

LEED Practices Within the Building Construction Industry

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In this interview, Walsh explains how the Leadership in Energy and Environmental Design (LEED) rating system works and discusses how LEED currently impacts safety, health and environmental (SH&E) practices within the building construction industry. He also discusses how LEED and other green building systems may be influenced to better address SH&E issues.

EPS: Please provide a brief description of your professional background and of your position as the Nevada U.S. USGBC's director and committee chair.

DW: I received a Master's degree in Toxicology and Industrial Hygiene from the University of Arizona in 1986 and have been consulting ever since. My thesis involved the chemical associated with new carpet odor. Interestingly, this chemical is a part of the air testing in LEED. I became interested in the early 2000s when I attended a class and learned that someone other than SH&E professionals was beginning to set indoor air quality standards for building construction. Since then, I have been commenting on LEED updates as they come out and have been trying to get interest from the SH&E community, especially the American Industrial Hygiene Association (AIHA), to get more SH&E professionals involved to try to influence the process.

I became a LEED Accredited Professional (LEEDAP) 3 years ago so I could be seen more as a peer rather than an outsider. I have participated in the Nevada Chapter of USGBC for many years and signed up my company as a national USGBC member company a few years ago so I could run for a local board position, which I obtained this year.

During the first all-day board retreat, I suggested forming an ad hoc committee for promoting LEED for existing buildings, which was a major chapter goal. As the one who suggested it, I volunteered to chair the committee, and lo and behold, I became the chair.

Beyond USGBC, I have written some initial portions of the new International Green Construction Code (IgCC), which is due for publication in March 2012. I was also one of the founding members of AIHA's Green Building Working Group where I created a brochure for distribution to green building professionals describing how an industrial hygienist can contribute to the green building process. We are also working on a white paper and a registry for SH&E professionals involved with green buildings.

EPS: How does the LEED rating system work?

DW: There is currently more than just one LEED system. LEED was originally developed to provide a system to define and measure green building through a set of performance standards for the construction of commercial buildings. Now there are various systems for special building uses, such as homes, schools and healthcare. There is also a rating system for existing buildings, which is where I believe LEED

will excel in the future.

LEED certification is pursued by building owners and developers for various reasons. A LEED building will typically have a relatively short payback period for the additional costs. Most studies appear to indicate the payback period is less than 5 years and can be substantially less depending on a variety of factors. After the payback, the savings can be significant.

Some aspects of green building that provide large returns include reduced absenteeism and improved worker productivity. This reason is better recognized by owners who will also be users, such as government agencies. Of course, energy savings is one of the better known means of payback. However, actual returns from incorporating LEED energy credits are sometimes not as valuable as advertised. This has been a criticism of LEED in recent years. Other reasons for pursuing LEED certification include government tax incentives, local municipality or state requirements, added marketing value and a



desire to reduce building impacts on resources and the environment.

The LEED process for new construction begins with the decision on the part of the owner(s) to build green. The intended use and function of the building is identified, and potential sites are chosen. The owner chooses the design team, and a design charrette is conducted. Once the building design is established, a decision is made regarding what level of LEED certification will be pursued. The levels, from the lowest to highest, include certified, silver, gold and platinum.

After these decisions have been made, the project is registered with the Green Building Certification Institute (GBCI), which is an independent organization providing third-party professional credentialing and project certification previously done by USGBC. The project's progress is tracked using LEED Online after it is registered. A LEEDAP typically manages the LEED aspects of the project and inputs the information into LEED Online. Having a LEEDAP on the project gives the project one credit toward certification. The [USGBC](#) and [GBCI](#) websites are good resources for an in-depth discussion of the LEED process.

EPS: *In what ways has LEED impacted SH&E practices within the U.S. construction industry? How has it influenced the way construction projects are planned or funded?*

DW: In my experience, LEED has had little to no impact on construction safety. In fact, some aspects, such as increased use of windows and skylights, installing photovoltaics on roofs, recycling building materials with protruding rebar, sharp edges on concrete, heavy debris, etc. have the potential to increase safety hazards associated with LEED buildings. If the project pursues the credit involving the development and implementation of a construction indoor air quality management plan (IAQMP), some of its aspects can help protect

worker health through dust control and hazardous material management.

Since "environmental" is one of the words comprising the LEED acronym, much emphasis is placed on this issue. The main aspects include promoting energy conservation and renewable energy, which reduce air pollution. LEED also emphasizes site selection to conserve undeveloped lands and has provisions to prevent pollutants from migrating offsite. Many other aspects of LEED are intended to conserve resources for future generations and to prevent environmental pollution.

Other disciplines have begun to develop their own rating systems, such as public works organizations for building sustainable roads, bridges and other infrastructure. One example of safety-related systems includes Prevention through Design (PTD), which is described in the May 2010 issue of AIHA's *The Synergist* and the April 2011 issue of *Professional Safety*. Another example of a system focusing on safety and health is the Sustainable Construction Safety and Health Rating System, which is discussed in the February 2011 issue of *Professional Safety*.

