2014 Seattle IEEE PES Outstanding Chapter Award (OCA) Submission (Large Chapter)

Submitted by the 2014 Executive Committee on behalf of the members of the Seattle PES Chapter

Chair: Kevin Schneider, Pacific Northwest National Laboratory
Vice-Chair: Eric Sortomme, Alstom Grid
Secretary: Marcelo Elizondo, Pacific Northwest National Laboratory
Treasurer: Max Emrick, Puget Sound Energy
Past-Chair: Henry Louie, Seattle University
Young Professional: Abdur Rehman, Puget Sound Energy
Women In Power-Interim: Sarah Szewczyk, Seattle City Light
Student Representative: Phillippe Phanivong, University of Washington
Web Master: Darrel Ross, Milsoft Utility Solutions
Awards Chair: Henry Louie, Seattle University
Member at Large: Miguel Ortega-Vazquez, University of Washington
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1. Executive Summary and Nomination Letter

This section contains the executive summary for the OCA award application and the nomination letter from the regional representative.

1.a Executive Summary

When the Seattle PES EXCOM voted to compete for the CY14 OCA in December of 2013 there was a clear purpose in mind: “To engage a larger portion of the geographically diverse membership, to better serve members that have been historically underserved, and to increase value to the general membership”. The first step was to increase the size of the EXCOM to include a more effective representation of the membership; EXCOM members were added for students, Young Professionals, and Women in Power. Members from each category were elected to the Seattle PES EXCOM, and the website was completely overhauled to be used as a tool to reach a broader section of the membership.

A large number of events were held with a targeted purpose for each event. Some events and tours were selected because of their distance from the Seattle metropolitan area so that members in those counties could participate. This included event at locations such as Cushman Dam, Olympic Community College, Nooksack Hydro facility, Centralia Community College, and the BPA HVDC converter station. Additionally, events were help to engage different segments of the membership. These included joint Young Professional social events with the local IEEE Section, as well as technical tour designed to appeal to the younger generation of engineers; e.g. windfarm tours, electricity in developing countries, and talks on emerging technologies. Outreach to traditionally underserved members (via website).
1.b Region Representative Nomination

Figure 1 is a copy of the nomination letter that was submitted by the Region Representative.

Figure 1: Copy of signed nomination letter, as submitted
2. Activities

In the past few years the Seattle PES section has returned from a period of relative inactivity, to the point it has been a High Performance Chapter (Chapter) for the past three years. Continuing this trend, CY14 saw a significant increase in the number of activities. These activities ranged from the more traditional technical tours to events that focused on student and continuing education groups. 18 technical activities, 4 educational activities, 5 PES/engineering promotional activities, 14 student activities, 4 affinity group activities, and 2 PES conferences were supported. The chapter averaged 3-4 events every month.

While many of the CY14 activities were initiated by the EXCOM, a large number of the event ideas were provided by the general membership. Suggestions were primarily received via the chapter website, which has a direct link to allow member to suggest ideas. Soliciting the general membership for ideas on what they thought the chapter should be doing was an integral part of engaging a larger, and more diverse, cross section of members. The majority of activities were also open to the general public to broaden general awareness of the PES and IEEE.

2.a Technical Activities

18 individual technical activities were held during CY14. The technical activities included tours of central generation facilities, PES distinguished lectures, and planning meetings to support chapter activities.

Table 1: List of Technical Activities

<table>
<thead>
<tr>
<th>Technical Activities</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Battery Tour #1</td>
<td>1/29/14</td>
</tr>
<tr>
<td>DLP#1-Mani Venkata</td>
<td>2/26/14</td>
</tr>
<tr>
<td>Tour of Cushman Dam</td>
<td>4/19/14</td>
</tr>
<tr>
<td>Flow Battery Tour #2</td>
<td>5/15/14</td>
</tr>
<tr>
<td>Tour of Trans Alta Coal Plant</td>
<td>7/10/14</td>
</tr>
<tr>
<td>Tour of Sparks Museum</td>
<td>8/9/14</td>
</tr>
<tr>
<td>Tour of Georgetown Steam Plant</td>
<td>8/12/14</td>
</tr>
<tr>
<td>Tour of BPA HVDC Station</td>
<td>9/11/14</td>
</tr>
<tr>
<td>Tour of Snoqualmie Power House</td>
<td>9/12/14</td>
</tr>
<tr>
<td>Tour of Snoqualmie Power House</td>
<td>9/27/14</td>
</tr>
<tr>
<td>DLP#3 Daniel Kirshen</td>
<td>12/9/14</td>
</tr>
<tr>
<td>NWESS Planning meeting</td>
<td>1/16/14</td>
</tr>
<tr>
<td>NWESS Planning meeting</td>
<td>2/20/14</td>
</tr>
<tr>
<td>NWESS Planning meeting</td>
<td>3/10/14</td>
</tr>
<tr>
<td>NWESS Planning meeting</td>
<td>4/25/14</td>
</tr>
<tr>
<td>PES EXCOM</td>
<td>3/5/14</td>
</tr>
<tr>
<td>PES EXCOM</td>
<td>4/6/14</td>
</tr>
<tr>
<td>PES EXCOM</td>
<td>10/15/14</td>
</tr>
</tbody>
</table>
2.b Educational Activities

The educational activities selected for CY14 were based primarily on input from local members. These activities were designed to inform/educate practicing engineers, not students. The first event was a talk by the head of the Washington State Department of Licensing. This talk explained the details of becoming a registered Professional Engineer in Washington State. The second event was an introduction to NERC certified training. This was a half day event where participants acted as either a balancing authority operator or reliability coordinator and performed multiple operational scenarios such as blackout restoration. The training was conducted on a web based training system operated by Incremental Systems. The picture just above shows the classroom training setup with a selection of the participating members. This event drew participants from as far away as Vancouver B.C.

The third event was a joint event with the Vancouver WA section on Licensing, similar to the first event. This third event was held because there were many members who were not able to attend the Seattle event, so a second event was scheduled for the members in the south end of the state.

The fourth event was an instrument transformer workshop, including hardware, which was attended by 75+ people. The picture to the below shows the large venue that was put together for the event. This type of training was held in response to a member’s suggestion that more “hands on” training events for practicing engineers.

There was also a suggestion to hold a PE/EIT review course, but because of recent changes in the state licensing process this was not practical. There are plans to put together a future course, once more members have gone through the new exam process. Even though this review class was not held in CY14, it shows how member input is influencing the activities of the chapter. Even when it is not possible to hold a suggested event immediately, it is put into the working list of potential activities. Additionally, attempts are made to engage the people that support such ideas so that we can grow the number of chapter members that are active.
2.c PES/Engineering Profession Promotion Activities

Promotion of the PES, and the engineering profession in general, was a central theme for the CY14 activities. These events were typically targeted towards people who are not in the engineering fields, or students who are still in the process of determining what path their career might take. The first event was a general membership meeting which the chapter typically holds as the first event of each year. At this event the general state of the IEEE and PES were discussed, as well as the vision for what the future of the society holds. The speaker for this event was Dr. Henry Louie, a member of the PES governing board; and Seattle PES past-chair. Additional events included two talks on the history of the electricity industry in the Pacific Northwest, both at community colleges, but separated by significant distance. Each event was well attended with a large number of attendees from the general public. A social hour was held at the Power House Brewery (pictured) which is an old substation that provided DC power for the southern portion of the old interurban rail between Seattle and Tacoma. As a side note, the George Town Steam Plant that was toured the following month provided DC power for the northern portion of the same rail line. By holding social events at locations with a tie to energy in the Northwest, we are able to show how the industry is part of the fabric of society. In the process, we engage more people and make the industry more accessible.

