

Vegetation-Related Transmission Outage Report Second Quarter 2008

The NERC Board of Trustees Compliance Committee has reviewed and accepted this Vegetation-Related Transmission Outage Second Quarter 2008 Report.

Vegetation-related transmission outages that occurred in the second quarter of 2008 are being reported in accordance with standard FAC-003-1.

The standard 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 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.

All Category 1 and 2 outages are considered to be violations of NERC standard FAC-003-1, with corresponding levels of noncompliance defined in the standard. The reporting of these violations is handled separately as part of the NERC performance reporting process. Category 3 outages are not considered to be violations of NERC standard FAC-003-1. Table 1 is a summary of the vegetation outages that occurred in the second quarter by voltage class and category.

Table 1: Second Quarter 2008 Summary of Vegetation-Outages by Voltage Class and Outage Category

Category	RE Designated Critical Lines <200 kV	230 kV	345 kV	500 kV	765 kV	Total
Category 1 — Grow-ins		5		1		6
Category 2 — Fall-ins						0
Category 3 — Fall-ins	1	4				5
Total	1	9	0	1	0	11

In comparison, during the second quarter of 2007 the following 13 vegetation-related transmission outages were reported:

- Five (5) Category 1
 - 1–<200 kV, 2–230 kV, and 2–345 kV
- Two (2) Category 2
 - 1–230 kV and 1–500 kV
- Six (6) Category 3
 - 5–230 kV and 1–345 kV

Category 1 — Grow-ins

Outages caused by vegetation growing into lines from inside/outside the right-of-way

Florida Reliability Coordinating Council

Reported one 230 kV outage from inside the right-of-way:

1. The transmission owner reported a 230 kV vegetation-related outage occurred on June 2, 2008 with duration of approximately three days. The line loading percentage at the time of the outage was 21 percent of normal rating. A tree contacted a conductor from underneath inside the right-of-way. The transmission owner had crews cut the entire width of the right-of-way to 100 feet. Other corrective steps include:
 - Revision of the annual work plan to include ground inspection annually in the month of May and also to include the circuit in the aerial patrol cycle.
 - Revision of the annual work plan to include clearing the right-of-way annually in February utilizing machinery and/or hand-cutting resources.
 - Aerial inspection of all transmission lines over 200 kV ahead of their normal patrol schedule.
 - Assessment of cycle lengths to ensure segments are short enough to provide desired reliability results to meet Reliability Standard FAC-003-1.

FRCC has initiated a spot-check investigation regarding the outage.

Northeast Power Coordinating Council

Reported one 230 kV outage from inside the right-of-way:

1. The transmission owner reported a 230 kV vegetation-related outage occurred on April 18, 2008 with duration of 7 hours and 4 minutes. The line sagged into an apple tree causing the line to trip and lockout. The line-loading at the time of the outage was 104 percent of normal rating. In 2001 the tree was not determined to pose a risk, the cycle for this line was eight years; the transmission owner is transitioning to a six year cycle. The clearance between the conductor and the tree, given to potential amount of conductor sag, was estimated and determined to be adequate. An atypical amount of conductor sag occurred at the time of contact causing the event. The transmission owner is investigating the reasons for the atypical amount of conductor sag and will work to continue to improve their vegetation management procedures and policies. NPCC is investigating the vegetation outage.

