Component Reporting

GADS Wind Training Module 13
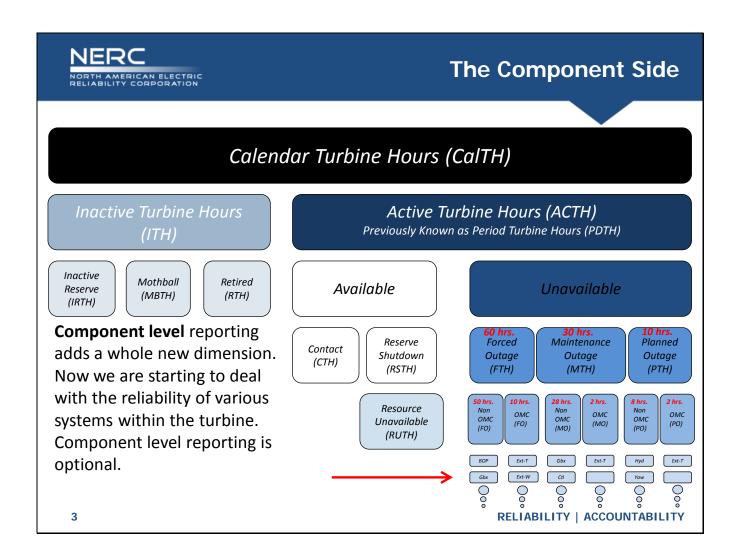April 2019 – Final

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- In this module we will explore:
  - Component Level Reporting Overview
  - Component Record Columns / Fields
  - Component Data Section
  - Optional Data Section
  - Component Tables
  - Where did OMC Go

Calendar Turbine Hours (CalTH)

Inactive Turbine Hours (ITH)

| Inactive Reserve (IRTH) | Mothball (MBTH) | Retired (RTH) |

Component level reporting adds a whole new dimension. Now we are starting to deal with the reliability of various systems within the turbine. Component level reporting is optional.

Active Turbine Hours (ACTH)
Previously Known as Period Turbine Hours (PDTH)

Available

| Contact (CTH) | Reserve Shutdown (RSTH) |

Resource Unavailable (RUTH)

Unavailable

| 60 hrs. Forced Outage (FTH) | 30 hrs. Maintenance Outage (MTH) | 10 hrs. Planned Outage (PTH) |

| 50 hrs. Non OMC (FO) | 10 hrs. OMC (FO) | 28 hrs. Non OMC (MO) | 2 hrs. OMC (MO) | 8 hrs. Non OMC (PO) | 2 hrs. OMC (PO) |

| BOP | Ext-T | Gbx | Ext-T | Hyd | Ext-T |
| Gbx | Ext-W | Ctl | | Yaw | |

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Component level reporting breaks down the outage hours into individual component groups.

Table 1 – Component Data Record

Column	Field Name	Column Header Label	Entry Type
1	Utility ID	UtilityID	Alpha-Numeric-10
2	Plant ID/Name	PlantIDName	Alpha-Numeric - 10
3	Group ID/Name	GroupIDName	Alpha-Numeric - 10
4	Sub-Group ID	SubGroupID	Alpha-Numeric - 10
5	Report Period (month)	ReptMonth	Numeric - 2
6	Report Year	ReptYear	Numeric - 4
7	System – Component Code	SysCompCode	Numeric - 14
8	Forced Turbine Hours (FTH)	FTH	Numeric - 8 + 2 decimals
9	Number of Forced Occurrences	ForcedCount	Numeric - 14
10	Maintenance Turbine Hours (MTH)	MTH	Numeric - 8 + 2 decimals
11	Number of Maintenance Occurrences	MaintCount	Numeric - 14
12	Planned Turbine Hours (PTH)	PTH	Numeric - 8 + 2 decimals
13	Number of Planned Occurrences	PlannedCount	Numeric - 14
14	Equivalent Forced Derated TH (EFDTH)	EFDTH	Numeric - 8 + 2 decimals
15	Equivalent Maintenance Derated TH (EMDTH)	EMDTH	Numeric - 8 + 2 decimals
16	Equivalent Planned Derated TH (EPDTH)	EPDTH	Numeric - 8 + 2 decimals
17	Forced Delay TH (FXDTH)	FXDTH	Numeric - 8 + 2 decimals
18	Maintenance Delay TH (MXDTH)	MXDTH	Numeric - 8 + 2 decimals
19	Planned Delay TH (PXDTH)	PXDTH	Numeric - 8 + 2 decimals

The Component record is divided into 3 sections:
1. Identification
2. Component Data
3. Optional Data

The Identification section is the same as in the Performance record and will not be described here.

