NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC
Transmission Availability Data System (TADS)
DATA REPORTING INSTRUCTION MANUAL

June 29, 2007

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1. Introduction

TADS is described in the Transmission Availability Data System Final Report ("Report") that was approved by the Planning Committee on June 7, 2007. The Report can be found at http://www.nerc.com/~filez/tadstf.html, and it will provide the user background on how TADS was developed.

We developed this Data Reporting Instruction Manual ("Manual") to provide users with help in completing the data forms for Phase I TADS. There are data forms, most of which have subparts, for each of the Elements for which outage information is reported. This list shows those Elements:

- AC Circuits ≥ 200 kV (Overhead and Underground Circuits). Radial circuits are included.
- DC Circuits with ≥ +/-200 kV DC voltage
- Transformers with ≥ 200 kV low-side voltage
- AC/DC Back-to-Back Converters with ≥ 200 kV AC voltage, both sides

1.1 TADS Definitions

The TADS Definitions document is a stand-alone document that is in Appendix 6. Most of the terms in the forms have specific definitions which may differ from the common usage of the same term. For example, the term "AC Circuit" is specifically defined and includes both two and three-terminal circuits. Therefore, it is important that the user refer to the definitions when completing the forms.

1.2 Forms Overview

The forms and their subparts are in shown in Appendices 1-5. These are depicted as pictures of the worksheets contained in a TADS Forms spreadsheet. The spreadsheet can be downloaded at http://www.nerc.com/~filez/tadstf.html. The five form categories are listed below.

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Each data form has a common layout.

1. One portion requests the Transmission Owner's (TO's) name, its Regional Entity (RE), and the calendar reporting year. This information is input once on Form 1 and linked to subsequent forms. If a TO has a reporting obligation for TADS Elements in different two (or more) Regional Entities, it must complete separate TADS submittals to each RE.
2. All forms have row numbers as well as columns with letters (A, B, etc.) The column letters and sometimes the row numbers are used as references in the instructions. With the exception of Forms 3.1, 3.2, and 3.3., users may add additional rows as needed. All added rows need to be numbered.
3. Many columns have drop-down menus that correspond to defined user choices. For example, all Cause Codes are in a drop-down menu and provide the user the choice among the *defined* Cause Codes only.
4. To keep the form format the same within a form type, certain columns are grayed out and labeled "NA."

Appendix 7 contains examples to assist the user in completing Forms 3.1-3.3, which contain inventory data. Appendix 8 contains examples to assist the user in completing Forms 4.1-4.4, which contain detailed Element outage data.

1.3 Data Confidentiality

Under NERC's confidentiality policy (Section 1500 of NERC's Rules of Procedures), the entity claiming that information is confidential must state the category under which such information qualifies as confidential.

For practicality, we have made judgments that data on certain forms will likely be confidential information because it contains critical energy infrastructure information (CEII), while other information is not confidential. A TO may make its CEII information (per NERC's classification) non-confidential by requesting, in writing, that NERC treat it as such.

CEII is defined by Federal Energy Regulatory Commission (FERC) rules as follows:[1]

(1) *Critical energy infrastructure information* means specific engineering, vulnerability, or detailed design information about proposed or existing critical infrastructure that:

(i) Relates details about the production, generation, transportation, transmission, or distribution of energy;

(ii) Could be useful to a person in planning an attack on critical infrastructure;

(iii) Is exempt from mandatory disclosure under the Freedom of Information Act, 5 U.S.C. 552; and

(iv) Does not simply give the general location of the critical infrastructure.

[1] 18 C.F.R. 388.113(c)(1)-(2)

(2) *Critical infrastructure* means existing and proposed systems and assets, whether physical or virtual, the incapacity or destruction of which would negatively affect security, economic security, public health or safety, or any combination of those matters.

The table below summarizes our judgments on confidential information for each form:

Table 1.3

Form	Default Confidentiality Status
1 Transmission Owner Information	Not confidential
2.1 Ties and Jointly-Owned AC and DC Circuits	Confidential-CEII
2.2 Jointly-Owned AC/DC Back-to-Back Converters	Confidential-CEII
3.1 AC and DC Circuit Inventory Data	Not confidential
3.2 Transformer Inventory Data	Not confidential
3.3 AC/DC Back-to-Back Converter Inventory Data	Not confidential
3.4 Summary Outage Data	Confidential-CEII
4.1 AC Circuit Detailed Automatic Outage Data	Confidential-CEII
4.2 DC Circuit Detailed Automatic Outage Data	Confidential-CEII
4.3 Transformer Detailed Automatic Outage Data	Confidential-CEII
4.4 AC/DC Back-to-Back Converter Detailed Automatic Outage Data	Confidential-CEII
5 Event ID Code Data	Confidential-CEII

As described in the Report, regional and NERC annual public performance reports will show *aggregated* TO confidential information. However, these reports will not inadvertently release confidential information by the display of regional or NERC information from which a TO's confidential information could be ascertained. For example, if the TO in a region is the only owner of assets in a particular Voltage Class, the metrics on that data would not be released if the TO's name and its confidential information could be identified, unless the TO agrees to such a release.

1.4 TADS Help

Assistance in completing the forms is available. The following process will be used:

1. Initial questions should be directed to the TO's Regional Entity (RE). Written e-mail questions are encouraged, with a copy to NERC. A contact list is in Appendix 9.
2. The RE's replies will copy NERC, and questions that cannot be answered by the RE will be answered by NERC with replies directed back to the user.
3. Particular questions may require phone support. RE (or NERC) phone responses will be documented with an e-mail to the user, with copies to the NERC (or the RE).

This process is intended to ensure consistency in responses to questions, and therefore data consistency. In addition, NERC will offer training sessions to familiarize users and REs with TADS prior to data submittal.

1.5 Form 1 Transmission Owner Information

Form 1 asks for three type of TO Information.

1. It requests the business contact information for the primary and back-up TADS contact person for the Transmission Owner.
2. It contains a list to confirm which forms were filed and which forms were not filed. For forms not filed, the TO is asked to explain why they were not filed (e.g., TO has none of the facilities reported on the form, the TO had no outages, etc.). This ensures that inadvertent form omissions are corrected prior to submittal.
3. Finally, it lists the NERC default confidentiality status of TO data on each form.

2. Forms for Ties and Jointly-Owned Facilities

These forms are used to ensure that *one* TO takes on the TADS reporting responsibility for jointly-owned facilities, including tie-lines.

2.1 Form 2.1 Ties and Jointly-Owned AC and DC Circuits

The characteristics of each tie and jointly-owned facility are input on this form (one facility per row).

Table 2.1

Column	Form 2.1 Descriptor
A	The type of circuit (AC or DC), input from a drop-down menu, describes the main characteristic of the facility.
B	From – Substation or Terminal Name. The alphanumeric code designating one of the Substation Names for an AC Circuit or one of the Terminal Names for a DC Circuit.
C	To – Substation or Terminal Name. The alphanumeric code designating a second Substation Name for an AC Circuit or a second Terminal Name for a DC Circuit.
D	The Voltage Class of the facility, input from a drop-down menu.
E	Underground or Overhead. This facility characteristic is input from a drop-down menu. See the definition of Overhead and Underground in Appendix 6, Section A.
F	The company name of the TO with TADS reporting responsibility
G-K	The company name(s) of the TOs that are joint owners of the facility. Up to five owner names are provided. We expect one of those names to be the TO with TADS reporting responsibility input in column F.

2.2 Form 2.2 Jointly-Owned AC/DC Back-to-Back Converter

The characteristics of each jointly-owned AC/DC Back-to-Back Converter are input on this form (one facility per row).

Table 2.2

Column	Form 2.2 Descriptor
A	Converter Station Name. The alphanumeric code designating the converters name.
B	NOT APPLICABLE
C	The AC Circuit Voltage Class, input from a drop-down menu, on one side of the converter

Column	Form 2.2 Descriptor
D	The AC Circuit Voltage Class, input from a drop-down menu, on one side of the converter
E	NOTAPPLICABLE
F	The company name of the TO with TADS reporting responsibility
G-K	The company name(s) of the TOs that are joint owners of the facility. Up to five owner names are provided. We expect one of those names to be the TO with TADS reporting responsibility input in column F.

3. Forms for Element Inventory and Summary Outage Data

3.1 Form 3.1 AC and DC inventory Data

Form 3.1 is a two-part form:

1. The top half of the form has inventory data for AC and DC Circuits ≥ 200 kV.
2. The bottom half contains Multi-Circuit Structure Mile data for AC Circuits only. All DC Circuits are assumed to have two circuits per structure; therefore, for each DC Circuit Voltage Class, the Multi-Circuit Structure Miles is one-half of the total Circuit Miles.

Table 3.1

Column	Form 3.1 Descriptor
A	Rows 1-4: AC Overhead Circuit Data by Voltage Class
A	Rows 5-8: AC Underground Circuit Data by Voltage Class
A	Rows 9-12: DC Overhead Circuit Data by Voltage Class
A	Rows 13-15: DC Underground Circuit Data by Voltage Class
See Appendix 6, Section A, for definitions of "Overhead" and "Underground"	
AC and DC Circuit Inventory Data	
Appendix 7 has an example that illustrates the data requirements for columns B-K for AC and DC Circuits	
B	The number of circuits that are installed and "in-service" at the end of the reporting year of in each Voltage Class which are reported by the TO. This includes AC Circuits that are tie lines or jointly-owned circuits. The term "in-service" refers to the accounting state of the circuit, not its operational state. If you have no circuits in a particular Voltage Class, put a Zero in columns B, D, and H, and leave all other columns in the row blank.
C	The number of Circuit Miles associated with the circuits in column B.
D	The number of circuits that were added during the year. These could be new circuits or a circuit that, after reconfiguring, defines a new circuit. For example, if an AC Circuit defined by two breakers that has a tap added with another breaker becomes a three-terminal instead of a two-terminal circuit. The three-terminal circuit is an addition, and the previous two-terminal circuit must be removed. The removed circuit will be contained in column H.
E	The equivalent number of circuits added.
F	The number of Circuit Miles added. These Circuit Miles are associated with the number of circuits in column D.
G	The equivalent number of Circuit Miles added.
H	The number of circuits that were removed during the year. In the example discussed for column D, the two-terminal circuit that became a three-terminal circuit would be a circuit that is removed and therefore contained in column H. Note: column I is not used in the calculation in column L.
I	The equivalent number of circuits removed.

Column	Form 3.1 Descriptor
J	The number of Circuit Miles removed. These Circuit Miles are associated with the number of circuits in column H.
K	The equivalent number of Circuit Miles removed.
L	This is a calculated value for the equivalent annual number of circuits for the reporting year. Note that column H is not used; it is requested as a "sanity check" for column I.
M	This is a calculated value for the equivalent annual number of Circuit Miles for the reporting year. Note that column J is not used; it is requested as a "sanity check" for column K.
Multi-Circuit Structure Miles Data	
Appendix 7 has an example that illustrates the data requirements for columns B-K for Multi-Circuit Structures.	
A	Rows 17-21 AC multi-circuit structure Voltage Class. Note the "Mixed Voltage" class. This class applies to multi-circuit structures that have two TADS AC Circuits of different voltages (e.g., 230 kV and 345 kV) on the same structure. A structure is not a multi-circuit structure in these rows unless in has two or more AC Circuits, each circuit with a voltage ≥ 200 kV. Therefore, a structure with a 230 kV and a 138 kV AC Circuit is not a multi-circuit structure.
B	NOT APPLICABLE
C	The number of Multi-Circuit Structure Miles in the Voltage Class associated with AC Circuits reported by the TO. This includes AC Circuits that are tie lines or jointly-owned circuits. If you have no circuits in a particular Voltage Class, put a Zero in columns B, D, and H, and leave all other columns in the row blank.
D-E	NOT APPLICABLE
F	The number of Multi-Circuit Structure Miles added in the Voltage Class associated with AC Circuits reported by the TO. This includes AC Circuits that are tie lines or jointly-owned circuits.
G	The equivalent number of Multi-Circuit Structure Miles added.
H-I	NOT APPLICABLE
J	The number of Multi-Circuit Structure Miles removed in the Voltage Class associated with AC Circuits reported by the TO. This includes AC Circuits that are tie lines or jointly-owned circuits.
K	The equivalent number of Multi-Circuit Structure Miles removed.
L	NOT APPLICABLE
M	This is a calculated value for the equivalent annual number of Multi-Circuit Structure Miles for the reporting year. Note that column J is not used; it is requested as a "sanity check" for column K.
N-Q	NOT APPLICABLE

3.2 Form 3.2 Transformer Inventory Data

The inventory data for Transformer is input on this form.

Table 3.2

Column	Form 3.2 Descriptor
A	Rows 1-4: The Voltage Class of the reported Transformers data, based upon all Transformer's high-side voltage. While high-side voltages are reported on this form, each Transformer must have a low-side voltage ≥ 200 kV.
Transformer Inventory Data	
Appendix 7 has an example that illustrates the data requirements for the equivalent number of circuits. The equivalent number of Transformers follows a similar methodology.	
B	The number of Transformers that are installed and "in-service" at the end of the reporting year of in each Voltage Class which are reported by the TO. Do not include spares. The term "in-service" refers to the accounting state of the Transformer, not its operational state. If you have no Transformers in a particular Voltage Class, put a Zero in columns B, C, and E, and leave all other columns in the row blank.
C	The number of Transformers that were added during the year. If a Transformer merely replaces a "like" Transformer (same high-side and low-side voltages) at the same location, this does not count as an addition or a removal. If the replacement is not a "like" Transformer, an addition should be counted as well as a removal.
D	The equivalent number of Transformers added.
E	The number of Transformers that were removed. If a Transformer merely replaces a "like" Transformer (same high-side and low-side voltages) at the same location, this does not count as an addition or a removal. If the replacement is not a "like" Transformer, an addition should be counted as well as a removal.
F	The equivalent number of Transformers removed.
G	This is a calculated value for the equivalent annual number of Transformers for the reporting year. Note that column E is not used; it is requested as a "sanity check" for column F.

3.3 Form 3.3 AC/DC BTB Converter Inventory Data

The inventory data for AC/DC BTB Converters is input on this form.

