Agenda Item 2
Board of Trustees Compliance Committee
Closed Session
March 18, 2014

Fourth Quarter 2013 Vegetation-Related Transmission Outage Report and Recommendation

Action

Accept the attached report and approve the recommendation to discontinue the practice of Board of Trustees Compliance Committee (BOTCC) review and acceptance of quarterly Vegetation-Related Transmission Outage reports.

Background

Ineffective vegetation management was identified as a major cause of the August 14, 2003 blackout and had also been cited as a major causal factor in other large-scale North American outages such as those that occurred in the summer of 1996 in the western United States. Recommendation 16 of the *Final Report on the August 14, 2003 Blackout in the United States and Canada: causes and Recommendations,* U.S.-Canada Power System Outage Task Force, April 5, 2004, suggested the establishment of enforceable standards for maintenance of electrical clearances in right-of-way (ROW) areas.

Reliability Standard FAC-003-1[1] was developed to ensure Transmission Owners (TOs) maintain and implement a vegetation management program to reduce the risk of cascading due to vegetation-related outages. The Reliability Standard requires TOs to report[2] sustained transmission line outages[3] caused by vegetation contact to its Regional Entity on a quarterly basis. The Regional Entity in turn, reports to NERC the outage information and any actions taken by the Regional Entity as a result of any of the reported outages.

Fourth Quarter of 2013 Report

A vegetation-related transmission outage report is prepared for the BOTCC's acceptance quarterly. The report is also distributed by e-mail to interested parties and placed on the NERC public website.

During the fourth quarter of 2013, there were three Category 3 vegetation-related transmission outages reported. Two outages involved a 230kV line and one outage involved a Regional Entity designated critical line under 200kV. These outages are described in more detail in the attached report.

[1] The goal of FAC-003-1 is to improve the reliability of the electric transmission systems by (a) preventing outages from vegetation located on transmission ROW and minimizing outages from vegetation located adjacent to ROW, (b) maintaining clearances between transmission lines and vegetation on and along transmission ROW, and (c) reporting vegetation-related outages of the transmission systems to the respective Regional Entities and NERC.

[2] The outage information provided by the TO must include, at a minimum: (a) the name of the circuit(s) outaged, (b) the date, time and duration of the outage, (c) a description of the cause of the outage and other pertinent comments and (d) any countermeasures taken by the TO.

[3] An outage is categorized as one of the following: Category 1 — Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the ROW; Category 2 — Fall-ins: Outages caused by vegetation falling into lines from inside the ROW; Category 3 — Fall-ins: Outages caused by vegetation falling into lines from outside the ROW.

Recommendation

As discussed in more detail below, in recent years, there has been a significant improvement in performance related to vegetation-related transmission outages (both associated with vegetation growing inside and outside the ROWs). In addition, as noted below in more detail, a new version of the FAC-003 Reliability Standard, approved by the Federal Energy Regulatory Commission (FERC) on September 19, 2013, contains enhanced requirements that are intended to further strengthen vegetation management practices. These two factors should continue to promote successful vegetation management programs that, in turn, contribute to ensuring the elimination of vegetation-related adverse impacts on the availability of the bulk power system.

While information on trends associated with vegetation-related outages remains relevant, NERC staff believes that the formal process of quarterly acceptance of the Vegetation-Related Transmission Outage reports by the BOTCC is no longer needed in light of the improvements in performance discussed below. Therefore, NERC staff recommends to the BOTCC that, starting in the first quarter 2014, the practice of requesting the committee to review and accept quarterly Vegetation-Related Transmission Outage reports be discontinued. NERC staff would continue to produce and post these reports on the NERC website on a quarterly basis.

