



The IEEE Reliability Society Joint Section Chapter: Boston - New Hampshire - Providence May 2023

<https://r1.ieee.org/boston-rl/>

Welcome to the Boston Chapter Newsletter:

The joint chapter hosted two presentations this quarter. Michael Ross presented “Superconductor Cables: Technology, Utility Applications and ComEd Project” April 12th, and Richard Anslow presented “Condition-Based Monitoring (CbM) for Industrial Machines” May 10th. See Meeting Highlights below.

We miss the in-person networking and are grateful subject matter experts continue to participate in on-line webinars to discuss applications and solutions. We are investigating options for in-person and/or hybrid meetings starting in September 2023.

If you are interested in hosting and/or presenting at a monthly meeting, being added to the meeting notifications, or attending an AdCom meeting, send an e-mail to Jay Yakura, Vice Chair james.yakura@ieee.org or Mike Bannan, Chair michael.bannan@ieee.org. We are always working to fill the calendar with reliability presentations months in advance.

You may find links to scheduled meetings on <https://events.vtools.ieee.org>; search for region 1, section Boston, CH01021. Our chapter site is <https://r1.ieee.org/boston-rl/>, and archived presentations may be found at <http://www.ieee.org/bostonrel>.

We welcome new members to the Advisory Committee and discussion questions.

Upcoming Activities

AdCom meetings: June 6, and September 5, 2023 - target dates.

Future Presentations: June 14, September 13, and October 11, 2023 - target dates.

Meeting Highlights:

April 12, 2023:

“Superconductor Cables: Technology, Utility Applications and ComEd Project”

Michael Ross, P.E., Managing Director of Superconductor Power Products-AMSC

31 participants

This dynamic presentation highlighted the history and development of high temperature superconductor cable technology. The results of implementation in the Chicago ComEd project demonstrate redundancy networking capabilities to improve resiliency, reliability, maintainability efficiencies, and cost reductions compared to traditional power utility materials and networks.

In 1986 it was discovered that High Temperature Superconducting (HTS) materials could be economically cooled with inexpensive liquid nitrogen. In 2000, the first trial demonstration of an HTS cable occurred in Carrollton, Georgia; followed by dozens of further demonstrations in the USA, Europe, Japan, Korea, and other countries.

In 2014, the first permanent, continuously utilized HTS cable was installed in Essen, Germany where it has operated flawlessly for 6 years.

In May of 2019, the US Federal Energy Regulatory Commission (FERC) approved the classification of this project as being a transmission asset and a cost recovery plan for the first permanent HTS cable installation in North America with Commonwealth Edison (ComEd) in Chicago. With project ground-breaking occurring in July 2020 and energized in Summer of 2021, this project represents commercial adoption of the technology and is already driving US electric utilities to educate and investigate this proven and newly available technology.

Michael reviewed ComEd’s Active HTS Cable Project in Chicago, identifying cable components and accessories, features, and applications of HTS cables on utility systems, and benefits of HTS cables for urban utilities including improved resiliency, reliability, and capacity. System modernization allows easier maintenance and replacement capabilities at one sixth the area required for the cables including the ability to service without digging up the streets, and the networking of local hubs allows power transfer across the grid in case of outages or maintenance requirements.

The Zoom presentation and slides may be found at the following links:

[Super Conducting Cables Presentation](#) Passcode: f9U^z!#H

[Super Conducting Cables Slides](#)

May 10, 2023:

“Condition-Based Monitoring (CbM) for Industrial Machines”

Richard Anslow, System Applications Manager, Industrial Automation, Analog Devices

17 participants

Richard presented an introduction to Condition-Based Maintenance/Monitoring (CbM), and how it can improve the availability and reduce costs of system ownership. One source cited that more than 38% of global energy is consumed by industry, and within industry almost 70% of electricity is consumed by electric motors. Even a 1% increase in operational efficiency would result in huge cost savings.

Three broad categories of equipment maintenance include PMs, CMs, and CbMs. In Preventative Maintenance, PM, equipment is taken out of service on a regular schedule, and in Corrective Maintenance (CM) or "run-to failure" maintenance occurs when the equipment fails. Both may be wasteful in terms of time and resources. A third option is Condition-based Monitoring (CbM) which involves monitoring of machines or assets using sensors to measure the current state of health. This places sensors where they can detect subsystem trends or excursions from baseline performance to alert process owners about specific problems before failures occur allowing replacement parts to be on hand at a conveniently planned repair time. The process owner is no longer replacing good parts on a scheduled maintenance plan, nor are they in crisis mode because the equipment failed unexpectedly.

Wireless Predictive Maintenance (PdM) Solutions for industrial motors combine techniques such as CbM, machine learning, and analytics to predict upcoming machine or asset failures. The process leverages integrated detection modes including sensors for vibration, temperature, magnetics, sound, and others. MEMs accelerometers for vibration analysis are used for all configurations reviewed, and while MEMS microphones monitor sound, they may also be susceptible to background noise in industrial environments. The complete PdM solution includes a database of expected baseline performance for known motor models and learning modes to confirm baseline, excursion, and post-repair performance trends.

The Zoom presentation and slides may be found at the following links:

[Condition-Based Monitoring Presentation](#)

Passcode: H^2%yt%+

[Condition-Based Monitoring Slides](#)

Advisory Committee (AdCom) Members 2023

Chair: Mike Bannan – BAE Systems - michael.bannan@ieee.org
Vice Chair: Jay Yakura – Retired james.yakura@ieee.org
Secretary: Don Markuson - Silicon Labs d.markuson@ieee.org
Treasurer: Don Markuson - Silicon Labs d.markuson@ieee.org
Website: James A. Yakura – B.S. Computer Science - james.a.yakura@ieee.org
Newsletter: Mary Jones – Analogic Corporation maryajones@ieee.org
Publicity: Vacant
Members at Large:
Dan Weidman - MIT Lincoln Laboratory danweidman@ieee.org
Gene Bridgers - Results MA gbridgers@resultsma.com
Giora Kuller - Retired g.k.kuller@ieee.org
Charles Recchia - charles.recchia@ieee.org

Chapter Seeks Volunteers

The IEEE mission is Advancing Technology of Humanity.
The IEEE Reliability Society mission is Promoting recognition of the reliability profession, developing, and disseminating reliability best practices, and being a resource for collaboration among reliability professions.



As a volunteer organization, our success is directly related to having people like you involved in the planning and execution of our meetings and communication processes.

Please consider joining us.

You may find URL links to all the meetings on <https://events.vtools.ieee.org>, - search for region 1, section Boston, CH01021. For updates on upcoming events see the IEEE Spectrum or contact Jay Yakura james.yakura@ieee.org or Mike Bannan michael.bannan@ieee.org to be added to our notification list or our Advisory Committee. Your contributions may be as much or as little as you would like.

Consider Reliability Society Membership

Society Membership includes: - Society Newsletter (electronic),
- IEEE Transactions on Reliability (online),
- IEEE Reliability Society Conference Digital Library (online), and
- IEEE Reliability Society Resource Center (online).

Readers can contact chapter newsletter editor Mary Jones (maryajones@ieee.org) with any comments, suggestions, or if interested in contributing to our next issue.

**The IEEE Reliability Society Joint Section Chapter
Boston - New Hampshire - Providence**