Table 3.3

Column	Form 3.3 Descriptor
A	Rows 1-4: The Voltage Class of the reported AC/DC BTB Converters is the highest AC terminal voltage in the AC/DC BTB Converter. This is a phase-to-phase voltage.
AC/DC BTB Converter Inventory Data	
Appendix 7 has an example that illustrates the data requirements for the equivalent number of circuits. The equivalent number of AC/DC BTB Converters follows a similar methodology.	
B	The number of AC/DC BTB Converters that are installed and "in-service" at the end of the reporting year of in each Voltage Class which are reported by the TO. The term "in-service" refers to the accounting state of the AC/DC BTB Converter, not its operational state. If you have no AC/DC BTB Converters in a particular Voltage Class, put a Zero in columns B, C, and E, and leave all other columns in the row blank.
C	The number of AC/DC BTB Converters that were added during the year.
D	The equivalent number of AC/DC BTB Converters added.
E	The number of AC/DC BTB Converters that were removed.

Column	Form 3.3 Descriptor
F	The equivalent number of AC/DC BTB Converters removed.
G	This is a calculated value for the equivalent annual number of AC/DC BTB Converters for the reporting year. Note that column E is not used; it is requested as a "sanity check" for column F.

3.4 Form 3.4 Summary Automatic Outage Data

This form contains summary outage data for each of the TADS Elements. Therefore, its description will use the term "Element" to mean a defined TADS Element.

Table 3.4

Column	Form 3.4 Descriptor
A	The Voltage Class of the reported Element. These are the same Voltage Classes used for Elements on the inventory data forms (Forms 3.1-3.3).
B	The total number of Sustained Outages for all Elements for the calendar year.
C	The total number of Momentary Outages for all Elements for the calendar year.
Columns B and C are a Self-Check: These totals in columns B and C can be derived from the detailed Automatic Outage data reported on Form 4.1 (AC Circuits), Form 4.1 (DC Circuits), Form 4.3 (Transformers), and Form 4.4 (AC/DC Back-To-Back Converters).	
D	Number of Elements with zero outages. This number only includes Elements that are in service at the *end of the year* because the percentage calculation in column E is based upon end-of-year inventory. One way to calculate the number of Elements with zero outages is as follows: 1. First find which Elements had *one or more* outages by using the data of the detailed Automatic Outage data forms (Forms 4.1-4.4). The optional TO Element Identifier would need to been used to identify the Element itself. 2. From the list of Elements developed in step 1 above, *subtract* the Elements that were removed from service during the year. The result is the number of Elements with one or more outages that were in service at the end of the year. 3. For the final calculation, subtract the result from step 2 from the total number of Elements in service at the end of the year (see column B on the inventory data forms (Forms 3.1-3.3) for his value). The result is the total number of Elements that are in service at the end of the year which had zero outages.
E	The percentage of Elements with zero outages is a calculated value. It takes the value in D and divides it by the value in column B from the inventory data forms, converting the result into a percentage.

4. Forms for Detailed Automatic Outage Data

These forms contain data for *each* and *every* Automatic Outage of an Element, both Sustained and Momentary. The user may probably need to add rows, since the number of outages for large systems will exceed the 12 numbered rows.

The first several columns (A-G) contain information that generally describes the Element that was outaged. The single exception is the Event ID Code. The remaining columns (H-O) describe the outage itself. Since there is so much similarity between the columns, all descriptors will be provided once, using the generic term of "Element" instead of AC Circuit, Transformer, etc.

Appendix 8 provides many examples illustrating the completion of the various Form 4 series.

Table 4.1-4.4

Data for Elements That Had an Automatic Outage	
Column	**Forms 4.1-4.4 Descriptor**
A	The Event ID Code associated with the outage. This is assigned by the TO. See Appendix 6, Section B for the definition of Event ID Code. The Event ID Code must be appended with the reporting year (e.g., WXY-2008).
B	The Element's Voltage Class. This is consistent to the Voltage Class definitions used for Inventory Data on Forms 3. AC Circuit= phase-to-phase Transformer=high-side voltage DC Circuit= phase-to-return AC/DC BTB Converter= highest AC terminal voltage
C-E	Data that provides a description of the physical location of the Element. Since these "identifiers" are to be used by the Regional Entities (and NERC) to develop a common Event ID Code for disturbances that cross a TO's transmission boundaries, we suggest that the names used come from the power flow case library used by the Regional Entity. AC Circuit= AC Substation Names (3 max) Transformer=AC Substation Name DC Circuit= AC/DC Terminal Names (3 max) AC/DC BTB Converter= Its name
F	The TO Element Identifier is an optional, but recommended, alphanumeric field that has the TO's internal identifier of the Element. This could be a circuit or transformer number or other identifier recognized by the TO.
G	This column is only for AC or DC Circuits and identifies whether the outaged Element in an Overhead or Underground Circuit.
The descriptions that follow use defined terms that the user should become familiar with. They will not be repeated here. Most data fields have drop-down menus. They each describe various facets of the outage.	
H	The Fault Type, input from a drop-down menu.
I	The Outage Initiation Code, input from a drop-down menu.
J	The Outage Start Time, in GMT
K-L	The Outage Duration expressed as hours (col. K) and minutes (col. L). Momentary Outages will enter a "0" (zero) in these two fields since we round to the nearest minute. A zero entry in col. L tells the reviewer that the outage was Momentary.
M	The Initiating Outage Code, input from a drop-down menu. This applies to all Automatic Outages (Sustained and Momentary)
N	The Sustained Outage Code, input from a drop-down menu. This only applies to Sustained Outages
O	The Outage Mode, input from a drop-down menu.

For the Outage Duration data in columns K and L, if an outage begins in a reporting calendar year and continues beyond the end of the year (December 31), the calculation of a total Outage Duration is not possible. In this case, the following process will be observed:

1. Two separate outage durations will be calculated.
    a. For the reporting year when the outage started, the user should input an Outage Duration (both hours and minutes) as "9999." This code will tell the analysis software to calculate a duration for the Outage from the Start Time until December 31, 24:00 Greenwich Mean Time.
    b. For the next reporting year, the *same* Event ID Code will be entered for the outage with an Outage Start Time coded as "9999." Since Event ID Codes must have the reporting year appended to them, an Event ID Code with a prior year entry tells the reviewer that this is a continuing outage. When the Element returns to service, the duration will be calculated for

the second reporting year as if the outage commenced on January 1, 00:00 GMT.

2. For purposes of calculating metrics, the metrics in the first reporting year will reflect the outage in that year for frequency calculations. However, the Outage Duration will be split between reporting years as described above, and any outages with Event ID Codes from the prior year will not be counted towards the frequency calculation in the second year.
3. For outages that span three (or more) reporting years, the procedure above will be extended, and three (or more) separate outage durations will be calculated.

5. Form for Event ID Code Data

TO's assign their own Event ID Codes. An Event is a transmission incident that results in the Sustained or Momentary Outages one or more Elements. The table below describes the data collected for the Event ID Code:

Table 5

Column	Form 5 Descriptor
A	The Event ID Code associated with one or more outages. This is assigned by the TO. See Appendix 6, Section B for the definition of Event and Event ID Code. The Event ID Code must be appended with the reporting year (e.g., WXY-2008).
B	The Event Type No. This is a descriptor of the Event. A table on Form 5 shows the permitted entries, which are in a drop-down menu
C	If Event Type 50 (Other) is selected for column B, the user should describe the Event.
D	This field asks whether a disturbance report was filed that was associated with the Event, with different answers contained in a drop-down menu. A disturbance report can either be an OE-417 report (a Department of Energy report) or a NERC reliability standard report required under EOP-004-1 (Disturbance Reporting).

Appendix 1 Form for Transmission Owner Information

Form 1 Transmission Owner Information				
Row No.				
1	**Transmission Owner Name**	ABC Power & Light Co.		
2	**Regional Entity Name**	ERCOT		
3	**Reporting Year**	2008		
4				
5	**TO Contacts:**			
6	Primary:		Name	
7			Title	
8			Address	
9				
10				
11			e-mail	
12			telephone (main)	
13			telephone (mobile)	
14				
15	Secondary:		Name	
16			Title	
17			Address	
18				
19				
20			e-mail	
21			telephone (main)	
22			telephone (mobile)	

Form No.	Short Form Name	Submission Status	Reason Not Submitted	NERC Confidentiality Classification*
1	TO Info	Submitted	**Must be submitted**	Data is **not** Confidential.
2.1	Tie & Joint AC/DC Ckts	Submitted	N/A; form was submitted	Confidential - Critical Energy Infastructure Information
2.2	Joint AC/DC BTB Converters	Not Submitted	No Joint Fac or Elements of this type	Confidential - Critical Energy Infastructure Information
3.1	AC/DC Ckt. Inven.	Submitted	N/A; form was submitted	Data is **not** Confidential.
3.2	Transformer Inven.	Submitted	N/A; form was submitted	Data is **not** Confidential.
3.3	AC/DC BTB Con. Inven.	Not Submitted	No Joint Fac or Elements of this type	Data is **not** Confidential.
3.4	Summary Auto. Outage Data	Submitted	**Must be submitted**	Confidential - Critical Energy Infastructure Information
4.1	AC Circuit Outages	Submitted	N/A; form was submitted	Confidential - Critical Energy Infastructure Information
4.2	DC Circuit Outages	Not Submitted	No Joint Fac or Elements of this type	Confidential - Critical Energy Infastructure Information
4.3	Transformer Outages	Not Submitted	No Outages	Confidential - Critical Energy Infastructure Information
4.4	AC/DC BTB Con.Outages	Not Submitted	No Joint Fac or Elements of this type	Confidential - Critical Energy Infastructure Information
5	Event ID Code	Submitted	N/A; form was submitted	Confidential - Critical Energy Infastructure Information
				*** If the TO wants to change NERC's confidentiality classification for any data, please explain in a separate letter to NERC.**

Appendix 2 Forms for Ties & Jointly-Owned Facilities

2.1. Ties and Jointly-Owned AC and DC Circuits

Form 2.1

Transmission Owner (TO): ABC Power & Light Co.

CONFIDENTIAL INFORMATION

Regional Entity: ERCOT [1]

Reporting (Calendar) Year: 2008

This form lists all the AC Circuits or DC Circuits that are either (a) tie-lines or (b) jointly-owned facilities and which are ≥ 200 kV.

To insure that outage data on these Elements are reported, the TO must list each Element, the joint-owners, and the TO that is reporting outage data on the Element.

		Substation/Terminal Name [1]					Name of Joint Transmission Owners				
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Row No.	Type of Circuit (AC or DC)	From	To	Voltage Class	Overhead or Underground	TO w. TADS Reporting Responsibility	TO#1	TO#2	TO#3	TO#4	TO#5
1	AC	Smith	Jones	200-299 kV	OH	ABC P&L	XYZ Power	ABC P&L			
2											
3											
4											
5											
6											
7											
8											

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.

2.2. Jointly-Owned AC/DC Back-to-Back Converters

Form 2.2

Transmission Owner (TO):	ABC Power & Light Co.
Regional Entity:	ERCOT [1]
Reporting (Calendar) Year:	2008

CONFIDENTIAL INFORMATION

This form lists all the AC/DC Back-to-Back Converters that are jointly-owned facilities and which are greater that 200 kV AC on both sides.

To insure that outage data on these Elements are reported, the TO must list each Element, the joint-owners, and the TO that is reporting outage data on the Element.

							Name of All Joint Transmission Owners				
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Row No.	Name of AC/DC Back-to-Back Converter Station	NA	AC Circuit Voltage Class on one side	AC Circuit Voltage Class on second side	NA	TO w. TADS Reporting Responsibility	TO#1	TO#2	TO#3	TO#4	TO#5
1	Garden	NA	200-299 kV	200-299 kV	NA	XYZ Power	ABC P&L	XYZ Power			
2		NA			NA						
3		NA			NA						
4		NA			NA						
5		NA			NA						
6		NA			NA						
7		NA			NA						
8		NA			NA						

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.

Appendix 3 Forms for Element Inventory and Summary Outage Data

3.1. AC and DC Circuit Inventory Data

Form 3.1

Transmission Owner (TO):	ABC Power & Light Co.
Regional Entity:	ERCOT [1]
Reporting (Calendar) Year:	2008

AC and DC Circuit Inventory Data

Row No.	(A) Voltage Class [2]	(B) No. of Circuits (End-of-Year)	(C) Circuit Miles (End-of-Year)	(D) No. of Circuits Added	(E) Equivalent Annual No. of Circuits Added [3]	(F) No. of Circuit Miles for Circuits Added	(G) Equivalent Annual No. of Circuit Miles for Circuits Added [3]	(H) No. of Circuits Removed	(I) Equivalent Annual No. of Circuits Removed [3]	(J) No. of Circuit Miles for Circuits Removed	(K) Equivalent Annual No. of Circuit Miles for Circuits Removed [3]	(L) CALCULATED Annual Equivalent No. of Circuits = B-D+E+I	(M) CALCULATED Annual Eqivalent No. of Circuit Miles = C-F+G+K
1	200-299 kV AC Overhead	83.0	400.0	8.0	6.2	66.0	55.0	3.0	2.1	28.0	21.0	83.3	410.0
2	300-399 kV AC Overhead												
3	400-599 kV AC Overhead												
4	600-799 kV AC Overhead												
5	200-299 kV AC Underground												
6	300-399 kV AC Underground												
7	400-599 kV AC Underground												
8	600-799 kV AC Underground												
9	200-299 kV DC Overhead												
10	300-399 kV DC Overhead												
11	400-599 kV DC Overhead												
12	600-799 kV DC Overhead												
13	200-299 kV DC Underground												
14	300-399 kV DC Underground												
15	400-599 kV DC Underground												
16	600-799 kV DC Underground												

Muliti-Circuit Structure Miles Inventory Data

	(A) Voltage Class [2]	(B) NA	(C) Multi-Circuit Structure Miles (End-of-Year)	(D) NA	(E) NA	(F) No. of Multi-Circuit Structure Miles for Circuits Added	(G) Equivalent Annual No. of Multi-Circuit Structure Miles for Cicuits Added [4]	(H) NA	(I) NA	(J) No. of Multi-Circuit Structure Miles for Circuits Removed	(K) Equivalent Annual No. of Multi-Circuit Structure Miles of Circuits Removed [4]	(L) NA	(M) CALCULATED Annual Eqivalent No. of Multi-Circuit Structure Miles = C-F+G+K
17	200-299 kV AC	NA		NA	NA			NA	NA			NA	0.0
18	300-399 kV AC	NA		NA	NA			NA	NA			NA	
19	400-599 kV AC	NA		NA	NA			NA	NA			NA	
20	700-799 kV AC	NA		NA	NA			NA	NA			NA	
21	Mixed Voltages [5]	NA		NA	NA			NA	NA			NA	

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook

[2] AC Circuit Voltages are phase-to-phase. DC Circuit Voltages are phase-to-return.