LEED has a tremendous impact on how construction projects are planned and funded. One example of planning includes choosing the site location. A downtown site with good transportation access and contaminated soil making it a Brownfield would qualify for many more credits than a rural location, far away from residential developments on pristine land.

Regarding funding, opinions and studies of green building costs and return on investment can vary greatly mainly because there are so many variables. A major issue is the upfront cost and the sometimes poorly defined payback timeframe, which can cause owners to be trepidatious about building green. Government tax incentives are another important funding aspect. The 2005 Nevada legislature passed some significant tax incentives that were taken advan-

tage of by the City Center project, which was a large contributor to Nevada becoming the number one state for green building square footage per capita in 2010.

EPS: *What new directions is green building taking? How is the Nevada USGBC involved in these initiatives?*

DW: One of the most important changes occurring recently is the development of building codes for green building. California has already developed its own and the International Code Council, which is responsible for various U.S. codes, including the International Building Code, International Fire Code, International Plumber Code, etc. will publish its International Green Construction Code (IgCC) in early 2012. This code will likely be adopted by many green-conscious cities and counties, making it mandatory for the construction of buildings in the future.

Though I was able to have a minor impact on the indoor environmental quality section of IgCC, my attempts at getting some safety considerations included (e.g., requiring contractors hired to build green buildings to have an above-average injury and illness record) were not accepted.

Other SH&E issues that have recently gained attention include noise control and the construction IAQMP. Noise control has made it into the IgCC and the latest public comment version of LEED. Also, an IAQMP has been proposed to be changed from a credit (optional) to a prerequisite (required) in the new LEED. The IgCC will require an IAQMP if this requirement is not removed between now and March 2012, which is a distinct possibility based on recently published proposed changes.

EPS: *What impact has LEED had internationally?*

DW: Many countries have their own green building rating systems modeled after LEED. There is now a World Green Building Council (WorldGBC), which is a union of

national green building councils. It began after a meeting of a group of eight countries with green building interests and was incorporated in 2002. USGBC is the oldest of these councils and is a member.

The WorldGBC facilitates the formation of international green building councils by assisting in forming strong organizations and by helping position them in their markets. Once the local GBC is established, the WorldGBC helps promote local green building actions to encourage sustainability and to address global issues that the locality may be impacting, such as climate change.

EPS: *Have you seen any direct correlation between green building construction and a reduction in occupational injuries?*

DW: No, I have not. Safety is currently not an aspect of green building as it relates to LEED or other green building rating systems with which I am familiar. In fact, many of the enormous building projects that were undertaken on the Las Vegas strip in the late 2000s were built under LEED requirements, but they gained more notoriety for the number of construction worker deaths that occurred during their construction. These deaths led to national attention being paid to state-run OSHA programs, which continues to this day.

EPS: *How are green building and prevention through design principles connected?*

DW: Unfortunately, there does not seem to be much connection between PTD and LEED at this point in time. Green building systems, such as LEED, provide a small number of requirements (prerequisites) and a large number of options (credits) to successfully complete the project and get certified. There is a level of planning regarding what LEED credits will be pursued during the project, and the logistics for achieving them must be established (i.e., reuse existing building materials, use Forest Stewardship Council-

certified wood products, specify low-emitting materials, etc.). However, when it comes to seeking acceptable levels of risk and extensive preplanning to account for SH&E issues, there does not seem to be much emphasis.

For example, the main LEED credit I typically get involved with is the air testing before occupancy credit. I usually get the call near the end of the project, and I end up doing the testing after or while the occupants are moving in. The credit states the testing is to be done between construction completion and before occupancy. Of the half dozen or so of these air testing projects I have done over the last few years, none have met that requirement. Also, none have passed all LEED criteria for contaminant concentrations the first time usually because of planning issues, such as solvents used in paints for last-minute touchups, dust stirred up by occupants moving in, air conditioner refrigerant leaks, etc.

I have been pushing for greater planning in the LEED building process for years by commenting on new versions of LEED. I have also pushed for this in the new IgCC. Very little of my input has been taken to heart. Sometimes I feel like I am a lone voice in this regard. Very few SH&E professionals are involved in this process. We need many more voices to try to get the people who make the decisions on green building to listen to common-sense approaches. We need to stop making the same mistakes over and over again that negatively impact safety and health issues in building design, construction and operation as well as creating conditions that degrade indoor air quality both immediately and over time.

