



NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

December 30, 2009

Ms. Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: NERC Notice of Penalty regarding Duke Energy Corporation, FERC Docket No. NP10-_-000

Dear Ms. Bose:

The North American Electric Reliability Corporation (“NERC”) hereby provides this Notice of Penalty¹ regarding Duke Energy Corporation (“Duke Energy”), NERC Registry ID NCR00761,² in accordance with the Federal Energy Regulatory Commission’s (“Commission” or “FERC”) rules, regulations and orders, as well as NERC Rules of Procedure including Appendix 4C (NERC Compliance Monitoring and Enforcement Program (“CMEP”)).³

On August 10, 2007, Duke Energy submitted a Violation Self-Reporting Form reporting its violation of NERC Reliability Standard FAC-003-1, Requirement (“R”) 3.4.1 for an August 8, 2007 vegetation grow-in contact with a transmission line that produced a sustained outage on the line. Upon reviewing the facts and circumstances of the incident, ReliabilityFirst later determined that the NERC Reliability Standard violation applicable to this incident was FAC-003-1 R2, rather than R3.4.1 as initially reported by Duke Energy. Also, in the course of investigating the grow-in contact report, ReliabilityFirst determined that Duke Energy had violated NERC Reliability Standard FAC-009-1 R1. This violation stemmed from the fact that Duke Energy failed to establish a capacity rating on the transmission line involved in the August 8, 2007 contact that was consistent with Duke Energy’s Facility Ratings Methodology requirement. The minimum conductor to ground clearance according to the National Electric Safety Code (“NESC”) was 24’9.” The actual ground clearance of the line was estimated as being 21.5’ at the time of contact when the line was loaded to 29% of rated capacity. Duke

¹ *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards* (Order No. 672), III FERC Stats. & Regs. ¶ 31,204 (2006); *Notice of New Docket Prefix “NP” for Notices of Penalty Filed by the North American Electric Reliability Corporation*, Docket No. RM05-30-000 (February 7, 2008). See also 18 C.F.R. Part 39 (2008). *Mandatory Reliability Standards for the Bulk-Power System*, FERC Stats. & Regs. ¶ 31,242 (2007) (Order No. 693), *reh’g denied*, 120 FERC ¶ 61,053 (2007) (Order No. 693-A). See 18 C.F.R § 39.7(c)(2).

² ReliabilityFirst Corporation confirmed that Duke Energy Corporation was included on the NERC Compliance Registry as a Balancing Authority, Distribution Provider, Generator Owner, Generator Operator, Purchasing-Selling Entity, Resource Planner, Transmission Operator, Transmission Owner and Transmission Planner on May 30, 2007 and as a Transmission Owner was subject to the requirements of NERC Reliability Standards FAC-003-1 and FAC-009-1.

³ See 18 C.F.R § 39.7(c)(2).

Energy initiated settlement discussions with ReliabilityFirst Corporation (“ReliabilityFirst”), agreeing to negotiate an agreement that would resolve both violations. This Notice of Penalty is being filed with the Commission because, based on information from ReliabilityFirst, Duke Energy neither admits nor denies the alleged violations of FAC-003-1 and FAC-009-1. Duke Energy and ReliabilityFirst have entered into a Settlement Agreement in which Duke Energy has agreed to the proposed penalty of one hundred thousand dollars (\$100,000) to be assessed to Duke Energy, in addition to other remedies which include mitigation actions, actions to prevent recurrence, and actions to enhance reliability of the Bulk Power System under the terms and conditions of the Settlement Agreement. ReliabilityFirst and Duke Energy have entered into the Settlement Agreement to resolve all outstanding issues arising from a preliminary and non-public assessment resulting in ReliabilityFirst’s determination and findings of the enforceable alleged violations at issue in this Notice of Penalty. Accordingly, the alleged violations identified as NERC Violation Tracking Identification Numbers RFC200700001 and RFC200800060 are being filed in accordance with the NERC Rules of Procedure and the CMEP.

Statement of Findings Underlying the Alleged Violations

This Notice of Penalty incorporates the findings and justifications set forth in the Settlement Agreement executed on November 11, 2009, by and between ReliabilityFirst and Duke Energy, hereinafter referred to collectively as the “Parties” or singularly as a “Party,” included as Attachment b and the Supplemental Record Information document issued by ReliabilityFirst on June 22, 2009. The details of the findings and basis for the penalty are set forth in the Settlement Agreement and herein. This Notice of Penalty filing contains the basis for approval of the Settlement Agreement by the NERC Board of Trustees Compliance Committee (“NERC BOTCC”). In accordance with Section 39.7 of the Commission’s regulations, 18 C.F.R. § 39.7 (2007), NERC provides the following summary table identifying each alleged violation of a Reliability Standard resolved by the Settlement Agreement, as discussed in greater detail below.

Region	Registered Entity	NOC ID	NERC Violation ID	Reliability Std.	Req. (R)	VRF	Total Penalty (\$)
RFC	Duke Energy Corporation		RFC200700001	FAC-003-1	2	High	100,000
RFC	Duke Energy Corporation		RFC200800060	FAC-009-1	1	Medium	

FAC-003-1, Requirement 2

The purpose of Reliability Standard FAC-003-1 is to improve the reliability of the electric transmission systems by prevent outages from vegetation located on transmission rights-of-way (ROW) and minimizing outages from vegetation located adjacent to ROW, maintaining clearances between transmission lines and vegetation on and along transmission ROW, and reporting vegetation-related outages of the transmission systems to the respective Regional Entities (REs) and NERC.

FAC-003-1, R2 requires the Transmission Owner, such as Duke Energy, to create and implement an annual plan for vegetation management work to ensure the reliability of the system. The plan shall describe the methods used, such as manual clearing, mechanical clearing, herbicide treatment, or other actions. The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. Adjustments to the plan shall be documented as they occur. The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each Transmission Owner shall have systems and procedures for documenting and tracking the planned vegetation management work and ensuring that the vegetation management work was completed according to work specifications. FAC-003-1, R2 has a “High” Violation Risk Factor (“VRF”).

According to the Settlement Agreement, on August 10, 2007, Duke Energy self-reported non-compliance with Reliability Standard FAC-003-1 R3.4.1, due to a vegetation contact and an outage on a transmission line in Indiana on August 8, 2007. ReliabilityFirst, after reviewing the facts and circumstances underlying the self-report, concluded that there was a violation of FAC-003-1 R2, rather than FAC-003-1 R3.4.1.

On October 19, 2007, Duke Energy submitted to ReliabilityFirst via email a “Vegetation Outage Report” containing information regarding the August 8, 2007 outage. The outage occurred on the 345 kV Gibson Station to Vectren Francisco to Vectren Duff transmission line (Line 34516) beginning at 15:02 EDT with the line being returned to service after an outage of 10 hours and 26 minutes (the “Event”). At 15:02 EDT on August 8, 2007, Duke Energy's System Operations Center (“SOC”) received an initial alarm relevant to the lockout of Line 34516. At 15:08, SOC contacted a pilot who coordinated arrangements for an observer from Duke Energy's Vegetation Management department to participate in an aerial patrol of the event, which triggered a ground patrol. The location of the fault was identified and viewed via aerial flight and ground patrol on August 8, 2007. At approximately 17:25 EDT, Duke Energy dispatched a contractor to remove the vegetation involved in the Event. The SOC, apprised of activity conducted by T&D Construction and Maintenance and results of the aerial patrol, permitted the contractor to commence work at 18:11 EDT. Vegetation removal was completed by 21:10 EDT.

In the “Vegetation Outage Report,” Duke Energy checked one of three boxes given “Category 1 – Grow-ins” and the sub-box “Grow-in located inside the right-of-way.” Duke also reported that the tree involved in the contact had been about 24 feet 10 inches tall overall with net height of about 19 feet 10 inches above grade, and the tree was assumed to have been in place for four years based upon last brush/herbicide cycle.