[3] See example in the Data Reporting Instructions Manual, Appendix 7

[4] See example in the Data Reporting Instructions, Appendix 7

[5] Mixed TADS voltages (e.g., 230 kV and 345 kV) on the same structure .

3.2. Transformer Inventory Data

Form 3.2							
	Transmission Owner (TO):	ABC Power & Light Co.					
	Regional Entity:	ERCOT	[1]				
	Reporting (Calendar) Year:	2008					
	Transformer Inventory Data						
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Row No.	Voltage Class [2]	No. of Transformers (End-of-Year) [3]	No. of Transformers Added	Equivalent Annual No. of Transformers Added [4]	No. of Transformers Removed	Equivalent Annual No. of Transformers Removed [4]	CALCULATED Annual Equivalent No. of Transformers = B-C+D+F
1	200-299 kV	26.0	1.0	0.6	1.0	0.6	26.2
2	300-399 kV						
3	400-599 kV						
4	600-799 kV						
	Notes:						
[1]	If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.						
[2]	Report high-side phase-to-phase voltage. However, to be reported, the Transformer must have a low-side voltage that is ≥ 200 kV.						
[3]	Only report transformers that are "in-service." Do not include spares.						
[4]	See example in the Data Reporting Instructions Manual, Appendix 7						

3.3. AC/DC Back-to-Back Converters Inventory Data

Form 3.3

Transmission Owner (TO): ABC Power & Light Co.
Regional Entity: ERCOT **[1]**
Reporting (Calendar) Year: 2008

AC/DC Back-to-Back Converters Inventory Data

Row No.	(A) Voltage Class [2]	(B) No. of Converters (End-of-Year)	(C) No. of Converters Added	(D) Equivalent Annual No. of Converters Added [3]	(E) No. of Converters Removed	(F) Equivalent Annual No. of Converters Removed [3]	(G) CALCULATED Annual Equivalent No. of Converters = B-C+D+F
1	200-299 kV DC	3.0	1.0	0.6	1.0	0.6	3.2
2	300-399 kV DC						
3	400-599 kV DC						
4	600-799 kV DC						

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.
[2] Report the highest terminal AC voltage (phase-to-phase).
[3] See example in the Data Reporting Instructions Manual, Appendix 7

3.4. Summary Automatic Outage Data

Form 3.4

CONFIDENTIAL INFORMATION

Transmission Owner (TO): ABC Power & Light Co.
Regional Entity: ERCOT [1]

Reporting (Calendar) Year: 2008

AC & DC Circuit Automatic Outage Data

Row No.	(A) Voltage Class [2]	(B) No. of Sustained Outages	(C) No. of Momentary Outages	(D) No. of Circuits with Zero Automatic Outages [3]	(E) Calculated Percentage Circuits with Zero Automatic Outages expressed as %
1	200-299 kV AC Overhead	12	8	41.5	50.00%
2	300-399 kV AC Overhead				
3	400-599 kV AC Overhead				
4	600-799 kV AC Overhead				
5	200-299 kV AC Underground				
6	300-399 kV AC Underground				
7	400-599 kV AC Underground				
8	600-799 kV AC Underground				
9	200-299 kV DC Overhead				
10	300-399 kV DC Overhead				
11	400-599 kV DC Overhead				
12	600-799 kV DC Overhead				
13	200-299 kV DC Underground				
14	300-399 kV DC Underground				
15	400-599 kV DC Underground				
16	600-799 kV DC Underground				

Transformer Automatic Outage Data

Row No.	(A) Voltage Class [4]	(B) No. of Sustained Outages	(C) No. of Momentary Outages	(D) Number of Transformers with Zero Automatic Outages [5]	(E) Calculated Percentage (%) Transformers with Zero Automatic Outages expressed as %
17	200-299 kV	3	8	21.0	80.77%
18	300-399 kV				
19	400-599 kV				
20	600-799 kV				

AC/DC Back-to-Back Converters Automatic Outage Data

Row No.	(A) Voltage Class [6]	(B) No. of Sustained Outages	(C) No. of Momentary Outages	(D) Number of Converters with Zero Automatic Outages [7]	(E) Calculated Percentage (%) Transformers with Zero Automatic Outages expressed as %
21	200-299 kV	0	4	2.0	66.67%
22	300-399 kV				
23	400-599 kV				
24	600-799 kV				

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.
[2] AC Circuit Voltages are phase-to-phase. DC Circuit Voltages are phase-to-return.
[3] Only consider circuits with zero outages that are "in-service" at the end of the year.
[4] Report high-side phase-to-phase voltage. However, to be reported, the Transformer must have a low-side voltage that is ≥ 200 kV.
[5] Only consider transformers with zero outages that are "in-service" at the end of the year. Do not includes spares.
[6] Report the highest terminal AC voltage (phase-to-phase).
[7] Only consider converters with zero outages that are "in-service" at the end of the year.

Appendix 4 Forms for Detailed Automatic Outage Data

4.1. AC Circuit Detailed Automatic Outage Data

Form 4.1 — CONFIDENTIAL INFORMATION

Transmission Owner: ABC Power & Light Co.
Regional Entity: ERCOT [1]
Reporting (Calendar) Year: 2008

AC Circuit Sustained and Momentary Outage Data

			Circuit Substation Boundaries										Cause Codes		
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
Row No.	Event ID Code	Voltage Class	Substation Name #1	Substation Name #2	Substation Name #3	TO Element Identifier (AC Circuit)	Overhead or Underground	Fault Target	Outage Initiation Code	Start Time (dd/mm/yyyy hh:mm) (GMT)	Outage Duration (hours) [2]	Outage Duration (minutes) [2]	Initiating Cause Code	Sustained Cause Code [3]	Outage Mode
1	A-2008	200-299 kV	Brown	Smith		BwSh#1	OH	Phase target	Element-Initiated Outage	5/5/2008 13:04	0	56	Lightning	Relay and/or Control Misoperation	Single Mode Outage
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.

[2] Report zero hours and zero minutes Outage Duration for Momemtary Outages

[3] For Momentary Outages, enter "NA-Momentary"

4.2. DC Circuit Detailed Automatic Outage Data

Form 4.2 — CONFIDENTIAL INFORMATION

Transmission Owner: ABC Power & Light Co.
Regional Entity: ERCOT [1]
Reporting (Calendar) Year: 2008

DC Circuit Sustained and Momentary Outage Data

			Circuit From/To										Cause Codes		
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
Row No.	Event ID Code	Voltage Class	Terminal Name #1	Terminal Name #2	Terminal Name #3	TO Element Identifier (DC Circuit)	Overhead or Underground	Fault Target	Outage Initiation Code	Start Time (dd/mm/yyyy hh:mm) (GMT)	Outage Duration (hours) [2]	Outage Duration (minutes) [2]	Initiating Cause Code	Sustained Cause Code [3]	Outage Mode
1	B-2008	200-299 kV	Grey	Blue		GyBe#1	OH	Phase target	Element-Initiated Outage	5/5/2008 13:04	0	56	Lightning	Relay and/or Control Misoperation	Single Mode Outage
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.

[2] Report zero hours and zero minutes Outage Duration for Momemtary Outages

[3] For Momentary Outages, enter "NA-Momentary"

4.3. Transformer Detailed Automatic Outage Data

Form 4.3					CONFIDENTIAL INFORMATION											
	Transmission Owner	ABC Power & Light Co.														
	Regional Entity:	ERCOT	[1]													
	Reporting (Calendar) Year:	2008														
	Transformer Sustained and Momentary Outage Data															
			Circuit From/To										Cause Codes			
	(A)	(B)	(C)	(D)	(E)	(F)	(E)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	
Row No.	Event ID Code	High-Side Voltage Class	Located at (Substation Name)	NA	NA	TO Element Identifier (Transformer)	NA	Fault Target	Outage Initiation Code	Start Time (dd/mm/yyyy hh:mm) (GMT)	Outage Duration (hours) [2]	Outage Duration (minutes) [2]	Initiating Cause Code	Sustained Cause Code [3]	Outage Mode	
1	C-2008	200-299 kV	Black	NA	NA	Bk #2	NA	None - no fault occurred	Substation-Initiated Outage	5/5/2008 13:04	0	56	Weather, excluding lightning	Relay and/or Control Misoperation	Single Mode Outage	
2				NA	NA		NA									
3				NA	NA		NA									
4				NA	NA		NA									
5				NA	NA		NA									
6				NA	NA		NA									
7				NA	NA		NA									
8				NA	NA		NA									
9				NA	NA		NA									
10				NA	NA		NA									
11				NA	NA		NA									
12				NA	NA		NA									
	Notes:															
[1]	If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.															
[2]	Report zero hours and zero minutes Outage Duration for Momemtary Outages															
[3]	For Momentary Outages, enter "NA-Momentary"															

4.4. AC/DC Back-to-Back Converter Detailed Outage Data

Form 4.4 — CONFIDENTIAL INFORMATION

Transmission Owner: ABC Power & Light Co.
Regional Entity: ERCOT [1]
Reporting (Calendar) Year: 2008

AC/DC Back-to-Back Converter Sustained and Momentary Outage Data

													Cause Codes		
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
Row No.	Event ID Code	Voltage Class	Converter Station Name	NA	NA	TO Element Identifier (AC/DC BTB)	NA	Fault Target	Outage Initiation Code	Start Time (dd/mm/yyyy hh:mm) (GMT)	Outage Duration (hours) [2]	Outage Duration (minutes) [2]	Initiating Cause Code	Sustained Cause Code [3]	Outage Mode
1	D-2008	200-299 kV	Grey	NA	NA	Grey#1	NA	Phase target	Element-Initiated Outage	5/5/2008 13:04	0	56	Lightning	Relay and/or Control Misoperation	Single Mode Outage
2				NA	NA		NA								
3				NA	NA		NA								
4				NA	NA		NA								
5				NA	NA		NA								
6				NA	NA		NA								
7				NA	NA		NA								
8				NA	NA		NA								
9				NA	NA		NA								
10				NA	NA		NA								
11				NA	NA		NA								
12				NA	NA		NA								

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook.

[2] Report zero hours and zero minutes Outage Duration for Momemtary Outages

[3] For Momentary Outages, enter "NA-Momentary"

Appendix 5 Form for Event ID Code Data

Form 5 — CONFIDENTIAL INFORMATION

Transmission Owner (TO): ABC Power & Light Co.
Regional Entity: ERCOT [1]
Reporting (Calendar) Year: 2008

Event Type No.	Table 1 Category from the TPL	Description
10	B	Automatic Outage of an AC Circuit or Transformer with normal clearing time.
20	B	Automatic Outage of a DC Circuit with normal clearing time.
30	C	Automatic Outage of two ADJACENT AC Circuits on the same structure with normal clearing
40	C	Automatic Outage of two ADJACENT DC Circuits on the same structure with normal clearing
50	NA	Other - please describe the event

Event ID Code Data

Row No.	(A) Event ID Code	(B) Event Type No. [2]	(C) Description of Event Type No. 50 (Other) [3]	(D) Disturbance Report Filed [4]
1	A-2008	10		Don't know
2	B-2008	20		Yes
3	C-2008	10		No
4	D-2008	10		No
5				
6				
7				
8				

Notes:

[1] If a TO owns assets in a different NERC Region, provide data for each Region in a separate workbook
[2] See Table above
[3] Provide a brief description of the outage (for Event Type No. 50 only)
[4] Was an OE-417 or EOP-004 filed at NERC that was associated with the Event?

Appendix 6 TADS Definitions

The TADS Definitions is a separate document with its own page numbering.

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC
Transmission Availability Data System (TADS)
DEFINITIONS

June 7, 2007

Table of Contents

A. TADS Population Definitions

1. Element

The following are Elements for which TADS data are to be collected:

1. AC Circuits ≥ 200 kV (Overhead and Underground)
2. Transformers with ≥ 200 kV low-side voltage
3. AC/DC Back-to-Back Converters with ≥ 200 kV AC voltage, both sides
4. DC Circuits with ≥ +/-200 kV DC voltage

2. AC Circuit

A set of AC overhead or underground three-phase conductors that are bound by AC Substations. Radial circuits are AC Circuits. See the Transformer exclusion in "In-Service State."

The boundary of an AC Circuit extends to the transmission side of an AC Substation. The circuit breaker or disconnect switch are not considered part of the AC Circuit but instead are defined as part of the AC Substation. The AC Circuit includes the conductor, transmission structure, joints and dead-ends, insulators, ground wire, and other hardware, including in-line switches.

3. Transformer

A bank comprised of three single-phase transformers or a single three-phase transformer. A Transformer is bounded by its associated switching or interrupting devices.

4. AC Substation

An AC Substation includes the circuit breakers and disconnect switches which define the boundaries of an AC Circuit, as well as other facilities ≥ 200 kV such as surge arrestors, buses, Transformers, wave traps, potential and current transformers, relays, motorized devices, grounding switches, shunt or series capacitors, and reactors.

5. AC/DC Terminal

A terminal that includes all AC and DC equipment needed for DC operation: PLC (power-line carrier) filters, AC filters, reactors and capacitors, Transformers, DC valves, smoothing reactors and DC filters. On the AC side, an AC/DC Terminal is normally bound by AC breakers at the AC Substation bus where it is connected. On the DC side, it is bound by DC converters and filters.

6. AC/DC Back-to-Back Converter

Two AC/DC Terminals in the same location with a DC bus between them. The boundaries are the AC breakers on each side.

7. DC Circuit

One pole of an Overhead or Underground DC line operating at greater than +/- 200 kV DC and which is bound by an AC/DC Terminal on each end.

8. Overhead Circuit

An AC or DC Circuit that is not an Underground Circuit. A cable conductor AC or DC Circuit inside a conduit which is *not* below the surface is an Overhead Circuit. A circuit

that is part Overhead and part Underground is to be classified based upon the majority characteristic (Overhead Circuit or Underground Circuit) using Circuit Miles.

9. Underground Circuit

An AC or DC Circuit that is below the surface, either below ground or below water. A circuit that is part Overhead Circuit and part Underground Circuit is to be classified based upon the majority characteristic (Overhead Circuit or Underground Circuit) using Circuit Miles.

10. Circuit Mile

One mile of either a set of AC three-phase conductors in an Overhead or Underground AC Circuit, or one pole of a DC Circuit. A one mile-long, AC Circuit tower line that carries two three-phase circuits (i.e., a double-circuit tower line) would equate to two Circuit Miles. A one mile-long, DC tower line that carries two DC poles would equate to two Circuit Miles. Also, a one mile-long, common-trenched, double-AC circuit Underground duct bank that carries two three-phase circuits would equate to two Circuit Miles.

