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Microbiology Laboratories

IAQ RADIO

Show Number: 684

Andre Desjarlais & Michael Lubliner

Oak Ridge National Laboratory & the Building Science Advisor Tool
Energy efficient & moisture durable; building envelope solutions

Good Day and welcome to IAQ Radio+ episode 684. This week we welcomed Andre Desjarlais and Mike "Luby" Lubliner for a discussion on the Oak Ridge National Laboratory (ORNL), Building Science, and the new Building Science Advisor Tool.

Michael Robert Lubliner is a Senior Energy Advisor at Oak Ridge National Laboratory. He previously worked at Washington State University Extension Energy Program as Building Science Residential Technical Lead for the Washington State Energy Office. He is internationally recognized for his 35 years of significant contributions to residential building science R&D of emerging technology and building systems engineering.

Andre Desjarlais is the Program Manager for the Building Envelope and Materials Research Program at the Oak Ridge National Laboratory. He has been involved in building envelope and materials research for over 45 years, first as a consultant and, for the last 30 years, at ORNL. Areas of expertise include building envelope and material energy efficiency, moisture control, and durability.

Nuggets mined from today's show:

Mike Lubliner: Change is hard. Mike has learned to embrace change by: learning from his mistakes, learning from his peers and learning from mentors such as: Andre Desjarlais, Joe Lstiburek and John Straube. Mike wants to pass the knowledge on to upcoming Building Scientists.

Andre Desjarlais: ORNL is one of 20 Dept. of Energy research laboratories. ORNL began as a bomb's lab, transitioned to an energy efficiency lab in the 1970s and now among other things does research on making building envelopes more durable and efficient. ORNL develops new materials, and makes its unique facilities available for use by business and industry. ORNL is funded by both public and private sources. ORNL is working to reduce your monthly electric bills.

Andre Desjarlais:
ORNL History - Link to History Presentation and Cliff & Pete's Visit
1938-1941- German physicists discovered nuclear fission and were working on weaponizing it. Germany annexed Czechoslovakia which had uranium ore. Albert Einstein (a known pacifist) after urging by other German scientists to wrote President FDR a letter to encourage the US to undertake similar research. The US declined and didn't undertake nuclear research until Pearl Harbor was attacked and the US entered WWII.
1942- Tennessee Senator Kenneth McKeller a member of the Senate Appropriations Committee was asked to hide $1 billion in his budget for the purpose of building super weapons. Senator McKeller asked "where in Tennessee would you like to hide it?". TN was an ideal location due to TVA hydroelectric power and sparse population in the event of an accident.

- 1947-1980- Plutonium used in nuclear weapons. The ORNL reactor was copied after WWII to provide nuclear energy. Production of nuclear isotopes for nuclear medicine.
- 1970s- Oil Embargo ignited interest in building energy efficiency.

Some ORNL stats:
- 6000 people work at ORNL.
- ORNL is home to the world's fastest computer.
- ORNL's annual budget is $1.5 billion.
- ORNL hosts 3000 visiting scientists annually, some for 2 weeks others for multiple years.
- ORNL is focused on: computing, materials development & education.

Andre Desjarlais and Mike Lubliner:

Our parents' homes with plaster walls and single pane windows didn't have moisture or durability problems. When buildings are tightened-up problems can occur when the tightening isn't done correctly.

Building Science Adviser online tool (BSA) – Presentation on BSA Tool

- Stimulating Positive Change.
- Builders are averse to change.
- Change involves risks.
- The safe bet is to continue doing what you've been doing.
- You don't grow and improve if you only take the safe bet.

The BSA is designed to build confidence in using new building materials and more energy efficiency designs. The BSA tool combines all of the info from:

- Building Codes
- Field Experience and Computer Simulations

ORNL is working in tandem with the Building American Solution Center in Washington State and other DOE labs.

