



The Beacon



The Newsletter of the IEEE Maine Section

October 28, 2016

Section Officers

Would you like to be part of the Maine Section team? We are looking for people to fill our many positions and improve our section. We can't function without you. And it's fun and rewarding! Officer positions are:

- Chair
- Vice Chair
- Secretary
- Treasurer
- Senior Member-at-Large
- Junior Member-at-Large
- Membership Development Chair
- Young Professionals Chair (formerly Graduates of the Last Decade)
- PACE (Professional Activities Committees for Engineers) Chair:
- Student Activities Chair
- Awards & Recognition Committee Chair
- Educational Activities Chair
- Women in Engineering
- Webmaster

Please email me (ron@ronaldobrownconsulting.com) of your interest. If you know a colleague whom you think would be a good candidate, please have him/her contact me or pass the person's name on to me.

IEEE Day Festivities - October 4, 2016

In conjunction with the UMaine Student Chapter, the Maine Section had a very successful triple-header on IEEE Day. It featured three events with three speakers during the day and dinner in the evening. Speakers were Susan Corbett and Mark Ouellette from innovative and nationally recognized broadband provider Axiom discussing the engineering aspects of a rural broadband provider, Walter Rawle of Ultra Electronics Flightline Systems who talked about ECE careers in aerospace, and UMaine's Lonnie Labonte who presented his wireless sensor that is bound for the International Space Station.



The student chapter gave away T-shirts to all attendees.

The poster, prepared by the UMaine Student Chapter, is pasted to the end of the Beacon and shows the variety of speakers. Our thanks to them for the poster and for spreading the word all over campus. It's activities like this that gets the word out about our great electrical engineering careers!

We received a PACE grant to help support this activity. (I don't recall the section ever receiving PACE funding before!) Our thanks to Region 1 for the grant. Additional photos of the event, along with other sections' photos are on Region 1's website, <http://sites.ieee.org/r1/>.

IEEE PES/IAS Maine Chapter technical presentation

You are invited to attend a full day IEEE PES/IAS Maine Chapter technical presentation on November 10, 2016. Topics are: Autotransformers, Transformer Specification Preparation, and Phase Shifting Transformers. Complete details are at the end of **The Beacon**. Attendance certificates will be provided. FMI & to register go to: <https://meetings.vtools.ieee.org/m/41751>.

Maine Engineering Workforce Summit

The Maine Section was a supporting partner for the **Maine Engineering Workforce Summit** and was part of the organizing committee. The summit was held at the Ramada Inn in Lewiston on September 29, 2016. With approximately 150 engineering and business leaders in attendance, the summit addressed Maine's critical shortage of engineering talent and what must be done to better develop our economy. The highlight of the day was the presentation by UMaine System Chancellor Jim Page of a plan for a new engineering building at UMaine.

IT Professionals Day

The Maine Section participated with a booth at the National IT Professionals Day at Central Maine Community College in Auburn on September 20, 2016. We attracted the interest of many CMCC students. At the same time, Ron Brown presented a talk titled *Professional Organizations -- What's in It for You?* which discussed the career advantages of professional membership -- especially the IEEE.

SWEBoK

It's a weird name, but if you want a basic understanding of software engineering, the IEEE Computer Society's Guide to the **Software Engineering Body of Knowledge (SWEBoK)** describes generally accepted knowledge of software engineering. The IEEE Computer Society published the first edition of the SWEBoK in 2004 as a part of its goal to define the software engineering profession. SWEBoK V3.0 was published in 2014 with worldwide participation. The document is freely available through the IEEE Computer Society and is now available as a public wiki: <http://swebokwiki.org>. Fear not. With only one chapter about Boolean logic, the remainder of the guide is descriptive and easy to read.

The Beacon is back! *(and we're looking for an editor)*

The Beacon has a new purpose: To let our Maine membership know of items of interest as a quick to read summary of the goings on of our membership and other things of interest. No long articles, but references to more detail if you want to pursue them. We will publish as regularly as possible and/or as often as you send in enough news

We depend on your input -- nothing long and elaborate. A quick 25-50 word note to our Editor (ron@ronaldobrownconsulting.com) (Do we have a volunteer to help out?) of something you did, an upcoming IEEE activity you're involved with, an interesting article you read, a member's retirement, etc. You get the idea.



IEEE Day - 4 October 2016

Join us in celebrating the 7th anniversary of IEEE Day, a day commemorating the first time IEEE members gathered to share their technical ideas in 1884.

University of Maine Student Branch and Maine Section



Join us in the Hill Auditorium for the following IEEE Day Events!