11. Multi-Circuit Structure Mile

A one-mile linear distance of sequential structures carrying multiple Overhead AC or DC Circuits.

12. Voltage Class

The following voltages classes will be used for reporting purposes:

1. 200 – 299 kV
2. 300 – 399 kV
3. 400 – 499 kV
4. 500 – 599 kV
5. 600 – 799 kV

For Transformers, the Voltage Class reported will be the high-side voltage, even though the cut-off voltage used in the definition is referenced on the low-side.

B. Outage Reporting Definitions

1. Automatic Outage

An outage is triggered by an automatic protection device, resulting in a normally in-service Element that is not in an In-Service State; e.g., there is a partial or full loss of continuous power flow through the Element to the system. A successful AC single-pole (phase) reclosing event is not an Automatic Outage.

2. Momentary Outage:

An Automatic Outage with an Outage Duration less than 1 minute. If the circuit recloses and trips again within less than a minute of the initial outage, it is only considered one outage. The circuit would need to remain in service for longer than one minute between the breaker operations to be considered as two outages.

3. Sustained Outage:

An Automatic Outage with an Outage Duration of a minute or greater.

4. In-Service State

An Element that is energized and fully connected to the system. An AC Circuit is considered to be in-service even though Transformers and their associated switching or interrupting devices are not in service. The illustrations below indicate the special handling of Transformers as they relate to an AC Circuit outage.

Figure 1

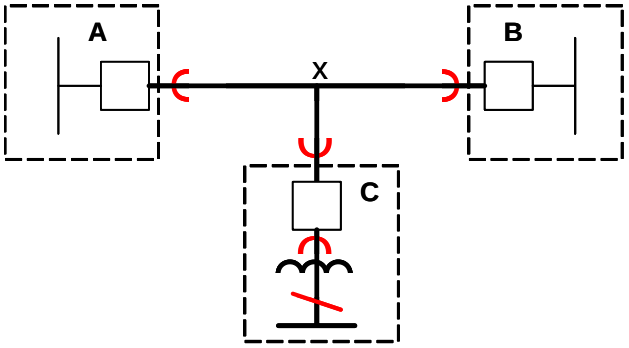
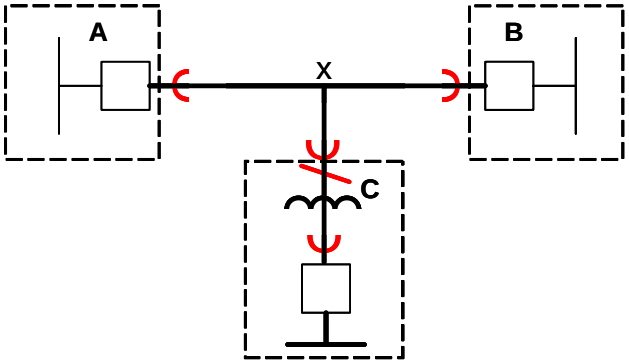


Figure 2



In both figures, the AC Circuit is bounded by AC Substations "A," "B," and "C" as indicated by the red arcs. Note that the Transformer in either figure may *or* may not be a TADS Transformer (i.e., one with a low-side voltage ≥ 200 kV). The Transformer's boundaries are the red disconnect switch and the red arc before the breaker.

Assume that each Transformer is out of service. Power cannot flow through the portion of the AC Circuit from "x" to Substation C because of the Transformer outage. Nevertheless, if all other portions of the AC Circuit are in service, the entire AC Circuit is considered to be in an In-Service State even if the Transformer is out of service.

5. Substation, Terminal, or Converter Name

For Automatic Outages of AC Circuits and DC Circuits, the termination name at each end of the circuit will be reported to help identify the geography of where the circuit is located. For AC Circuits, these are the AC Substation Names; for DC Circuits, these are the AC/DC Terminal Names. For AC/DC Back-to-Back Converters, this is the Converter Station Name.

6. TO Element Identifier

An optional alphanumeric name that the TO may enter to identify the Element which is outaged (e.g., a circuit name.)

7. Outage Start Time

The date (mm/dd/yyyy) and time (hh:mm), rounded to the minute, that the Automatic Outage of an Element started. Outage Start Time is expressed in Greenwich Mean Time [a.k.a., Coordinated Universal Time (UTC)], not local time.

8. Outage Duration

The amount of time from the Outage Start Time to the when the Element is fully restored to original or to normal configuration, including equipment replacement. Outage Duration is expressed as hours and minutes, rounded to the nearest minute. Momentary

Outages are assigned a time of zero Outage Duration. TADS data is reported on a calendar-year basis, and the TADS Data Reporting Instructions address the recording of the Outage Durations of an Sustained Outage that starts in one calendar year and concludes in another calendar year.

9. Event

An Event is a transmission incident that results in the Sustained or Momentary outage of one or more Elements.

10. Event Identification (ID) Code

A unique alphanumeric identifier assigned by the Transmission Owner that to an Event. Because outages that begin in one reporting year and end in the next reporting year will have the same Event ID Code, the code must have the reporting year appended to it to ensure its uniqueness. For example, an Event ID Code may be W324-2008. This unique Event ID Code establishes an easy way to identify which Automatic Outages are related to one another as defined by their Outage Mode Codes (see Section D).

1. An Event associated a Single Mode Automatic Outage with a will have a just one Event ID Code.
2. Each outage in a related set of two or more outages (e.g., Dependant Mode, Dependent Mode Initiating, Common Mode, or Common Mode Initiating) shall be given the same Event ID Code.

11. Event Type Number

A code that describes the type of Automatic Outage. The following Event Type Numbers will be used initially:

Event Type No.	Table 1 Category from the TPL Standards	Description
10	B	Automatic Outage of an AC Circuit or Transformer with normal clearing time.
20	B	Automatic Outage of a DC Circuit with normal clearing time.
30	C	Automatic Outage of two ADJACENT AC Circuits on the same structure with normal clearing time.
40	C	Automatic Outage of two ADJACENT DC Circuits on the same structure with normal clearing time.
50	NA	Other - please describe the event

12. Fault Type

The descriptor of the fault, if any, associated with an Automatic Outage. Several choices are possible:

1. There was no target because no fault occurred
2. Phase target
3. Ground target
4. Both
5. Unknown.

C. Outage Initiation Codes

The Outage Initiation Codes describe *where* an Automatic Outage was initiated on the power system.

1. Element-Initiated Outage

An Automatic Outage of an Element that is initiated on or within the Element that is outaged.

2. Substation or Terminal-Initiated Outage

An Automatic Outage of an Element that is initiated on or within AC Substation facilities ≥ 200 kV (Substation-Initiated Outage) or an AC/DC Terminal facilities ≥ 200 kV (Terminal-Initiated Outage).

3. Other Facility-Initiated Outage

An Automatic Outage that is initiated on or within other facilities < 200 kV.

D. Outage Mode Codes

1. Single Mode Outage

An Automatic Outage of a single Element which occurred independent of any other outages.

2. Dependant Mode Initiating Outage

A Single Mode Outage that initiates subsequent Automatic Outages.

3. Dependant Mode Outage

An Automatic Outage of an Element which occurred as a result of an initiating outage, whether the initiating outage was an Elements outage or a non-Element outage.

4. Common Mode Outage

One of two or more Automatic Outages with the same Initiating Cause Code and where the outages are not consequences of each other and occur nearly simultaneously (i.e., within cycles or seconds of one another).

5. Common Mode Initiating Outage

A Common Mode Outage that initiates one or more subsequent Automatic Outages.

E. Cause Codes Types

1. Initiating Cause Code

The Cause Code that describes the initiating cause of the outage.

2. Sustained Cause Code

The Cause Code that describes the cause that contributed to the longest duration of the outage.

For example, a lightning strike on an AC Circuit (the Initiating Cause Code) that should have cleared normally may have become a Sustained Outage because of relay misoperation (the Sustained Cause Code). Momentary Outages do not have a Sustained Cause Code.

F. Cause Codes

1. Weather, excluding lightning

Automatic Outages caused by weather such as snow, extreme temperature, rain, hail, fog, sleet/ice, wind (including galloping conductor), tornado, microburst, or dust storm.

2. Lightning

Automatic Outages caused by lightning.

3. Environmental

Automatic Outages caused by environmental conditions such as earth movement (including earthquake, subsidence, earth slide), flood, geomagnetic storm, or avalanche.

4. Contamination

Automatic Outages caused by contamination such as bird droppings, dust, corrosion, salt spray, industrial pollution, smog, or ash.

5. Foreign Interference

Automatic Outages caused by foreign interference from such objects such as an aircraft, machinery, a vehicle, a train, a boat, a balloon, a kite, a bird (including streamers), an animal, flying debris not caused by wind, and falling conductors from one line into another. Foreign Interference is not due to an error by a utility employee or contractor. See item 12, "Human Error."

6. Fire

Automatic Outages caused by fire or smoke.

7. Vandalism, Terrorism or Malicious Acts

Automatic Outages caused by intentional activity such as shot conductors or insulators, removing bolts from structures, and bombs.

8. Failed Equipment

Automatic Outages caused by the failure of equipment. Use this code only when the equipment failed even though it was operated within design specifications. The failed equipment could be (i) a component of an Element (such as a failed insulator), (ii) part of an AC Substation (such as a failed circuit breaker), or (iii) other facilities < 200 kV.

9. Relay and/or Control Misoperation

Automatic Outages caused by relay and/or control initiated operations when not desired or the failure to operate when desired. This category also includes incorrect relay or control settings that do not coordinate with other protective devices.

10. Vegetation

Automatic Outages caused by vegetation.

11. Power System Condition

Automatic Outages caused by power system conditions such as instability, overload trip, out-of-step, abnormal voltage, abnormal frequency, unique system configurations (e.g.,

an abnormal terminal configuration due to existing condition with one breaker already out of service).

12. Human Error

Automatic Outages caused by any incorrect action traceable to employees and/or contractors for companies operating, maintaining, and/or providing assistance to the Transmission Owner will be identified and reported in this category. Also, any human failure or interpretation of standard industry practices and guidelines that cause an outage will be reported in this category.

13. Unknown

Automatic Outages caused by unknown causes should be reported in this category.

14. Other

Automatic Outages for which the cause is known; however, the cause is not included in the above list.

Appendix 7 Inventory Data Examples

The following examples demonstrate a calculation method that can be used to complete the TADS inventory spreadsheet data on Form 3.1 associated with the number of AC Circuits, the number of Circuit Miles, and the number of Multi-Circuit Structure Miles. However, the methods used to determine the inventory data associated with the number of AC Circuits can be used for any Element.

The TADS Task Force acknowledges that other calculation methods can be utilized to complete the inventory spreadsheet. Every reporting entity must determine the method that is best for their organization.

Base Model:

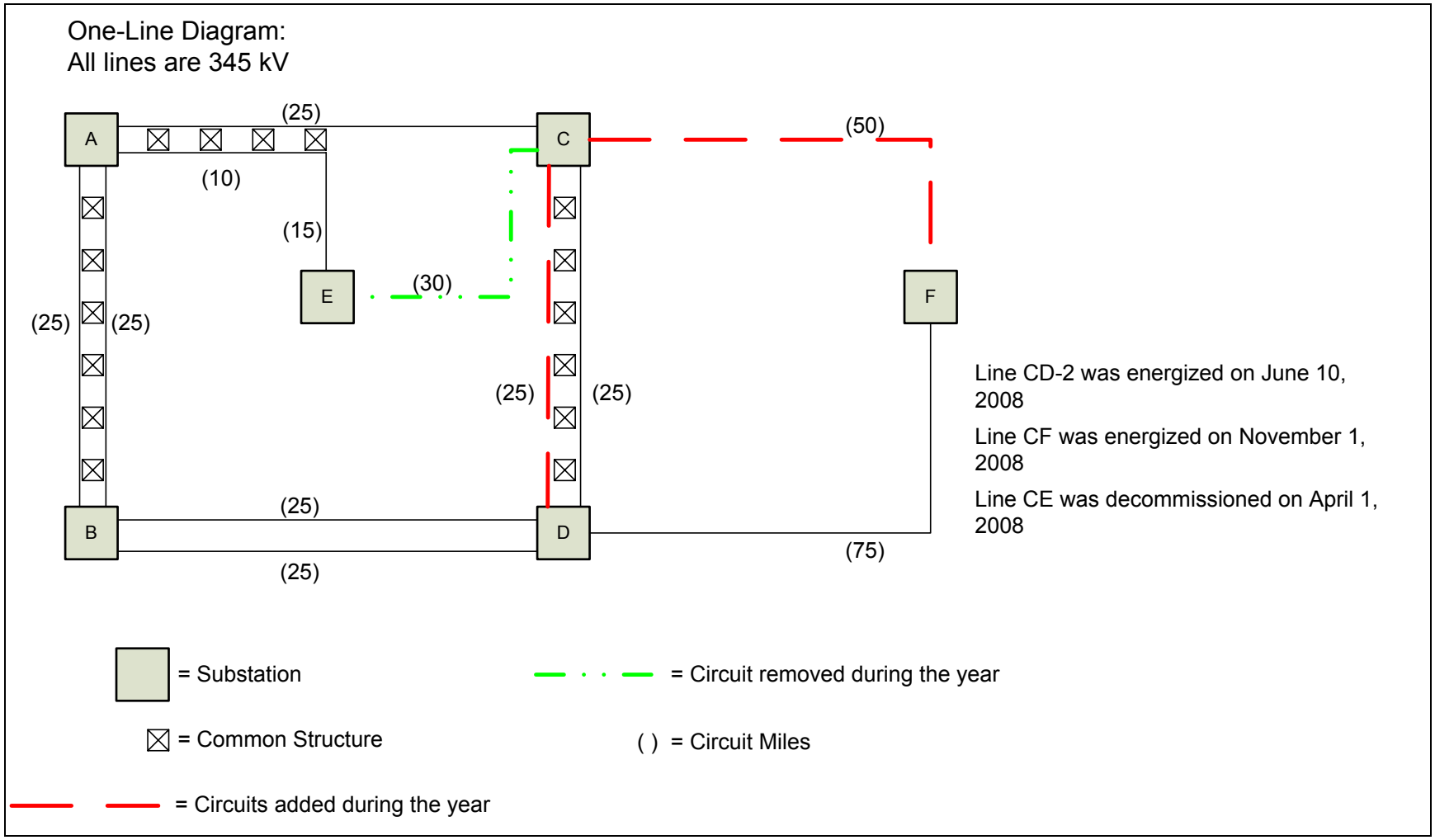


Figure 1: One-line diagram showing both new and removed circuits

Calculation 1: No. of AC Circuits and Circuit Miles that were in-service at the end of the reporting year.