Duke Energy conducted an analysis of the span of the transmission line involved in the Event (“Span”) and determined that a discrepancy existed between the design clearance of the Span and the Span's clearance as it was actually constructed (“as-built”). The conductor temperature on the line was approximately 56 degrees Celsius at the time of the Event, which Duke later determined based on load flow data provided by Duke Energy Indiana System Operations. For this operating temperature condition, based on the intended design, the conductor to ground clearance on the Span should have been 35 feet at the Span's lowest point in sag. The location of

the conductor to ground fault is believed to have been located close to the Span's low sag point and Duke found that, at the time of the Event, the Span's actual conductor to ground clearance was approximately 21'6." Per the Span's original design and ground profile, there should have been 30 feet of conductor to ground clearance at the low point in sag at the line's maximum design temperature of 90 degrees Celsius; however, estimates are that, as built, the Span's conductor to ground clearance at the low point in sag would have been approximately 17 feet at maximum design loading of 90 degrees Celsius.

Based on these facts and notwithstanding the fact that the Span was not built to design specification, ReliabilityFirst alleged that Duke Energy failed to effectively implement a vegetation management plan that took into account the anticipated growth of vegetation located inside the right-of-way with respect to maintaining clearances to conductors thus resulting in a transmission line outage constituting a violation of FAC-003-1, Requirement 2.

FAC-009-1, Requirement 1

The purpose of Reliability Standard FAC-009-1 is to ensure that Facility Ratings used in the reliable planning and operation of the Bulk Power System are determined based on an established methodology or methodologies.

FAC-009-1, R1 requires the Transmission Owner and Generator Owner to establish Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings Methodology. FAC-009-1, R1 has a "Medium" VRF.

According to the Settlement Agreement, after investigation of the aforementioned FAC-003-1 violation, ReliabilityFirst determined that sufficient evidence existed to support finding an alleged violation of FAC-009-1, R1.

Specifically, Duke Energy submitted its conductor and equipment ratings methodology, which requires maintenance of the minimum clearances mandated by the NESC. The required NESC minimum clearance for a 345 kV transmission line, such as the line involved in the outage discussed above, is 24 feet 9 inches. Duke Energy's analysis of the outage on the transmission line in question indicated that the line was rated to operate at 90 degrees Celsius. At the time of the outage, the line was operating at 56 degrees Celsius and the approximate clearance distance was 21 feet 6 inches, over three (3) feet below the NESC specified clearance. Duke Energy also determined that, had the line been operating at 90 degrees Celsius as per its rating, that the clearance would have been approximately 17 feet, almost eight (8) feet below the NESC specified clearance.

Immediately after the August 8, 2007, vegetation contact, Duke personnel on-site at the suspected point of contact with the Span noted the presence of a significant amount of mine spoils which served to increase the ground elevation level from what was assumed and planned with respect to the line's design. Duke also later determined that one of the Span's transmission towers had been built shorter than designed. The tower elevation was physically lower than expected and an incorrect profile was used during construction, which contributed to the clearance anomaly. Duke determined that clearances were sufficient to maintain the then-

current winter rating of 70 degrees Celcius. Immediately after its personnel's on-site visit, Duke had the mine spoils removed and later, subsequent to discovery of the too-short tower, Duke further excavated below the Span to ensure that the line could be operated at 90 degree C summer rating while maintaining an acceptable NESC clearance. Duke ultimately determined that the mine spoils under the Span were in existence prior to the original construction on the line.

Notwithstanding that the Span as-built was found not to be as designed, because Duke Energy's facility rating methodology required maintenance of the NESC minimum clearances, ReliabilityFirst alleged that Duke Energy established a rating on the transmission line in question that was inconsistent with the associated Duke Energy Facility Ratings Methodology of maintaining the NESC minimum ground clearance of 24'9" and, therefore, was in violation of FAC-009-1, Requirement 1.

Additional Penalty Considerations

ReliabilityFirst found commendable and noteworthy that Duke Energy has committed to explore the efficacy of using Light Detection and Ranging ("LiDAR") technology in its transmission vegetation management program. This technology may advance vegetation management throughout the industry.

ReliabilityFirst assessed a total penalty of \$100,000 for the two violations, which is addressed by the present settlement agreement. In reaching this determination, ReliabilityFirst considered the following factors: (1) Duke Energy self-reported the violation of FAC-003-1 and provided the information that allowed ReliabilityFirst to determine that a violation of FAC-009-1 had occurred; (2) Duke Energy remedied the alleged violations in a timely manner; and (3) Duke Energy was cooperative and engaged throughout the violation investigations. In addition, there were no aggravating circumstances. ReliabilityFirst determined that, in this instance, the single, aggregate penalty amount of \$100,000 bears a reasonable relation to the seriousness and duration of the alleged violations. Further, based on Duke Energy's commitment to compliance and agreement to expeditiously reconcile this issue via settlement, ReliabilityFirst determined that the penalty of \$100,000 was appropriate.

Status of Mitigation Plans⁴

In response to the August 8, 2007 outage discussed above, Duke Energy performed a number of mitigating actions, including the following: (1) cleared the ROW beneath the transmission line involved in the outage and any other vegetation that could be a potential issue in the safe operation of the line; (2) re-inspected⁵ the entirety of its 230 kV and 345 kV Midwest systems⁶ for any vegetation issues and undertook any resultant clearing activities that were needed; (3)

⁴ See 18 C.F.R § 39.7(d)(7).

⁵ Duke Energy had inspected its Midwest system 230 kV and 345 kV lines in May and June 2007 pursuant to an mitigation plan to address an earlier vegetation contact in May 2007 incurred before reliability standard FAC-003-1 became mandatory on June 18, 2007.

⁶ Duke Energy's Midwest systems include Duke Energy Indiana (DEI), Duke Energy Ohio (DEO) and Duke Energy Kentucky (DEK). Duke Energy is the registrant in the NERC Compliance Registry for these three entities.

performed an initial investigation specific to the Span involved in the Event and Duke Energy graded the site to remove mine spoils that were not shown on the original plan and profile drawings; and (4) conducted a survey to determine the root cause of the Event. All the foregoing activities were completed by April 21, 2008.

To support verification of its mitigation activities Duke Energy has provided ReliabilityFirst with vendor invoices and company payment authorizations. Specifically, Duke Energy provided two (2) brush control reports executed by its contractor and submitted to Duke Energy. The invoices represent work performed on August 8, 2007, and August 9, 2007. Duke Energy also had aerial patrols performed across its 230 kV and 345 kV system beginning August 8, 2007 and concluding August 20, 2007. Duke Energy documented its aerial patrols by providing an Aerial Log for Bulk System. Duke Energy also provided an invoice for grading and trucking services rendered by its vendor for lowering of the ground elevation at the Span to remove the mine spoils and to compensate for the short Span tower which showed the work was completed on August 11, 2007. Duke Energy provided invoices for ground survey work, additional grading and transportation services, and site restoration, including final grading, seed and erosion prevention.

Based on this information, ReliabilityFirst determined that Duke Energy was compliant with FAC-003-1 and FAC-009-1 as of April 21, 2008,⁷ after completing the aforementioned mitigating actions.

Statement Describing the Proposed Penalty, Sanction or Enforcement Action Imposed⁸

Basis for Determination

Taking into consideration the Commission's direction in Orders No. 693 and No. 672, the NERC Sanction Guidelines and the Commission's July 3, 2008 Guidance Order,⁹ the NERC BOTCC reviewed the Settlement Agreement and supporting documentation on November 9, 2009. The NERC BOTCC approved the Settlement Agreement, including ReliabilityFirst's imposition of a financial penalty of \$100,000 against Duke Energy, based upon ReliabilityFirst's findings and determinations, the NERC BOTCC's review of the applicable requirements of the Commission-approved Reliability Standards and the underlying facts and circumstances of the violations at issue.

In reaching this determination, the NERC BOTCC considered the following factors:

- (1) Duke Energy self-reported the FAC-003-1 violation;
- (2) Duke Energy remedied the alleged violations in a timely manner;

⁷ April 21, 2008 was the date on which the final excavation work was completed, allowing Duke to return its line to the pre-outage rating. The vegetation clearing work was completed in August of 2007 as noted in the previous paragraph.