The BSA is a web-based expert system which combines access to consultant and expert brains into an online tool. BSA provides guidance for both new and existing buildings. https://bsa-new.ornl.gov/

- Expert System-User Interface Screen-Inference Engine
- Knowledge Base. Dial from Bad to Good.
- References
- Solutions

Mike Lubliner: Building Science Adviser:

DOE Solution Center- Building Science- Assessment of Wall Systems. The BSA tool works for both new and retrofit construction.

Inflation Reduction Act will fund grants of $2,500-$5000.
Walls analysis tool.

Build Tight, Ventilate Right. Roofs, Windows, Walls, Building Envelope, Air Barriers, Joe Lstiburek's Reports.

The BSA provides an opportunity to teach the next generation of building scientist both onsite and in labs. Additional resources on the BSA tool website:

- Solar Decathlon
- Whole Building Design Guide
- Building Enclosures
- Pre Assessments
- Why do wall retrofitting?
- Durability- "No Free Thermodynamic Lunch"
- Assessments- moisture
- Problem Case Studies
- Vetted information

Recommends builders spend time of the BSA website with clients. BSA can be a teaching and sales tool.

Website Tour and Demonstration:

- Select climate zone
- Choose type of wall materials
- New wall-Exterior Retrofit or Gut Rehab
- Comparison to Building Codes
- Resources
- Case Studies

ROUND-UP

Andre Desjarlais:

Any concerns about China or other foreign countries stealing or technology? - Security at ORNL and other government labs has been stepped up. Advance background checks, more security at facility entrances, etc.

It is the hope and desire of BSA that 3rd world countries adopt the technology and build more energy efficiently. Climate and building methods are different in North America than in Europe and Asia.

- December 16th, 2022 is the 75th anniversary of the transistor.
- When the ORNL reactor was first started it was estimated that it would take 96 hours to go critical so scientists went home. Back then there were no telephones in the area and when the gauges started redlining, a car was sent around to the homes of the scientists to advise them what was going on.

Mike Lubliner:

BSA dials down to credible information and provides positive outcomes.
https://bsa-new.ornl.gov/

Big Building Science List (inspired by Joe Lstiburek)

- Drain the rain
- Save cash and flash
- Overhangs
- Build tight and test
- Ventilate and test
- Know the perm ratings
- Vapor and wind barriers
- Drain bulk moisture from the perimeter
- Don't do stupid things
- Mike Lubliner's Building Joe's Way Song

Restoration Global Watchdog and Moisture Mob Consigliere Pete Consigli

- Many spinning plates during the show and nothing hit the floor.
- Pete's freshman year calculus professor worked on the Manhattan Project. His college thesis was security classified so high no one was allowed to read it, so he was awarded his degree without his thesis being reviewed.

- Building Science Pioneer: Joe Lstiburek's many important contributions
- See and hear Joe Lstiburek and other Building Science Pioneers at
- https://www.climatezoneone.com/

Z-Man signing off

Trivia:

ON what were the names of the scientists who attended the first self-sustaining nuclear reaction inscribed?

Answer: Chianti wine bottle label.

Radio Joe:

Thanks to Mike for performing at the end of the show! Lyrics to Building Science Business.

You get up in the morning, you drive your car to Logan, take a 747 to a meeting.
You make a lot of money, & people think your funny, and the crowd really takes a beating.

You have great lines, and like to drink fine wine cost more than your sports car you say.
If you clients get annoyed, you will be self employed, an aspen vacation let's play!

BSB, Joe's way,
BSB, now what did he say
BSB, Drain the rain
BSB on the plane
BSB, Save some cash
BSB you better flash
BSB, No overhang
BSB no yin, just yang
BSB, build it tight
BSB, test it on site, right?
BSB, Ventilate right,
BSB, test it on site, right?
BSB, No virgin poly,
BSA A Canadian folly
BSB, it don't rot & fall
BSB, Joes perfect wall,
BSB, No perimeter drain,
BSB, makes Joe go insane
BSB, Know your perm,
BSB, And you will learn
BSB, Don't do stupid things
BSB, Or Joe goes ching ching
BSB, Joes way
BSB, thats what BSA say!