Circuit Miles calculations (Elements at the end of the year)	
Element Identification	Circuit Miles
AB-1	25
AB-2	25
BD-1	25
BD-2	25
AE	30
AC	25
CD-1	25
DF	75
CD-2	25
CF	50
Total Circuit Miles	330

10 would be entered into the column titled "No. of Circuits (End of Year)"
330 would be entered into the column titled "Circuit miles (End of Year)"

Calculation 2: No. of AC Circuits and Circuit Miles that were added or removed during the reporting year.

Circuit Miles Calculations (Elements added, retired or changed during the year)				
Element Identification	Circuit Miles	Number of Days from In-Service date to the end of the reporting year	Equivalent Annual Element Value	Equivalent Circuit Miles
CD-2	25	205	.56	14.04
CF	50	61	.17	8.36
Totals for Elements added			.73	22.4
Element Identification	Circuit Miles	Number of days from retirement/change date to the beginning of the reporting year	Equivalent Annual Element Value	Equivalent Circuit Miles
CE	30	91	.25	7.4
Total for Elements retired or changed			.25	7.4

2 would be entered into the column titled "No. of Circuits Added"
.73 would be entered into the column titled "Equivalent Annual No. of Circuits Added [3]"

(205/366) + (61/366) = .73 **(2008 is a leap year)**

75 would be entered into the column titled "No. of Circuit Miles for Circuits Added"
22.4 would be entered into the column titled "Equivalent Annual No. of Circuit Miles for Circuits Added [3]"

25 Miles (205/366) + 50 Miles (61/366) = 22.4 **(2008 is a leap year)**

1 would be entered into the column titled "No. of Circuits removed"
.25 would be entered into the column titled "Equivalent Annual No. of Circuits Removed [3]"

(91/366) = .25 **(2008 is a leap year)**

30 would be entered into the column titled "No. of Circuit Miles for Circuits Removed"
7.4 would be entered into the column titled "Equivalent Annual No. of Circuit Miles for Circuits Removed [3]"

30 Miles (91/366) = 7.4 **(2008 is a leap year)**

Calculation 3: Multi-Circuit Structure Miles for AC Circuits that were in-service at the end of the reporting year.

Multi-Circuit Structure Miles Calculations (Elements at the end of the year)	
Element Identification	Multi-Circuit Structure Miles
AB-1 & AB-2	25
AC & AE	10
CD-1 & CD-2	25
Total Structure Miles	60

60 would be entered into the column titled "Multi-Circuit Structure Miles (End of Year)"

Calculation 4: Multi-Circuit Structure Miles for AC Circuits that were added or removed during the reporting year.

Multi-Circuit Structure Miles Calculations (Elements added during the year)			
Element Identification	Multi-Circuit Structure Miles	Number of Days from In-Service date to the end of the reporting year	Equivalent Multi-Circuit Structure Miles
CD-1 & CD-2	25	205	14.04
Total Equivalent Structure Miles added during the year			14.04

25 would be entered into the column titled "Multi-Circuit Structure Miles for Circuits Added"
14.04 would be entered into the column titled "Equivalent Annual No. of Multi-Circuit Structure Miles for Circuits Added"

25 Structure Miles (205/366) = 14.04 **(2008 is a leap year)**

Situation 1:

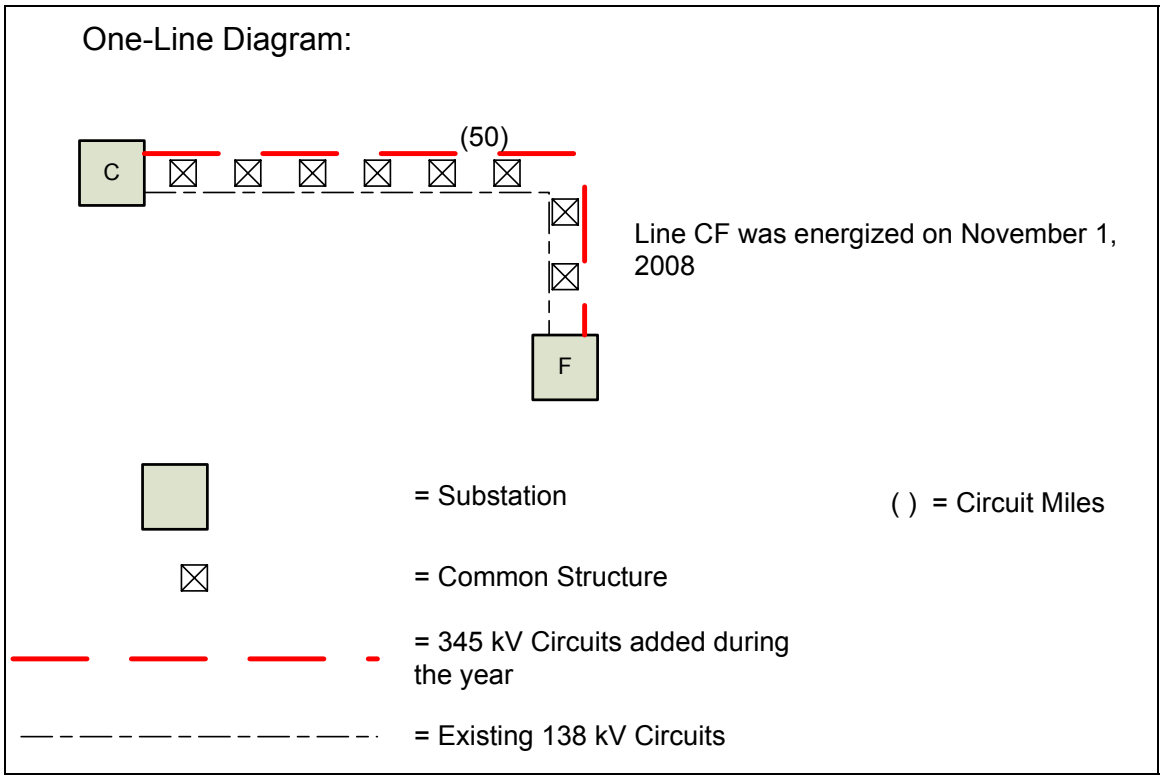


Figure 2: The addition of a TADS Element on a common structure with a non-TADS Element

In this situation AC Circuit CF was placed on a common structure with an existing 138 kV circuit. For TADS this common structure situation shall not be included in the common structure mile calculation. TADS reporting includes only those common structure miles where two or more TADS Elements share a common structure.

The calculations for AC Circuit CF are the same as in the Base Model.

Base Case and Situation 1 Inventory Data, Form 3.1

	AC and DC Circuit Inventory Data												
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Row No.	Voltage Class [2]	No. of Circuits (End-of-Year)	Circuit Miles (End-of-Year)	No. of Circuits Added	Equivalent Annual No. of Circuits Added [3]	No. of Circuit Miles for Circuits Added	Equivalent Annual No. of Circuit Miles for Circuits Added [3]	No. of Circuits Removed	Equivalent Annual No. of Circuits Removed [3]	No. of Circuit Miles for Circuits Removed	Equivalent Annual No. of Circuit Miles for Circuits Removed [3]	CALCULATED Annual Equivalent No. of Circuits = B-D+E+I	CALCULATED Annual Eqivalent No. of Circuit Miles = C-F+G+K
1	200-299 kV AC Overhead											0.0	0.0
2	300-399 kV AC Overhead	10.0	330.0	2.0	0.73	75.0	22.4	1.0	0.25	30.0	7.4	8.980	284.8

	Muliti-Circuit Structure Miles Inventory Data												
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
	Voltage Class [2]	NA	Multi-Circuit Structure Miles (End-of-Year)	NA	NA	No. of Multi-Circuit Structure Miles for Circuits Added	Equivalent Annual No. of Multi-Circuit Structure Miles for Cicuits Added [5]	NA	NA	No. of Multi-Structure Structure Miles for Circuits Removed	Equivalent Annual No. of Multi-Circuit Structure Miles of Circuits Removed [6]	NA	CALCULATED Annual Eqivalent No. of Multi-Circuit Structure Miles = C-F+G+K
17	200-299 kV AC	NA		NA	NA			NA	NA			NA	
18	300-399 kV AC	NA	60	NA	NA	25	14.04	NA	NA	0	0	NA	49.04

Situation 2:

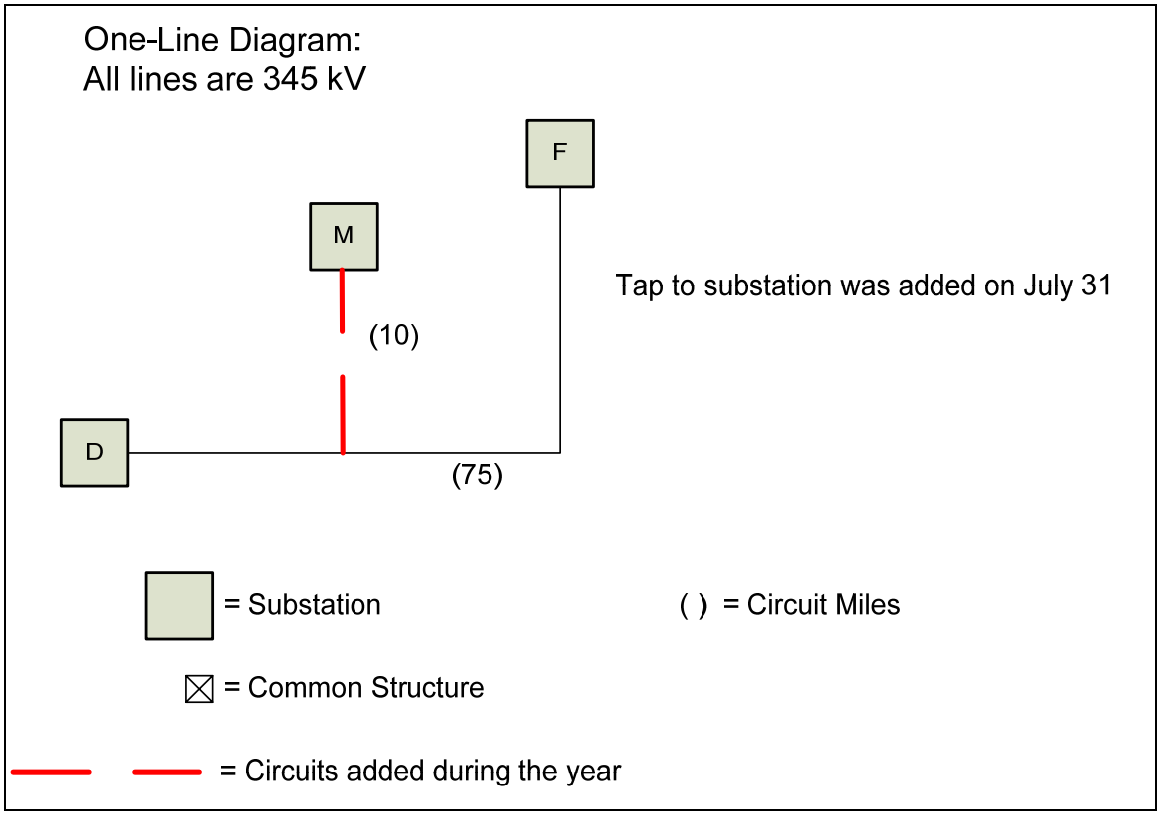


Figure 3: Tap addition

In this example we are demonstrating how to calculate your equipment data if in-addition to the work that was done in the Base Model you added a 10 mile tap off line DF.

Calculation 1a: No. of AC Circuits and Circuit Miles that were in-service at the end of the reporting year.

Circuit Miles calculations (Elements at the end of the year)	
Element Identification	Circuit Miles
AB-1	25
AB-2	25
BD-1	25
BD-2	25
AE	30
AC	25
CD-1	25
DFM	85
CD-2	25
CF	50
Total Circuit Miles	340

10 would be entered into the column titled "No. of Circuits (End of Year)"
340 would be entered into the column titled "Circuit miles (End of Year)"

Calculation 2a: No. of AC Circuits and Circuit Miles that were added or removed during the reporting year.

Circuit Miles Calculations (Elements added, retired or changed during the year)				
Element Identification	Circuit Miles	Number of days from in-service date through the end of the reporting year	Equivalent Annual Element Value	Equivalent Circuit Miles
CD-2	25	205	.56	14.04
CF	50	61	.17	8.36
DFM	85	154	.42	35.7
Totals for Elements added			1.15	58.1
Element Identification	Circuit Miles	Number of days from retirement/change date to the beginning of the reporting year	Equivalent Annual Element Value	Equivalent Circuit Miles
CE	30	91	.25	7.4
DF	75	212	.58	43.5
Total for Elements retired or changed			.83	50.9

3 would be entered into the column titled "No. of Circuits Added"
1.15 would be entered into the column titled "Equivalent Annual No. of Circuits Added [3]"

(205/366) + (61/366) + (154/366) = 1.15 **(2008 is a leap year)**

160 would be entered into the column titled "No. of Circuit Miles for Circuits Added"
58.1 would be entered into the column titled "Equivalent Annual No. of Circuit Miles for Circuits Added [3]"

25 Miles (205/366) + 50 Miles (61/366) + 85 Miles (154/366) = 58.1
(2008 is a leap year)

2 would be entered into the column titled "No. of Circuits removed"
.83 would be entered into the column titled "Equivalent Annual No. of Circuits Removed [3]"

(91/366) + (212/366) = .83 **(2008 is a leap year)**

105 would be entered into the column titled "No. of Circuit Miles for Circuits Removed"
50.9 would be entered into the column titled "Equivalent Annual No. of Circuit Miles for Circuits Removed [3]"

30 Miles (91/366) 75 Miles (212/366) = 50.9 **(2008 is a leap year)**

Calculation 3a: Multi-Circuit Structure Miles for AC Circuits that were in-service at the end of the reporting year.

This calculation is the same as in the Base Model.

Calculation 4a: Multi-Circuit Structure Miles for AC Circuits that were added or removed during the reporting year.

This calculation is the same as in the Base Model.