⁸ See 18 C.F.R § 39.7(d)(4).

⁹ *North American Electric Reliability Corporation*, "Guidance Order on Reliability Notices of Penalty," 124 FERC 61,015 (2008).

- (3) These violations of FAC-003-1 and FAC-009-1 are the first violations for Duke Energy of NERC Reliability Standards in the ReliabilityFirst footprint; and
- (4) There were no aggravating circumstances identified by ReliabilityFirst.

Other Relevant Matters

Considering the Commission's directions in Order No. 672,¹⁰ the NERC BOTCC also found that this Notice of Penalty should include the following relevant matters.

The August 8, 2007, vegetation contact was preventable.

Notwithstanding the descriptions and discussions provided on the subject in the Settlement Agreement and in Duke's reports to ReliabilityFirst, the NERC BOTCC believes that the August 8, 2007, vegetation contact with the Span (identified above) on line 34516 was preventable.

In reaching this position, the NERC BOTCC considered the following:

- (1) Lines in the system involved are patrolled twice yearly, by helicopter;
- (2) The system in question had already sustained a vegetation outage earlier that year on May 8, 2007;
- (3) Pursuant to the mitigation plan arising from and undertaken to address the earlier contact, and within a few months prior of the August 2007 contact, the specific line involved (34516) had been aerially patrolled and foot patrolled, after selection for the latter patrol;¹¹
- (4) At the site location on the day after the contact, the mine spoils were readily noted and immediate action was taken to remove them; this action preceded later discovery that one of the towers at site was also constructed shorter than design and that the mine spoils had been in place prior to construction of the line;
- (5) The tree making the contact was reportedly about 24 feet 10 inches tall at the time of contact and had been there for a minimum of four years based upon the last brush/herbicide cycle;
- (6) At full rated line sag at 90 degrees Celsius, line temperature ground clearance was expected to be 30 feet; and
- (7) The IEEE Standard 516-2003 minimum clearance for a 345 kV line required by FAC-003-1 R1.2.2 is 9.44 feet.

The NERC BOTCC believes that recognizing such potential problems should be expected of an experienced observer and in fact notes that Duke personnel at the site the day after the contact recognized and immediately acted to remedy the situation found there. Furthermore, once found, they must be acted upon immediately because no contact between vegetation and BPS transmission facilities is acceptable.

¹⁰ See 18 C.F.R § 39.7(d)(7).

¹¹ Duke's Mitigation Plan from the May 2007 contact indicated that all lines would be patrolled by air with selected lines also patrolled by foot.

For the foregoing reasons, the NERC BOTCC approves the Settlement Agreement and believes that the proposed \$100,000 dollar penalty is appropriate for the violation and circumstances in question, and consistent with NERC's goal to promote and ensure reliability of the bulk power system.

Pursuant to Order No. 693, the penalty will be effective upon expiration of the 30 day period following the filing of this Notice of Penalty with FERC, or, if FERC decides to review the penalty, upon final determination by FERC.

Attachments to be included as Part of this Notice of Penalty

The attachments to be included as parts of this Notice of Penalty are the following documents:

- a) Duke Energy's self-report dated August 10, 2007, included as Attachment a; and
- b) Settlement Agreement of Duke Energy Corporation and ReliabilityFirst Corporation, included as Attachment b.

A Form of Notice Suitable for Publication¹²

A copy of a notice suitable for publication is included in Attachment c.

¹² See 18 C.F.R § 39.7(d)(6).

Notices and Communications

Notices and communications with respect to this filing may be addressed to the following:

<p>David N. Cook* Vice President and General Counsel North American Electric Reliability Corporation 116-390 Village Boulevard Princeton, New Jersey 08540-5721 (609)452-8060 (609) 452-9550 – facsimile david.cook@nerc.net</p> <p>Michael D. Austin* Compliance Enforcement Specialist ReliabilityFirst Corporation 320 Springside Drive, Suite 300 Akron, Ohio 44333 (330) 456-2488 (330) 456-5408 – facsimile mike.austin@rfirst.org</p> <p>Jeffrey Trepel* Associate General Counsel Duke Energy Corporation 526 South Church Street, EC03T P.O. Box 1006 Charlotte, North Carolina 28202 (704) 382-8131 jtrepel@duke-energy.com</p> <p>Karen Feld* Vice President Compliance and Integration Duke Energy Corporation 400 South Tyron Street Charlotte, North Carolina (704) 382-8554 karen.feld@duke-energy.com</p> <p>*Persons to be included on the Commission's service list are indicated with an asterisk. NERC requests waiver of the Commission's rules and regulations to permit the inclusion of more than two people on the service list.</p>	<p>Rebecca J. Michael* Assistant General Counsel Holly A. Hawkins Attorney* North American Electric Reliability Corporation 1120 G Street, N.W. Suite 990 Washington, D.C. 20005-3801 (202) 393-3998 (202) 393-3955 – facsimile rebecca.michael@nerc.net holly.hawkins@nerc.net</p> <p>Timothy R. Gallagher* President & CEO ReliabilityFirst Corporation 320 Springside Drive, Suite 300 Akron, Ohio 44333 (330) 456-2488 (330) 456-5390 – facsimile tim.gallagher@rfirst.org</p> <p>Raymond J. Palmieri* Vice President and Director of Compliance ReliabilityFirst Corporation 320 Springside Drive, Suite 300 Akron, Ohio 44333 (330) 456-2488 (330) 456-5408 – facsimile ray.palmieri@rfirst.org</p> <p>Robert K. Wargo* Manager of Compliance Enforcement ReliabilityFirst Corporation 320 Springside Drive, Suite 300 Akron, Ohio 44333 (330) 456-2488 (330) 456-5408 – facsimile bob.wargo@rfirst.org</p>
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Conclusion

NERC respectfully requests that the Commission accept this Notice of Penalty as compliant with its rules, regulations and orders.

Respectfully submitted,

David N. Cook
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/s/ Rebecca J. Michael
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cc: Duke Energy Corporation
Reliability *First* Corporation

Attachments

Attachment a

**Duke Energy's self-report dated August 10,
2007**



COMPLIANCE MONITORING AND ENFORCEMENT PROGRAM
VIOLATION SELF-REPORTING FORM

This Violation Self-Reporting Form can be used for submittals via e-mail or fax for violations of the Reliability Standards identified by a self- assessment.

1. Reliability Standard (XXX-###-# or XXX-###-RFC-##) FAC-003-1

2. Violation(s): Check the appropriate box(s) to identify violation(s) of any of the applicable requirement(s) referenced in the standard.

For violations of requirements with Levels of Non-Compliance or Violation Severity Levels (VSL) specified in the standard:

- Entity is Level 1 Non-Compliance or has Lower VSL for the following: requirement(s): for function(s):
Entity is Level 2 Non-Compliance or has Moderate VSL for the following: requirement(s): for function(s):
Entity is Level 3 Non-Compliance or has High VSL for the following: requirement(s): 3.4.1 (Subject to #3 below) for function(s):TO
Entity is Level 4 Non-Compliance or has Severe VSL for the following: requirement(s): for function(s):

For violations of requirements with no Levels of Non-Compliance or Violation Severity Levels specified in the standard:

- Entity is in violation of requirement(s) not referenced in the Levels of Non-Compliance or Violation Severity Levels section of the standard: requirement(s): for function(s):

3. Description of the violation: Vegetation Grow-in (Noting, however, that the Standard Requirement set forth in R3/3.4.1 is to report, quarterly, sustained transmission line outages caused by grow-ins; a grow-in in of itself does not appear to be a violation of any Requirement set forth in the Standard.)

4. Additional information: Prior to June 18, 2007, ReliabilityFirst compliance staff accepted a Duke Energy mitigation plan for vegetation management (second revised). Duke Energy is in the process of implementing this plan with a target completion date of December 31, 2007. Duke Energy is reviewing this plan and will submit a revised plan to ReliabilityFirst by August 24, 2007.

