
The Oregon Joint Use Association (OJUA) and the National Electrical Safety Code® (NESC®)

A Progressive Model for Industry Cooperation

April 2016



Notice and Disclaimer of Liability Concerning the Use of IEEE- SA Documents

This IEEE Standards Association ("IEEE-SA") publication ("Work") is not a consensus standard document. Specifically, this document is NOT AN IEEE STANDARD. Information contained in this Work has been created by, or obtained from, sources believed to be reliable, and reviewed by members of the NESC activity that produced this Work. IEEE and the NESC members expressly disclaim all warranties (express, implied, and statutory) related to this Work, including, but not limited to, the warranties of: merchantability; fitness for a particular purpose; non-infringement; quality, accuracy, effectiveness, currency, or completeness of the Work or content within the Work. In addition, IEEE and the NESC members disclaim any and all conditions relating to: results; and workmanlike effort. This NESC document is supplied "AS IS" and "WITH ALL FAULTS."

Although the NESC members who have created this Work believe that the information and guidance given in this Work serve as an enhancement to users, all persons must rely upon their own skill and judgment when making use of it. IN NO EVENT SHALL IEEE OR NESC MEMBERS BE LIABLE FOR ANY ERRORS OR OMISSIONS OR DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS WORK, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Further, information contained in this Work may be protected by intellectual property rights held by third parties or organizations, and the use of this information may require the user to negotiate with any such rights holders in order to legally acquire the rights to do so. IEEE and the NESC members make no assurances that the use of the material contained in this work is free from patent infringement. Essential Patent Claims may exist for which no assurances have been made to the IEEE, whether by participants in this NESC activity or entities outside the activity. The IEEE is not responsible for identifying essential patent claims for which a license may be required, for conducting inquiries into the legal validity or scope of patents claims, or determining whether any licensing terms or conditions, if any, or any licensing agreements are reasonable or non-discriminatory. Users are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. No commitment to grant licenses under patent rights on a reasonable or non-discriminatory basis has been sought or received from any rights holder. The policies and procedures under which this document was created can be viewed at <http://standards.ieee.org/about/sasb/iccom/>.

This Work is published with the understanding that IEEE and the NESC members are supplying information through this Work, not attempting to render engineering or other professional services. If such services are required, the assistance of an appropriate professional should be sought. IEEE is not responsible for the statements and opinions advanced in this Work.

Contents

INTRODUCTION	2
CHALLENGE OF SIGNIFICANT PROPORTIONS	2
A BRIEF HISTORY	3
THE TIPPING POINT FOR CHANGE	3
CONSISTENCY AMIDST THE CONFUSION	3
THE OREGON MODEL	3
THE BIRTH OF THE OREGON JOINT USE ASSOCIATION	3
A STRUCTURE FOR SUCCESS	4
"SECRET SAUCE"	4
THE PUC'S ROLE IN THE OJUA PARTNERSHIP	6
MEASURES OF SUCCESS	6
FINAL THOUGHTS	6
CITATIONS	7



Introduction

"So often, the things you do aren't appreciated until you stop doing them" – anonymous

Pity the lowly utility pole. Despite the fact that 97% of the electrical transmission miles in the U.S. use overhead facilities¹, poles are so common a sight that they readily fade from everyday view into the unseen background. But behold the outcry when something goes amiss.

This point was driven home dramatically during Hurricane Sandy in 2012. As the second most costly hurricane in U.S. history², Hurricane Sandy caused an estimated 8.7 million electrical outages across 20 States and the District of Columbia³.



Root cause analysis conducted after the storm underscored the critical role that poles play in our power infrastructure. When all the statistics were in, customer-affecting outages in the distribution network were found to be caused by damage to an eye-popping 18,617 poles and their associated aerial lines and transformers⁴.

Although many of these outages were inevitable given sustained hurricane wind speeds and flying debris, there's little doubt that the physical condition of the poles and utility adherence to proper engineering and safety standards were also important factors that impacted system reliability.