<table>
<thead>
<tr>
<th>Table 3: List of PES/Engineering Profession Promotion Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>PES/Engineering Profession Promotion</td>
</tr>
<tr>
<td>Membership Meeting</td>
</tr>
<tr>
<td>History Talk CCC</td>
</tr>
<tr>
<td>Rotary Club career Fair Bellingham (K-12)</td>
</tr>
<tr>
<td>History Talk OCC</td>
</tr>
<tr>
<td>Social- Power House Brewery</td>
</tr>
<tr>
<td>DLP#2 Henry Louie</td>
</tr>
</tbody>
</table>

2.d Student Activities

Numerous student activities were held during CY14. Outreach to students at the University and College level is an important part of the Seattle chapters plan. Many of the most active
members in the chapter are recent graduates from local Universities and Colleges. As such, engaging with students is seen as an essential part of the chapters continued success.

Two student specific tours were given, one of a Seattle City Light substation and another of the Wildhorse windfarm. Additionally, the chapter coordinated with the University of Washington to put together a series of talks directed at undergraduate and graduate students, and open to the general public. Numerous PES members attended each of these events, including one or more EXCOM members at each.

The final activity was an evening session of mock interviews for University students. Numerous local members from Industry provided students with the University of Washington with an opportunity to practice their interviewing skills. Interviewers were PES members that included people from Investor Owned Utilities, Municipal Utilities, a Public Utility District, vendors, and a DOE National Laboratory.

Table 4: List of Student Activities

<table>
<thead>
<tr>
<th>Student Activities</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seattle City Light Substation Tour</td>
<td>3/14/14</td>
</tr>
<tr>
<td>Tour of Wildhorse Windfarm</td>
<td>5/9/14</td>
</tr>
<tr>
<td>Talk-SCL New Denny Substation</td>
<td>9/25/14</td>
</tr>
<tr>
<td>Talk to UW-IEEE Students</td>
<td>9/30/14</td>
</tr>
<tr>
<td>Talk -Wind Forecasting</td>
<td>10/2/14</td>
</tr>
<tr>
<td>Talk-Electrochemical Grid Storage</td>
<td>10/9/14</td>
</tr>
<tr>
<td>Talk-Solar Tariffs</td>
<td>10/16/14</td>
</tr>
<tr>
<td>Talk-Distributed Control and protection</td>
<td>10/23/14</td>
</tr>
<tr>
<td>Talk-Aggregation of Flexible Consumer Assets</td>
<td>11/6/14</td>
</tr>
<tr>
<td>Talk-Grid Scale Energy Storage at PSE</td>
<td>11/13/14</td>
</tr>
<tr>
<td>Talk-Offshore wind power</td>
<td>11/20/14</td>
</tr>
<tr>
<td>Talk-Hydro Scheduling at BPA</td>
<td>12/4/14</td>
</tr>
<tr>
<td>Mock Interviews at UW</td>
<td>11/14/14</td>
</tr>
</tbody>
</table>

2.e Affinity Groups Activities

Engagement with affinity groups had a mixed level of success in CY14. A new GOLD, now YP, member of the EXCOM was appointed in CY13 in preparation for the CY14 activities. An EXCOM position for a WIP representative was also created and filled mid-way through CY14. The challenge that arose was that the individual that filled that position had to move out of the region due to being reassigned. That left the WIP position vacant for the majority of the year, and was only filled at the very end of CY14. As a result, the majority of affinity group activities were YP events with strong ties to students. There were no WIP dedicated events, but this is expected to change in CY15 not that there is a full time WIP representative.
In CY14 there were two YP social events, and two webinars. The first of the two social events was held at the Garage Billiards and was coordinated with the IEEE Section, and the second event was held at Gameworks. These events were meant to be non-technical, with the intent to increasing the professional network of Young Professionals.

The two webinars were presented by YP members of the Seattle Chapter. The first was an introduction to Electric Vehicles, a topic which is effective at engaging young professionals. The second webinar was a review of the Seattle PES Chapter website, and how the Chapter is using it to engage the membership. This webinar was widely attended by members of numerous chapters.

Table 5: List of Affinity Group Activities

<table>
<thead>
<tr>
<th>Affinity Groups</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP Social #1</td>
<td>4/8/14</td>
</tr>
<tr>
<td>YP Social #2</td>
<td>6/25/14</td>
</tr>
<tr>
<td>YP Webinar- The ABCs of EVs</td>
<td>9/28/14</td>
</tr>
<tr>
<td>YP Webinar- Chapter websites</td>
<td>10/30/14</td>
</tr>
</tbody>
</table>

2.f PES Conferences

In CY14 the Seattle PES supported two separate official PES conferences. The first conference was the 2014 Northwest Energy System Symposium (NWESS) and the second was the 2014 International Test Conference (ITC).

NWESS is a bi-annual conference that focuses on the power and energy issues that are particular to the Pacific Northwest. Members of the local PES chapter were involved in the entire 18 month planning process, with 2 PES EXCOM members being on the NWESS planning committee. The ITC was supported by PES members, including coordinating a panel session on smart grid and power system resiliency.

Table 6: List of PES Conferences

<table>
<thead>
<tr>
<th>PES Conferences</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWESS</td>
<td>4/30/14</td>
</tr>
<tr>
<td>ITC</td>
<td>10/22/14</td>
</tr>
</tbody>
</table>
3. Members

The Seattle PES Chapter exists because of the contributions of its members. Therefore recognizing the contributions of its members, and helping to advance their careers is paramount.

3.a Member Awards/Recognition/Nominations

For the past several years the Seattle PES Chapter has annually awarded an “Engineer of the Year Award”. In CY14 a second award was added “Young Engineer of the Year Award”. For CY14 the Outstanding Engineer was Betty Tobin of Snohomish Public Utility District and the Outstanding Young Engineer was Louis Tibbs of Puget Sound Energy. The awards were announced in December of 2014, and in person presentations were made March 19th, 2015. The pictures of Betty and Louis receiving the awards are shown to the right.

Presenting the award in the following year is the normal process for the Seattle PES Chapter, just as the CY13 Outstanding Engineering of the Year Award was made April 30th, 2014 at NWESS.

At the end of CY14 it was voted that the chapter would also begin an “Outstanding Educator of the Year Award” starting in CY15. The Chapter website currently has links for nominations for all three of these awards.

3.b Member Advancement

The Seattle PES Chapter holds a Senior Member drive on a bi-annual basis, with the last being in 2013. As a result, in CY14 the Seattle PES chapter coordinated the senior member drive with the Seattle IEEE Section instead of a separate event. Additionally, the Seattle PES EXCOM nominated two members for advancement to Senior Member based on their past contributions. Both nominations were approved.

In addition to advancements to Senior Member, the Seattle PES Chapter also submitted an IEEE Fellow nomination for Dr. Mani Vadari. While the nomination was submitted in CY15, by Professor Daniel Kirshen, the time consuming process was started in early CY14.

3.c Membership Growth/Retention

PES membership in the Seattle area has been strong for several years, with several utilities and companies in the electric industry headquartered in Western Washington. Because the membership base has been so strong, the Seattle PES Chapter focused its efforts on providing greater value to its existing membership base through the numerous activities discussed in this document, instead of directly attempting to increase the number of members.