5. Mitigation Plan attached: Yes No

6. Officer Verification: I understand that this information is being provided as required by the ReliabilityFirst Compliance Monitoring and Enforcement Program. Any review of this violation will require all information certified on this form be supported by appropriate documentation.

Officer's Name: Dal Poston

Officer's Title: Vice President - Central Operations

Officer's e-mail address: dposton@duke-energy.com Phone: (704)382-4623

Registered Company Name: Duke Energy Corporation CDMS User ID: DUKCIN

Primary Compliance Contact (PCC)/Alternate: Michael Kuhl / Ed Kirschner

Email: Michael.kuhl@duke-energy.com Phone (513)287-3630 Date: August 10, 2007

E-mail Submittals to: compliance@rfirst.org or Fax#: 330- 456-5408 - Attention Compliance Dept. For any questions regarding compliance submittals, please e-mail: compliance@rfirst.org.

Attachment b

Settlement Agreement of Duke Energy Corporation and Reliability*First* Corporation

In re)	DOCKET NUMBERS
DUKE ENERGY CORPORATION)	RFC200700001
)	RFC200800060

SETTLEMENT AGREEMENT
OF
RELIABILITYFIRST CORPORATION
AND
DUKE ENERGY CORPORATION

I. INTRODUCTION

1. ReliabilityFirst Corporation (“ReliabilityFirst” or “RFC”) and Duke Energy Corporation (“Duke Energy”) enter into this Settlement Agreement (“Agreement”) to resolve all outstanding issues arising from a preliminary and non-public assessment resulting in ReliabilityFirst’s determination and findings, pursuant to the North American Electric Reliability Corporation (“NERC”) Rules of Procedure, by Duke Energy of the NERC Reliability Standards FAC-003-1, Requirement 2, and FAC-009-1, Requirement 1.

II. STIPULATION

2. The stipulations herein are solely for the purpose of resolving between Duke Energy and ReliabilityFirst the matters discussed herein, and do not constitute stipulations or admissions for any other purpose. Duke Energy and ReliabilityFirst hereby stipulate and agree to the following:

A. BACKGROUND

3. Duke Energy is a holding company headquartered in Charlotte, North Carolina, that operates its business primarily through: (1) utility companies that generate, transmit, distribute and sell electricity at retail and wholesale in North Carolina, South Carolina, Indiana, Ohio and Kentucky; (2) its Duke Energy Generation Services, Inc. subsidiary, which engages in developing, owning and managing non-regulated energy projects; and (3) international entities that develop, operate and manage power generation facilities, and that engage in sales and marketing of natural gas and electric power outside the United States and Canada. Duke Energy is the registered entity in ReliabilityFirst on behalf of the Duke Energy Midwest utilities performing registered functions in the RFC region, which are

Duke Energy Indiana, Inc. (“DEI”), Duke Energy Kentucky, Inc. (“DEK”) and Duke Energy Ohio, Inc. (“DEO”). In the states of North Carolina and South Carolina, Duke Energy Carolinas, LLC operates an entirely separate transmission and generation system, serving an entirely different load. In the SERC Reliability Corporation (“SERC”) region, Duke Energy Carolinas, LLC is the registered entity for all functions. The alleged violations that are the subject matter of this Agreement involve exclusively transmission facilities owned and operated by DEI. DEI is a vertically integrated electric utility that generates, transmits, distributes and sells electricity under franchise agreements with an obligation to serve retail loads within its franchised service territory in central, north central and southern Indiana.

4. The Duke Energy Midwest bulk transmission system is comprised of 138 kV, 230 kV, and 345 kV systems. The 345 kV system generally serves to transmit power from Duke Energy Midwest’s large generating units on the system and to interconnect the Duke Energy Midwest system with other systems. These interconnections enable the transmission of power between systems from jointly owned generating units, and they provide capacity for economy and emergency power transfers. The 345 kV system is connected to the 138 kV and 230 kV systems through large transformers at a number of substations across the system. These 138 kV and 230 kV systems generally distribute power received through the transformers and also from several smaller generating units, which are connected directly at these voltage levels. As of December 2007, DEI’s wholly and jointly owned transmission facilities included approximately 762 circuit miles of 345 kV lines, 666 circuit miles of 230 kV lines and 1414 circuit miles of 138 kV lines. DEI is interconnected with eight other transmission systems (including DEO).

The line pertinent to this matter, Line 34516, is a 345 kV line running from Gibson to Duff substations, for a total of 45 miles as of the date of the Event as defined in Paragraph 7 hereof.

B. ALLEGED VIOLATIONS

5. Between June 18, 2007, the date on which compliance with NERC Reliability Standards became mandatory and the present date, Duke Energy was, and continues to be, registered on the NERC Compliance Registry on behalf of its Midwest utilities as a Distribution Provider (“DP”), Transmission Operator (“TOP”), Balancing Authority (“BA”), Transmission Planner (“TP”), Resource Planner (“RP”), Generator Owner (“GO”), Generator Operator (“GOP”), Load Serving Entity (“LSE”), Purchasing – Selling Entity (“PSE”), and Transmission Owner (“TO”).
6. On August 10, 2007, Duke Energy submitted to ReliabilityFirst via email a Compliance Monitoring and Enforcement Program Violation Self-Reporting Form with regard to an August 8, 2007, outage on a transmission line in Indiana in which Duke Energy identified Non-Compliance to Requirement 3/3.41 of

Reliability Standard FAC-003-1. Specifically, in the Self-Reporting Form, Duke Energy stated that the violation involved a “Vegetation Grow-in. Noting, however, that the Standard Requirement set forth in R3/3.4.1 is to *report*, quarterly, sustained transmission line outages caused by grow-ins; a grow-in of itself does not appear to be a violation of any Requirement set forth in the Standard.”

7. On October 19, 2007, Duke Energy submitted to ReliabilityFirst via email a “Vegetation Outage Report” containing information regarding an outage on the 345 kV Gibson Station to Vectren Francisco to Vectren Duff transmission line which occurred on August 8, 2007, at 15:02, with the line being returned to service after an outage of 10 hours and 26 minutes (the “Event”). In the “Vegetation Outage Report,” Duke Energy checked one of three boxes given “Category 1 – Grow-ins” and the sub-box “Grow-in located inside the right-of-way.” In the adjacent box, Duke Energy offered a fuller explanation of the Event as follows:

“Duke Energy self-reported an outage on August 10, 2007. Note, however, that the outage reporting exceptions set forth in this report form as well as the requirements of FAC-003-1 state that a vegetation-related outage due to human activity shall not be considered a reportable event. Factors other than vegetation caused the outage. This matter is currently under investigation by ReliabilityFirst.”¹

8. On January 18, 2008, Duke Energy supplied, as part of their submittal, a document entitled “Attachment A – Indiana 34516 Transmission Line Design Error Study” in response to an information request from ReliabilityFirst. In Attachment A, Duke Energy stated that,

“[o]n August 8, 2007, Duke Energy Indiana transmission line 34516 locked out due to a conductor to ground fault in the span between structures 973-6217 and 973-6218.”

9. According to the “Vegetation Outage Questionnaire” submitted by Duke Energy on November 19, 2007, Duke Energy had completed foot patrols (on May 16, 2007) and aerial patrols (on May 22, 2007) in the immediate vicinity of the August 8, 2007, vegetation contact event as part of an accepted mitigation plan related to a previous vegetation contact violation (NERC Violation ID # RFC200701484 – Occurrence on May 8, 2007). In the Questionnaire, Duke

¹ At the time that Duke Energy prepared the Vegetation Outage Report, Duke Energy believed that the low conductor-to-ground clearance was the result of mine spoils having been placed on the land beneath the conductor. Subsequent investigation by Duke Energy determined that the mine spoils existed prior to construction of the line and that the low conductor-to-ground clearance was the apparent result of a structure in the span involved in the Event not having been constructed as designed. See Paragraph 26 herein.

Energy further explained that:

“[e]xperienced observers did not recognize this vegetation as being a potential problem. [During the Event] this line sagged well below design rated conditions and below NESC minimum clearances, which would not be expected by any experienced observer.”

