and you heard the people out there now. I can't tell them that they have to accept something else that someone already started. They have to do this as an ASHRAE standard. We would use your standard as reference material but we couldn't do more than that. And the comment was well, that might work alright. We'll have to go back and figure it out but they said that the reason the standard was being written was because the outfit that they called NCBCS, which was the National Association of Building Codes and Standards or something like that, which was sort of an offshoot of the Bureau of Standards had asked the Bureau of Standards to do this. (Editor's note: NCBCS was the acronym for National Conference of Building Codes and Standards) And so they have to go back to NCBCS and get them to agree that this could be shifted over to ASHRAE if that is what they decided to do. Well when would that be? Well the NCBCS meeting wouldn't be until March, and this was January, it wouldn't be until March. And well this time thing is going to be important part of what we are talking about. Well I said you know it's getting awfully late. You want this thing by next September is what they said was their goal. I said you know that's a very difficult thing to do. A standard done by all these experts as volunteers is not something you do quickly. Well we really had to have it. It was really urgent. I agreed it was urgent. We had long lines at the gas stations at that time and such were people couldn't get gas because it was short and all these things and people were up pretty tight over energy. So anyway we, they left, we set it up so that we could do this. We've got our standards committee together and set it up as to how we would do it and what we would have to do. We set up an organization within ASHRAE to be able to do this as part of standards. And we were set up so we could do it. We were simply waiting for their response and the response came. I went to the meeting of NCBCS and it was in Salt Lake City and they asked us ASHRAE, to do this job for them. They wanted it to ultimately be a standard, probably a national or an international standard but a standard. And I agreed and that's what we did. We could write a standard. We didn't write code at that time. So from there we put our action into effect. Now before all this happened back at the January meeting in Los Angeles, I missed that part, we had a discussion with, I had had a discussion with the Board of Directors and decided whether we were going to do this before I could accept it. And the problem was where does the money come from to support this effort? ASHRAE doesn't have the money. We have our budget and we can't, we don't have any place to get this money from. Well if we have to we will raise everybody's dues. Well that was waving a red flag in front of the whole Board of Directors. The immediate reaction of that is well you can't do that you're going to lose members. And our discussion that lasted as I remember over two hours was over whether we could or couldn't do it and whether we had to do it. And my point was we didn't really have any choice. We had to do it. If we

didn't do it think how many members we were going to lose because somebody else was going to do it and they were all going to move over there because we won't be part of it anymore. We needed to show the world that there were people who understood how to use energy and how to use it effectively, a lot more so than we've been doing. We know how to do it and we had to sell ourselves on the fact that we could do it better than anybody else and that it was worth the fact that we put this effort into it because it was going to take a lot of effort and we understood it was going to take a lot of effort under intense programming. And these were volunteers. We would have asked our people to volunteer, our members to volunteer their time with no compensation, no transportation costs and we were obviously going to have a bunch of meetings in order to accomplish this and we had to do it quickly. And the Board finally agreed and I don't know whether I beat them into submission or whether they really understood what I was selling them but there's one way or the other it worked. So they agreed and so we had set this up. We had made the arrangement and we were going to get the money and we would have it by next spring and the dues that were going to be paid so we would have some money so we could publish the first draft of it. We didn't have money to publish the first draft and we're not paying these people to come to these meetings and paying them for their time but we had to at least pay for the printing. And there were no government funds available. There was no Department of Energy at that time. So we were out there to do a volunteer job as for the benefit of the public and we weren't going to get anything out of it except the fact that we would have a standard that we could work with. And that's where we went. So after the meeting then with NCBCS, came back, we put everybody to work. We called all these members that agreed they would work on this committee, put them to work and I think, I don't remember the numbers now, I think there was like one hundred fifty ASHRAE members that worked on that standard. Now along with this we asked IES, it was called then, they added American to it later, but the Illuminating Engineering Society. We asked them to join us and take care of the section on lighting because building lighting was a very energy user. We also asked the American Institute of Architects to join us and to do the chapter on the envelope. And that seemed like a reasonable thing to do and they joined us and we set up then with the ASHRAE committees, committee for each of the subjects that we had establish that we were going to cover and the IES committee and the AIA committee and we met, not collectively but we met as individual committees and we moved the meetings around the country so the people were paying their own way to the meetings, some of them had a short trip this time and a long trip next time. But it worked and they met at least a couple times a month, every one of them and some of them more than that. And they met and they worked and they worked to beat the dickens. And in ninety days, in the time I got this thing from NCBCS we had completed a draft. Now that's impossible but we did it and it worked. Now the - but in that we had some complications. There were of course, the people that want to make it applicable to all existing buildings as well because that's where the energy was being used. We were going to only affect new buildings with a standard of this kind. Well there's no way we could do it, make it effective in existing buildings because there's no legal basis to make it effective in existing buildings. We weren't in the legal end of things but we couldn't write a standard that would require somebody to take their building, an all glass building and cover all the glass with insulation or something of that kind which was part of what was being asked. So we backed off of that. We wrote it to cover new construction. It was commercial building or buildings other than residential. And we wrote the standard. We had a lot of people work very hard, a lot of very intense feeling, a lot of effort and there