SERC Reliability Corporation

Reported one 500 kV and one 230 kV outages from inside the right-of-way:

1. The transmission owner reported a 230 kV vegetation-related outage occurred on June 11, 2008 with duration of 3 hours and 23 minutes. The line loading percentage at the time of the outage was 50 percent of normal rating. The transmission owner reported that a tree rooted in a land owner's fence row, and directly under a conductor, grew close enough to the conductor to create a flashover and phase to ground fault. The tree was removed and the line was flown to identify any other issues. An investigation of the facts and circumstances around the event is still underway. The region has participated in the investigation of the event, including a site visit.
2. The transmission owner reported a 500 kV vegetation-related outage occurred on June 13, 2008 with duration of 22 hours and 17 minutes. The transmission owner reported that following the outage, an investigation identified an Eastern Cottonwood Tree showing evidence of flashover damaged located below a 500 kV conductor; the line loading percentage at the time of the outage was 12.3 percent of normal rating. The transmission owner completed floor vegetation maintenance through the affected and adjacent spans from edge to edge of the right-of-way. On June 19, 2008 the transmission owner completed an aerial patrol of all lines within the state above 200 kV and has since completed an aerial patrol of all owned transmission lines. SERC is pursuing an investigation into the outage.

Western Electricity Coordinating Council

Reported two 230 kV outages from inside the right-of-way:

1. The transmission owner reported a 230 kV vegetation-related outage occurred on June 5, 2008 with duration of 37 minutes. The line loading percentage at the time of the outage was 46 percent. A flowering Century Plant grew into the area of the line causing a clearance 2 zone violation and causing the line to relay. As a result, the transmission owner has removed the clump of Century Plants that caused the outage and determined that all other Century Plants have been checked and verified as not flowering. The transmission owner is in the process of removing all other Century Plants within the right-of-way and has revised the vegetation management program. The Region has spot-checked the transmission owner's vegetation management program and is discussing the details of the mitigation plan with the transmission owner.
2. The transmission owner reported a 230 kV vegetation-related outage occurred on June 28, 2008 with duration of 23 hours. The line loading percentage at the time of the outage was 22 percent of normal rating. A wild cherry tree grew into the line. As a result, the tree was removed and additional trees in the span and along the line were cut. Regional staff made an onsite visit to the transmission owner and visited the site of the outage.

Category 3 — Fall-ins

Outages caused by vegetation falling into lines from outside the right-of-way

SERC Reliability Corporation

Reported three 230 kV outages from outside the right-of-way:

1. The transmission owner reported a 230 kV outage occurred on May 23, 2008 with duration of 17 hours and 43 minutes. The outage was caused by a live pine tree rooted on a sandy creek-bank, five feet from the right-of-way, falling onto the conductor. Roots were undermined allowing the tree to fall. Five adjacent trees that appeared to have destabilizing erosion around the roots were cut the same day. An active sand dredging operation in the creek in the immediate vicinity of the fallen tree may have contributed to the undermining of the roots.
2. The transmission owner reported a 230 kV outage occurred on June 18, 2008 with duration of 7 hours and 25 minutes. The outage was caused by a 106 foot tall red oak tree that fell 35 feet off the right-of-way into a conductor; root damage was apparent. The tree was removed from the conductor and the area was patrolled for any additional potential hazards.
3. The transmission owner reported a 230 kV outage occurred on June 19, 2008 with duration of 13 hours and 36 minutes. A 110 foot fall red oak, on a ridge 20 feet high, 35 feet from the right-of-way broke off about 6 feet above the ground. The trunk of the tree was hollow but appeared externally healthy. The tree was removed and no additional danger trees were identified in the immediate area.

Western Electricity Coordinating Council, Inc.

Reported one 230 kV outage from outside the right-of-way:

1. The transmission owner reported a 230 kV outage occurred on June 22, 2008 with duration of 12 hours and 31 minutes. A cottonwood tree from a tree farm nearby fell into two phases of the line. The transmission owner will target several rows of these trees for removal in order to create more separation from the transmission line.

WECC also reported one RE designated critical line <200 kV outage from outside the right-of-way:

1. The transmission owner reported a <200 kV vegetation-related outage occurred on June 21, 2008 with duration of 79 hours and 15 minutes. The transmission owner removed the tree as a result and reports that vegetation management of this line is ongoing.

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

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 2 provides this information by voltage class for each year.