While increasing membership was not the primary focus, the strong agenda of PES events, across such as large portion of the chapters footprint resulted in an increase in membership. On
12/31/2013 the Seattle PES chapter had 479 members and on 12/31/2014 it had 501, a 4.59% increase in members. The 4.59% increase in membership outpaced the 3.1% increase of the PES.

4. Chapter Operations

4.a Chapter Web Page

The chapter webpage was the primary tool for effectively engaging the local Seattle PES membership, this was essential given the broad geographic separation of the membership. To support this goal the website was rebuilt from scratch using the newest PES templates. In addition to the newest templates, additional functionalities for engaging the membership were included. These include, but were not limited to:

- Calendar of upcoming events
- Pictures of past events
- List of all EXCOM members, plus e-mail addresses
- Web links to RSVP for events (specifically for tours with max limits)
- Web links for awards nominations
- Web links for general suggestions

Figure 2 is a screen capture of the Chapter Website. Figure 3 is a screen capture of the linked Facebook website. Linking to social media is a key strategy for the Seattle Chapter because of the large number of Universities and Colleges in the area, as well as the generally active nature of the Young Professionals. Harnessing the new ideas and enthusiasm of this membership demographic is key for the long term vitality of the Chapter.

Figure 2: PES Chapter Website

Figure 3: PES Chapter Facebook Page (linked to PES Chapter website)
An important part of managing a vibrant webpage is understanding what is happening behind the front page. The chapter webmaster made extensive use of web analytics to gauge the effectiveness of the changes that he continually made throughout the year, and continues to.

Figure 4 and Figure 5 are the same but one is by month instead of by day. From these two plots, we can see that we had 11,956 page views and 1506 unique viewers for the year of 2014. Other notable data includes the pages per session at 4.83 and the session duration at 3:21. This means that the average user viewed nearly 5 pages and spent over three minutes on our website. A bounced session is when a visitor leaves the site after viewing only the first page they arrived at it on. An important note about bounced sessions is more visible in the by-month image which indicates that visitors to our site stopped leaving right away about half way through the year. Our visitation numbers also increased at this time. This means we experienced more than double the visitors while simultaneously reducing bounced sessions in the second half of the year - a great improvement on both counts.

![Website sessions vs. bounced sessions](image-url)

**Figure 4: Website sessions vs. bounced**
Figure 5: Website sessions vs. bounced by month

Figure 6 shows that 10% of the website traffic came from mobile devices in CY14. It is expected that this percentage will increase over time. To address this, efforts were made to ensure that the Chapter website rendered well on mobile devices as well as monitors.

Figure 6: Mobile vs. non-mobile website views
Figure 7 shows the website a user flow. The first column indicates the source the visitor came from to arrive at the website. The second column indicates which page they first loaded. This is very information dense. The left column shows that about 50% of visitors typed the URL directly into their web browsers. Another 40% or so came from search engines. This means we have good visibility on the web. And the remaining 10% was split up between Referrals and Social. Social is nearly all links from the Facebook page. Referrals tend to be links from sister societies or the local IEEE Section or main IEEE PES websites.

![User Flow Diagram](image1)

**Figure 7: User flow default channel**

Figure 8 lists the actual source so you can see some of the websites which provided links to our site (eg: ewh.ieee.org, ieee-seattle.org). Also relevant for these images is the orange part of the flow out the edge of each green rectangle. The orange part depicts how many users closed the webpage at that point. You can see that a significant chunk of our traffic went directly to our RSVP page and, presumably after RSVP-ing to some event, left the website.
4.b PES Only
The Seattle PES Chapter is a PES-only chapter.

5. Other Activities
The Seattle Chapter nominated professor Chen-Ching Liu of Washington State University, a past Seattle PES Chair, for the Distinguished Lecturer Program. This nomination was accepted and Professor Liu is now a DLP.

In addition the numerous activities and tours that were held during CY14, there were many more that were discussed, but not held. This was primarily due to the limitations on time. The events that were not held have been listed and are being scheduled as part of CY15 activities.

6. Concluding Thoughts on the CY14 Efforts
When the EXCOM voted to compete for the CY14 OCA in December of 2013 there was a clear purpose in mind: “To engage a larger portion of the geographically diverse membership, to better serve members that have been historically underserved, and to increase value to the general membership”. It is clear that these goals have been achieved. As CY15 has begun, the number of actives has reduced from the CY14, but it has done so in a controlled manner to a sustainable level with many more people than were involved when the process began; and that was really the goal. As of April of 2015, the Seattle PES has a larger base of active members.
than at any other time in recent memory. Events continue to be held across the region, and numerous people outside of the EXCOM continue to actively plan and engage events. PES members now regularly engage with the local chapter and networking across the membership has increased.

7. Appendix A: 2014 PES Announcements

This appendix contains copies of the just some of the formal meeting announcements that were sent as part of the CY14 activities.
IEEE Power & Energy Society
Seattle Chapter Meeting
Tuesday, 21 January 2014

If you are new to PES or thinking of joining PES, do not miss this meeting!

Topics: General Membership Meeting—learn about PES benefits, volunteer opportunities, provide guidance for 2012 events
Date: Tuesday, Jan. 21, 2014
Time: 6:00 – 8:00PM
Place: Bellevue City Hall 450 110th Avenue NE Bellevue WA. Room 1E-108
Speaker: Henry Louie, PES VP of Membership and Image

Agenda
6:00 pm Networking and Refreshments
6:30 pm – Welcome and Introductions
6:45 pm – Presentation

Abstract
The General Membership Meeting provides an opportunity for PES members to learn about PES, the local chapter, and activities at the international level. Special attention will be given to member benefits, including discounts and special access to conferences, educational materials, periodicals and scholarships. Volunteer leadership opportunities for 2014 and upcoming events will be discussed.

Speaker:
Dr. Henry Louie received the B.S.E.E. degree from Kettering University in 2002, the M.S. degree from the University of Illinois at Urbana-Champaign in 2004, and a Ph.D. in Electrical Engineering from the University of Washington in 2008. He is an Assistant Professor in the Department of Electrical and Computer Engineering at Seattle University. He has held several volunteer leadership roles within the IEEE Power & Energy Society at the local and international levels, including the Chair of the Seattle Chapter, Governing Board Member-at-Large, and the Vice President of Membership & Image (current). Dr. Louie is a Senior Member of the IEEE.

Light refreshments will be provided.

Non-IEEE PES members and students are welcome to attend.
Topic: Vanadium Flow Batteries for Utility Scale Applications (Presentation and Production Facility Tour)
Date: Wednesday, January 29th, 2014
Time: 5:00 – 7:00
Place: UniEnergy Technologies, 4333 Harbour Pointe Blvd., Suite A, Mukilteo, WA 98275
Speaker: Russ Weed, VP Business Development and General Counsel.

Agenda
5:00 pm – Networking and Refreshments
5:30 pm – Welcome and introductions
5:35 pm – Presentation
5:50 pm – Tour of UET production facility

Vanadium Flow Batteries for Utility Scale Applications:
UniEnergy Technologies (UET) produces and delivers large-scale energy storage systems for utility and grid, micro-grid, commercial and industrial, and other applications of value. The core technology is an advanced vanadium flow battery. The UniSystem™ is safe, operationally flexible, reliable, long-life, and cost-effective. Based in the Seattle area, UET has a 67,000 sqft facility scaling up to produce 100MW annually. UET’s solution is differentiated by (1) new generation vanadium-based electrolyte first developed and patented at Pacific Northwest National Laboratory with the support of the US DOE Office of Electricity, with double the energy density and much broader temperature range than conventional electrolyte; (2) a containerized design derived from multiple decades of design experience among the UET team, with a compact system footprint maximizing power and optimizing energy; (3) mature large-scale electrode stacks with 7 years of field deployment and hundreds deployed in the field; and (4) state of the art controls at each level of the UniSystem™ (from cell to site).