was a lot of push and shove that went on but it was all done in the spirit of getting this thing done. And we got it done except for one thing and that was that about halfway through the effort, AIA decided that the that they didn't like this being a standard, an ASHRAE standard and even though their name was going to be on it or maybe because their name was going to be on it, they didn't think it was appropriate. And so they said they wanted a meeting to discuss this whole thing because they were going to withdraw otherwise. So I met with them and the head of their energy committee in Chicago and we spent a whole day going over the subject and what they wanted us to do was to change it to ASHRAE principles of practice. But we didn't have such a thing as principles of practice but what we agreed to do was to write a standard and principles of practice are not a standard. We have our rules what a standard is for ASHRAE and this was a standard for ASHRAE and was ultimately going to become a country wide standard and ultimately an international standard. That's what we expected to have happen to it and I couldn't budge. Now in this process, we had give and take in the meeting, back and forth. They were steadfast that we had to change it. And ultimately it ended up when I wasn't budging from the fact that we had to be a standard because I couldn't change the standard, they told me that if we didn't change that they would oppose us in the technical press which essentially was to say that our standard was a bad thing. And I took that as a threat and threats don't make me give up, they make me mad. And so I stuck right with where I was and I didn't budge. Not that I really had any basis for budging anyway. And we left and they took their people and left the standard on the section on the envelope just as it was partially completed. Now their people have done a good job up to that point. We finished it but we had to jump in and finish it and we were halfway through the time already. So we had to start a new committee for that and rework it and we got it done. And we finished it in time and so we had a standard in for publishing at the time that I finish my year as president, the end of June. And it was ready for issue to the reviewers but it took a year after our ninety days of doing it, it took a year for the reviews to get all done. So we spent a year and nine months on that first standard. Then they wanted it ready and out on the street. The Bureau of Standards wanted it out on the street by September. We didn't get it out by September because of this review process. We had, you know, from June till September and we couldn’t get the review done in that length of time. You have to review it and there's consensus review which meant we had to respond to every question that came in or every comment that came in. And we put out, I think it was something in the excess of five thousand copies of that draft. And this was the story behind what happened with Standard 90. The thing that is the real story or the real part of the thing is that we had the most terrific outpouring of effort of ASHRAE members and the intense effort that went into that that is absolutely unbelievable. They believed in the process. This was a thing whose time had come and you know you can't stop that. It's going to happen and it did and they made it happen. They worked hard, all of them worked hard. Everyone that was on those committees or on the whole standard. They worked very hard, very intensely and with a purpose of getting it done and they did. And I say again, you can't do it, but we did. It was an exciting time. It was a very intense time. It was a to tremendously satisfying time. I guess if I hadn't been in love with ASHRAE already why I would have fallen in love with them anyway. It was a feeling of the dedication of all these people, not to themselves individually, not to their pocketbook, not to what they were going to earn someplace. It was their dedication to doing something good that was necessary for the United States and for the rest of the world. And we did it and I think we did a good job. I guess that's that's the story. Do you have some questions?

B.N.

Well the term standard ninety, did the term standard come from the ninety days that it took to put this together?