EPS: *As a consultant, what advice do you have for other consultants who may need to guide clients pursuing LEED certification?*

DW: In my experience, SH&E professionals are not generally a part

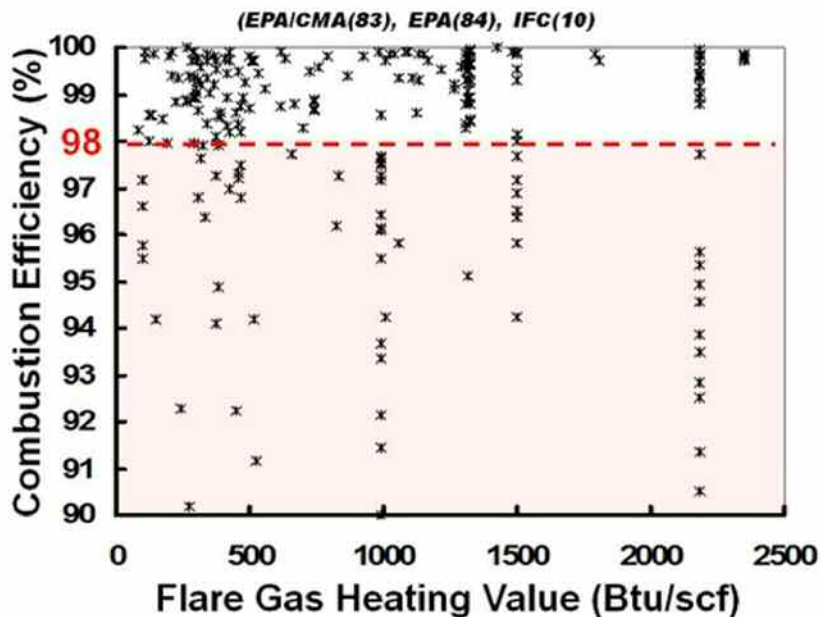


of the design and planning team for the construction of a new building or for the renovation of an existing building unless asbestos is involved. However, some opportunities exist to change that in the near future through the likely-to-be-required (no longer optional) construction IAQMP in the latest versions of the LEED rating systems. If SH&E professionals can position themselves as the go-to professionals for writing these plans by working with local architects, building departments and the ICC (if the IgCC IAQMP requirement remains), we may be able to influence the contents of the IAQMP to address many SH&E issues. For those who want to have a voice in the IgCC, there is still some time. The IAQMP's

The LEED process for new construction begins with the decision on the part of the owner(s) to build green.

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Figure 1 Results of Classic Studies Employing Reliable Extractive-Sampling Protocols



40 CFR 60.18(c)(3)(ii), EPA specified the minimum net heating value (Btu/scf) of the flared gas to assure flame stability and high destruction efficiency. However, E.I. DuPont de Nemours and Company (DuPont), among others, recognized that the net heating value (Btu/scf) of the flared gas hardly told the whole flame stability story.

In particular, DuPont and others recognized that the requirement to enrich the flared gas by injecting a higher-energy gas, such as natural gas, should be unnecessary when flaring a gaseous mixture that, merely by virtue of the presence of hydrogen, has a heating value that is less than that required by 40 CFR 60.18(c)(3)(ii).

Accordingly, DuPont carried out a comprehensive testing program that led EPA to conclude that “. . . hydrogen-

fueled flares achieve greater than 98% destruction efficiency.”

Subsequently, in the only substantive change in the operating condition requirements to this day, EPA amended the 40 CFR60.18 and 40 CFR63.11 specifications to allow compliance by adhering either to the heat content specifications that had already been set out for organic mixture flares, or, in the case of hydrogen-mixture flares having a hydrogen content of 8.0% (by volume) or greater, by using flares with a diameter of 3 in. or greater that are designed for and operated with an exit velocity less than 37.2 m/s.

In the event that EPA has now come to realize that today’s law as developed by EPA is inadequate to assure >98% combustion efficiency, it would seem that it is up to EPA, just as it was in the mid-1980s, to carry out or sponsor further research, propose revisions to the law and issue a basis and purpose document that supports EPA-proposed revised

regulations that actually will carry out the intended purpose of 40 CFR60.18 and 40 CFR63.11. While it is a consummation devoutly to be wished, you may not want to hold your breath. ☺

Jim Seebold served as technical advisor for the mid-1980s EPA Evaluation of the Efficiency of Industrial Flares. He conceived and led the Petroleum Environmental Research Forum’s 4-year, \$7-million, 20-participant industry-government-university collaboration that determined speciated trace emissions from gaseous hydrocarbon external combustion and was the founding principal investigator of the International Flare Consortium. He may be contacted at jim.seebold@earthlink.net.

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fate may be decided at hearings scheduled for mid-May. However, there will be one more comment period. For more information, [click here](#).

The commissioning process is another area of the LEED that already has recognition. However, SH&E is not currently a big part of commissioning though it could be. SH&E professionals should interact more with commissioning agents (<http://www.bcx.org>) and local green building organizations (e.g., local USGBC chapters) to show them our value and how we can add to their services. Instead of complaining about how the green building industry does not address SH&E con-

cerns, we need to get out and participate so that eventually our voices will be heard. ☺

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