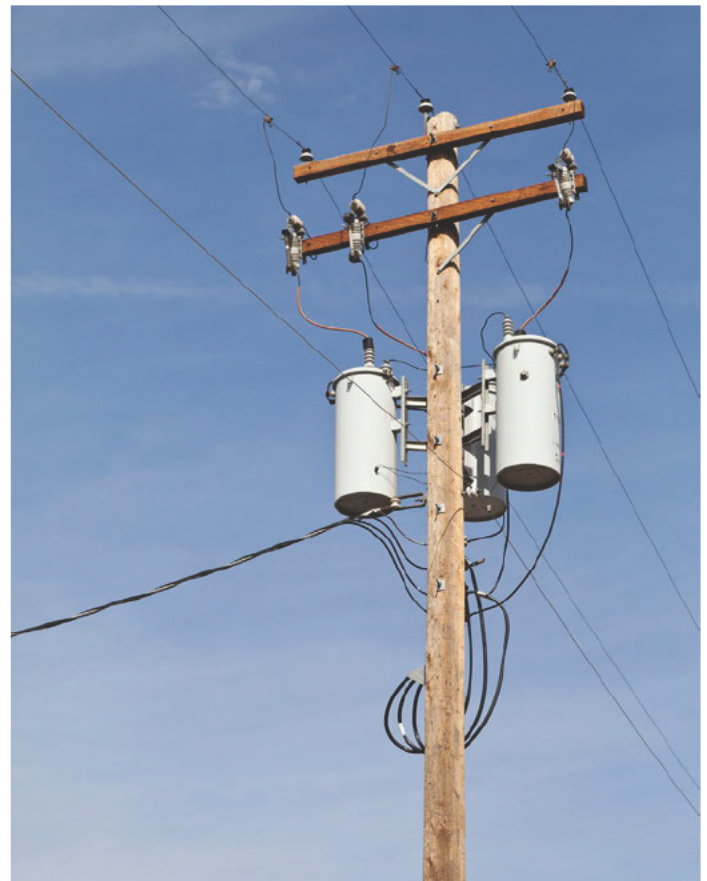


Challenge of Significant Proportions

With more than 160 million utility poles in use in the U.S.⁵, the ability to provide on-going inspection, maintenance and standards compliance would be a highly daunting task even if all the poles were used by only a single operator that exercised fully consistent practices.

The magnitude of the actual challenge starts to take shape when one considers that there are over 3,300 different electric utilities, 6,500 wireline telecommunications providers and 660 cable companies in operation in the United States^{6,7,8}, with many of them vying for space on the same poles.

Given the potential impact to system safety and reliability, the manner in which these various providers co-exist on a shared infrastructure – commonly referred to as 'joint use' – is a topic of keen interest (and potential concern) to every public utility commission (PUC). This White Paper presents a proven and highly effective approach for managing joint use that will likely be of interest to PUCs and regulatory entities both within and outside the United States.



A Brief History

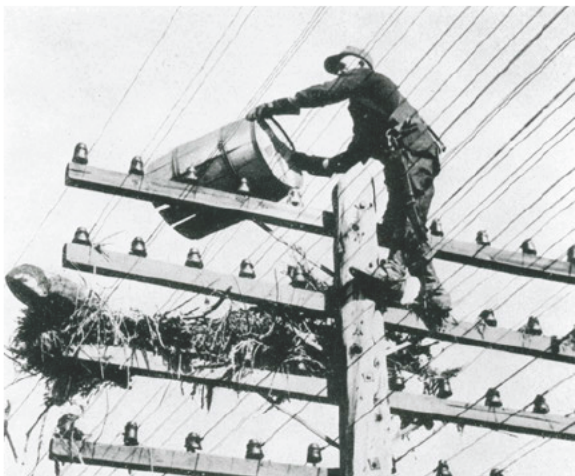
Days gone by often tend to get romanticized as simpler and less complicated times, but in the case of joint use, that is a fairly accurate view of how things had been throughout the first half of the twentieth century.

With fewer categories of industry participants looking to share common rights-of-way, and a highly integrated national telephone network backed by the exacting engineering standards of AT&T and Bell Laboratories, the decades leading up to the 1960's were generally ones of relative stability and peaceful co-existence between the electric utilities and the telephone companies.