R.K.

No it didn't. It just happened to be number ninety in the standard but ninety days, seventy five. My term was '73-74 so I actually came out and it was published in '74-75. So it was '75 when it came out. About a year later by the time it actually got out on the street.

B.N.

You know since that time course you know, the standard has become worldwide in use and it served as the model really for energy use and conservation. Did you ever envision at the time that it was going to become that comprehensive and that useful?

R.K.

Yes I did. I was running around the country, particularly down around Washington DC trying to get interest out of Congress, both the House and the Senate. I had some contacts there just from what I'd had in business and having work in various things and in the Pacific Northwest and Alaska and so forth. I talked with the congressmen and senators that I knew and others that I could get into one way or the other and because we had no, ASHRAE had no Washington representation at that time. That came, that was outgrowth of Standard 90 that we got into Washington DC. But anyway in this thing I talked to them and fundamentally they patted me on my head and said, yeah that's a good kid now run along we have got some real business to talk about. That's really what they were, the attitude that I was getting. Their point was that they could take the tar sands in Colorado and out of these they could create the petroleum products that we needed. They could distill from those and there was a whole lot of money going to be spent on developing a process and doing it. And it was big bucks and the government was going to put all the money in to do this thing. The other one was making the ethanol out of corn and a big deal there and that again was big money and they were interested in what they were going to appropriate big funds for to do these important jobs and I was just sort of a slight nuisance en route. I told them at the time that we would save 50 percent of all the energy used in buildings with the application of this in every new building that was built. I said after we got this one squared away we would go ahead and do one for existing buildings and how you could bring them up to some level substantially better than they were. We had to first get the new one out and they, I can't say they snickered at me but at least they didn't give me much credence. What they did was, we weren't talking about big money and the government is big money. And I learned that at that point in time, I guess I should have known it before then but I didn't. I didn't understand it to that extent. I thought what we were trying to do is a job and the job we were talking to do wasn't going to cost them anything. We were doing it for free. We'd liked to have got paid for what we invested in it but they weren't interested in that kind of piddle little money. So it was a disheartening effort with our federal government and what they did to help. There were a few people who did take a hold of it and try to do something about it and they were not effective enough to change anybody's mind. But we did it. We got the standard. Bureau of Standards accepted it. NCBCS accepted it and it went out ultimately after the reviews were complete. But the IES are still with us, AIA isn't. But they're building, they're designing buildings that meet the mechanics, the ASHRAE standard. So that's dictating to the whole design profession what has to be done.

B.N.

In looking at energy consumption, you know you see charts all the time of energy consumption in the United States, and it seems like whether you're talking about electrical consumption or whatever, the charts seem to be tapering off or even maybe possibly starting to decrease when you compare that to population growth and business growth. Do you think a lot of that was due to the application of Standard 90 to buildings?

R.K.

I don't have any question that we had a major effect. We have done what I said. We've taken, we've cut the use of energy to less than 50 percent of what it was for heating and air conditioning and lighting buildings. And so we did everything we said we were going to and it was a very effective one. Now at that time there wasn't an energy shortage in Canada. They had their own natural gas and oil and they weren't into a problem up there and so there was not a lot of enthusiasm out of our Canadian members but some of them were helping in this effort anyway which is the kind of cooperation we've always had between the U.S. and Canada at ASHRAE. But they weren't expecting to use the standard up there but I felt that they would ultimately have to. You know if you cut this much energy out of the use of buildings, our buildings are going to be running more economically than theirs would be. They needed to do the same thing. We're competing in the same overall marketplace and I was sure that it would go there. I was also sure that ultimately it would reach the rest of the world. That I never really had any doubt about. It was a thing whose time had come.

B.N.

And I suppose when you look at it when you were talking about how big money is important well if you start to save 50 percent of energy consumption in all new buildings, that's big money isn't it?

R.K.