10. In “Attachment A – Indiana 34516 Transmission Line Design Error Study” submitted on January 18, 2008, Duke Energy further stated, as to the root cause of the Event, that,

“On August 8, 2007, the transmission line conductors were approximately 13.5 feet closer to the ground than expected at the low point in sag. At the time of the outage event the conductor temperature was approximately 56 degrees Celsius based on load flow data provided by Duke Energy Indiana System Operations. For this operating temperature condition, it was expected that the conductor to ground clearance would have been 35 feet at the low point in sag. The location of the conductor to ground fault is believed to have been located close to this low point in sag. The as-built conductor to ground clearance was approximately 21.5 feet. Based on the original design and ground profile there should have been 30 feet of conductor to ground clearance at the low point in sag at the maximum design temperature of 90 degrees Celsius. The as-built conductor to ground clearance at the low point in sag would have been approximately 17 feet at maximum design loading of 90 degrees Celsius.”

11. Requirement 2 of FAC-003-1, states in part,

“The Transmission Owner shall create and implement an annual plan for vegetation management work to ensure the reliability of the system. . . . The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. . . . The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each Transmission Owner shall have systems and procedures for documenting and tracking the planned vegetation management work and ensuring that the vegetation management work was completed according to work specifications.”

12. ReliabilityFirst alleges that Duke Energy failed to effectively implement a vegetation management plan that took into account the anticipated growth of vegetation located inside the right-of-way with respect to maintaining clearances to conductors thus resulting in a transmission line outage thus constituting a violation of FAC-003-1, Requirement 2.
13. On March 6, 2008, Duke Energy provided, upon request of ReliabilityFirst, a document entitled “Duke Energy Engineering Guide – Field Operations – Midwest – Conductor and Equipment Ratings” issued January 2007 (hereafter referred to as the “Conductor and Equipment Rating Guide”). In a cover letter accompanying the Conductor and Equipment Rating Guide Duke Energy stated,

“This guide provides the Duke Energy Midwest Ratings Methodology in effect on August 8, 2007 and is consistent with the document reviewed by RFC compliance in October 2006.”
14. On Page 2 of the Conductor and Equipment Rating Guide, Duke Energy stated that,

“Conductor ratings at Cinergy are based on maintaining minimum clearances mandated by the National Electrical Safety Code (“NESC”). An integral part of establishing clearances is the assumption of a maximum operating temperature for the conductor upon which sag calculations are made.”
15. On Page 3 of the Conductor and Equipment Rating Guide, Duke Energy further stated that,

“The conductor rating criteria selected for use to rate Cinergy conductors and the establishment of a maximum allowable conductor temperature based on NESC clearances forms a valid practice for line design and operation.”

...

“Because of that lack of information about past operational history for existing lines, the variability in materials used for the construction of existing lines and the effects of many years of exposure to the elements, T&D Standards feels it is unwise to arbitrarily extend the operational ratings established in the ratings guide beyond the values published in the guide.”
16. On December 19, 2007, Duke Energy provided to ReliabilityFirst a document entitled “Duke Energy Transmission Vegetation Management Program

(“TVMP”)” in which it stated that the National Electrical Safety Code (“NESC”) minimum ground clearance for a 345 kV transmission line is 24’9” and that,

“The NESC values are the minimum clearances that must be maintained during the worst-case conductor sag.”

17. On March 6, 2008, Duke Energy provided, upon request of ReliabilityFirst, a document entitled “Exhibit 10 – David Ward E-Mail” (Dated February 12, 2008), in which David Ward communicated to the “system operations organization”, that,

“As a result of further investigation into the August 8, 2007 outage event, Transmission Engineering has determined that the conductor to ground clearance between structures 973-6217 and 973-6218 does not meet NESC minimum clearances for 90 degrees Celsius operation . . . Until such time, circuit 34516 should not be operated under such conditions that will cause the conductor temperature to exceed 70 degrees Celsius.”

18. In “Attachment A – Indiana 34516 Transmission Line Design Error Study” submitted on January 18, 2008, Duke Energy further states, that,

“As a result of this event and due to the rugged and unusual terrain, Duke Energy is concerned that there is a possibility of other locations on the 230kV and 345kV system where the conductor to ground clearances may not meet the National Electric Safety code minimum clearance requirements.”

Subsequently, beginning in February 2008, Duke Energy conducted and completed the Illinois Coal Basin Study (discussed at Paragraph 32 herein) to resolve any doubt about conductor-to-ground clearances created by the Event.

19. Requirement 1 of FAC-009-1, states in total,

“The Transmission Owner and Generator Owner shall each establish Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings Methodology.”

20. ReliabilityFirst alleges that Duke Energy established a rating on the DEI Transmission Line 34516 that resulted in a ground clearance of approximately 21.5 feet, which is inconsistent with the associated Duke Energy Facility Ratings Methodology of maintaining the NESC minimum ground clearance of 24’9” and, therefore, was in violation of FAC-009-1, Requirement 1.

21. At the time of the Event, Line 34516 was loaded at 29% of its rating. Flows were

instantaneously redistributed to other lines out of Gibson Station, including Lines 34506, 34507, 34508, 34509 and the 34511. The Duke Energy transmission system experienced no overloads or voltage violations. The Midwest Independent Transmission System Operator, Inc. (“Midwest ISO”) implemented normal congestion management in order to mitigate predicted overloads (N-1 Basis) for simulated contingencies. The Midwest ISO reported no actual overloads or voltage violations due to the Event. There were no reliability impacts on any customers.

22. A timeline of the Event and Duke Energy’s response to the Event is as follows:

At 15:02 (EDT) on August 8, 2007, Duke Energy’s System Operations Center (“SOC”) received an initial alarm relevant to the lockout of Line 34516. At 15:08 (EDT), SOC contacted a pilot who coordinated arrangements for an observer from Duke Energy’s Vegetation Management department to participate in an aerial patrol of the event, which triggered a ground patrol. The location of the fault was identified and viewed via aerial flight and ground patrol on August 8, 2007.

At approximately 17:25 (EDT), Duke Energy dispatched a contractor to remove the vegetation involved in the Event. The SOC, apprised of activity conducted by T&D Construction and Maintenance and results of the aerial patrol, permitted the contractor to commence work at 18:11 (EDT). Vegetation removal was completed by 21:10 (EDT).

On the morning of August 9, 2007, the Vice President responsible for Duke Energy’s TVMP was on-site evaluating the incident. Additionally, the Director of Duke Energy’s Midwest vegetation management activities and others were present. Duke Energy conducted an internal investigation immediately after the Event using field reports and measurements from aerial patrols, vegetation management personnel on site, line construction and maintenance supervision inspections and a transmission design engineering review. After a review of the facts related to the Event, it was determined that the primary cause of the outage was the line to ground clearance. At this time, the low conductor clearance was identified and initially attributed to the placement of mine spoils under the relevant span.

On August 10, 2007, Transmission Engineering staff and T&D Construction and Maintenance representatives assessed the site. As a result of the assessment, Duke Energy excavated a significant amount of earth from beneath the conductor on August 10-11, 2007. Additionally, Transmission Engineering immediately communicated to the SOC revised facility ratings information for the line in question.

Transmission Engineering completed a ground survey of the site in October 2007. In early November, Transmission Engineering concluded that a factor other than mine spoils contributed to the Event. During November 2007, Transmission Engineering identified design issues, including a tower elevation that was

physically lower than expected and an incorrect profile used during construction, contributed to the clearance anomaly and that clearances were sufficient to maintain the then-current winter rating of 70 degrees C. Subsequent re-evaluation during January/February 2008 revealed a need to remove an additional one to two feet of earth from beneath the conductor in order to return the line to a 90 degrees C rating for summer. This work was completed in the Spring of 2008.