Vegetation-related transmission outage performance has steadily and significantly improved since 2004, when NERC began to monitor such performance. This is primarily the result of TOs implementing new and improved vegetation management programs to meet the requirements identified in the FAC-003-1 Reliability Standard. Figure 1 below shows the significant reduction of vegetation-related transmission outages caused by vegetation growing into transmission lines from within the ROW (Category 1 outage). During the 2004-2010 period, there were a total of 63 Category 1 outages. Approximately half of these transmission outages involved voltage classes 345 kV and higher. In contrast, during the last 3 years there was only one Category 1 outage reported for a 230 kV transmission line.

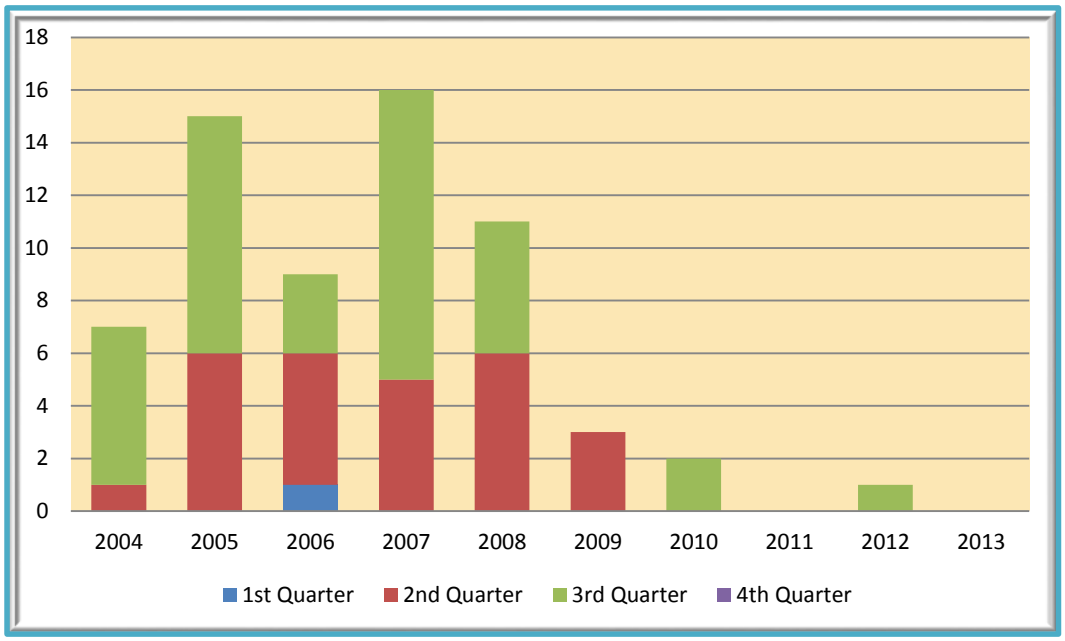

Figure 1: Category 1 — Grow-in Outages Caused by Vegetation Growing into Lines from Inside the ROW.

Further enhancements to the FAC-003 Reliability Standard were made in Version 3 and approved by FERC for a staged implementation beginning July 1, 2014. Version 3 of FAC-003 expands the applicability of the Standard to include overhead transmission lines that are operated below 200 kV, if they are either an element of an Interconnection Reliability Operating Limit (IROL) or an element of a Major WECC Transfer Path. The Reliability Standard also makes explicit an applicable TO and Generator Owner (GO) obligation to prevent an encroachment into the minimum vegetation clearance distance (MVCD) for a line subject to the Standard, regardless of whether that encroachment results in a sustained outage or fault. Also, for the first time, this Standard requires TOs and GOs annually to inspect all transmission lines subject to the Standard and to complete 100 percent of their annual vegetation work plan. The Reliability Standard also incorporates the MVCDs into the text of the Standard, and does not rely on clearance distances from an outside reference, as is the case with the version 1 Standard.

DRAFT – SUBJECT TO COMMITTEE ACCEPTANCE

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Vegetation–Related Transmission Outage Report

Fourth Quarter 2013

RELIABILITY | ACCOUNTABILITY




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Executive Summary

The NERC Board of Trustees Compliance Committee has reviewed and accepted this Vegetation-Related Transmission Outage Fourth Quarter 2013 Report.