Speaker/Host:
Russ Weed leads UET and Bolong’s business development and strategic activities in North America, Europe, and globally. In that role, he is responsible for strategic alliances with channel, product, and other partners; optimizing product management; negotiations and contracting; mergers and acquisitions; fundraising efforts; and media activities. Russ is general counsel for UET and Bolong as well. With more than 22 years of experience as a VP business development and general counsel, including previously at GE and Labtec, Russ has led and teamed in the strategizing, preparation, negotiation, closing, and execution of a wide range of deals and business matters, in addition to licensing, intellectual property, government relations, employment, compliance, trade regulation, and risk management.

Non-IEEE PES members and students are welcome to attend.
**Topic:** (IEEE-PES Distinguished Lecturer Series) Advances in Distribution Automation and Real-Time Operations for Emerging Distribution Systems  
**Date:** Wednesday, February 26th, 2014  
**Time:** 5:30 – 7:30 pm  
**Place:** Alstom Grid, 10865 Willows Rd. NE, Redmond, WA 98052 at the “Wingin It Cafe”.  
**Speaker:** S. S. (Mani) Venkata, Alstom Grid

**Agenda:**
5:30 pm – Networking and Refreshments  
6:00 pm – Welcome and Introductions  
6:15 pm – Presentation

**Abstract:**
Rapid and dramatic changes have been occurring in the electrical distribution systems all around the world during the past two decades. There are many drivers that have been providing the impetus for these changes such as new sensors, technologies, renewable energy sources and looped/meshed topologies. These developments also have been creating challenging needs and opportunities for new models, tools and techniques to design, plan and operate the emerging systems. The primary focus of this presentation is to identify the advances that are evolving in distribution automation and real-time operations. In this process, the talk will emphasize the need for leveraging the intelligence of, and information provided by, sensors, energy boxes and smart meters to integrate Distributed Energy Sources (DER) with Distribution Management Systems (DMS) to enhance optimal performance of the emerging distribution Grid. This need builds on the DOE Vision towards an Intelligent North American Grid by 2030. The results when implemented, will improve load factor, efficiency, and reliability to meet the 2020 DOE Smart Grid R&D Cost and Performance Targets. This presentation will also focus on the following specific areas: Cold load pick-up, solar swing management, advanced and adaptive Protection for grid and microgrid, and DER modeling. The results achieved to date in these topics will be presented and discussed. In addition, research opportunities for other related topics will be identified for the benefit of engineers and operators in the field.

**Speaker:**
S. S. (Mani) Venkata joined Alstom Grid Inc. in January 2011 as a Principal Scientist and Director of DER R&D. He also continues as an Affiliate Professor of Electrical Engineering at the University of Washington (UW). Seattle, Washington since January 2008. He is also President, Venkata Consulting Solutions Inc. He was with KEMA Inc. for six years during 2005-2010. He was Dean and Distinguished Professor of Wallace H. Coulter School of Engineering at Clarkson University, Potsdam, New York during 2004-2005. During 2003 he was Palmer Chair Professor of Electrical and

Non-IEEE PES members and students are welcome to attend.
Topic: History and Current Status of the Electricity Infrastructure in the Pacific Northwest
Date: Thursday, February 27th, 2014
Time: 2:00 – 3:30 pm
Places: In person: Centralia Community College, Energy Technology building, Room 115
Broadcast: Grays Harbor College, POC: nancy.esberg@dglc.edu
Speaker: Kevin Schneider, Pacific Northwest National Laboratory

Agenda
2:00 pm – Welcome and Overview
2:15 pm – Presentation
3:15 pm – Q&A

History and Current Status of the Electricity Infrastructure in the Pacific Northwest
Electricity first came to Washington State in 1881 when the SS Willamette anchored in Elliot Bay, Edison Central Stations began to be built shortly after. These early Edison Central Systems were 100 volt direct current systems driven by steam dynamos that supplied tens of kilowatts to end-use customers, generally in the form of lighting load. Today, electricity is supplied by a single interconnected multi-voltage alternating current system operating at up to 500,000 volts and is supplied by generators that can be hundreds of megawatts each. The end-use loads have also expanded to include heating, cooling, and large motor loads for industry.

In the 130+ years since the SS Willamette first visited Washington State the region’s electricity infrastructure has continually grown and evolved to meet the demands of the end-use customers; over this period of time all aspects of the infrastructure have changed. While early changes focused on the best voltage to use and which companies should supply which regions, recent issues have focused on what is the best mix of generation assets and how to best incorporate emerging smart grid technologies. High penetration levels of wind generation, aging infrastructure, privacy concerns with customer information, and cyber-security are just a few of the issues facing the industry today. This presentation will include a brief history of the region’s electricity infrastructure and then discuss the issues that are being faced today, and the societal impact of the chosen solutions.

Speaker:
Kevin Schneider served in the US Navy as a nuclear electrician for six years including a tour on the USS Los Angeles (SSN-688). After leaving the Navy he received his B.S. degree in Physics and his M.S. and Ph.D. degrees in Electrical Engineering from the University of Washington. He is currently a senior research engineer at the Pacific Northwest National Laboratory, working at the Battelle Seattle Research Center in Seattle Washington. His main areas of research are distribution system analysis and power system operations. He leads many of the laboratory’s efforts in the areas of distribution and microgrid analysis.

Dr. Schneider is an Adjunct Faculty member at Washington State University, an Affiliate Assistant Professor at the University of Washington, and is a licensed Professional Engineer in Washington State. He is a senior member of the IEEE and currently serves as the Chair of the Seattle PES Chapter and the Chair of the IEEE Distribution System Analysis Sub-Committee.

Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society
Seattle Chapter Meeting
Friday March 14th, 2014

Topic: Tour of North Seattle Receiving Substation
Date: Friday, March 14th, 2014
Time: 5:00 – 7:00
Place: 814 NE 75th Street

Agenda
10:30 am – Safety Briefing
11:30 am – Substation Tour

This tour is intended for students in the University of Washington’s Electrical Engineering Department. Specifically students in one of the two following classes:
- EE 455: Power System Dynamics and Protection
- EE 457: Distribution System Analysis

While the tour is intended for students, any unfilled spots on the tour are open to PES members. A strict attendance limit will be enforced because of Seattle City Light safety regulations.

RSVP
- Professor Rich Christie
- Professor Kevin Schneider

Non-IEEE PES members and students are welcome to attend.
IEEE & IEEE Power & Energy Society
GOLD & Young Professionals Event
Saturday March 8th 2014

Topic: IEEE GOLD Social and Networking Event
Date: Saturday, March 8th, 2014
Time: 7:00 – 9:00 pm
Place: Welcome & Introduction: Seattle University Campus – Bannan 102 (see instructions below)
Social & Networking: Garage Billiards – 1130 Broadway, Seattle, WA 98122
Speaker: TBA
RSVP: https://docs.google.com/forms/d/1IQN0lfwoY-xWrp0KL65K-w1dZKMGrBrz4vbBza1FL4E

Agenda
7:00 pm – Welcome & Introduction at Seattle U
7:30 pm – Walk to the Garage on Broadway
7:35 pm – Social and Networking

Details:
The IEEE GOLD event is hosted by the IEEE Seattle Section and IEEE PES Seattle Chapter. This is an opportunity for Young Professionals to network in a casual setting and enjoy a night of social activities like bowling, pool, gaming arcade, and networking! The event will be held at the Garage Bowl and Billiards on Capitol Hill. The event will start with a short talk at Seattle University where Graduates of the Last Decade (GOLD) members can learn more about the IEEE, the PES, and career-enhancing opportunities for Young Professionals. Directly after we will walk to the Garage.