Situation 2 Inventory Data, Form 3.1

AC and DC Circuit Inventory Data												
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Voltage Class [2]	No. of Circuits (End-of-Year)	Circuit Miles (End-of-Year)	No. of Circuits Added	Equivalent Annual No. of Circuits Added [3]	No. of Circuit Miles for Circuits Added	Equivalent Annual No. of Circuit Miles for Circuits Added [3]	No. of Circuits Removed	Equivalent Annual No. of Circuits Removed [3]	No. of Circuit Miles for Circuits Removed	Equivalent Annual No. of Circuit Miles for Circuits Removed [3]	CALCULATED Annual Equivalent No. of Circuits = B-D+E+I	CALCULATED Annual Eqivalent No. of Circuit Miles = C-F+G+K
200-299 kV AC Overhead												
300-399 kV AC Overhead	10.0	340.0	3.0	1.15	160.0	58.1	2.0	0.83	105.0	50.9	8.980	289.0

Multi-Circuit Structure Miles data is the same as the Base Case.

Situation 3:

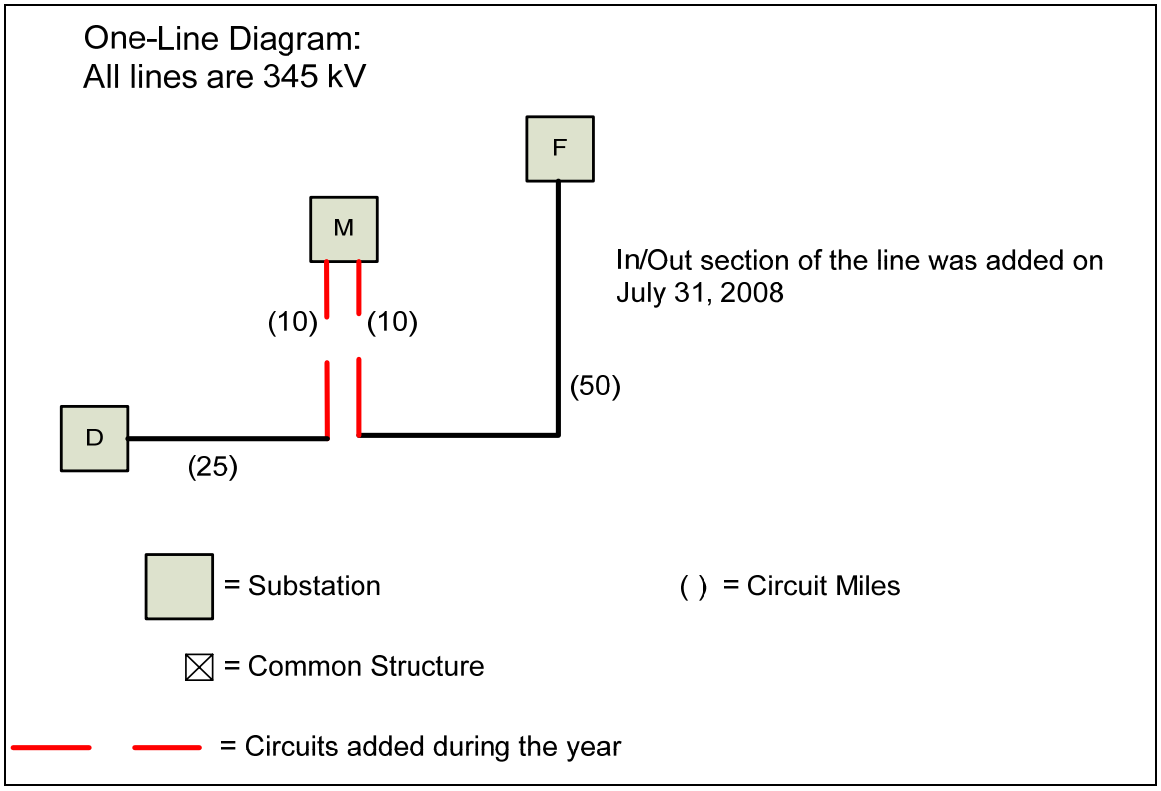


Figure 3: In/Out section addition

In this example we are demonstrating how to calculate your inventory data if in-addition to the work that was done in the Base Model you added a 10 miles section for a new substation.

Calculation 1b: No. of AC Circuits and Circuit Miles that were in-service at the end of the reporting year.

Circuit Miles calculations (Elements at the end of the year)	
Element Identification	Circuit Miles
AB-1	25
AB-2	25
BD-1	25
BD-2	25
AE	30
AC	25
CD-1	25
DM	35
MF	60
CD-2	25
CF	50
Total Circuit Miles	350

11 would be entered into the column titled "No. of Circuits (End of Year)"
350 would be entered into the column titled "Circuit miles (End of Year)"

Calculation 2b: No. of AC Circuits and Circuit Miles that were added or removed during the reporting year.

Circuit Miles Calculations (Elements added, retired or changed during the year)				
Element Identification	Circuit Miles	Number of days from in-service date through the end of the reporting year	Equivalent Annual Element Value	Equivalent Circuit Miles
CD-2	25	205	.56	14.04
CF	50	61	.17	8.36
DM	35	154	.42	14.7
MF	60	154	.42	25.2
Totals for Elements added			1.57	62.3
Element Identification	Circuit Miles	Number of days from retirement/change date to the beginning of the reporting year	Equivalent Annual Element Value	Equivalent Circuit Miles
CE	30	91	.25	7.4
DF	75	212	.58	43.5
Total for Elements retired or changed			.83	50.9

4 would be entered into the column titled "No. of Circuits Added"
1.57 would be entered into the column titled "Equivalent Annual No. of Circuits Added [3]"

(205/366) + (61/366) + (154/366) + (154/366) = 1.57 **(2008 is a leap year)**

170 would be entered into the column titled "No. of Circuit Miles for Circuits Added"
62.3 would be entered into the column titled "Equivalent Annual No. of Circuit Miles for Circuits Added [3]"

25 Miles (205/366) + 50 Miles (61/366) + 35 Miles (154/366) + 60 Miles (154/366) = 62.3
(2008 is a leap year)

2 would be entered into the column titled "No. of Circuits removed"
.83 would be entered into the column titled "Equivalent Annual No. of Circuits Removed [3]"

(91/366) + (212/366) = .83 **(2008 is a leap year)**

105 would be entered into the column titled "No. of Circuit Miles for Circuits Removed"
50.9 would be entered into the column titled "Equivalent Annual No. of Circuit Miles for Circuits Removed [3]"

30 Miles (91/366) + 75 Miles (212/366) = 50.9 **(2008 is a leap year)**

Calculation 3b: Multi-Circuit Structure Miles for AC Circuits that were in-service at the end of the reporting year.

This calculation is the same as in the Base Model.

Calculation 4b: Multi-Circuit Structure Miles for AC Circuits that were added or removed during the reporting year.

This calculation is the same as in the Base Model.

Situation 3 Inventory Data, Form 3.1

AC and DC Circuit Inventory Data												
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Voltage Class [2]	No. of Circuits (End-of-Year)	Circuit Miles (End-of-Year)	No. of Circuits Added	Equivalent Annual No. of Circuits Added [3]	No. of Circuit Miles for Circuits Added	Equivalent Annual No. of Circuit Miles for Circuits Added [3]	No. of Circuits Removed	Equivalent Annual No. of Circuits Removed [3]	No. of Circuit Miles for Circuits Removed	Equivalent Annual No. of Circuit Miles for Circuits Removed [3]	CALCULATED Annual Equivalent No. of Circuits = B-D+E+I	CALCULATED Annual Eqivalent No. of Circuit Miles = C-F+G+K
200-299 kV AC Overhead												
300-399 kV AC Overhead	11.0	350.0	4.0	1.57	170.0	62.3	2.0	0.83	105.0	50.9	9.400	293.2

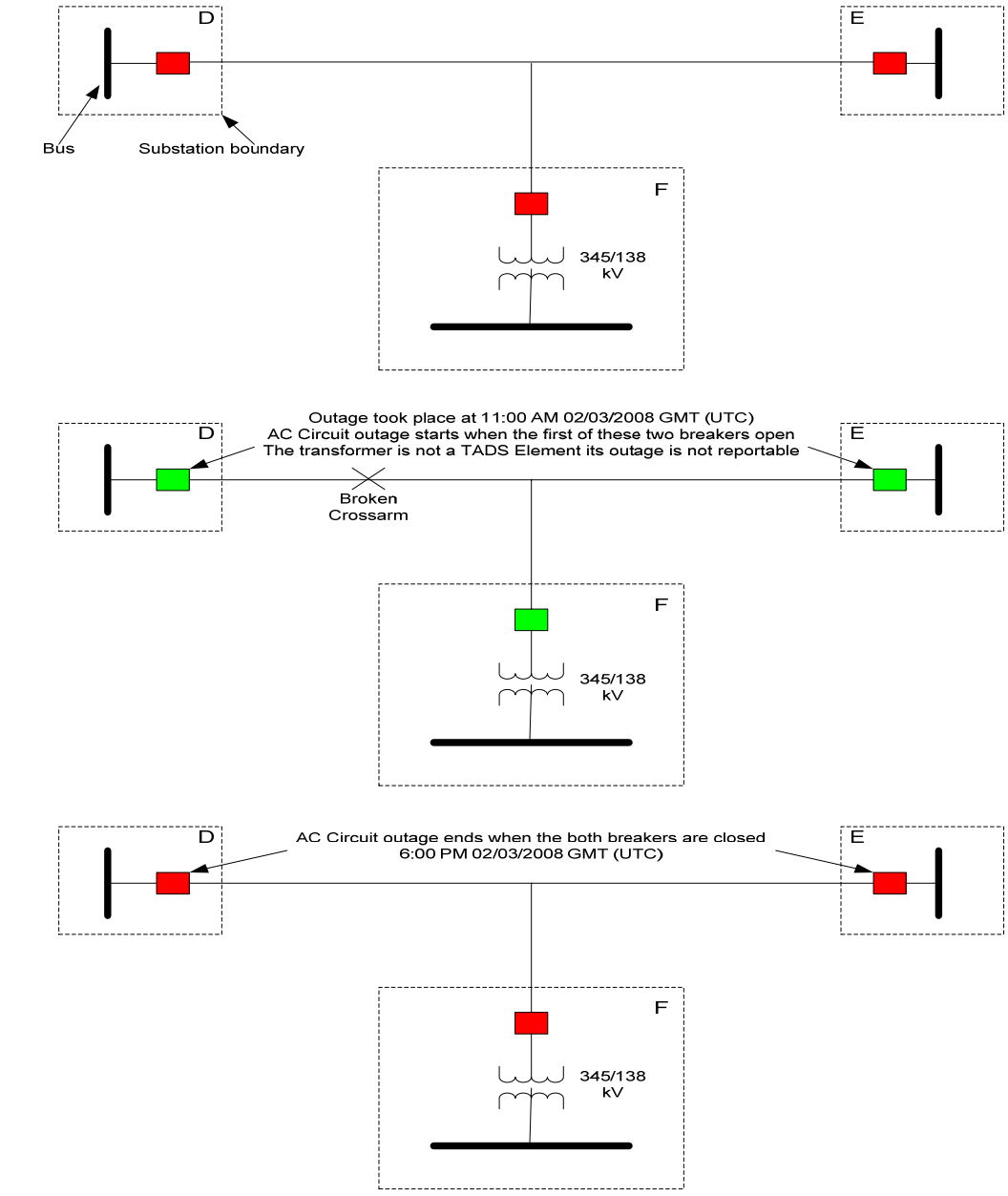
Multi-Circuit Structure Miles data is the same as the Base Case.

Appendix 8 Detailed Outage Data Examples

The following examples illustrate several AC Circuit and Transformer outage scenarios and the applicable detailed outage data for each scenario. While not all possible situations could be covered, the examples are complete enough to help with outage interpretation.

Three terminal line with a non-TADS Element

Example: Event ID Code 0001



Event ID code 0001 is a three terminal AC Circuit with a non-TADS Element attached to one of the segments. The non-TADS element is the 345/138 kV transformer.

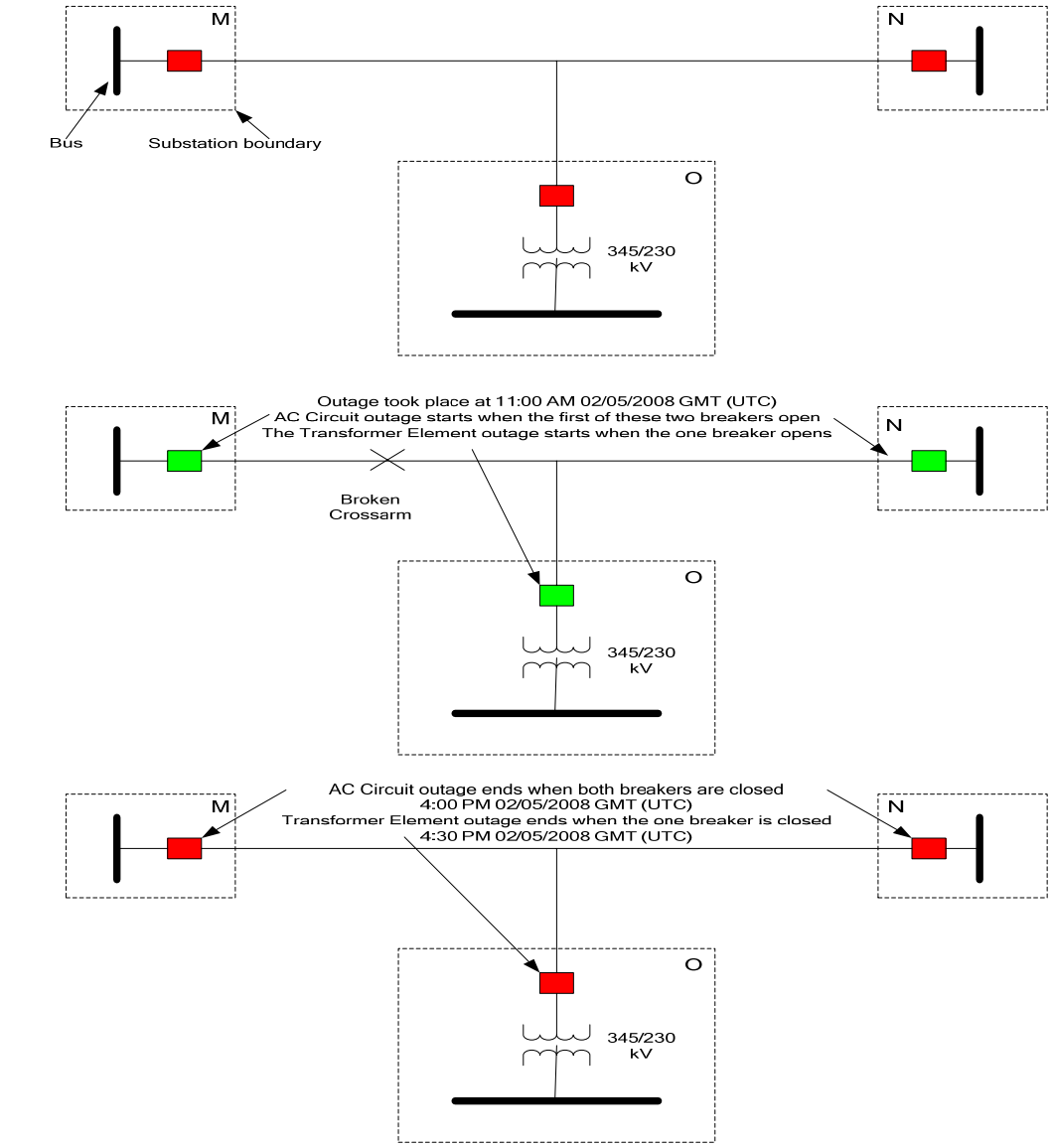
Since the transformer is not a TADS Element outages to the transformer are not reportable.