The reportable[1] vegetation-related transmission outages that occurred in the Fourth Quarter of 2013 are being reported in accordance with Requirement 4[2] of standard FAC-003-1[3].

Specifically, Requirement 3.4 requires each outage to be categorized as one of the following:

- Category 1 — Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the Right -of -Way (ROW).
- Category 2 — Fall-ins: Outages caused by vegetation falling into lines from inside the ROW.
- Category 3 — Fall-ins: Outages caused by vegetation falling into lines from outside the ROW.

Table 1 is a summary of the vegetation outages that occurred in the Fourth Quarter of 2013 by voltage class and category.

Category	RE Designated Critical Lines <200 kV	230 kV	345 kV	500 kV	765 kV	Total
Category 1 — Grow-ins	0	0	0	0	0	**0**
Category 2 — Fall-ins	0	0	0	0	0	**0**
Category 3 — Fall-ins	1	2	0	0	0	**3**
Total	**1**	**2**	**0**	**0**	**0**	**3**

Table 1: Summary of Vegetation-Related Outages, by Voltage Class and Outage Category for Fourth Quarter 2013

The three vegetation-related transmission outages reported in the Fourth Quarter of 2013 were classified as Category 3. One outage involved a critical line under 200 kV line, and two outages involved 230 kV lines. All three outage events were weather-related due to high wind events causing a tree outside the ROW to uproot or break off and fall into the line.

[1] Per R3.2 of Reliability Standard FAC-003-1, the Transmission Owner is not required to report to the Regional Entity certain sustained transmission line outages caused by vegetation such as (1) vegetation-related outages that result from vegetation falling into lines from outside the ROW that result from natural disasters or (2) vegetation-related outages due to human or animal activity.

[2] The Regional Entity shall report the outage information provided to it by Transmission Owners, as required by Requirement 3, quarterly to NERC, as well as any actions taken by the Regional Entity as a result of any of the reported outages.

[3] FAC-003-2 was approved on March 21, 2013 by the Federal Energy Regulatory Commission (Commission). The Commission approved the related definitions, violation severity levels, implementation plan, and effective dates proposed by NERC. The Commission also approved the related violation risk factors, except that it directed a revision to the violation risk factor corresponding to one requirement. On September 19, 2013 the Commission issued Order No. 785 that approved version 3 of Standard FAC-003. As a result, version 2 will be superseded by version 3. The enforceability date of July 1, 2014 for Transmission Owners will remain the same. Version 3 also applies to Generation Owners with enforceability starting on January 1, 2015.

There were two Category 3 vegetation-related transmission outages reported during the Fourth Quarter of 2012. One outage was on a 230 kV line, and the other was on a 345 kV line within two different Regional Entities' footprint. The Fourth Quarter of 2011 had one 230 kV outage, and there were no outages reported in the Fourth Quarter of 2010. The events that occurred in the Fourth Quarter of 2013 do not cause a concern or pose a significant risk on the reliability of the bulk power system.

Reported Vegetation Outages for Q4 2013

The following vegetation related transmission line trips were reported to NERC per R4 of FAC-003-1 for the Fourth Quarter of 2013.

Category 1 — Grow-ins

No outage caused by vegetation growing into lines from vegetation inside and/or outside of the ROW was reported during the Fourth Quarter 2013.

Category 2 — Fall-ins

No outage caused by vegetation falling into lines from inside the ROW was reported during the Fourth Quarter 2013.

Category 3 — Fall-ins

Three (3) outages caused by vegetation falling into lines from outside the right-of-way were reported during the Fourth Quarter 2013.

Northeast Power Coordinating Council (NPCC)

NPCC reported the following two 230 kV vegetation-related transmission outages from outside the ROW:

Outage on November 1, 2013: During a wind event, a major lead broke off from a 95-foot tall, co-dominate, white pine tree located 4-1/2 feet outside of the ROW easement and fell onto the transmission line causing an outage of 15 hours and 4 minutes. The tree had internal rot that was not visible from the outside and was removed.