Bowling, pool tables, and parking will be covered for the first 50 registered members. Please RSVP here. Preference will be given to GOLD Young Professional members – the event will open to all members by the first week of March. The Garage is a 21 and up establishment - please bring your ID. Welcome and introductions will take place at the Seattle University campus. Parking will be covered and attendees should enter through 12th and Marion entrance and inform the parking attendant that they are here for the IEEE GOLD event. Attendees should make their way to Bannan #102 (first floor of Bannan building) – a map of the facility can be found here: http://www.seattleu.edu/maps/.

After the welcome and introduction, we’ll be walking over to the Garage (5 mins walk) where the Social and Networking will take place.

Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society  
Cushman Dam Tour  
Saturday, April 19, 2014

**Topic:** Tacoma Power Cushman #2 Hydro Plant Tour  
**Date:** April 19, 2014  
**Time:** 9:30 am – 11:30 AM  
**Place:** Cushman Hydroelectric Project (21451 N. Highway 101, Shelton, WA 98584)  
**Speakers/Guides:** Brad Ennis, Chris Mattson, Eric Hoffman & Ozan Ferrin  
**RSVP:** [http://sites.ieee.org/seattle-pes/](http://sites.ieee.org/seattle-pes/)

**Agenda:**  
9:30 Welcome and Introduction, Presentation at Cushman Project Office conference room  
9:45 Tour of Cushman #2 Control Room and Generating Facilities  
10:30 Optional Tour of Tacoma Power North Fork Powerhouse and Fish Tram (stair hike)  
11:30 Adjourn

**Clothing and Safety:** This tour is of an operating power plant. We could be around rotating equipment and subject to loud noises. For clothing dress for the weather as the second portion of this tour is outside and will involve walking and climbing stairs. No tennis shoes or open toed shoes allowed. Ear protection will be provided. Adults only; no one under 10 allowed.

**Tacoma Power Cushman #2 Hydro Plant:**  
Cushman Dam No. 2 was completed in 1930, forming the small 150-acre Kokanee Lake. This dam measures 235 feet above bedrock and is 575 feet in length. The powerhouse for Cushman No 2 sits several miles below the dam, overlooking scenic Hood Canal along U.S. Highway 101; the powerhouse attracts hundreds of visitors every year. Electricity moves from the Cushman Hydro Project to Tacoma on a 40-mile-long transmission line. Construction of the Tacoma Narrows transmission line crossing was a notable engineering achievement of the time. Stretching more than a mile and a quarter between towers in Tacoma and Gig Harbor, the power lines were the longest single span in the world. This is a completely automated powerhouse with modern control systems. The tour will allow you to see the integration of modern control systems with historic turbine and generators.

**Optional North Fork Power House Tour:** New fish passage facilities  
Tacoma Power’s new innovative fish passage system is under construction at the Cushman Hydroelectric Project. This tour will take you to the facility to view the fish trap and hauls system along with the energy recovery systems.

[Info Link](#)  

Non-IEEE PES members and students are welcome to attend.
# Conference Schedule

**Wednesday, April 30, 2014**

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<th>Session</th>
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<td>7:30 - 8:20</td>
<td>Registration &amp; Refreshments</td>
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<td>8:20 - 8:30</td>
<td>Introductions</td>
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<td>Rich Christie PhD, NWESS Chair</td>
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<td>8:30 - 8:45</td>
<td>Governor’s Opening Remarks</td>
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<td>Jay Inslee, WA State Governor</td>
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<td>Key Note</td>
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<td>Richard Locke, WA State Commerce</td>
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<td>9:15 - 10:15</td>
<td>Cybersecurity</td>
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<td>Paul Skare, Pacific NW National Lab</td>
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<td>10:15-10:45</td>
<td>Break</td>
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<td>10:45-12:15</td>
<td>Energy Storage</td>
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<td>Patrick Leslie, Puget Sound Energy</td>
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<td>Dave Kaplan, 1st Energy Systems</td>
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<td>Jason Zyskowski, Snohomish PUD</td>
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<td>12:15-1:30</td>
<td>Lunch</td>
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<td>Seattle PES Engineer of the Year Award</td>
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<td>1:30-3:00</td>
<td>Panel — EIM/Balancing</td>
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<td>Elliot Mainzer, Bonneville Power</td>
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<td>Robert Cromwell, Seattle City Light</td>
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<td>Maria Pope, Portland General Electric</td>
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<td>3:00-3:15</td>
<td>Break</td>
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<td>3:15-4:00</td>
<td>Panel Q&amp;A</td>
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<td>4:00-6:00</td>
<td>Student Poster Session</td>
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**Thursday, May 1, 2014**

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<tr>
<td>8:00-8:30</td>
<td>Refreshments</td>
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<td>8:30-9:30</td>
<td>Underwater Turbine Project</td>
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<td>Eric Schneider</td>
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<td>9:30-10:30</td>
<td>Big Data</td>
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<td>Manu Parashar, Alstom Grid</td>
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<td>10:30-11:00</td>
<td>Break</td>
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<tr>
<td>11:00-12:00</td>
<td>SmartGrid Demo</td>
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<td>Mark Reed, Idaho Falls Power</td>
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<td>12:00-1:00</td>
<td>Lunch</td>
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<td>1:00-2:00</td>
<td>Holden Village Microgrid</td>
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<td>Chris Shultz, Holden Village</td>
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<td>2:00-2:15</td>
<td>Break</td>
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<td>2:15-4:00</td>
<td>Panel — OMS GIS</td>
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<td>Tracey Cantrell, Seattle City Light</td>
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<td>Joyce Miceli, Seattle City Light</td>
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<td>Nick Tomassini, Tacoma Power</td>
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<td>Jennifer Boyer, Puget Sound Energy</td>
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**Handy Links**

- Registration
- Map
- NWESS Website
Topic: Wild Horse Wind Farm Tour, and 230kV Substation
Date: May 9, 2014
Time: 9:30 am – 11:30 AM
Place: Wild Horse Wind Farm
RSVP: http://sites.ieee.org/seattle-pes/

Agenda:
10:00AM - Students arrive at Wild Horse
10:15AM - 11:00 noon - Wild Horse Wind Presentation by Wild Horse center personnel
11:00 - 11:15 – PSE Substation Safety Presentation by PSE Engineering
11:15 – 12:15pm - Tour of wind turbine and solar array, travel to Wild Horse sub – Wild Horse Center Personnel
12:15pm – 2:00 pm - Wild Horse Substation Tour – PSE Engineers (Ron Forster, Jim Evans, Max Emrick)
2:00pm – 2:45pm – Return to Visitor Center to return hard hats and protective gear.

Clothing and Safety – No tennis shoes or open toed shoes allowed. Adults only, no one under 18 allowed.

Wild Horse Wind and Solar Facility:

Located near Ellensburg in Kittitas County, PSE’s second wind facility — Wild Horse Wind and Solar Facility — has 149 turbines spanning across 10,000 acres. The facility can generate up to 273 megawatts of electricity, enough to serve more than 80,000 homes. Wild Horse came online in December 2006, and was expanded in 2009.

