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Ken Sinclair Knows Much About Facility Operation

Ken is Editor/Owner of AutomatedBuildings.com

As a young man, Ken Sinclair enrolled in technical school and studied Air Conditioning and Design. As he stated, "I got dragged into the large building space. I guess I did end up repairing refrigeration fans and boilers; they were just bigger than I had imagined." His credentials span more than 35 years in the industry optimizing operating procedures in existing facilities and large buildings. His online Internet readers know him as the Editor/Owner of AutomatedBuildings.com. George Thomas talks to Ken about building automation.

What was your first position that aided your success in the field?

Johnson Controls in Milwaukee, WI, originally trained me as a service/sales engineer. I worked with a team of experts that had seen almost everything. They exposed me to a lot of different mechanical systems and individuals with control problems that required different solutions.

What was your equipment training?

The training was mostly pneumatic, but as service manager I was working with equipment installed from the turn of the century. Pneumatics had a great run in history. Johnson at that time was introducing the Fluidic Logic equipment which used pneumatic technology to perform analog or digital operations similar to those performed with electronics. This equipment had a very short life span and was quickly overshadowed by electronics. The hardwired logic central systems like the T6000 series led to the development of minicomputer-based systems like the JC/80.

What sparked your interest in energy conservation?

I left my post of service manager with JCI to operate several buildings for a local developer. After that I accepted a contract position as the Assistance Energy Analyst for the Province of Alberta, Canada. It was the 1970s and for the first time ever, it was viewed that there was not an inexhaustible supply of energy. Many projects had been designed as if cheap energy would always be there. Energy conservation had a very high profile in the Alberta government during those years.

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While working on a computer simulation for a 60-acre solar heated bubble that was to bring a mild environment to a northern Alberta town for both the construction and finished town-site, Don Holte of Nova Engineering taught me that the scope and approach to environment control engineering was unlimited. Don went on to be the International President of ASHRAE. Several of my industry mentors shared a good understanding of computerized, large building simulation principles.

This position gave me exposure to the world of computer simulated energy performance. My task was to take four large government buildings and achieve the simulated savings with control modification. I believe we over-achieved our goal because the buildings were actually running much worse than simulated. This set the scene for Sinclair Energy Services Ltd.

Why did you establish Sinclair Energy Services Ltd?

I began Sinclair Energy Services Ltd to do computer simulations, energy conservation, as well as identifying computerized-controls related opportunities in existing large structures. We used the Meriwether Building Simulation program supported by the Canadian Government on a mainframe computer in Ottawa. We would input our simulation runs in Edmonton on paper cards and received the results back in extremely large printouts. This was my first go at a national network...leading edge technology for the 1970s.

In 1975 the University of Alberta (U of A) started a total Direct Digital Control system. I was fortunate to be a member of this project that was installing large

campus buildings with only DDC without any conventional controls. This project and others helped me gain insight into large complex operations.

In the early 1980s, I moved to Vancouver Island and my company started providing similar services for the British Columbia Buildings Corporation (BCBC). The DDC revolution had just begun. Our energy studies on existing buildings ended in the retrofit of the existing controls to the new DDC systems. Working in this capacity further increased my team of industry mentors.

You mentioned Don Holte of Nova Engineering as one of your mentors. Who were your other mentors?

Cliff Badger of Johnson Controls not only taught me controls and building systems, but how to think and ask logical questions to learn more. He was a great first mentor. Ron Burns was next as Director of Energy Management for the University of Alberta. Under him, with a team of co-mentors, we built what in the mid-1970s had never been built before, a totally computerized Direct Digital Control system complete with computerized graphics for a large university campus. The project created and documented many standards and procedures that are still part of our industry today. Later, I met Tom Hartman who taught me the concept of dynamic control by pushing zeros and ones in the control language of a Honeywell Delta system. I then closely watched Jack McGowan's evolution to God of GridWise.

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Jack is now the Chairman of the Gridwise Architecture Council, but that did not happen overnight. Several hard working years of writing, planning, and working on committees helped create the radical change encapsulated in GridWise smart grid thinking. I very much believe in GridWise thinking. I worked with both large chilled water storage and ice storage off-peak cooling systems prior to the start-up of AutomatedBuildings.com.

I am impressed that Jack and others were able to create the GridWise Constitution.

What manufacturing company, do you feel, was a leader in early DDC systems?