Outage on November 24, 2013: During a high wind event, a 95-foot tall white pine tree located 11-1/2 feet outside the ROW easement, uprooted, fell, and stayed leaning on a single phase of the 230kV transmission line causing an outage of 28 hours and 35 minutes. The faulted location was found by helicopter patrol on November 25, and the tree was removed. Additional trees outside the ROW, that are located along the edge of the ROW, will be removed.

Western Electricity Coordinating Council (WECC)

WECC reported the following vegetation-related transmission outage from outside the ROW for one Regional Entity designated critical line under 200 kV:

Outage on October 30, 2013: During a localized wind storm, a healthy Ponderosa Pine tree, located approximately three miles from the substation, was uprooted and fell into the transmission line causing an outage of 1 hour 45 minutes. No customer load was lost. The entity has conducted ongoing patrols for vegetation issues, including danger trees outside the ROW. Additionally, WECC continues to monitor all Category 3 vegetation-related outages on two 115 kV transmission lines that traverse a rugged mountainous area.

Table 2 summarizes the number of transmission outages by voltage level, region, and category.

Region		FRCC	MRO	NPCC	RFC	SERC	SPP	TRE	WECC	TOTAL
First Quarter	*Category 1*									
	Category 2									
	Category 3					2-230kV	1-345kV			**2-230kV 1-345kV**
Second Quarter	*Category 1*									
	Category 2									
	Category 3					2-230kV			2-<200kV	**2-<200kV 2-230kV**
Third Quarter	*Category 1*									
	Category 2									
	Category 3			1-230kV	1-230kV	1-230kV			1-<200kV 1-230kV	**1-<200kV 4-230kV**
Fourth Quarter	*Category 1*									
	Category 2									
	Category 3			2-230kV					1-<200kV	**1-<200kV 2-230kV**
TOTAL for 2013	*Category 1*									
	Category 2									
	Category 3			**3-230kV**	**1-230kV**	**5-230kV**	**1-345kV**		**4-<200kV 1-230kV**	**4-<200kV 10-230kV 1-345kV**
Category 1: GROW-INS (inside/ outside ROW) **Category 2: FALL-INS (inside ROW)** **Category 3: FALL-INS (outside ROW)**										

Table 2: Summary of Vegetation-Related Transmission Outages[4] by Region and by Outage Category for Each Quarter in 2013

[4] Contains only sustained outages of transmission lines and does not include violations resulting from momentary outages or encroachments into the clearance zone as described in standard FAC-003.

Figure 1 illustrates the number of outages caused by vegetation growing into transmission lines from within the right-of-way that have been reported since 2004.