Wild Horse benefits the surrounding community by creating jobs and providing leasing income for landowners. The facility also produces significant local tax revenue.

Wild Horse also contains one of the Pacific Northwest’s largest solar-power arrays.
Topic: **IEEE Young Professional Social get-together**
Date:  Wednesday, June 25th, 2014
Time:  7:00 – 9:00pm
Place:  Game Works in Seattle
        1511 7th Avenue Seattle, WA 98101
RSVP:  [http://sites.ieee.org/seattle-pes/](http://sites.ieee.org/seattle-pes/)

**Details:**

The informal IEEE Young Professionals event is organized by the IEEE PES Seattle Chapter and IEEE Seattle section. This is an opportunity for Young Professionals to network in a casual setting and enjoy a night of social activities. The event will be held at the Game Works in Seattle – this will be an informal event so all you have to do is RSVP and show up.

Have a suggestion for our next Young Professionals event? Please contact the IEEE PES Young Professionals representative, Abdur Rehman.

Non-IEEE PES members and students are welcome to attend.

Contact: Abdur.Rehman@pse.com – 425-765-9887, for information on this event.
IEEE Power & Energy Society
Seattle Chapter Meeting
Saturday June 28th, 2014

Topic: Real-Time Simulations for Power System Operators
Date: Saturday, June 28th, 2014
Time: 9:30am – 12:30 pm
Place: Seattle University, Bannan Building, Room ENGR 308
Speaker: Robin Podmore, President, IncSys

Agenda
9:30 am – Welcome and Introduction.
9:45 am – PowerSimulator Based Emergency Simulations (Hands-on Participation)
12:30 am – Adjourn

Abstract:
The traditional pipeline for System Operators that has been supplied by former generator operators, substation operators and linemen that became System Operators at the end of their career is decreasing. NERC Certification requirements, greater emphasis on reliability and modern computer applications, require candidates that have more advanced analytical knowledge. However, the profile established for System Operators includes numerous soft skills including: agile reasoning, planning, attention to detail, clear precise communication, teamwork, leadership, flexibility, emotional control under stress and ability to adapt. These skills can be developed with PowerSimulator based training.

This 3 hour workshop will introduce engineer to the challenges faced by system operators and the tools they use to train. This workshop will include hands on simulation based exercises that are identical to those used to train NERC certified operators to react to emergency situations. Due to the limited space of this event please RSVP at: http://sites.ieee.org/seattle-pes/rsvp/

Instructor
Dr. Robin Podmore received his Bachelors and Doctorate degrees in Electrical Engineering from University of Canterbury, New Zealand. Dr. Podmore has dedicated his career to development of computer applications for power system operations with a strong focus on Operator Training Simulators. Under Dr. Podmore’s direction the ESCA (now Alstom) OTS was developed. Since that development, Dr. Podmore has enthusiastically devoted his career to driving down the cost of simulation to ensure access of the best training tools for all operators. Dr. Podmore founded Incremental Systems Corporation (IncSys) in 1990 and has been working with the EPRI Operator Training Simulator (OTS) since 1991. Today he can proudly say that he has accomplished his mission to make realistic simulation a reality for all system operators. Dr. Podmore is an IEEE Fellow and was recently elected into the National Academy of Engineering.

Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society
Seattle Chapter Meeting
Thursday, July 10th, 2014

Topic: Centralia Power Plant tour
Date: Thursday, July 10th, 2014
Time: 12:30 – 4:30pm
Place: Centralia Power Plant, 913 Big Hanaford Road
Centralia, WA 98531

Agenda
12:30 pm – Welcome and Overview
1:00 pm – Tour of power plant
4:30 pm – End of tour

Centralia Power Plant tour
Centralia power plant is the largest base load plant in Washington State. The plant has a 1.34-MW coal-fired plant and a 248-MW natural gas combined-cycle plant. Both plants are located in the same facility in Centralia, WA. The coal-fired plant started operation in 1971, and the gas plant in 2002. TransAlta operates the Centralia power plant since 1999. Over the years, TransAlta has invested in pollution control technologies, resulting in one of cleanest coal-fired plants in North America. In this tour, you will get to know the facilities and learn about the power plant’s operations.

Please be sure to wear closed toed shoes. TransAlta will lend attendees safety glasses, hard hats, and hearing protections, all of which are required to enter the plant.

RSVP Instructions: To attend this tour you must RSVP at: http://sites.ieee.org/seattle-pes/rsvp/
The tour is limited to 40 attendees.

Non-IEEE PES members and students are welcome to attend.
IEEE PES & IEEE Seattle
Young Professionals Event
Thursday July 24th 2014

Topic: Informal Social
Date: Thursday, July 24th, 2014
Time: 6:00 – 8:00pm
Place: Powerhouse Restaurant & Brewery
       454 East Main Puyallup, WA 98372
RSVP: http://sites.ieee.org/seattle-pes/

Details:
This is an informal no-host event that allows PES member to meet in a social setting and network. In order to engage the PES members in the South Sound area we will be meeting for dinner at the Powerhouse Restaurant & Brewery in Puyallup Washington: http://www.powerhousebrewpub.com. Please RSVP so that I can get a sense of how large of a table(s) to reserve.

Details:
The Powerhouse Restaurant and Brewery is located in the old 55 kV Puyallup substation which was constructed in 1907 for the Puget Sound Electric Railway. Power was supplied by the Electron Dam and electricity was used to power the southern leg of the interurban trolley from Seattle to Olympia. The Northern leg of the interurban trolley was powered by the Georgetown Steam Plant on the north end of Boeing field; a PES tour is tentatively scheduled for the Georgetown Steam Plant August 12th. In 1927 the Puget Sound Electric Railway was bought by the Puget Sound Traction Light & Power company, a predecessor of Puget Sound Energy. The substation remained in operation until 1957 and was bought by a private owner in 1994. This retired substation was part of a regional 55 kV network that still has some lines in operation today.

Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society
Seattle Chapter Meeting
August 9, 2014

Topic: Sparks Museum of Electrical Invention, Bellingham
Date: August 9, 2014
Time: 1:00pm – 4:00 PM, Museum Tour
Place: 1312 Bay Street, Bellingham, WA 98225

Agenda
1:00 pm – Museum Tour with Curators John Jenkins and Jonathan Winter
2:30 pm – MeggaZapper Electrical Show
4:00 pm – Optional No Host Late Lunch at the Chuckanut Brewery & Kitchen

The Spark Museum of Electrical Invention offers an exciting and educational experience for audiences of all ages. Compelling, interactive exhibits spanning four centuries of scientific achievement and cultural heritage are featured in a world-class collection of unique objects. The Spark Museum displays the inventions and innovations that changed the course of human history.

MeggaZapper: The Museum is offering our awesome new MeggaZapper Electrical Show every Saturday & Sunday at 2:30 p.m.—children under the age of 5 are encouraged not to attend, as part of the show, though safe, can be suddenly very loud. The Show features the MeggaZapper, one of the largest Tesla coil "lightning machines" in the country, where, for a donation, adult visitors (18 years of age and older) can enter the Lightning Cage and get up close and personal with 4 million volts of loose electricity!

If you have never seen this museum it is a wonderful place to look at electrical equipment in its early beginning.

Sign up for this event at the IEEE PES Website: http://sites.ieee.org/seattle-pes/
Arrange your own travel to be there at 1pm.

IEEE PES will pay for the General Admission and Group Tour costs. This visit is free.