III. PARTIES' SEPARATE REPRESENTATIONS

A. STATEMENT OF RELIABILITYFIRST AND SUMMARY OF FINDINGS

23. On August 8, 2007, and for some time preceding the Event, Duke failed to effectively implement a vegetation management plan that took into account the anticipated growth of vegetation located inside the right-of-way and all other environmental factors that should be considered in order to maintain clearances to conductors. The failure to maintain clearances was the proximate cause of the outage on August 8, 2007, on the 345 kV Gibson Station to Vectren Francisco to Vectren Duff transmission line. The failure to maintain the specified clearance is a violation of FAC-003-1, Requirement 2, which requires that vegetation management work be completed according to a plan created and implemented to ensure reliability of the system, and that each Transmission Owner have systems and procedures in place for documenting and tracking the planned vegetation management work and ensuring that the work is completed according to specifications.
24. On August 8, 2007, and for some time prior, Duke failed to establish a rating on the DEI Transmission Line 34516 that was consistent with its Facility Rating Methodology. This act or omission was the proximate cause of a resulting conductor to ground clearance between structures 973-6217 and 973-6218 of approximately 21.5 feet, which is inconsistent with the associated Duke Facility Ratings Methodology of maintaining the NESC minimum ground clearance of 24'9". NESC minimum clearances are those which must be maintained in worst-case conductor sag. Requirement 1 of FAC-009-1 requires that established Facility Ratings be consistent with the associated Facility Ratings Methodology.
25. ReliabilityFirst agrees that this Agreement is in the best interest of the parties and in the best interest of bulk power system reliability.

B. STATEMENT OF DUKE ENERGY

26. Duke Energy neither admits nor denies that the facts set forth in Paragraphs 5 through 25 above constitute violations of Reliability Standard FAC-003-1, Requirement 2 or FAC-009-1, Requirement 1

FAC-003-1, Requirement 2

As noted in Paragraph 11 above, FAC-003-1, Requirement 2, states in part:

“The Transmission Owner shall create and implement an annual plan for vegetation management work to ensure the reliability of the system. . . . The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. . . . The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each Transmission Owner shall have systems and procedures for documenting and tracking the planned vegetation management work and ensuring that the vegetation management work was completed according to work specifications.”

Duke Energy states that consistent with FAC-003-1, Requirement 2, Duke Energy has created and implemented a formal TVMP for its Midwest transmission system. Consistent with Requirement 2, the TVMP includes an annual plan for vegetation management work, which includes systems and procedures for documenting the planned work and ensuring that it is completed according to work specifications. The TVMP explicitly takes into account the anticipated growth of vegetation.² Thus, the TVMP incorporates all of the elements set forth in FAC-003-1, Requirement 2.

Further, on August 8, 2007, Duke Energy was operating under a mitigation plan, which previously had been filed and accepted by ReliabilityFirst in response to a pre-June 18, 2007, vegetation grow-in incident occurring in May, 2007, which had been self-reported by Duke Energy to RFC. In the Notice of Alleged Violation related to the May 2007 incident, dated November 20, 2007, RFC stated: “In accordance with the NERC Rules of Procedure, Appendix 4C, no penalties will be assessed by ReliabilityFirst for violations subject to the Mitigation Plan that occur during the time period in which the accepted Mitigation Plan is being implemented, unless the mitigation is not successfully completed in accordance with the timetable set forth in the Mitigation Plan or an agreed upon extension thereof granted by ReliabilityFirst.” The accepted mitigation plan started on June 18, 2007, and was certified complete as of

² For example, the TVMP states:

Section 8-Inspection and Monitoring

“The inspection and follow-up process should attempt to identify locations where the above mentioned clearance targets are a current problem or *potential problem*. (Section 6 outlines clearance guidelines.)” (Emphasis added).

December 31, 2007, by Duke Energy. No vegetation-related reportable outages have occurred on the Duke Energy Midwest system since the completion date of the mitigation plan.

FAC-009-1, Requirement 1

Duke Energy further states that it has followed its internal Facilities Ratings Methodology in establishing a rating for the DEI transmission Line 34516 consistent with Requirement 1 of FAC-009-1. The rating of Line 34516 was properly applied to the line as designed at all times. The Event resulted from an anomalous condition, specifically that at this location the conductor was closer to the ground than designed.

FAC-009-1, Requirement 1, states in full:

“The Transmission Owner and Generator Owner shall each establish Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings Methodology.”

Duke established a rating on the DEI Transmission Line 34516 that resulted in a ground clearance of approximately 21.5 feet, which is inconsistent with the associated Duke Facility Ratings Methodology of maintaining the NESC minimum ground clearance of 24'9”.

Duke Energy specifically designed Line 34516 (as it does every other line on its system) to have a conductor to ground clearance that met or exceeded NESC minimum clearances for summer and winter rated conditions, based upon maximum operating temperatures and accounting for sag. Thus, the act of *establishing a rating* for the line could not result in a ground clearance of 21.5 feet. Rather, due to apparent interpretations of survey data during the original construction of the line, the *actual* line clearances were at a height lower than the specified design for the span of Line 34516 involved in this incident. Nowhere in the Conductor and Equipment Rating Guide did it state that part of Duke’s facility ratings methodology was to take as-built measurements of a facility and to then calculate a rating from those measurements. Rather, the design of a line was based on meeting NESC clearances at its rated temperature, and then it was expected that the line would be built as designed.

With specific regard to Line 34516, it was originally constructed in the mid-1970s. The design criterion for the line was to meet or exceed the NESC provisions that were in effect at that time and it was rated in accordance with its design to operate at 80 degrees C. At the time of the Event, the summer rating on Line 34516 was 90 degrees C (as the result of some previous upgrades). On

October 16, 2007, Duke Energy changed the rating on Line 34516 from a summer rating of 90 C to a winter rating of 70 C.

Duke Energy did not become aware that the clearance for the applicable span of Line 34516 was not built as designed until November 14, 2007, when Duke Energy's root cause analysis prepared in response to the Event revealed the discrepancy. Thus, when Duke Energy discovered the construction anomaly on November 14, 2007, Line 34516 was already operating at 70 C.

Prior to this incident, Duke Energy had no reason to believe that Line 34516 was not built as designed. As a result of the Illinois Coal Basin Study that was undertaken by Duke Energy in February 2008 (discussed at Paragraph 31 herein) Duke Energy now believes that the construction anomaly on Line 34516 was an exceptional occurrence.

27. Duke Energy has agreed to enter into this Agreement with ReliabilityFirst to avoid extended litigation with respect to the matters described or referred to herein, to avoid uncertainty, and to effectuate a complete and final resolution of the issues set forth herein. Duke Energy agrees that this Agreement is in the best interest of the parties and in the best interest of maintaining a reliable electric infrastructure.

IV. MITIGATING ACTIONS, REMEDIES AND SANCTIONS

28. In response to the Event, and in addition to other remedies, sanctions, and actions discussed below as a result of this Agreement, Duke Energy has performed the following mitigating actions to prevent re-occurrence:
 - (a) Clearing the right-of-way beneath Line 34516 and any other vegetation that could be a potential issue in the safe operation of the line. (Completed August 2007).
 - (b) Inspecting the entirety of Duke Energy's 230 kV and 345 kV Midwest systems for any vegetation issues. (Completed August 2007).
 - (c) Duke Energy performed an initial investigation specific to the span involved in the Event. Immediate remediation was performed by grading the site to remove mine spoils that were not shown on the original plan and profile drawings. The inspection and survey of Line 34516 (completed on August 11, 2007), yielded no other discrepancies between "as designed" and "as-built" conditions.
 - (d) Follow up work to the initial investigation indicated that the mining operation adjacent to the line had ceased operation prior to the construction of the line. In order to determine the root cause of the event, a survey of the facilities using traditional ground surveying techniques was performed. Results of the survey indicated that the centerline profile on the plan and profile drawing was inaccurate and that one structure was at a

lower elevation than depicted on the plan and profile drawing. Line 34516 was re-rated until the additional grading work was performed. Upon completion of that work, the span identified in the initial investigation was fully restored to expected clearances and Line 34516 returned to its previous rating. (Completed on April 21, 2008.)