The status-quo began to change, however, in the late 50's with the advent of commercially available cable TV. The initial framework for consistent national regulation of this technology would have to wait, however, until the Federal Communications Commission (FCC) issued its *First and Second Reports and Orders on CATV* in 1965 and 1967, respectively⁹.

Given the expense of installing new poles for the physical delivery of their content to subscribers, many cable providers instead sought to hang their coaxial cabling on existing poles owned by the power or telephone utilities. This practice was authorized by the FCC in 1978 in the *Pole Attachments Act*, but stopped short of requiring the incumbent utilities to provide access to their poles.

While some of these shared use arrangements between the utilities and cable companies were formalized by contract and adhered to the engineering specifications of the pole owner, other attachments were unsanctioned and resulted in lost revenue for the utility as well as a loss of quality control. Unfortunately, many of these 'bootleg' setups were done in a careless and haphazard manner that could potentially threaten utility transmission reliability or line crew safety. In regulatory jurisdictions across the U.S., tensions began to rise.

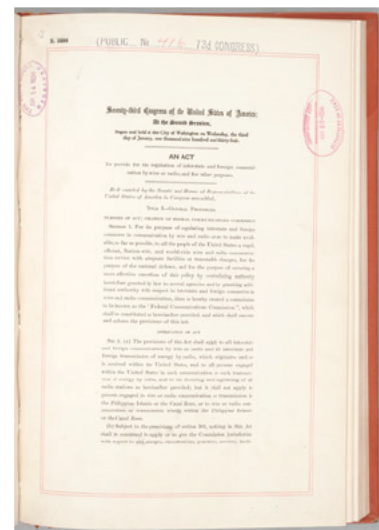


The Tipping Point for Change

The 1980's brought a literal explosion of new communications and computing technology for both the industry and end users – personal computing, fiber optics and broadband Internet access to name just a few.

In the regulatory environment, these developments exposed the growing technological deficiencies of the prevailing law of the land, the *Communications Act of 1934*. The result was the issuance of the *Telecommunications Act of 1996*, which was the first significant update to U.S. telecommunications law in more than sixty years.

One of the main impacts of the 1996 Act was to encourage new forms of competition by reducing or removing traditional barriers to entry. In practical terms, the Act *required* incumbent utilities to give the cable TV, CLEC (competitive local exchange carrier) and fiber optic network providers access to the utilities' distribution networks at discounted wholesale rates. With the 'stroke of a pen', the legal floodgates were opened that now mandated joint use of poles.



Consistency amidst the Confusion

For decades prior to the 1996 Act, the authoritative guide for utilities on the safe installation, operation and maintenance of poles and overhead lines had been the **National Electrical Safety Code (NESC)**.

First issued in 1914 under the auspices of the National Bureau of Standards, responsibility for the NESC was assumed by **the Institute of Electrical and Electronics Engineers (IEEE)** in 1972. In the face of all this profound change, the NESC remained the definitive national standard for the safe operation of power and communication utility systems – the identical role that it maintains to the current day.

The Oregon Model

The dramatic industry changes of the 70's, 80's and 90's were felt just as acutely in Oregon as in the rest of the nation. With a diverse set of power and communications providers within its jurisdiction, the Oregon Public Utility Commission (OPUC) found itself in 1999 in the center of a joint use attachment and rental rate controversy between the incumbent utilities and new industry entrants.

Having been an early adopter of the data-rich NESC as their definitive technical reference in the 1920's, the OPUC decided to approach the joint use dispute with detailed fact-finding and a comprehensive pole audit that identified over 10,000 unauthorized attachments. To help determine the most effective approach to resolve the situation, the OPUC requested that the Oregon Legislature empower a task force of industry experts to propose a fair and systematic approach for certifying pole attachments, together with recommendations for appropriate non-compliance sanctions.

The efforts of the task force were viewed by all parties as an overwhelming success, and set the stage for a unique partnership between regulators and industry that has continued to grow and thrive.

