

## Trees, Power Lines and FERC— An interview With FERC Chairman Jon Wellinghoff

by Stephen R. Cieslewicz, CN Utility Consulting

If you do a Google image search for “power outages,” you quickly will notice a trend known to those in this industry who try to keep the lights on. Trees are the culprits in countless power outages because they’ve grown into energized lines or fallen onto them from a distance, typically from outside normal clearing limits. Trees represent the largest cause of outages during routine and exceptional weather events, and this trend is growing.

When looking at data and damage, it appears that the bulk electric system (BES) held up exceptionally well through the snowstorms and most recently Hurricane Sandy. The federal strategy for compelling the management of trees and other vegetation to prevent outages appears to have worked. The transmission grid, at least from a vegetation management perspective, appears to be in good condition and somewhat resilient to these recent serious incidents.

The same cannot be said for the nation’s electric distribution systems. According to CN Utility Consulting’s recent studies, nearly half the trees that are being pruned away from energized power lines across the United States are in contact with the lines at the time of work. This number has nearly doubled during the past five years. The exception is California, which has 24/7 state-mandated clearance requirements for trees and power lines. Exceptional conditions also are present in the handful of geographic areas where progressive utilities have maintained effective and well-funded approaches to utility vegetation management (UVM).

What lessons can state regulators and utilities learn from the feds about mitigating tree and power line-related outages during routine and major events? It has been only a few years since the Federal Energy Regulatory Commission (FERC) promulgated mandatory clearance requirements, but evidence shows the approach works.

There is no better source to answer these types of questions or give an update on the status of the national FAC-003 standard than FERC Chairman Jon Wellinghoff.

**Cieslewicz: Chairman Wellinghoff, why is FERC interested in tree and power line issues?**

**Wellinghoff:** Tree contact with transmission lines has been a leading cause of electric power outages, including the August 2003 blackout that affected 50 million people in the northeast United States and Canada. The Energy Policy Act of 2005 authorized the commission to approve mandatory and enforceable reliability standards for the nation’s bulk power system. One is a vegetation management standard (FAC-003-1) that applies to transmission lines operated at 200 kV and above, as well as lower-voltage lines that are designated as “critical to the reliability of the electric system in the region.”

**Cieslewicz: Do you have advice or suggestions for the state regulators who are looking for ways to keep the lights on through better vegetation management regulations and oversight?**

**Wellinghoff:** The industry has responded well to having a standard that requires each utility to develop and consistently follow a proactive plan for vegetation management for higher-voltage transmission lines at the federal level. At the state level, enacting a regionally appropriate inspection cycle and minimum clearance requirement for sub-200-kV transmission and distribution facilities coupled with a cost recovery mechanism may help in this regard.

**Cieslewicz: With only a few states’ having enforceable regulatory clearance requirements for keeping trees away from power lines, will FERC be lowering the applicability of FAC-003 down to the 100-kV level?**

**Wellinghoff:** The Federal Power Act expressly states that the commission has no jurisdiction over local distribution facilities, so it will continue to fall to the states to regulate local distribution facilities. As to lower-voltage transmission lines, the commission has previously declined to direct NERC (North American Electric Reliability Corp.) to submit a modification to lower the applicability of FAC-003-1 to generally include all facilities operated at voltages as low as 100 kV, but it did direct NERC to consider inclusion of lower-voltage transmission lines that could impact bulk power system reliability. In response



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to this directive, NERC submitted a revised standard, FAC-003-2, that would apply to lines below 200 kV if they are an element of an Interconnection Reliability Operating Limit (IROL) or of a Major WECC Transfer Path. In October, the commission issued a Notice of Proposed Rulemaking in Docket No. RM12-4-000 that proposes to accept this revised standard.

**Cieslewicz: In 2010 you held a technical conference focused on utility vegetation management. What was the intent, and what did you learn?**

**Wellinghoff:** We wanted both to take a look at changes in vegetation management practices that may have resulted from FAC-003-1 and to get a better understanding of the range of management practices used by transmission owners, including their reasons for selecting a given practice. There were a few key issues that were discussed



during the conference, the first of which was that prior to FAC-003 becoming mandatory, some utilities had not done enough to maintain their ROWs (rights of way). So they had trees with expected maturity heights in excess of needed clearances that needed to be removed. The resetting of the ROW through needed clearing appeared excessive to landowners, and it will take time before lower-growing vegetation is fully restored.