Outage Mode: Single Mode Outage

This is a Single Mode Outage because the 345/138 kV transformer is not a TADS Element.

Three terminal line with a TADS Element

Example: Event ID Code 0002



Event ID Code 0002 is a three terminal AC Circuit with a TADS Element attached to one of the segments. The TADS element is the 345/230 kV transformer.

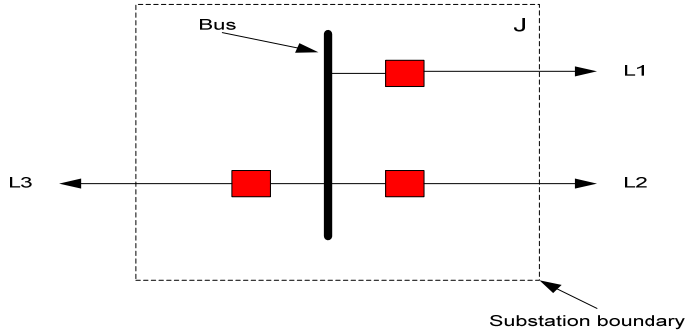
Since the transformer is TADS Element outages to the transformer are reportable.

Outage Mode: Dependent Mode Initiating Outage (For the AC Circuit)
Outage Mode: Dependent Mode Outage (For the Transformer)

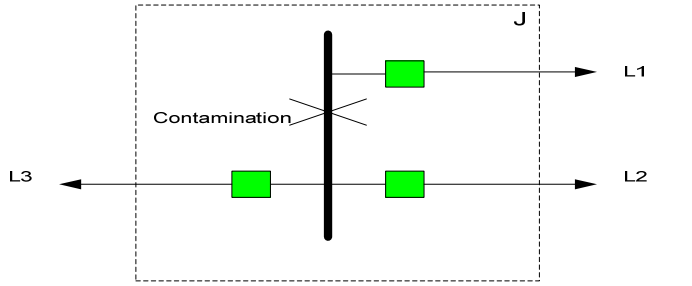
This is a Dependent Mode because the outage of the transformer is dependent on the outage of the AC Circuit.

Bus Fault that interrupts TADS Elements

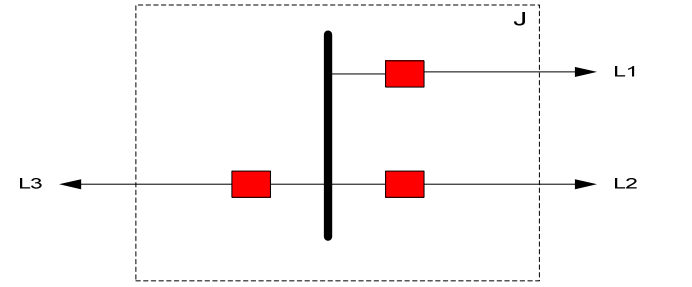
Example: Event ID Code 0003



Fault on the Bus at 6:00 PM 4/29/2008 GMT (UTC)



Individual outages are over when corresponding line breakers are placed in-service
Breakers for L1 and L2 were closed at 6:20 PM 04/29/2008 GMT (UTC)
Breaker for L3 was closed at 7:00 PM 4/29/2008 GMT (UTC)



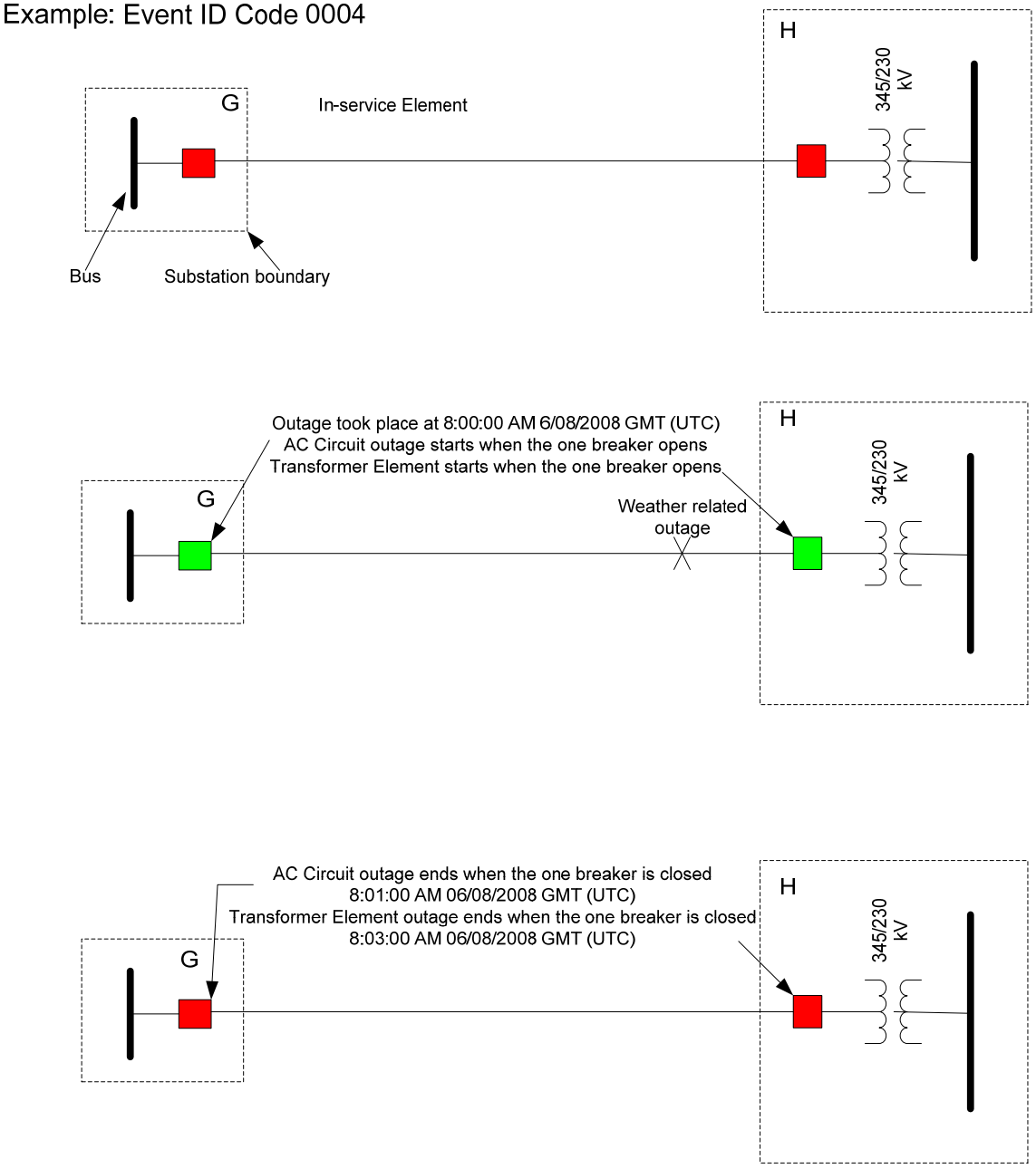
Event ID Code 0003 is an example of a 345 kV straight bus. An outage to any of the lines connected to the bus is reportable.

Outage Mode: Common Mode Outage

This is a Common Mode Outage because the outage is not the consequence of any single TADS Element.

AC Circuit that is directly connected to a TADS Transformer

Example: Event ID Code 0004



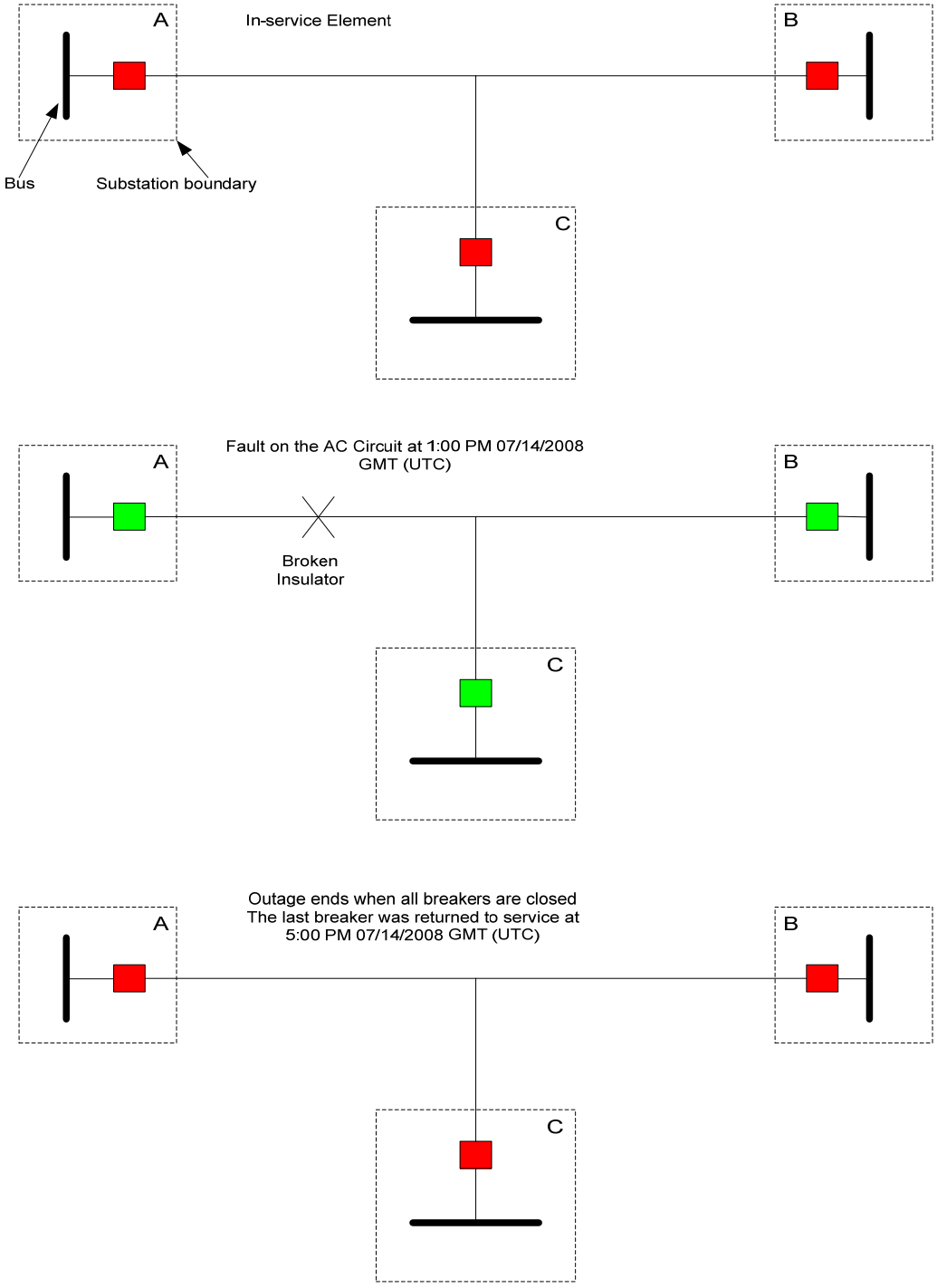
Event ID Code 0004 is an example of an AC Circuit that it connected directly to a TADS Transformer.

Outage Mode: Dependent Mode Initiating Outage (For the AC Circuit)
Outage Mode: Dependent Mode Outage (For the Transformer)

This is a Dependent Mode Outage because the outage of the transformer is due to the outage of the AC Circuit.

Three terminal AC Circuit

Example: Event ID Code 0005

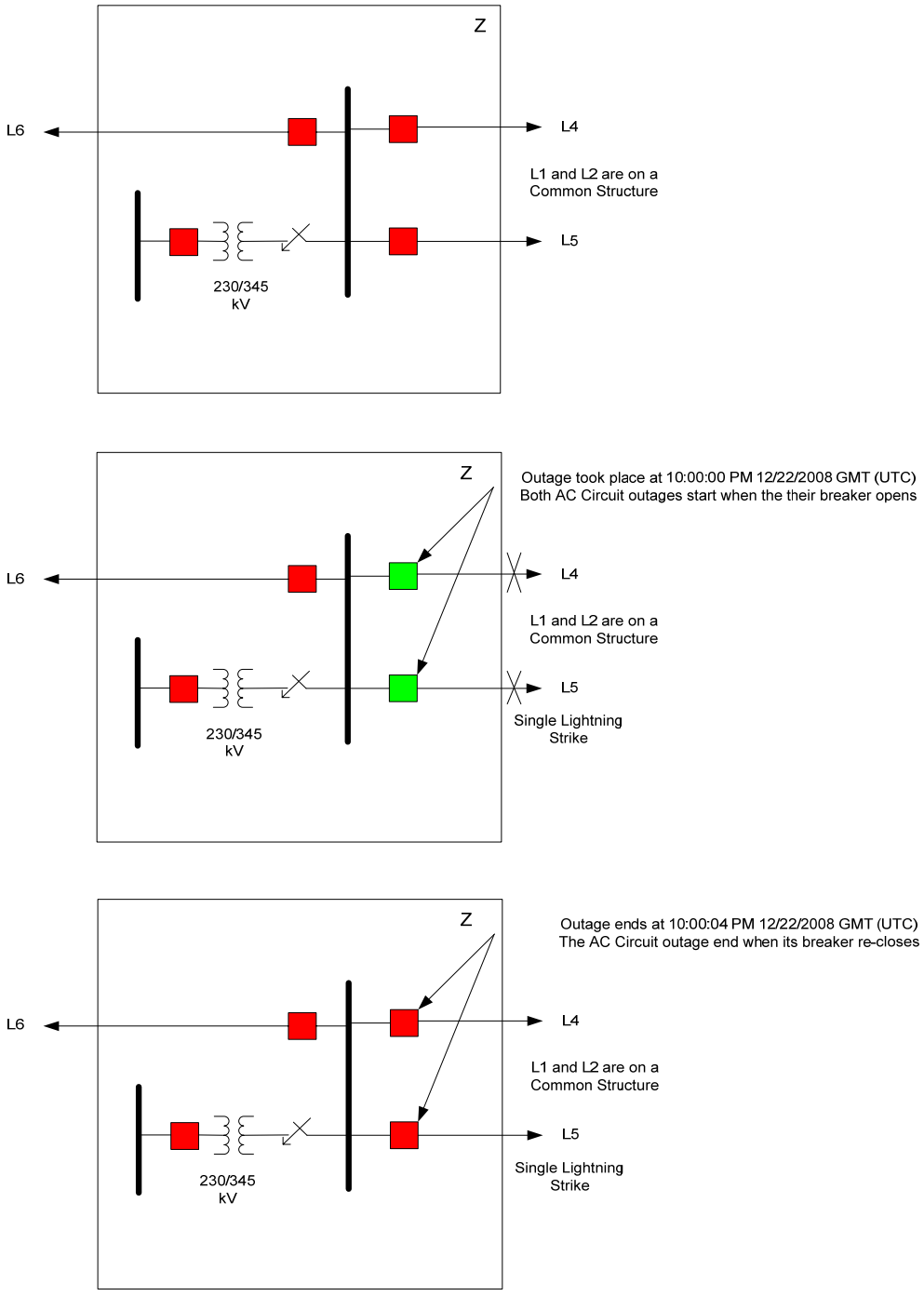


Outage Mode: Single Mode Outage

No other TADS Elements were impacted with this outage.