29. To support verification of its mitigation activities Duke Energy has provided Reliability*First* with vendor invoices and company payment authorizations. Specifically, to support 28(a) above, Duke Energy provided two brush control reports executed by its contractor and submitted to Duke Energy. The invoices represent work performed on August 8, 2007, and August 9, 2007. To support 28(b) above, Duke Energy had aerial patrols performed across its 230kV and 345kV system beginning August 8, 2007, and concluding August 20, 2007. Duke Energy documented its aerial patrols by providing an Aerial Log for Bulk System. To support 28(c) above, Duke Energy provided an invoice for grading and trucking services rendered by its vendor to grade and remove mining spoils. Grading and mine spoils removal were performed to lower the ground elevation and were completed on August 11, 2007. To support 28(d) above, Duke Energy provided invoices for ground survey work, additional grading and transportation services, and site restoration. Ground survey work was finished on November 17, 2007. Additional grading was performed in April 2008 to address the analysis and investigation resulting from the November 2007 survey. Duke Energy provided site restoration work including final grading, seed and erosion prevention.
30. For purposes of settling any and all disputes arising from Reliability*First*'s assessment of the matters contained herein, Duke Energy has agreed to take the following actions:
 - (a) Duke Energy has implemented the use of Light Detection and Ranging ("LiDAR") technology for vegetation management of all Duke Energy bulk transmission (230/345 kV) in the RFC region. Duke Energy will use this experience to aid the industry in understanding the benefit of this use of the technology and, in particular, the potential reduction in human error in clearance measurement and effectiveness associated with aerial vegetation patrols. Duke Energy will develop a report with sufficient content and detail to illustrate the benefits of and issues with this technology and its specific impact or effect its bulk transmission system within the RFC footprint. This report shall be submitted to RFC by November 30, 2009, or within 90 days of approval of this Agreement by the Federal Energy Regulatory Commission ("FERC"), whichever is later. The cost estimate for implementation of the LiDAR technology for use within the RFC region is in excess of \$1,000,000.
 - (b) Duke Energy has developed a community outreach program to educate the public on trimming practices and guidelines for proper vegetation in and around transmission rights-of-way. Also, Duke Energy is proactively

working with local planning boards, developers, etc. to inform them of the need to maintain encroachment-free rights-of-way. Duke will deliver and present to RFC Compliance Enforcement a report on its outreach program efforts by November 30, 2009.

- (c) Duke Energy has re-organized its vegetation management group to include a transmission program manager with a primary focus on the bulk system. This Supervisor, Vegetation Program Management is responsible for the transmission program and transmission foresters, and will provide better focused overall management. Duke shall identify the effective date, responsibilities, and the name of personnel assigned to this position. For the purposes of this Agreement, Duke Energy agrees to maintain this position through the end of 2009.
- (d) Duke Energy has implemented a “hack and squirt” herbicide treatment procedure on its Midwest transmission system, including within the RFC footprint, in order to improve herbicide efficiency during the active growing season. This procedure complements the foliar application. “Hack and squirt” herbicide application differs from the traditional foliar application in that it consists of several “hacks” with a machete on a lower stem to break the bark layer of the vegetation. Once the bark layer is broken, the herbicide is sprayed directly into the wound and is able to make contact with the cambium layer of the woody plant thus allowing very effective transport of the herbicide through the plant. “Hack and squirt” application is more appropriate on taller vegetation where it is more difficult to get an effective foliar application over the canopy of the vegetation and minimizes the potential impact to adjacent compatible vegetation.

31. Additionally, to enhance the usefulness and accuracy of its Line Rating Methodology, Duke Energy is taking or will take the following actions:

- (a) Duke Energy utilized LiDAR data being collected by Vegetation Management to develop a 3D model of the Illinois Coal Basin Area. This model is being used to check clearances on over 600 miles of 230/345 kV transmission facilities. Internal engineering resources are then used to evaluate potential clearance issues identified in the screening process to determine impacts on line ratings and what, if any, actions are required to restore the facility to its original rating. The cost to develop the model and perform initial clearance screening is in excess of \$500,000. The anticipated date to complete review of all such lines in the Illinois Coal Basin Area is February 28, 2009.
- (b) An early finding from the Illinois Coal Basin Study is that LiDAR technology enhances the accuracy of data used to develop clearances and provides the ability to change design technology from a centerline profile analysis to one that encompasses the entire easement. As a result, Duke Energy will use data collected by Vegetation Management to develop a

3D model of its entire 230/345 kV system located in Indiana, Ohio and Kentucky in order to complete a “Conductor to Ground Clearance” Project. Duke Energy will also partner with its LiDAR vendor to look for process improvements to drive down the cost of developing a 3D model using LiDAR data, and make this data conversion technique more cost effective. If ground clearance issues are identified, Duke Energy will re-rate the implicated facilities. It is expected, based upon experience with the development of the model for the Illinois Coal Basin Area, that this project will cost in excess of \$1,500,000 and will be completed by the end of 2010.

This new 3D model will be maintained as a system of record going forward. All 230/345 kV transmission system modifications will utilize LiDAR, or similar survey data, to update the model for any changes. All line re-rating projects will utilize the 3D model and the new analysis technique as opposed to using original design documents and centerline profiles. Any redesigns will be based on new, “as-built” information. New data should generally prove to be more accurate and reliable than old data. This enhances reliability as any isolated design or construction variations will not be replicated in the re-rating process.

Duke Energy has engaged a consultant who drafted a “white paper” with regard to the documentation of ratings methodologies. Duke Energy will use information from this “white paper” to simplify and clarify documentation of its rating methodology. This effort is to be completed by December 31, 2010.

32. Duke Energy shall pay a total monetary penalty of \$100,000 to ReliabilityFirst. ReliabilityFirst shall present an invoice to Duke Energy within twenty days after the Agreement is either approved by the Federal Energy Regulatory Commission (“FERC”) or becomes effective by operation of law, requiring payment within thirty days of receipt of the invoice. ReliabilityFirst shall notify NERC if the payment is not received. If Duke Energy does not make the monetary penalty payment above on the date agreed by the parties, interest payable to ReliabilityFirst will begin to accrue pursuant to FERC’s regulations at 18 C.F.R. § 35.19(a)(2)(iii) from the date that payment is due, in addition to the penalty specified above.
33. For purposes of settling any and all disputes arising from ReliabilityFirst’s assessment and review of the matters at issue, ReliabilityFirst and Duke Energy agree that on and after the date that this Agreement is approved by FERC or becomes effective by operation of law (except to the extent such actions will be taken prior to such approval), Duke Energy shall take the following actions:

Activity	Dates to be completed
i. Develop 3D model of Illinois Coal Basin – review applicable lines. (See 31a for detail.)	February 28, 2009
ii. Community Outreach	Continuous

iii. Supervisor of Vegetation Program Management	Continuous through at least Dec. 31, 2009
iv. Hack and Squirt	Continuous, as needed
v. LiDAR report submitted to RFC. (See 30a.)	November 30, 2009 ³
vi. Develop 3D model of entire bulk system. (See 31b.)	By December 31, 2010
vii. Re-rate implicated lines (if any). (See 31b.)	By December 31, 2010
viii. Revise documentation of ratings methodologies. (See 31b.)	By December 31, 2010

In order to facilitate ReliabilityFirst's need to communicate the status and provide accountability to the Electric Reliability Organization (in this instance NERC), Duke Energy will provide status updates at a minimum quarterly or, if requested by ReliabilityFirst, more frequently. Duke Energy will submit these status updates to ReliabilityFirst in accordance with the confidentiality provisions of Section 1500 of the NERC Rules of Procedure.