The Powers Control Company, which after many name changes became part of Siemens, was able to take some concepts we had running on the DEC PDP-11 at the university and commercialize them. As computing power increased and hardware became smaller, they pushed the thinking into the first Standalone Control Unit (SCU) that set the mold for almost all DDC systems.

The SCU was the first relatively low-cost stand alone control panel that allowed DDC to be applied to smaller buildings. Many panels could be networked together to allow larger systems to be created without a head-end computer. The first SCUs had their data programs backed up with a tape recorder and were accessed by a dumb terminal. Later, this evolved to an interface with a Personal Computer.

You must be amazed how those refrigerator-sized computers now occupy a small footprint in a control panel. What other companies impressed you the most with miniaturizing DDC equipment?

As I mentioned before, I moved to the west coast of Canada in the 1980s and was introduced to a new industry that was making DDC equipment extremely small and affordable. As a consultant working with BCBC, the province's largest landlord, we were able to help grow the industry with a Request For Proposal approach that encouraged innovation but included escalating mandatory requirements. Actually with BCBC folks we created a design document for the RFP procedure for procuring DDC Client Comfort Systems. This was one of their first documents that was online and is still available today.

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I still refer to it for individuals trying to get a toe hold on what is BAS? Out of the original upstart company bidding the RFP projects emerged several companies, Delta Controls and Reliable Controls becoming the largest.

When I was working on the U of A project, we would joke about the time when the complete control system would be on a card you could put in your pocket. At AHR Expo this year the Tridium folks had the Sedona Chip on their lapels. Yes, it still all amazes me.

In your opinion does the Lon versus BACnet war continue?

Only in the minds of a few and they are not users, only providers. Smart owners and integrators use the standard that best fits their client's requirements and has the lowest cost and most benefit for the project.

Is this an issue or not in creating open systems?

No, a few good standards are very healthy for our industry. The fact that we can count our fieldbus standards on one hand is a huge achievement. At LonWorld in Toronto several years ago, I stated that the best way to stop a war was to start a larger war.

The issue is no longer whether it will be Lon or BACnet. The issue is now how far into the field will IT standards go and what type of connections to the IT world will the fieldbus standards provide.

How do you see the deployment of Ethernet in buildings?

No, a few good standards are very healthy for our industry. The fact that we can count our fieldbus standards on one hand is a huge achievement.

The deployment of the Ethernet backbone will be a huge part of the total data plan. Most data plans will be built on a structured cabling approach using all the synergies of combined networks. The potential risks and concerns will be discussed and dealt with very early in the planning. The total number of networks and their connections to the outside world are crucial decisions. Data will be handled as a utility being part of the conceptual building plan. Mandatory data preliminary design will be submitted with conceptual planning for the structure. If this does not happen, tell them it must or the building will be dark and cold without proper data connection and folks will move to buildings that have this utility properly planned.

Data will no longer be handled as an add-on after the building is constructed. Wireless actually increases the need for good structured cabling as most wireless only provides communication for a few 100 feet so it must be connected to something close, fast, and secure.

Do you see IT departments becoming gate-keepers to deploying BAS systems in buildings?

Gate-keepers sounds a bit extreme. I believe they have to be viewed as network nannies. It is crucial that they keep complete control of their networks, but they are being pressured by powerful Software as a Service (SaaS) interests to remove applications from local networks and run them remotely then furnishing remote answers to the local network. If the remotely generated answers are ignored at the local level, then your gate-keeper scenario fits.

How do we deal with these guys?

I feel for these IT guys. The CEO wants to know why he cannot have them do something on their servers what he just did on the Internet this morning. The reality is the IT department has a data networking infrastructure that has grown from the ashes of 1980 and 1990 networking equipment and in-house systems. The earlier the company was into networking, the greater the liability. Moving to today while keeping the legacy enterprise afloat is hard work.

SaaS may be the best news that has happened to creaky networks. Of course some of the early network wizards have outlived their useful lives and need to be retreaded—and the newest Net-headed kid in the staff taken seriously.

Show promoters are saying that AHR Expo 2008 may have been the largest attended show ever. Is this correct?

Yes, you are correct. It was a new show record with total visitor attendance of more than 39,000. However, 17 years of not being in New York is a long time.

What impressed you while visiting the show?