The Birth of the Oregon Joint Use Association

As Oregon entered the new millennium, it seemed clear to the Commissioners that the going-forward pace of technological change was not likely to slow, and would instead bring a continuing set of challenges for incumbents and new entrants alike.

Coming off the success of the Joint Use Task Force, the OPUC moved to formalize the effort legislatively as a permanent industry workgroup – the **Oregon Joint Use Association (OJUA)** – which would be an on-going expert advisor to the Commission on all administrative matters pertaining to pole owners and tenants.

With the formation of OJUA, many of the original task force participants transitioned into the Association's first board of directors. One of the original members of the Board, **John Wallace**, remains extremely active in joint use issues (now as a member of the OPUC staff), and shares some of the challenges and successes of the early years.

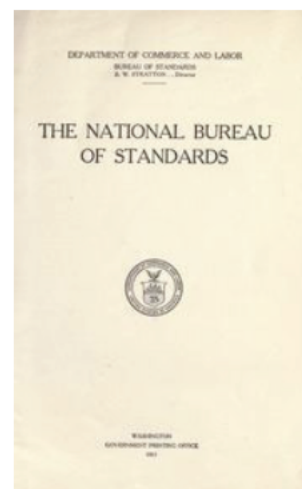
"The OJUA really didn't start out with a formal blueprint for how it was going to evolve. We looked to see if other states had undertaken a similar approach to bring regulators and industry together like this, and we really couldn't find any existing effort that we could pattern ourselves after."

"Even though we knew we were on our own to figure this out, the Board was convinced that a highly cooperative approach was the absolutely right way to go – not just between the Commission and the utilities, but also between the different utility participants themselves."

"The rest, as they say, is history. When you put people together against common problems, you almost always come out with a better solution. Although the term has been somewhat overused, it really is the power of the collaborative process. The enduring success of the OPUC-OJUA relationship is all about 'peeling the onion' together."

This approach also rings true for Lori Koho, Administrator for the OPUC's Safety, Reliability and Security Division.

"We have a lot of interaction with the staff at other state commissions, and it's often hard for them to believe the place we gotten to in terms of the cooperation between all the different parties. I tell everyone that it hasn't always been easy, but it definitely has been worth the effort."



A Structure for Success

The cooperative nature of the OJUA is reinforced by the inclusive nature of its structure. Currently, its board represents more than 50 member companies that actually extend beyond Oregon's borders into adjacent states. As a non-profit, it is financially self-sustaining through membership dues and training events and requires no public funds.

As the OJUA has evolved and met new challenges over the past 15 years, eight key functions have emerged as fundamental enablers of their continuing effectiveness (and a potential structural blueprint for other commissions that are considering a similar effort in their own jurisdictions)

- Serve as advocate and advisor on joint use issues to the Commission as well as to industry
- Create a cooperative and collaborative working environment for pole owners and tenants
- Recommend and adopt industry standards and methodologies in the areas of best construction practices, facility identification, and inspection/correction practices
- Provide accessible, quality, and affordable training on the NESC
- Provide a fair and objective avenue for conflict resolution within the industry
- Review and make recommendations on proposed legislation
- Provide management and oversight of the association to ensure its financial stability
- Promote and expand membership

The industry cooperation and conflict resolution functions of the OJUA, in particular, have a significant impact on the productivity of the OPUC staff. Long-time OJUA Board Member Jeff Kent explains.

"With any commercial undertaking, misunderstandings and disagreements will crop up on occasion. The OJUA has really put an emphasis on 'fair play', and encourages all of its members to work things out between themselves. This local approach actually takes care of the majority of day-to-day issues that come up.

Some disagreements, however, need an objective third party to hear both sides, and this is where the OJUA Conflict Resolution Committee can help. If there wasn't a JUA, all disputes would wind up with the PUC for fact-finding and resolution – both of which can be very time-consuming.

Here in Oregon, problems from pole owners or tenants that relate to administrative rules often get referred by the PUC to the OJUA. Although the Conflict Resolution Committee's process is voluntary and its recommendations are not legally binding, nearly 100% of the issues get resolved through the OJUA process. This frees the PUC Commissioners and staff to focus their attentions on other initiatives.