That is very big money. Tremendous money. And it was a benefit that the public received as a gift from ASHRAE. Now subsequent to the revisions each time had been supported at least in part by government subsidies but all the initial work was entirely out of our pocket. Nobody came to our help and we did it and was paid for by the members. It wasn't contributions by anybody. It was simply we raised the dues. Now along with that we had to establish a credibility and this isn't ASHRAE's Standard 90 but it's part of the poll process. And that was we had to have people understand that there were real, that there was an organization in this country and in the world that knew how to make buildings energy efficient. And we needed to get that word out. So how are you going to do it? Well we had a process. I asked each chapter to create an energy committee and each chapter of Energy Committee was not to go out and save energy. What their job was, was to take the stuff that either they wrote or we wrote at the national level or the international level of the society. The things we could write and present to them that they could take the local paper, to anybody else that was interested and tell them about what we were doing. And they did. We retained out of some of these dues that I had taken away from people, we took some of that money, a small amount and we hired a PR outfit in New York. And our offices were in New York at the time for ASHRAE. And so was IES. But anyway, we hired a PR outfit and they guided us. They didn't do it for us but they guided us and they were affected but they also had contacts. But we were published in the Wall Street Journal, Engineering News Record and innumerable other national publications as well as local papers. And I go back to the point that I made earlier today, that just two years before that we went down to the Bahamas and down there we got, I got recognized as

being part of the Ashtray group and they thought, they weren't kidding they were serious that's what they thought it was. And that's a little embarrassing to say the least, but the point is that since then, well before that I had had this occur occasionally but not in any concerted effort like it was down there. They really thought that that was what we were. But anyway in said after that I have never been addressed as being part of the Ashtray group. Not once. So people learned about us. So the P.R effort was very important. We then became a name, ASHRAE which was published in papers and people read about it and they were all concerned about energy because they were having problems about it. There was great fear that was going to get much worse than it did. But if they had just let us do what we were going to do and help us do it the thing would have been over without any of this other money having been spent because they didn't need to do those other things. We saved the whole thing. It would have saved the whole shortage. So it was a very big thing for the country, for the world and for our membership all the way through. But we also had to have the exposure to be able to, for people to give us the credence that we had coming. And we got it and it worked. And you've seen the results.

B.N.

You can see the results in terms of all the Christmas lighting that people put out now because they feel they can afford a little extra energy.

R.K.

Yeah well it's a little dab. It's not very much but when you start looking at the total energy but it is wasteful energy as far as that aspect goes. But it is not hitting at the time of year where we're really in trouble energy wise, why our big biggest problem in most of the country is the summer load. But anyway it's a thing that I think also had a major effect on ASHRAE because our membership didn't decrease. All the other societies were going down in numbers, in number of members. We didn't, we never lost any significant membership whatsoever and we started to grow like a mushroom we were growing so fast. We've been growing. Thirty years ago we were only half as big as we are now and so that's pretty good progress in thirty years in any kind of a professional association. I don't think there's any other one that can come close to that.

B.N.

It's another example of how heating, ventilating, air conditioning , refrigeration engineers have transformed and changed the face of the human race.

R.K.

Absolutely. There no question about it. We've changed all the demographics of the world. Well almost all. We may not have, like I said once before, we may not have changed the demographics of the guys who run around mostly naked down in the jungles in the middle of Africa but we have covered almost all the rest of the world and even some, a good portion of Africa as far as that part goes and other places like that. But the, everything you had for breakfast and for lunch and for dinner was refrigerated in its process of getting to you, just as sure of anything. Whether it was the bakery goods you had or the eggs or the bacon or whatever else it was or the cereals that you buy out of a box that are mostly sugar but never the less all of that still was refrigerated in the process of getting to the point where it was manufactured into the actual cereal. So these things are all dependent upon that but that, you know, that's one area of food and famine. Famine is almost not known anymore in the world as it was in years past because we can store food for long periods of time because we have refrigeration. We have the air conditioning. Air conditioning has changed how the demographics, certainly in the United States