I would say the overall desire by all for a significant change in providing improved paths to sustainable buildings, with the underpinning that Building Automation, utilizing web communications and web services, makes up a large portion. I have often maintained that Building Automation coupled with powerful web services or SaaS is the greenest of glues and holds tremendous power to bring radical and rapid change to our industry. And besides we have the sheer potential of the almost one million buildings that badly need retrofitting in New York.

How would you improve paths to sustainable buildings?

In my opinion we need to raise the profile of both Data networks and Building Automation in new and retrofit construction to achieve true sustainable buildings. Both increase the ability of a building to adapt to change which defines sustainability. The past focus of an architectural monument has to be replaced with providing a living, breathing building that interfaces with its occupants, the community, the nation's electrical grid and more. Data and BAS are key players together. As an industry, we must get the message out.

What is your definition of a High-Performance Building?

Self-sufficient, sustainable and loved by its occupants like their home.

We know energy will be getting more expensive, but it might become scarce. Is this the biggest challenge to buildings in the future?

No. I feel that retrofitting the existing building stock to free-up enough energy so growth can still exist on the electrical grid is the greatest challenge. The bulk of the building stock in North America was built in a mindless energy time when developers ruled and architects and engineers played games like: if you would build a solar collector, I can cool it with mechanical cooling while we both annoy the client. And they all got paid well for it! Brute strength

A High-Performance Building is self-sufficient, sustainable and loved by its occupants like their home.

solutions to solve bad designs by architects for developer's speculating with no client input which were then turned over to operate in an unaccountable triple net-leasing scheme has left our operating stock the laughing stock of the world. Our present method of construction is broken and must be fixed.

What prompted you to start AutomatedBuildings.com?

My wife Jane and I retired from 30 years of successfully running Sinclair Energy Services Ltd. Our life expectancy did not look good as we had both been very active and busy in this firm and to prevent harm and or possible death to one or the other, we badly need a diversion. I was extremely interested in how the web was affecting the DDC industry and suggested we start AutomatedBuildings.com as my hobby and for our mutual self-preservation. In addition, no one would publish my articles, views and general ramblings in regular paper magazines back then. Ten years ago when we started the magazine, the Internet was viewed by some in the building industry as a flash in the pan. Web methods were only supported by the middle BAS market. It took sometime for the complete industry to catch on to its popularity. Lots of our old articles are still well read because they contain insightful information on the industry evolution plus some of the ideas that have not yet been achieved.

What publications took notice of you since AutomatedBuildings.com began?

I have written many chapters for books focusing on building automation as well as articles for several magazines in Asia. Recently, I received an award in New York for helping get our articles published in Russian.

I wrote the Building Automation Column for Engineered Systems for more than seven years. I started in August 2000 with my first column entitled *Building Automation: The Net Effect*, with this pull quote: 'Someday, engineers and managers will wonder how they ever got along without it.' Radical thinking back then, but it is hard to imagine not using *The Net* now.

This Building Automation column has provided me with an industry soapbox to rant on, scolding and generally cajoling the industry while reporting the content of the bevy of authors from our online magazine AutomatedBuildings.com.

The synergy between the two publications has allowed us to float future watch ideas in this column that have rapidly become our new reality.

What is in your crystal ball for building automation systems of the future?

I see the commoditization of all sensors, controllers, actuators, and communication equipment into cell phone like devices. They will support a number of common protocols all communicating wirelessly back to routers connected to ultra high-speed Ethernet glass backbones. Every device and sensor will be seen on the Internet from anywhere. Connection to these new systems and legacy systems will be greatly enhanced with SaaS computing in the clouds which will return valuable optimization information to the buildings while providing a new level of client touch and feel.

All major equipment will come with sophisticated controls networks and will never leave the virtual control of the factory. The equipment's virtual presence will always be tracked, and its need to know control information will be shared with the local wireless cloud. When the equipment is powered up, the factory will run it through its paces and then allow the need to know information to flow to the local control networks.

Structured data backbones will carry the fourth utility, data, while providing seamless connection for building-to-grid as well as connection to communities in and outside the building.

Our industry will not perish in all this change. It will thrive as the self-centered focus as our industry evolves to be a holistic part of a bigger world. As building automation moves from the boiler rooms and communication closets to the main stream, radical changes in thought will be required by our industry.

George, it is a great time to be in the **AutomatedBuildings.com** news business.