34. It is understood that ReliabilityFirst staff shall audit the progress of mitigation plans and any other remedies of this Agreement, including, but not limited to, site inspection, interviews, and request other documentation to validate progress and/or completion of the mitigation plans and any other remedies of this Agreement. ReliabilityFirst shall reasonably coordinate audits and information requests with the Duke Energy related to this Agreement.
35. The estimated costs to Duke Energy to implement the agreed-to actions in Section IV are \$3,302,000. ReliabilityFirst may audit and inspect financial records to validate actual expenditures with estimates in this Agreement. Funding and programs set forth in this Agreement have been or will be above the budgets and programs for these functions for 2007.
36. If Duke Energy fails to complete the actions described in paragraphs 30-33 above, ReliabilityFirst reserves the right to assess and collect a monetary penalty, to impose a sanction or otherwise to impose enforcement actions. Duke Energy shall retain all rights to defend against such additional enforcement actions in accordance with NERC Rules of Procedure.
37. The use of LiDAR for determining the line to vegetation clearance has the potential to increase the accuracy of measurements and to reduce the potential for human error in the field. Duke Energy and ReliabilityFirst believe that potential exists for increasing the reliability of the bulk electric system through more precise measurements of line to vegetation and line to ground clearance. Duke and ReliabilityFirst also recognize that with new technology offering more precise measurements, there exists a potential to discover clearances that were considered adequate now more precisely measured as inadequate. In order to balance accuracy and innovation in the industry, and to encourage the

³ Or within 90 days of approval of this Agreement by FERC, whichever is later.

advancement of newer technologies to improve reliability, the following stipulations and conditions agreed to:

- (a) Duke Energy will not be subject to any new or additional enforcement actions, sanctions or penalties for any vegetation clearance/encroachment issues or any line clearance/rating issues which are discovered by Duke Energy through December 31, 2010, as a result of LiDAR activities and associated activities performed by Duke Energy pursuant to this Agreement;
- (b) Duke Energy expressly agrees and understands that vegetation within rights of way that results in flashover or outages will be pursued as new possible alleged violations, according to the NERC Rules of Procedure. Duke shall retain all rights to defend against such enforcement actions, also according to the NERC Rules of Procedure.

Except as expressly provided in this section, Duke Energy agrees it is the sole responsibility of Duke Energy to maintain compliance with FAC-003-1 and any successor reliability standards as approved by NERC and FERC.

V. ADDITIONAL TERMS

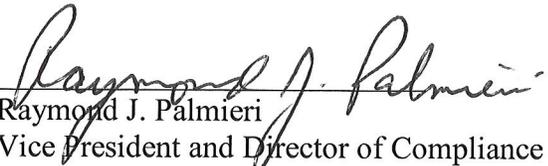
- 38. The signatories to the Agreement agree that they enter into the Agreement voluntarily and that, other than the recitations set forth herein, no tender, offer or promise of any kind by any member, employee, officer, director, agent or representative of ReliabilityFirst or Duke Energy has been made to induce the signatories or any other party to enter into the Agreement.
- 39. The Regional Entity shall report the terms of all settlements of compliance matters to NERC. NERC will review the Agreement for the purpose of evaluating its consistency with other settlements entered into for similar violations or under other, similar circumstances. Based on this review, NERC shall have an opportunity to either approve the Agreement or reject the Agreement and notify the Regional Entity and the Registered Entity of changes to the Agreement that would result in approval. If NERC rejects the Agreement, the parties shall request that NERC provide specific written reasons for such rejection and the Regional Entity will attempt to negotiate a revised settlement agreement with the Registered Entity including any changes to the Agreement specified by NERC. If a settlement cannot be reached, the enforcement process shall continue to conclusion. If NERC approves the Agreement, NERC will (i) report the approved Agreement to FERC for FERC's review and approval by order or operation of law and (ii) publicly post the alleged violation and the terms provided for in the Agreement.
- 40. This Agreement shall become effective upon FERC's approval of the Agreement by order or operation of law as submitted to it or as modified in a manner acceptable to the parties.

Duke Energy agrees that this Agreement, when approved by NERC and FERC, shall represent a final settlement of all matters set forth herein and Duke Energy waives its right to further hearings and appeal, unless and only to the extent that Duke Energy contends that any NERC or FERC action on the Agreement contains one or more material modifications to the Agreement. ReliabilityFirst reserves all rights to initiate enforcement, penalty or sanction actions against Duke Energy in accordance with the NERC Rules of Procedure in the event that Duke Energy fails to comply with the mitigation plan and compliance program agreed to in this Agreement. Duke Energy agrees to provide ReliabilityFirst with documentation of mitigation actions, compliance actions and other actions agreed to in Section IV, paragraphs 28 through 33 of this Agreement within thirty days after final approval by NERC and FERC of this Agreement. For those mitigation actions, compliance actions and other actions agreed to in Section IV which are not completed by the date of final approval by NERC and FERC of this Agreement, Duke Energy agrees to provide documentation within 30 days of completion of those actions. In the event Duke Energy fails to comply with any of the stipulations, remedies, sanctions or additional terms, as set forth in this Agreement, ReliabilityFirst will initiate enforcement, penalty, or sanction actions against Duke Energy, including enforcement, penalty, or sanctions actions arising from the Alleged Violations which are the subject of this Agreement, to the maximum extent allowed by the NERC Rules of Procedure, up to the maximum statutorily allowed penalty. Duke Energy shall retain all rights to defend against such enforcement actions, also according to the NERC Rules of Procedure.

41. Each of the undersigned warrants that he or she is an authorized representative of the entity designated, is authorized to bind such entity and accepts the Agreement on the entity's behalf.
42. Duke Energy consents to the use of ReliabilityFirst's determinations, findings, and conclusions set forth in this Agreement for the purpose of assessing the factors, including the factor of determining Duke Energy's history of violations related to its Midwest operations that are set forth in the May 15, 2008, Revised Policy Statement on Enforcement, or that may be set forth in any successor policy statement or order. Such use may be in any enforcement action or compliance proceeding undertaken by ReliabilityFirst provided, however, that Duke Energy does not consent to the use of the specific acts set forth in this Agreement as the sole basis for any other action or proceeding brought by ReliabilityFirst; nor does Duke Energy consent to the use of this Agreement by any other party in any other action or proceeding.
43. The undersigned representative of each party affirms that he or she has read the Agreement, that all of the matters set forth in the Agreement are true and correct to the best of his or her knowledge, information and belief, and that he or she understands that the Agreement is entered into by such party in express reliance on those representations, provided, however, that such affirmation by each party's representative shall not apply to the other party's statements of position set forth in Section III of this Agreement.

44. The Agreement may be signed in counterparts.
45. This Agreement is executed in duplicate, each of which so executed shall be deemed to be an original.

Agreed to and accepted:

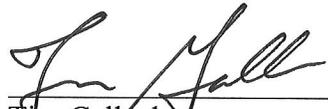

Raymond J. Palmieri
Vice President and Director of Compliance
ReliabilityFirst Corporation

11/11/09
Date


Karen R. Feld
Vice President, Compliance & Integration – Power Delivery
Duke Energy Corporation

11-11-09
Date

Approved by:


Tom Gallagher
President
ReliabilityFirst Corporation

11-11-09
Date

Attachment c

Notice of Filing

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Duke Energy Corporation

Docket No. NP10-____-000

NOTICE OF FILING
December 30, 2009

Take notice that on December 30, 2009, the North American Electric Reliability Corporation (NERC) filed a Notice of Penalty regarding Duke Energy Corporation in the Reliability *First* Corporation region.

Any person desiring to intervene or to protest this filing must file in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211, 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Any person wishing to become a party must file a notice of intervention or motion to intervene, as appropriate. Such notices, motions, or protests must be filed on or before the comment date. On or before the comment date, it is not necessary to serve motions to intervene or protests on persons other than the Applicant.

The Commission encourages electronic submission of protests and interventions in lieu of paper using the "eFiling" link at <http://www.ferc.gov>. Persons unable to file electronically should submit an original and 14 copies of the protest or intervention to the Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426.

This filing is accessible on-line at <http://www.ferc.gov>, using the "eLibrary" link and is available for review in the Commission's Public Reference Room in Washington, D.C. There is an "eSubscription" link on the web site that enables subscribers to receive email notification when a document is added to a subscribed docket(s). For assistance with any FERC Online service, please email FERCOnlineSupport@ferc.gov, or call (866) 208-3676 (toll free). For TTY, call (202) 502-8659.

Comment Date: [BLANK]

Kimberly D. Bose,
Secretary