Table 2: Summary of Vegetation-Related Transmission Outages by Region and by Outage Category for Each Quarter in 2008

Region	First Quarter			Second Quarter			Third Quarter			Fourth Quarter			TOTAL		
	Category 1	Category 2	Category 3	Category 1	Category 2	Category 3	Category 1	Category 2	Category 3	Category 1	Category 2	Category 3	Category 1	Category 2	Category 3
	GROW-INS (inside/outside ROW)	FALL-INS (inside ROW)	FALL-INS (outside ROW)	GROW-INS (inside/outside ROW)	FALL-INS (inside ROW)	FALL-INS (outside ROW)	GROW-INS (inside/outside ROW)	FALL-INS (inside ROW)	FALL-INS (outside ROW)	GROW-INS (inside/outside ROW)	FALL-INS (inside ROW)	FALL-INS (outside ROW)	GROW-INS (inside/outside ROW)	FALL-INS (inside ROW)	FALL-INS (outside ROW)
FRCC			1-230 kV	1-230 kV									1-230 kV		1-230 kV
MRO															
NPCC				1-230 kV									1-230 kV		
RFC															
SERC			1-230 kV	1-230 kV 1-500 kV		3-230 kV							1-230 kV 1-500 kV		4-230 kV
SPP															
TRE															
WECC			4-<200 kV 8-230 kV	2-230 kV		1-230 kV 1-<200 kV							2-230 kV		5-<200 kV 9-230 kV
TOTAL			4-<200 kV 10-230 kV	5-230 kV 1-500 kV		4-230 kV 1-<200 kV							5-230 kV 1-500 kV		5-<200 kV 14-230 kV

Figure 1: Category 1 — Grow-ins from within the Right-of-Way

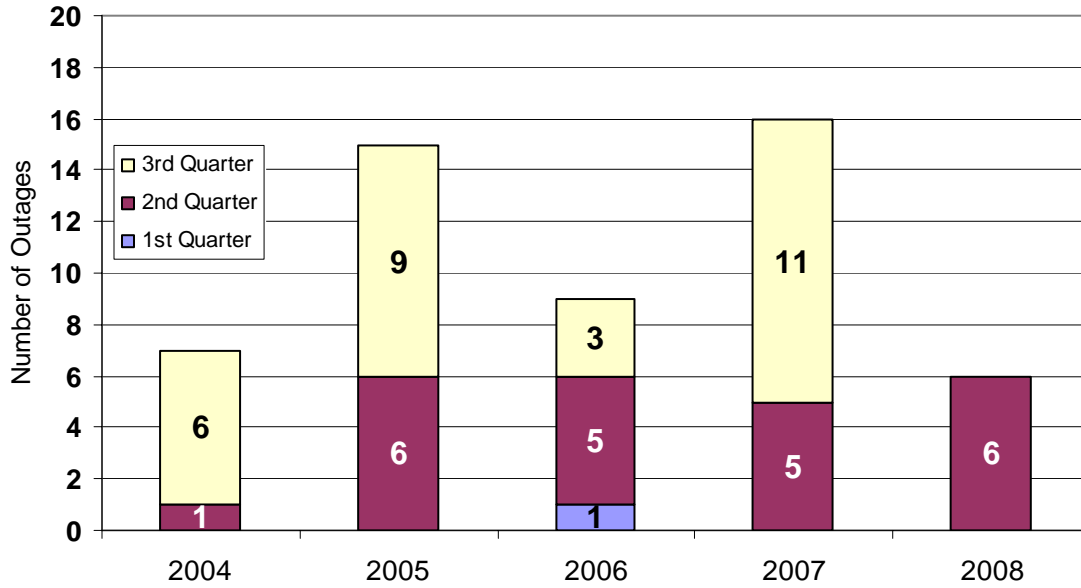


Figure 2: Category 1 — Grow-In Vegetation Related Outages of 230 kV and Higher Transmission within the Right-of-Way by Voltage Class