Second, there was a clear recognition that the commission determines only the “what” (there must be adequate clearances for reliability) and not the “how” (neither FAC-003 nor the commission requires any particular method of vegetation management). Rather, transmission owners choose their preferred method of vegetation management, which is outlined in a utility’s transmission vegetation management program (TVMP) and restricted only by local laws and easement or right of way agreements with the landowner. Some panelists noted that there are studies showing cost and environmental benefits from using a science-based “wire zone, border zone” vegetation management approach, which allows native, lower-growing vegetation along the border of the ROW, as opposed to repeatedly clear cutting.

Third, we heard that better communication between the public and transmission owners is needed on the topic of easements. Lack of communication is a major problem which leads to landowner frustration at the loss of trees, which often are not replaced by the utility. Many landowners are unaware of the existence of a utility ROW agreement for their property since this agreement may have been negotiated with previous owners decades prior to the current owner’s purchase of the property.

**Cieslewicz: A review of NERC outage data shows a clear nexus between the development and enforcement of FAC-003 and the reduction of the number of growth-related outages across North America. There was none in 2011 and the first two quarters of 2012. If the purpose of the regulation was to prevent these occurrences, why is the standard now being revised?**

**Wellinghoff:** First of all, the purpose of the proposed standard remains the same. In addition, I think that the revised standard submitted by NERC, combined with continued industry focus on best practices for vegetation management, will enhance the reliability of the bulk power system. The proposed reliability standard addresses several commission directives from Order No. 693 to improve the standard. For instance, the revised standard recognizes that not all transmission lines needed for reliability are operated at voltages of 200 kV and above, and it expands the applicability to include overhead transmission lines operated below 200 kV that are either an element of an Interconnection Reliability Operating Limit or an element of a Major WECC Transfer Path. In addition, the proposed reliability standard incorporates a new minimum annual vegetation inspection requirement, as well as new minimum vegetation clearance distances into the text of the standard, and importantly, the proposed standard also would make explicit a transmission owner’s obligation to prevent an encroachment into the minimum vegetation clearance distance regardless of whether that encroachment results in a sustained outage.

**Cieslewicz: A key ongoing message from FERC has been that utility companies must reclaim and manage the full extent of their ROW easements. Is this still a priority for FERC?**

**Wellinghoff:** I think encouraging good vegetation management practices will always remain a priority for FERC. The staff report on the Northeast storm contained several relevant and broadly applicable findings and recommendations. For instance, it found that about 25 percent of the confirmed vegetation-related transmission line outages involved trees that, while located outside the utility’s maintained ROW, were inside the utility’s full ROW. It recommended that, where possible and practical, utilities should use industry best practice of ensuring that danger trees are not present within the full rights of way. That is, they should work toward reclaiming the full right of way width where feasible for trees that could cause problems. The report also recommended that utilities work to enhance their off-right of way danger tree management to protect lines operated at 200 kV and above and lower-voltage transmission lines that, if lost, would negatively impact

## California's Mandatory Clearance Requirement Saves Money, Lives

by Michael Peevey, California Public Utility Commission

In the 1990s, the California Public Utility Commission (CPUC) convened a lengthy and thorough rulemaking proceeding to develop and implement new rules for vegetation management in the state. The CPUC



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worked to improve electric reliability and public safety while considering long-term costs to ratepayers and the complexities of ongoing utility maintenance work. The result of this multistakeholder effort was a mandatory clearance requirement that was fully implemented in 1997. Over the years, the commission has reviewed and updated this rule to fine-tune and improve its efficacy in preventing outages and fires and improving public safety. Our cost-benefit analysis has shown that while initial vegetation management costs were greater because of a higher required standard of care on the part of the utilities, ratepayers saved significantly more money

in the prevention and avoidance of outages and accidents. The mandatory clearance requirements improved safety, kept the lights on and avoided costly system damage that would have occurred had it not been for the upfront mandated vegetation maintenance by utilities in the state. CPUC believes mandatory clearance requirements work and are likely the best approach in compelling effective vegetation management work by electric utility companies with exposed distribution systems.

Most tree-related outages are not caused by growth into lines but from trees' falling into lines from outside normal clearance limits. CPUC found utility companies required to comply with mandatory clearance requirements would be compelled to increase the frequency and thoroughness of on-site tree inspections followed by completion of required work. If a California utility allowed trees to encroach within the proscribed clearance, they would face considerable fines. Utilities that evaluate tree lines every three to five years are less likely to spot and fix problems before they happen than those utilities that evaluate tree lines more often. Because of the mandatory clearance requirements in California, utilities are looking at the conditions and completing necessary work annually, which allows them to spot trees that might grow into the clearance zone and trees that might be declining in health and pose a threat of falling into the lines.

California is sensitive to tree and power line-related fires. Data shows that tree and power line fire potential is no greater here than in other states, but this threat resulted in the CPUC's new rulemaking proceeding to further strengthen public safety assurance efforts.