For those that want to there will be a no host late lunch at the Chuckanut Brewery and Kitchen. 601 West Holly Street. This is just down the road from the Sparks Museum.

Sparks Museum  http://www.sparkmuseum.org/

Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society
Seattle Chapter Meeting
Tuesday August 12th 2014

Topic: Tour of the Georgetown Steam Plant

Date: Tuesday, August 12th, 2014
Time: 6:30 – 8:00
Place: Georgetown Steam Plant (6605 13th Ave S, Seattle, WA 98108)
Host: Michael Aronowitz, Seattle City Light

Agenda
6:30 pm – Welcome and Introductions
7:00 pm – Tour

Georgetown Steam Plant:
In 1906 the Seattle Electric Company (SEC), a Stone and Webster company, completed construction on the Georgetown Steam Plant. When it began operation it supplied alternating current to the city of Georgetown and direct current for street cars in Seattle and the interurban between Seattle and Tacoma. Ownership of the facility transferred to the Puget Sound Traction and Lighting Company during its formation in 1912, via merger. When it was originally constructed it was located on the Duwamish River which it used for cooling. The plant remained in operation even after the Duwamish was straightened between 1914 and 1920. Originally an oil-fired power plant the conversion to coal occurred in 1917. This facility housed the last operating examples of the early Curtis steam turbines that had double the efficiency of the older steam engines. Initially the facility housed two vertically mounted turbines, 3 and 8 MW, but a horizontally mounted unit, 10 MW, was added in 1919 and nearly doubled the capacity of the plant. This new turbine was installed as a peaking unit to address the growing peak system load. In 1951 the plant was purchased by the City of Seattle Department of Lighting, the predecessor of Seattle City Light. The Georgetown Steam Plant remained in operation until 1972. Today the Georgetown Steam Plant is a National Historic Landmark and is still owned by Seattle City Light. Tours to the general public are not currently available so we are very fortunate for this opportunity.

Visit Requirements:
- While this is not an active power plant this is still an industrial facility. Closed toe shoes and sensible clothes are required.
- Because of the age of this facility it is not ADA compliant. There will be steep stairs and narrow walkways.
- All attendees will be asked to sign an Accident Waiver and Release from Liability form upon arrival

RSVP Instructions:
To attend this talk you must RSVP at: http://sites.ieee.org/seattle-pes/rsvp/

Non-IEEE PES members and students are welcome to attend.
Topic: BPA Celilo HVdc Converter Station tour

Date: Thursday, September 11th, 2014 (RSVP deadline September 7th, attendees must be U.S. citizens)

Time: 09:00 am – 12:00 pm

Place: BPA Celilo Substation and Converter Station, Wasco County, OR 97058

Agenda
08:45 am – Welcome
09:00 am – Tour of converter station
12:00 pm – End of tour

(source: BPA factsheet)

BPA Celilo HVdc Converter Station tour
The BPA Celilo converter station is part of the Pacific High Voltage DC Intertie. The Pacific HVdc Intertie connects the Pacific Northwest through an 846-mile (1,364-kilometer) line with the Pacific Southwest, with terminals at Celilo in The Dalles, Oregon, and Sylmar, near Los Angeles, California. Converter stations at each end of the line change alternating-current electricity to direct current and back. BPA engineers will provide a technical tour of the Celilo converter station.

RSVP Instructions: To attend this tour you must RSVP by September 2nd, 2014 at:
http://sites.ieee.org/seattle-pes/rsvp/

The tour is limited to 20 attendees. Attendees must be U.S. citizens.

By September 2nd, attendees should also fill out the BPA Visitor Access Request form and return it to Kevin Schmieder. After RSVP, attendees will receive the form from a PES Seattle officer via email. Attendees should return completed forms to the PES Seattle officer via email. PES Seattle will submit all forms to BPA for approval.


Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society
Seattle Chapter Meeting
Friday Sept 12, 2014

Topic: Puget Sound Energy Snoqualmie Plant 2 Tour
Date: Friday Sept 12th, 2014
Time: 1:00 – 3:00 PM
Speaker: Chris Brown Puget Sound Energy

Agenda
- 1:00pm – 1:30pm: Welcome and Introduction,
  Safety Presentation Split into (2) groups
- 1:30 pm – 3:00pm: Tour of intake structures, power plant equipment and discharge areas

Weather, Clothing and Safety

Safety is a very important part of the PSE culture and will play an important role during our day. This tour is of an operating power plant with some ongoing construction. We will be around rotating equipment and subject to loud noises. A safety presentation will be given at the beginning of our tour to go over rules and regulations for visiting the plant. This tour is for adults only and will require a "Puget Sound Energy Waiver" and "Release of Liability Individual Waiver" be signed prior to the tour.

Dress for the weather as some of this tour is outside and will involve walking and climbing stairs. Sturdy footwear is required.

ABSOLUTELY NO TENNIS SHOES/SNEAKERS OR OPEN TOED SHOES.

Snoqualmie Plant 2

Puget Sound Energy’s Snoqualmie Falls Hydroelectric Project is located about 30 miles east of Seattle on the western slopes of the Cascade Mountains, and is one of the oldest hydroelectric plants in the United States. Originally built in 1910 with one Francis Runner Turbine, this plant was expanded in 1956, increasing the overall capacity of both plants to 44.4 MW. A new turbine installed in 2013, alongside an existing turbine provides over 38.5 MW.

This tour will start in the Snoqualmie Plant 2 parking lot to view the plant intake structures. From there we will move inside the powerhouse to view the integration of modern plant control systems into historic but modernized electrical and mechanical systems. At Plant 2, there is a unique bypass flow control system to keep water flowing if a generator shuts down.

Directions

For GPS use this address:
37479 SE Elh Hatchery Rd, Fall City, WA 98024

Directions with a map from the I-90 exit are on the next page.
Topic: Tour of the Nooksack Power House
Date: Saturday September 27th
Time: 9:30 am

Nooksack Power House

The original power house was commissioned by the Bellingham Bay Improvement Company (BBIC) in 1903 and was completed in 1906. The planned output was to be used to supply power to Whatcom County, and Bellingham in particular; the BBIC having the municipal franchise to provide electricity in the city. But in the interim the BBIC sold their holdings in the facility to Stone & Webster, a Boston company that owned and operated many of the early systems in the Pacific Northwest. This powerhouse is still in operation and is currently the second oldest operating power plant in Western Washington, Snoqualmie being the oldest.

The power house was operated by Puget Sound Energy (PSE) until 1997 when a fire destroyed the generators. Because of its relatively small size PSE determined that it was not cost effective for a utility to operate such a small utility. The facility is currently operated by a private company with power providing loads in the Pacific Northwest. The current nameplate capacity of the facility is 1,500 kW. If you are interested in a more complete history I have attached a written history of the facility, completed in 1987, by Kenneth D. Rose of Puget Sound Power and Light Company, now PSE. This is an absolutely fascinating document if you are interested in history.

Weather, Clothing and Safety

This is an operational facility so appropriate clothing, such as closed toe shoes, is required. There is also a short walk to the facility.

Directions

This facility is normally not staffed and located in a national forest, on public land; as such the owners do not want to overly advertise its location. Per their requests, I will provide directions once people have RSVP’d.