Here's a real-life example in which a pole owner denied an agreed-upon 'prompt-pay' discount to a tenant based on repeated lateness in their attachment-related payments. Since the discount amounted to a sizable amount of money, both parties were keenly interested in getting the matter resolved.

Unable to reach an agreement between themselves, the matter came before the Conflict Resolution Committee. The OJUA heard arguments from the complainant and the respondent, reviewed the associated documentation, and offered an unbiased perspective. The outcome: a fair play resolution that kept the matter 'in-house' and prevented it from having to go before the Commission."


"Secret Sauce"

Although the OJUA has established a well-deserved reputation for promoting cooperation and collaboration among its diverse membership, that outcome is not an automatic achievement.


One of the most powerful (and popular) elements of the OJUA is its yearly get-together around a two-day, expert-led training event. The aptly named 'Spring Training' focuses on all aspects of the NESC, including new technology, code changes, improvements in construction and maintenance processes, and active discussion on interpreting the NESC guidelines for unique local situations.

Widely regarded as an essential part of the organizational 'glue' that fosters member cooperation over competition, attendance counts for the event have been steadily growing year over year, with recent sessions also notable for the number of new attendees – many of which travel to the event from well beyond Oregon.

[2016 OJUA Spring Training Event Program Schedule](#)



OJUA SPRING TRAINING – 2016
Embassy Suites, Portland Airport
April 20 & 21
Draft Program Schedule



David J. Marne, P.E. is a registered professional electrical engineer. Mr. Marne is the author of McGraw-Hill's National Electrical Safety Code® (NESC®) Handbook and is a nationally recognized speaker on the NESC®. He serves on NESC® Subcommittee 4 Overhead Lines Clearances, Subcommittee 7 Underground Lines, Subcommittee 3 Electric Supply Stations, and the Interpretations Subcommittee. He is company president and senior electrical engineer for Marne and Associates, Inc. in Missoula, Montana where he specializes in National Electrical Safety Code® (NESC®) training, OSHA training for power and communication workers, engineering design training, and expert witness services related to the NESC®, the OSHA Standards for Power and Communication workers, and California's General Order 95, 128, and 165 (G095, G0 128, and G0165). Mr. Marne has over 30 years of experience in the utility industry engineering and managing transmission and distribution line projects, substation projects, electrical system planning studies, joint use (power and communication) projects, and providing training and expert witness services.

The PUC's Role in the OJUA Partnership

If one were inclined to think that the OPUC operates with a hands-off approach to regulatory governance, nothing could be further from the truth. The PUC's Lori Koho explains.

"The outstanding relationship with our industry partners really represents years of spade work both before and after the creation of the JUA. The trust and mutual respect that we have achieved in Oregon required the PUC staff to spend more hours than I can count in the field giving safety talks and establishing a two-way dialogue with utility management, supervisors and linemen about the importance of the NESC."

There's no getting around the fact, though, that the PUC has an absolute responsibility to ensure industry compliance with the Code. Policies alone without accountability won't do it. That said, while we certainly have the means to enforce code compliance, we don't go about that task with a 'heavy hand' or an adversarial attitude."

In fact, we put special emphasis on staffing our utility-facing positions with highly experienced folks that have come out of the industry. They understand the operational and budgetary realities that the utilities face, and pretty much have instant credibility when they conduct an audit or help a utility craft a remediation plan. Having a PUC staff that the utilities respect is a fundamental underpinning to what we've been able to achieve."

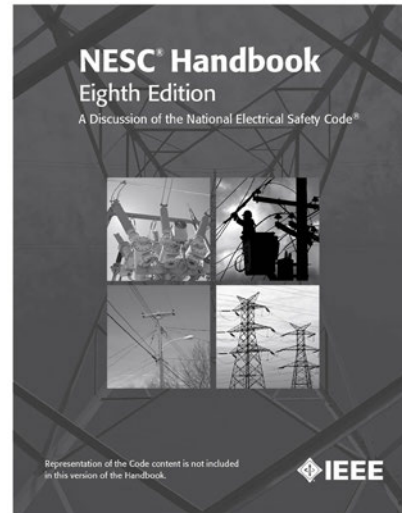
Measures of Success

With the NESC seen as the 'bedrock' underlying the OPUC-OJUA partnership, the benefits of Code compliance are both numerous and varied.