Common cause outage to two AC Circuits

Example: Event ID Code 0006

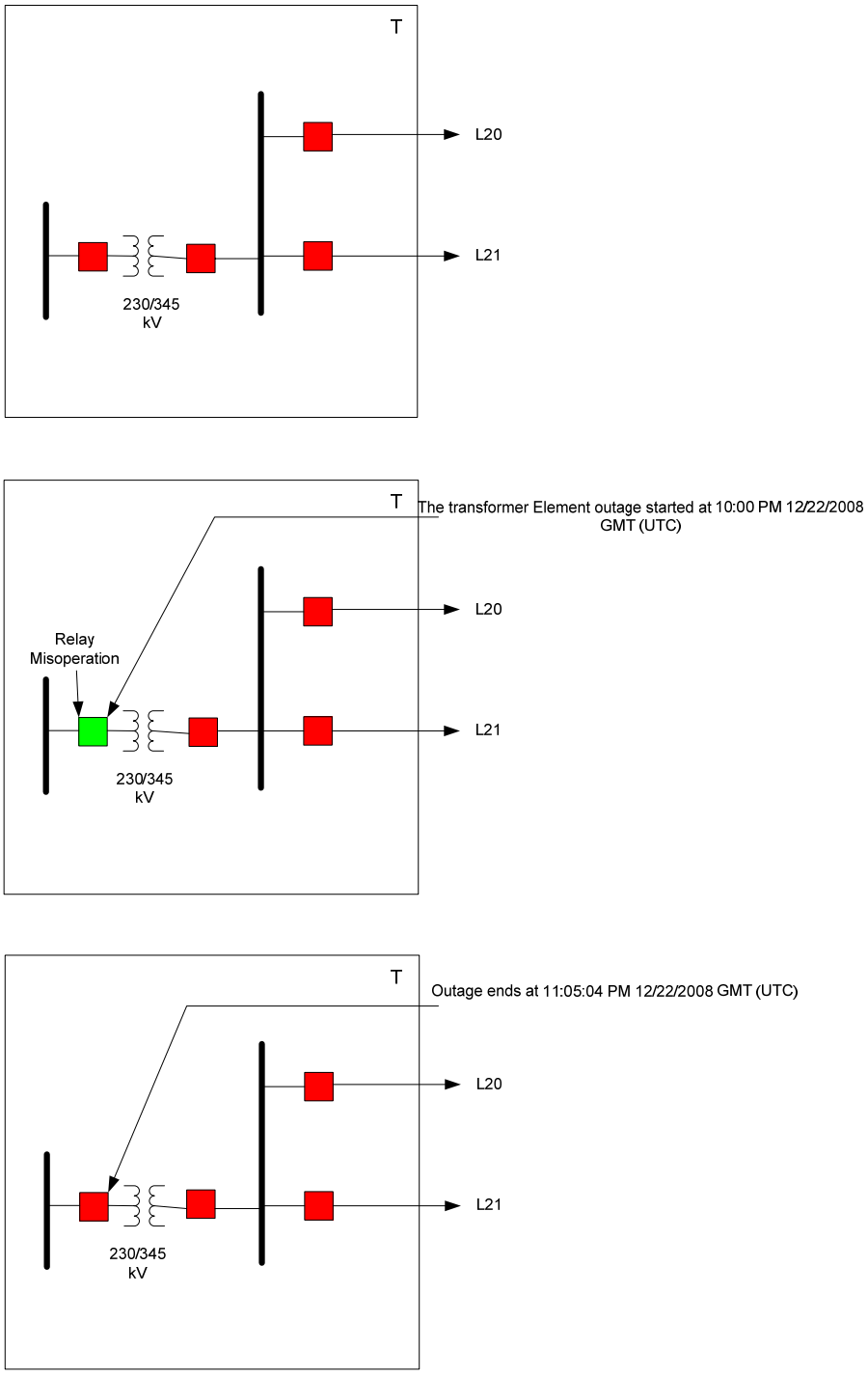


Outage Mode: Common Mode Outage

A single lightning strike cause both lines to open. The outage on either TADS Element was not a consequence of each other.

Transformer outage

Example: Event ID Code 0007

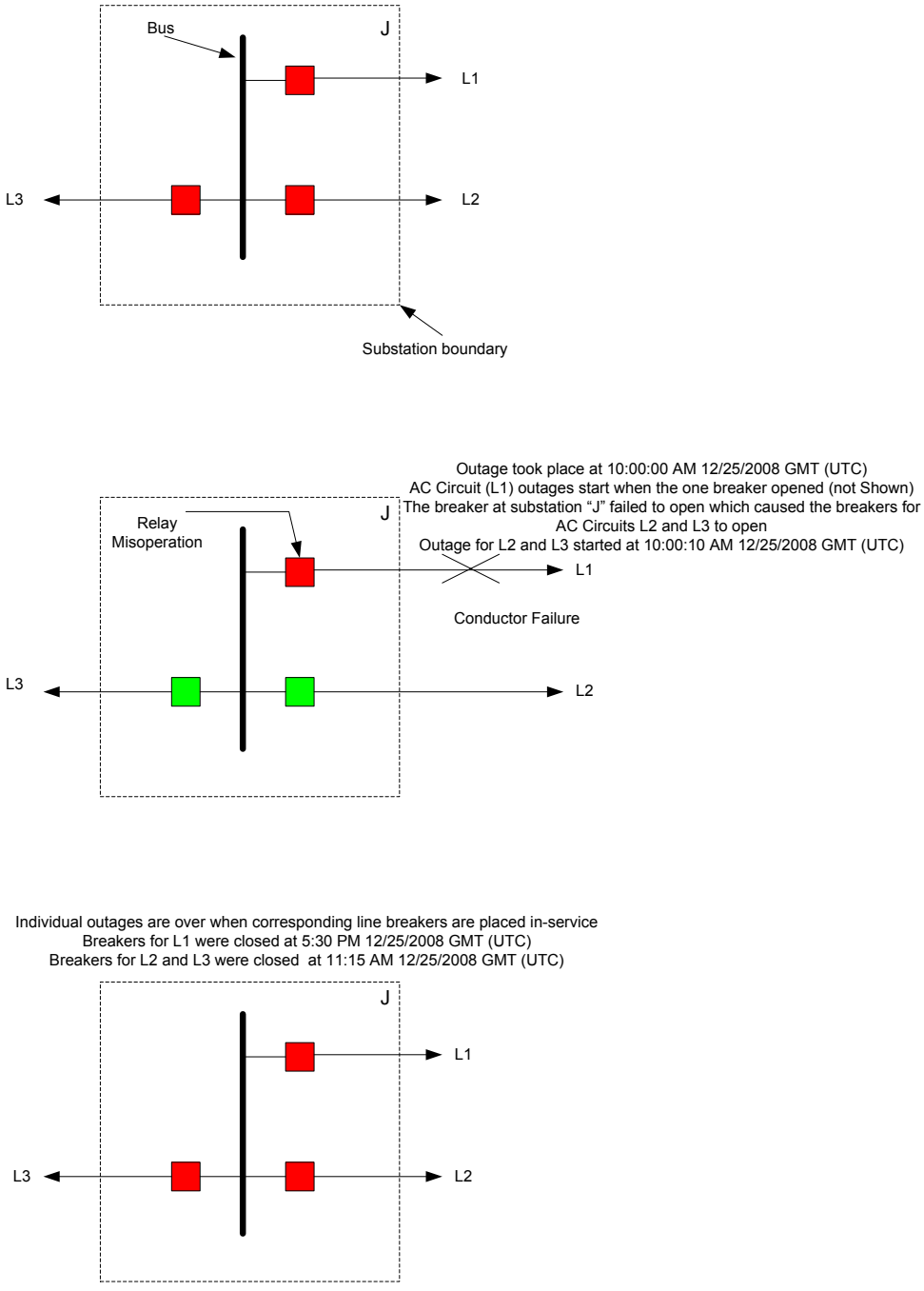


Outage Mode: Single Mode Outage

No other TADS Elements were outage because of the relay misoperation.

Line outage with a breaker failure

Example: Event ID Code 0008



Outage Mode: Dependent Mode Initiating Outage (For L1)
Outage Mode: Dependent Mode Outage (For L2 and L3)

The outages on AC Circuits L2 and L3 were due to the breaker failure on L1. If the breaker for L1 had not failed the breakers for L3 and L2 would not have opened.

Form 4.1 AC Circuit Detailed Automatic Outage Data

	AC Circuit Sustained and Momentary Outage Data														
			Circuit Substation Boundaries										Cause Codes		
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
Row No.	Event ID Code	Voltage Class	Substation Name #1	Substation Name #2	Substation Name #3	TO Element Identifier (AC Circuit)	Overhead or Underground	Fault Target	Outage Initiation Code	Start Time (dd/mm/yyyy hh:mm) (GMT)	Outage Duration (hours) [2]	Outage Duration (minutes) [2]	Initiating Cause Code	Sustained Cause Code [3]	Outage Mode
1	0001-2008	300-399 kV	D	E	F		OH	Ground target	Element-Initiated Outage	2/3/2008 11:00	7	0	Failed Equipment	Failed Equipment	Single Mode Outage
2	0002-2008	300-399 kV	M	N	O		OH	Ground target	Element-Initiated Outage	2/5/2008 11:00	5	0	Failed Equipment	Failed Equipment	Dependent Mode Initiating Outage
3	0003-2008	300-399 kV	J	K			OH	Ground target	Substation-Initiated Outage	2/5/2008 11:00	0	20	Failed Equipment	Failed Equipment	Common Mode Outage
4	0003-2008	300-399 kV	J	Q			OH	Ground target	Substation-Initiated Outage	4/29/2008 18:00	0	20	Failed Equipment	Failed Equipment	Common Mode Outage
5	0003-2008	300-399 kV	J	X			OH	Ground target	Substation-Initiated Outage	4/29/2008 18:00	1	0	Failed Equipment	Failed Equipment	Common Mode Outage
6	0004-2008	300-399 kV	G	H			OH	Phase target	Element-Initiated Outage	6/8/2008 8:00	0	1	Weather, excluding lightning	Weather, excluding lightning	Dependent Mode Initiating Outage
7	0005-2008	300-399 kV	A	B	C		OH	Phase target	Element-Initiated Outage	7/14/2008 13:00	4	0	Failed Equipment	Failed Equipment	Single Mode Outage
8	0006-2008	300-399 kV	Z	W			OH	Ground target	Element-Initiated Outage	12/22/2008 22:00	0	0	Lightning	NA- Momentary	Common Mode Outage
9	0006-2008	300-399 kV	Z	Y			OH	Ground target	Element-Initiated Outage	12/22/2008 22:00	0	0	Lightning	NA- Momentary	Common Mode Outage
10	0008-2008	300-399 kV	J	K			OH	Phase target	Element-Initiated Outage	2/25/2008 10:00	7	30	Failed Equipment	Failed Equipment	Dependent Mode Initiating Outage
11	0008-2008	300-399 kV	J	Q			OH	Phase target	Substation-Initiated Outage	2/25/2008 10:00	1	15	Relay and/or Control Misoperation	Failed Equipment	Dependent Mode Outage
12	0008-2008	300-399 kV	J	X			OH	Phase target	Substation-Initiated Outage	2/25/2008 10:00	1	15	Relay and/or Control Misoperation	Failed Equipment	Dependent Mode Outage

Form 4.3 Transformer Detailed Automatic Outage Data

	Transformer Sustained and Momentary Outage Data														
			Circuit From/To										Cause Codes		
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
Row No.	Event ID Code	High-Side Voltage Class	Located at (Substation Name)	NA	NA	TO Element Identifier (Transformer)	NA	Fault Target	Outage Initiation Code	Start Time (dd/mm/yyyy hh:mm) (GMT)	Outage Duration (hours) [2]	Outage Duration (minutes) [2]	Initiating Cause Code	Sustained Cause Code [3]	Outage Mode
1	0002-2008	300-399 kV	O	NA	NA		NA	Ground target	Element-Initiated Outage	2/5/2008 11:00	5	30	Failed Equipment	Failed Equipment	Dependent Mode Outage
2	0004-2008	300-399 kV	H	NA	NA		NA	Ground target	Element-Initiated Outage	6/8/2008 8:00	0	3	Weather, excluding lightning	Weather, excluding lightning	Dependent Mode Outage
3	0007-2008	300-399 kV	T	NA	NA		NA	Phase target	Substation-Initiated Outage	12/22/2008 22:00	1	5	Relay and/or Control Misoperation	Relay and/or Control Misoperation	Single Mode Outage

Appendix 9 Regional Entity and NERC Contacts

Contact information will be added later