- **11:30:** Lunch and Learn: with Mark Ouellette, COO with Axiom Technologies
- **4:00:** "The Aerospace Industry: Challenges and Opportunities for Electrical Engineering Graduates" with Dr. Walter Rawle, Buckfield resident and career leader in aerospace
- **5:15:** "Wireless Leak Detection System for the I.S.S. – UMaine's project in space!" with recent UMaine ECE graduate Lonnie LaBonte
- **6:15:** Dinner/reception (IEEE Maine Section Meeting), sponsored by the IEEE Maine Section (details/registration www.evh.ieee.org/r1/maine/me_events.php)



IEEE PES/IAS Maine Chapter technical presentation

You are invited to attend a full day IEEE PES/IAS Maine Chapter technical presentation on November 10th, 2016. Topics are: Autotransformers, Transformer Specification Preparation, and Phase Shifting Transformers. Ronnie Minhaz, P.Eng, of Transformer Consulting Services Inc., will be the presenter. We have had the pleasure of working with Ronnie in the past and are excited to have him come back to Maine!

Attendance certificates will be provided to those who register for the event in advance and are present for the duration of the event.

We hope to see you there!

When: November 10th, 2016; 8:00-4:45 pm

Where: Fairfield Inn & Suites Brunswick Freeport; 36 Old Portland Rd, Brunswick, Maine, 04011

Agenda:

08:00-09:45 am: **Preparation of Transformer Specification**

09:45-10:00 am: Coffee Break

10:00-12:00 am: **Preparation of Transformer Specification/Fundamentals of Auto Transformer Design**

12:00-01:00 pm: Lunch break

01:00-2:30 pm: **Fundamentals of Auto Transformer Design**

02:30-02:45 pm: Coffee Break

02:45-04:30 pm: **Phase Shifting Transformer Fundamentals**

04:30-04:45 pm: Q&A

Cost (includes attendance, lunch, and coffee/tea):

IEEE Members - \$35

Non-members - \$45

Student Members - \$25

To Register:

<https://meetings.vtools.ieee.org/m/41751>

Questions:

Jonathan DeMay

IEEE PES/IAS Maine Chapter Treasurer and
Interim Chair

Direct Line: [207.626.9598](tel:207.626.9598)

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Schedule:

08:00-09:45 am: Session 1

09:45-10:00 am: Coffee Break

10:00-12:00 am: Session 2

12:00-01:00 pm: Lunch break

01:00-2:30 pm: Session 3

02:30-02:45 pm: Coffee Break

02:45-04:30 pm: Session 4

04:30-04:45 pm: Q&A

Details of the Day:

Session 1 & 2:

Presentation 1: Preparation of Transformer Specification

- Ratings
- Single phase vs Three phase
- Winding Connections
- Vector Group
- Insulation Levels
- Terminals
- Accessories
- Types of Cooling
- Sound Levels
- Tap Range and location
- Taps in Auto-Transformer
- Items to consider for Taps
- Tap Changer Application
- Tap Changer Types
- Impedance
- Loss Evaluation
- Over-Excitation
- Short-Circuit Requirement
- Short-Circuit Withstand
- Special requirements
- Overloads
- Implications of Overloads
- Parallel Operation
- Rating Plate/Name Plate
- Alternatives
- Ambiguity in specification
- Over specifying
- Data Sheets
- Tests
- Tender Review
- Design Review
- Transportation
- Globalization

Session 2&3:

Presentation 2: Fundamentals of Auto Transformer Design

- Fundamental/co-ratio
- Advantage/disadvantage of auto Tx
- Tap changers
 - Electrical Location
 - Geometrical location
- Types of taps
 - Operation
 - Function
 - Types of Connection
 - Electrical Connection
- Standards for Auto Transformer
- Physical location of only DTC Tap windings
 - Advantage/disadvantage
 - Dielectric challenges
 - Short Circuit challenges
 - Thermal challenges
- Physical location of only LTC Tap windings
 - Advantage/disadvantage
 - Dielectric challenges
 - Short Circuit challenges
 - Thermal challenges
- Physical location of both DTC and LTC Tap windings
 - Advantage/disadvantage
 - Dielectric challenges
 - Short Circuit challenges
 - Thermal challenges
- Impedance variation due to geometric location of tap windings

- Different type of tap windings (Taped Helix, Multi-start..etc) and their impact in design
- Non-Linear Devices
- Series Transformer/Reactor when needed
- Different type of Tertiary loading and their impacts in auto design
- Over load for auto
- Testing of auto
- Pictures of a 450 MVA 345 kV auto and explanation of mechanical challenges

Session 4:

Presentation #3: Phase Shifting Transformer Fundamentals

- PST Transformer Fundamentals
 - Symmetrical/Asymmetrical
 - Quadrature/Non-Quadrature
 - Single Core
 - Two-Core
 - Limitations of OLTC
 - Testing
 - Manufacturing Points
 - Recent Developments
- Phase Shifting Transformers (PST) Applications
 - Power Flow Control in Today's Deregulated Power System Market
 - Parallel Transmission Paths Owned or Operated by Different Entities
 - PSTs Are More Economical and Reliable Than FACTS Devices
 - Unique Designs and Construction
 - PST Cost Tradeoffs