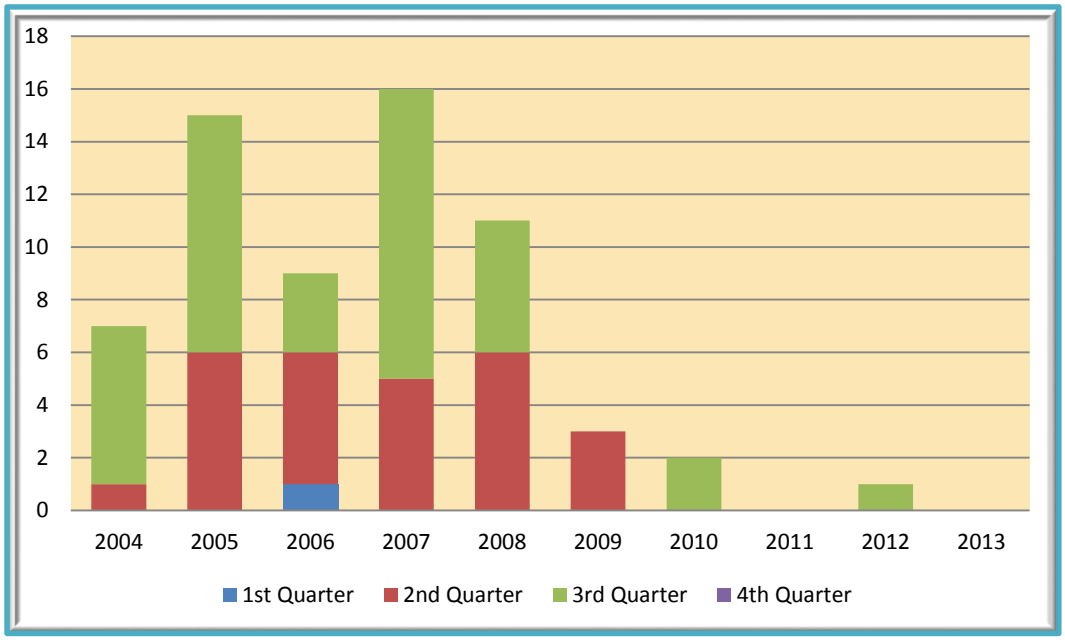
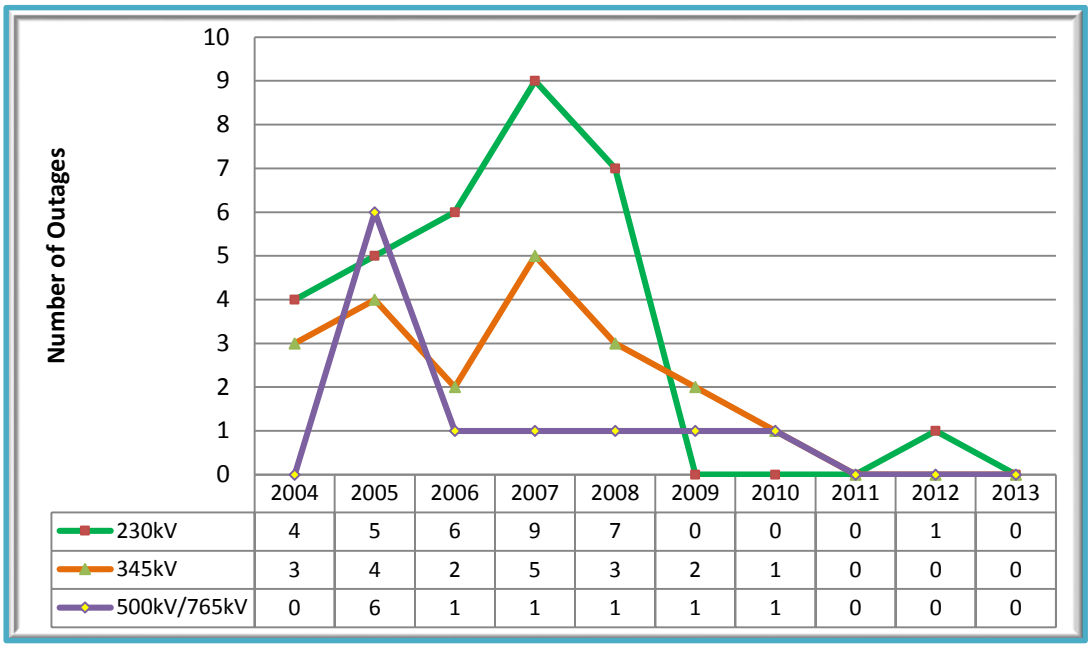


Figure 1: Category 1 — Grow-in Outages Caused by Vegetation Growing into Lines from Inside and/or Outside the ROW.[5]

Figure 2 provides this information by voltage class for each year.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
230kV	4	5	6	9	7	0	0	0	1	0
345kV	3	4	2	5	3	2	1	0	0	0
500kV/765kV	0	6	1	1	1	1	1	0	0	0

Figure 2: Category 1 —Grow-In Vegetation Related Outages of 230 kV and Higher

[5] Includes one 2007 Category 1 outage caused by vegetation growing into an RE-designated critical line <200 kV.