extensively. The south there was too hot and humid to be able to work inside buildings in summer, is now full of buildings that are air conditioned, whether manufacturing plants or office buildings or homes and they're living there very comfortably. And, you know, you go from the air conditioned home to air conditioned car to the air conditioned office building to your air conditioned restaurant for a lunch back to your air conditioned office building and maybe go over to an air conditioned gym and then go home to an air conditioned building again in your air conditioned car. And that's the way you live in those climates that are intense in the summer time, high humidity and high temperature. And that couldn't have happened without air conditioning. It's happening because of air conditioning. That's part of it but the other one that I like to go back to all of them time is the discussion I had way back when I was a relatively young engineer with Willis Carrier's stepson. He had been over in Africa working for Carrier air conditioning mines. Well why would you air condition a mine? You know, you crawl underground there and you got out in the sun there and you thought you were in pretty good shape but they had gone deep enough with these so that the temperature down in them was too intense for even for the natives over there that are accustomed to high temperatures for even them to be able to work any significant amount of time down there without collapsing. So they air conditioned these mines and then they would dig them deeper. So they could follow the load on down and keep the gold mines and I think that diamonds are done the same way but I don't really know but anyway the point is that they were doing things like that and that would be back in about 1950 so it was more than fifty years ago. And so there were things like that that I wouldn't have known of if I hadn't run into this but you turn around and you start looking at things and everywhere you look refrigeration and air conditioning are a part of our world not just our country or our neighborhood but our whole world. And they're changing it drastically or have changed it drastically and will continue to change it. Now we need to keep on improving the efficiency so we reduce the impact on the environment of the effluent from our energy using devices. But we changed what all the manufactures we're building. We required them to meet new standards of efficiency and particularly part load standards. That was one of the things in Standard 90. We run your machinery at part load much more of the year than you do a full load. Few days per year at most you're at full load but most of the time you're at part load so the efficiency at part load is very important in creating this efficiency they were after in energy use. And we did it. Manufacturers worked with it. They're still upgrading. We're asking them each time we rewrite a standard, we upped the ante on how good they were supposed to do it. And they met it every time.

B.N.

Many people think that the energy conservation standards are something that has come down from on high from the federal government particularly since the establishment of the Department of Energy and of course what your story is saying is that these energy conservation standards predated any work that the government did. That they actually came from the engineering profession.

R.K.

Yes, that's right. They started it but they gave up and turned it over to us to do because they were not able to get a standard that was acceptable to the industry.

B.N.

Are you out of film?

Camera operator

We're almost at the point where I need to change tape.

R.K.

Well I think were about at the end of where we need to go aren't we?

B.N.

How much more time is on there?

Camera operator

I don’t know. Anywhere from 30 seconds to a minute.

B.N.

What would you say to the environmental critics who say using energy for air conditioning and some kinds refrigeration are just really wasting energy?

R.K.

That's pretty simple. The efficiency of the people who are working in air conditioned facilities whether they're manufacturing plants or homes, restaurants, public buildings, the people that are working in those are working at a much higher level of efficiency than they would be working otherwise. You can't ventilate with outside air and bring the temperatures down to where they can work as efficiently as they're working under these circumstances of having air conditioning. And if you didn't do that you would be creating a bigger problem because you would have less efficiency and everything else and that would add to our problem rather than improving it. And we have improved them drastically. Same thing goes refrigeration. Without refrigeration being used for products, particularly agricultural products, our food line, we would still have major famines throughout the world and major famines were a terrible thing in years past but they don't happen very often now because we can store food into the years when we don't have so much. We can also ship food from an area that is able to produce it over to an area that for some reason isn't able to produce it now. And we save lives, many lives that way and that certainly is a benefit that you wouldn't get without the use of refrigeration. And we go on with the other things whether you are shipping it, whether whatever you're doing with it you need to recognize it was going to be refrigerated. Japan for example, relies on liquefied petroleum products that are brought in by ship. How do you bring them by ship? You have a refrigerated ship so you can keep the temperature low enough so you can keep the pressures in the tanks within the ship within manageable levels. You couldn't ship it otherwise. And so we do so many good things that the fact that we're using energy this way is not wrong. It is much better than having a bonfire out there we can roast the squirrel that we just killed to be able to keep from starving to death. We're going to create more smoke per person out of that by far, more problem out of that than what we would by what we're doing now.

B.N.

Thank you Rod for this insight into ASHRAE’s contribution into energy efficiency in buildings.

(from 37:45 it repeats the interview from highlighted "But")