Trees that grow near or into distribution create a greater likelihood that people will not see the lines. And if they can't see them, they can't avoid them. Tragically, every week a worker in the green industry falls victim to electrocution, and in most cases it is a result of not seeing the wires before he or she performs the tree work. It is not only tree workers and arborists who are electrocuted or harmed. Every year, many private citizens—children and adults—also meet this fate by climbing trees with obscured, energized lines.

the overall reliability of the bulk electric system. Utilities should work with property owners, state regulators and local communities to develop a strategy for managing those trees that pose the greatest threat to those facilities. In addition, the report said that if state laws or policies significantly impact utilities' ability to manage off-right of way danger trees that could impact these critical facilities, utilities should work with stakeholders and state and local governments to develop solutions that reduce risk to those lines.

**Cieslewicz: Is it fair to say that FERC expects utilities to adhere to industry-accepted and science-based practices such as ANSI A-300 to perform required UVM?**

**Wellinghoff:** While we always expect utilities to plan to operate reliably and cost-effectively while respecting the environment, FERC has no direct responsibility over the methods used for tree pruning or utility vegetation management. Reliability Standard FAC-003-1 requires that minimum clearances be maintained between power lines and trees to prevent flashovers as well as contacts. It is designed to minimize disruptions of electric service due to vegetation contacts with transmission lines and, thereby, improve the reliability of the nation's bulk power system. It does not prescribe how the transmission line owner must meet the performance requirement. It only sets a minimum requirement for vegetation management programs, i.e., that they conduct inspections and meet the required clearances. As a result, utilities have discretion to determine the means by which they meet clearance requirements. Thus, a utility can employ one method of vegetation management instead of another or decide to prune trees and other vegetation more than the minimum requirements, so long as the transmission line owner meets the required clearances. The reliability standard does not establish a maximum clearance distance within the utility's right of way.

Vegetation management practices are usually defined by the specific right of way agreements that the transmission line owner has secured with the property owner subject to any state or local regulations. Further, the utility must comply with any currently applicable vegetation management regulations and environmental ordinances established by state and or local jurisdictions, to the extent they do not conflict with the commission-approved reliability standards. That said, since the October 2010 vegetation management conference, we have been working with NERC to identify and promote best practices within the industry and will continue to do so.

**Cieslewicz: While the science seems to point to significant environmental and cultural benefits associated with a well-managed ROW (above simply preventing outages), there have been acrimonious incidents in some locations where utilities have tried to reclaim their ROWs and remove incompatible vegetation. Do you have suggestions for addressing this, and is**

**there a role for the regulators or government in dealing with this issue?**

**Wellinghoff:** Probably the most effective tool is better communication between the public and transmission owners, both in terms of the reason for and timing of ROW work, the methods to be used (and why the utility has chosen a particular method), and the rights and responsibilities of the utility and homeowner. Lack of communication causes landowner frustration over the loss of trees, which are not always replaced by the utility. Moreover, as I mentioned earlier, many landowners are unaware of the existence of a utility ROW agreement for their property. In addition, there are numerous examples of good utility practices in working with landowners. For example, when trees that are expected to grow into the transmission lines are removed, some utilities replace them free of charge to the landowner with lower-growing native species. Utilities could offer voucher programs that allow property owners to select small trees from nurseries to replace larger trees removed from the right of way. In this way, successful vegetation management programs can help property owners maintain and even enhance the environmental benefits and aesthetics of the right of way while ensuring sufficient clearance between the vegetation and energized conductors.

**Cieslewicz:** An ongoing issue for utilities has been the agency obstacles. These occur when a local, state or federal agency prevent or limit the

**amount of required work necessary to prevent FAC-003 violations on transmission ROWs. What is being done to prevent an outage or other accidents such as fires from occurring as a result of contradictory direction from agencies and jurisdictions?**

**Wellinghoff:** Commission staff has on multiple occasions discussed vegetation management concerns with various federal land management agencies and the affected utilities. In addition, Reliability Standard FAC-003-1 does contain a backstop provision to protect reliability. This provision, Requirement R1.4, requires a transmission owner to develop mitigation measures when it identifies locations on the ROW where it is restricted from attaining the required clearances. Proposed standard FAC-003-2 Requirement R5 similarly requires the transmission owner to take corrective action to ensure continued vegetation management to prevent encroachments. These measures may include such things as reducing facility ratings and flows on the affected transmission lines until the required clearance can be performed.

**Cieslewicz:** Any final advice you would like to pass along to utilities that handle both transmission and distribution companies?

**Wellinghoff:** I think the best advice is the most simple: Apply the lessons learned from the transmission side to the distribution side of the company, talk with other companies, and learn from the experiences and best practices of other similar utilities. **ELP**

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