From the perspective of the 'utility ecosystem', everyone benefits. Ratepayers benefit from receiving safe and reliable service. Utility workers and their families benefit by having a safer workplace. Utility management benefits by having a more reliable system, fewer ratepayer complaints, lower long-term maintenance costs, greater system resistance to adverse weather conditions, and lower overtime costs during service restorations.

While some benefits are subjective, many are measurable and trackable. System reliability indices in Oregon, for instance, show significantly better performance than the national average. A particularly 'heart-tugging' metric that is directly influenced by systematic tree trimming -- children injured or killed by powerline contact while climbing in trees -- has gone from an average of 4 incidents per year in the early 1980's, to 1 incident per year in the 90's, to ZERO incidents from 2000 through 2015.

From both the OPUC and OJUA perspectives, there is no question about it -- *"the NESC works. Period."*



Final Thoughts

For readers that are intrigued by the approach that Oregon has taken, but who might be dissuaded by the sense that "it's just too large of an undertaking", the OPUC's John Wallace offers some sage counsel.

"Rome wasn't built in a day, and neither is an environment like what Oregon has been able to achieve. That said, there are clearly some fundamentals that any commission wanting to go this route should put on their 'short list'."

First, the NESC has to be recognized by force of law as the minimum standard. Next, the state commission needs to be recognized through the legislature as the authorized administrative authority to interpret and enforce the code."

From that point on, it's all about the 'pick and shovel' work of leveraging your industry-savvy staff (and hiring them if necessary) to tirelessly work with the various utilities in your jurisdiction so that they use the NESC as the basis for all their installation, inspection, replacement and maintenance activities."

Be consistent in your message and follow-through. Don't hold back on conducting audits and holding 'feet to the fire' in terms of remediation and compliance -- these are essential ingredients in establishing credibility and respect."

If you go about this process conscientiously and in a spirit of cooperation and collaboration, your success is essentially guaranteed."

Citations

- [1] http://www.elp.com/articles/powergrid_international/print/volume-18/issue-2/features/underground-vs-overhead-power-line-installation-cost-comparison-.html
- [2] https://en.wikipedia.org/wiki/Hurricane_Sandy
- [3] http://www.oe.netl.doe.gov/docs/Northeast%20Storm%20Comparison_FINAL_041513c.pdf
- [4] http://www.oe.netl.doe.gov/docs/Northeast%20Storm%20Comparison_FINAL_041513c.pdf
- [5] http://www.elp.com/articles/powergrid_international/print/volume-16/issue-10/features/preservative-choices-for-wood-utility-poles.html
- [6] <http://www.publicpower.org/files/PDFs/USElectricUtilityIndustryStatistics.pdf>
- [7] <https://transition.fcc.gov/wcb/iatd/lec.html>
- [8] <https://www.ncta.com/industry-data>
- [9] https://en.wikipedia.org/wiki/Cable_television_in_the_United_States

Trademarks and Disclaimers

IEEE believes the information in this publication is accurate as of its publication date; such information is subject to change without notice. IEEE is not responsible for any inadvertent errors.

The Institute of Electrical and Electronics Engineers, Inc. 3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2016 by The Institute of Electrical and Electronics Engineers, Inc.

All rights reserved. Published April 2016. Printed in the United States of America.

IEEE is a registered trademark in the U. S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

IEEE prohibits discrimination, harassment, and bullying. For more information, visit www.ieee.org/web/aboutus/whatis/policies/p9-26.html.

No part of this publication may be reproduced in any form, in an electronic retrieval system, or otherwise, without the prior written permission of the publisher.

To order IEEE Press Publications, call 1-800-678-IEEE.

Find IEEE standards and standards-related product listings at: standards.ieee.org

IEEE STANDARDS ASSOCIATION

445 Hoes Lane, Piscataway, NJ 08854 USA | standards.ieee.org

Tel. +1 732-981-0060 Fax +1 732-562-1571