Directions

Room on this tour is very limited, no more than 10 people. If you are interested, and sure you can make it, please RSVP at: http://sites.ieee.org/seattle-pes/rsvp/

Non-IEEE PES members and students are welcome to attend.
Title: Aggregation of Flexible Consumer Assets in Smart Grids

Speaker: Jakob Stoustrup, Pacific Northwest National Laboratory (PNNL)

Location: MGH 241, UW campus

Map: http://www.washington.edu/maps/?1=MGH

Time and Date: 4:30 PM, Thursday, November 6, 2014

Abstract:

One of the visions of the so-called smart grid is to exploit consumer flexibility in order to alleviate the adverse effects of intermittent power production as the penetration of e.g. wind and solar energy resources increase. In this presentation, we present an architecture for aggregation and control of a portfolio of flexible consumers. The architecture makes it possible to control the aggregated consumption of the portfolio to follow a power reference while honoring local consumer constraints. Hereby, an aggregator is able to utilize a portfolio of consumers as a virtual power plant to deliver services in the electricity markets. The architecture is implemented and demonstrated in a field test on a portfolio consisting of a number of heat pumps each located in an inhabited household.

Jakob Stoustrup is a Chief Scientist at PNNL in Richland, where he leads the Control of Complex Systems Initiative. He has an M.Sc. in EE and a Ph.D. in Applied Mathematics from the Technical University of Denmark, and was a Professor of Automation & Control at Aalborg University, Denmark prior to coming to PNNL. His research contributions have been to robust control theory, to model predictive control theory and to the theory of fault tolerant control systems. With co-workers, he has proposed a novel Plug-and-Play Control framework.

An IEEE Senior Member, Dr. Stoustrup is Vice-Chair of the IEEE CSS Technical Committee on Smart Grids, and has been nominated to be its Chair. He is also a member of the IEEE Technical Committee on Power Generation. In 2013, he was appointed as the first IEEE CSS Wikipedia Editor, in cooperation with IFAC, the International Federation of Automatic Control. Dr. Stoustrup has chaired and participated in IFAC technical committees. He has received the Statoil Prize and the Daimm Award for Scientific Research. He has been a member of the European Research Council as well as the Danish, Norwegian and Swedish Research Councils. He is a member of The Danish Academy of Technical Sciences, where he has acted as a Board Member.
Topic: Lighting Up a Village: How Social Enterprises and Technology Can Change the Lives of Billions
Date: Thursday, November 20, 2014
Time: 6:00 – 8:00PM
Place: Alstom Grid, 10865 Willows Rd NE, Redmond, WA 98052
Speakers: Dr. Henry Louie (Seattle University), Dr. Vincent Van Acker (Alstom Grid), Steve Szablya, PE (Seattle University) and Daniel Nausner

Agenda for the Evening
6:00 pm – Welcome, Networking, Introductions and Refreshments
6:45 pm – Presentation
Electricity is one of the most convenient carriers of energy, yet approximately 1.2 billion people do not have access to the electric grid. This form of energy poverty disproportionately afflicts the world’s most impoverished people—those living on one to two US Dollars per day. This presentation provides insight into the challenges and context of energy poverty and describes how rural microgrids are providing first time access to electricity in villages around the world. A newly installed microgrid in Malindi Bay Kenya is used as an example of how new technologies and innovative business strategies are transforming the lives of the energy impoverished.
8:00 pm – Closing

Biographies
Dr. Henry Louie is an Associate Professor in the Department of Electrical and Computer Engineering at Seattle University. He is the Vice President of Membership & Image of the IEEE Power & Energy Society. He is a Distinguished Lecturer of the IEEE on the topics of energy poverty and rural microgrids.

Dr. Vincent Van Acker is a Lead Delivery Engineer in Distribution Automation at Alstom Grid in Redmond, WA. He received his MSc. Degree in Power Systems from the University of Porto, Portugal, and his PhD in Power Systems and Computer Engineering from Iowa State University. Since 2010, he has participated in several projects aiming at reducing energy poverty in the developing world.

Mr. Steve Szablya, PE., is an adjunct professor at Seattle University in the Electrical and Computer Engineering department advising senior design projects, including humanitarian projects for which he co-authored several papers with Dr. Henry Louie and Dr. Vincent Van Acker. He is co-chairman of kiloWatts for Humanity and a member of the IEEE Community Solutions Initiative.

Daniel Nausner received his B.S.E.E. and B.S. in Mathematics from Seattle University in 2014. He has worked on several microgrid projects.

Light refreshments will be provided.

Non-IEEE PES members and students are welcome to attend.
IEEE Power & Energy Society
Seattle Chapter Meeting
Tuesday December 9th, 2014

Topic: Keep the Lights On and the Information Flowing
Date: Tuesday December 9th, 2014
Time: 5:30 – 7:30 pm
Place: University of Washington, Department of Electrical Engineering (Room: EEB 303)
Speaker: Professor Daniel Kirschen

Agenda
5:30 pm – Networking and Refreshments
6:00 pm – Welcome and Introductions
6:15 pm – Presentation

Abstract:
Supplying electric power requires a large and very visible electrical infrastructure made of transmission
lines, substations and generating plants. Nowadays however, these components cannot operate without the
assistance of a much more concealed information infrastructure of communication links, instrumentation
and control centers. Questions have begun to be raised about the negative impact that this increasing
reliance on the information infrastructure might have on the resilience of the power system. Reports on
major incidents have mentioned malfunctions or inadequacies in the control and communication systems
as contributing factors to the degradation of the situation which ultimately led to blackouts. It is therefore
important and urgent to understand the mechanisms through which failures in the information
infrastructure can endanger the security of the power system. Once these mechanisms are understood, we
must quantify their potential impact. Finally, on the basis of this quantification we must then develop
techniques to maintain or enhance the overall robustness of the system. The framework that is
traditionally used to assess the security of power systems is not suitable for these tasks because it does not
consider explicitly the information infrastructure. The main purpose of this presentation is thus to propose
a new framework that clarifies the interactions between the primary “electrical” and the secondary
“information” infrastructures in terms of security.

Speaker
Daniel Kirschen received his Electrical and Mechanical Engineer’s Degree from the Universite Libre de Bruxelles (Brussels, Belgium) in 1979. He obtained his Master’s and PhD degrees in Electrical Engineering from the University of Wisconsin – Madison in 1980 and 1985 respectively.

He then joined Control Data Corporation’s Energy Management Division (then a division of Empros Systems International and of Siemens Energy and Automation) where he worked on the development of advanced application programs for utility control centers. In particular, he worked on the development of optimal power flow and

Non-IEEE PES members and students are welcome.
Topic: **Instrument Transformer Workshop by Omicron**

**Date:** Wednesday, December 17th, 2014  
**Time:** 7:30am – 3:30pm  
**Place:** Hilton Bellevue Hotel  
300 112th Ave SE, Bellevue, WA 98004

**RSVP:** [omicronusa.com/2014ITSeattle](http://omicronusa.com/2014ITSeattle)  
Limited seats available. RSVP is required. Lunch will be provided.

**Instrument Transformer Workshop by Omicron**
The hands-on workshop will provide an introduction to instrument transformers design and testing, including a comparison of conventional methods verses innovative test methods. Application examples will be provided, including a review of practical experiences of performing tests on transformer bushing CT’s.

![Image](image_url)  
**Morning Session**
- 7:30 – 7:45 - Check-in  
- 7:45 – 8:00 - Welcome  
- 8:00 – 9:30 - Topic 1: Current Transformer  
- 9:30 – 10:00 - Coffee Break  
- 10:00 – 11:30 - Topic 2: Voltage Transformer  
- 11:30 – 12:30 - Lunch

**Afternoon session**
- 12:30 – 3:30 - Topic 3: Practical Measurements on instrument transformers  
- 3:30 – Adjourn