Component record reporting is optional. If you do report the Identification and Component Data is required. If you report the optional data in the Performance record you will also need to report the optional data in the component record. This data is checked against the values in the Performance record.

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Column	Field Name
7	System – Component Code
8	Forced Turbine Hours (FTH)
9	Number of Forced Occurrences
10	Maintenance Turbine Hours (MTH)
11	Number of Maintenance Occurrences
12	Planned Turbine Hours (PTH)
13	Number of Planned Occurrences

Each Component record contains 7 required data fields. A Sub-group will usually have 10-20 individual component records per month:

1. System – Component Code – Selected from the codes available in Appendix C.
2. Forced turbine hours for the code selected and the number of occurrences
3. Maintenance turbine hours for the code selected and the number of occurrences
4. Planned turbine hours for the code selected and the number of occurrences

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- If reporting component data, columns 1-13 are required
- Codes are selected from Appendix C. You can only select 1 code for each record so there will be multiple records per monthly submittal
- All the hours for the selected code are entered in to the record. There is no differentiation between regular downtime and OMC downtime at this point
- Note that FO, MO, PO in each of the component records must sum up to the totals reported in the Performance record

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Column	Field Name
14	Equivalent Forced Derated TH (EFDTH)
15	Equivalent Maintenance Derated TH (EMDTH)
16	Equivalent Planned Derated TH (EPDTH)
17	Forced Delay TH (FXDTH)
18	Maintenance Delay TH (MXDTH)
19	Planned Delay TH (PXDTH)

Component data reporting is optional but if you are reporting component data remember that there is an Identification and required section that are reported. Like the Performance record there is an optional section that identifies derates and delays.

You can report all or part of the optional data but what you do report needs to be reflected in the totals found in the Performance record.

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Optional data should sum up to what is reported in the Performance record.

Appendix C – System-Component Codes

The following tables list available components for each system and the code to enter for each component:

System	Component	Entry
Balance of Plant	General	674
	Battery Systems	1042
	Breakers	1037
	CT / PT	1041
	Fuses	1044
	Main Substation Transformer	1038
	Metering and Relays	655
	Overhead Lines	652
	Pad Mount-Multiple WTG	651
	Preventative Maintenance	682
	SCADA	656
	Site Communication	1043
	Site Reactive Power Comp	654
	Substation	653
	Switches	1039
	Transmission (Gen Tie)	1077
	Underground	650
	Wave Trap	1040
	Wind Park Control System	657
Brake	General	673
	Brake Hydraulic System	1045
	High Speed Shaft Brake	617
	Mechanical Lock	618

There are 15 separate component code Systems.

Each System is broken down into various smaller components with individual code numbers.

Only one code is selected for each turbine outage.

There is a System called Wind Turbine for general turbine maintenance

- There are a lot of selections in the 15 system selections. Become familiar with the boundaries for each section.
- In each System there is a General component. You can use this when there are no other options that fit your outage.
- The General Component category can also become an alternative level of reporting. All outages are categorized into one of the 15 Systems and their downtime attributed to the General category only.
- There is a System called Wind Turbine. This system is used when multiple systems are worked on at the same time such as during preventative maintenance. This is not for a component failure that causes damage to multiple systems. Example: High speed coupler fails and takes out the generator and up tower controller. The primary cause is the HS coupler and should be coded that way.

Appendix C – System-Component Codes

System	Component	Entry
External	General (OMC)	681
	Catastrophe (OMC)	1034
	Economic (OMC)	1035
	External Communication (OMC)	1057
	Legal, Contractual or Environmental (OMC)	1079
	Off-Taker Transmission & Distribution (OMC)	675
	Weather – Ice (OMC)	1036
	Weather – Lightning (OMC)	678
	Weather – Temperature (OMC)	676
	Weather – Turbulence (OMC)	1076
	Security (OMC)	1081
	Execution Delays (OMC)	1082

OMC is the System called "External"

The sum of the External downtime hours should add up to the OMC hours in the Performance report.

Generally, outage types and categories are not changed during an outage. There is one exception seen in code 1082. When return to service (RTS) is prevented by material, labor, equipment or weather for 60 days or more the outage maybe reclassified. This identifies the reason for the extended event.
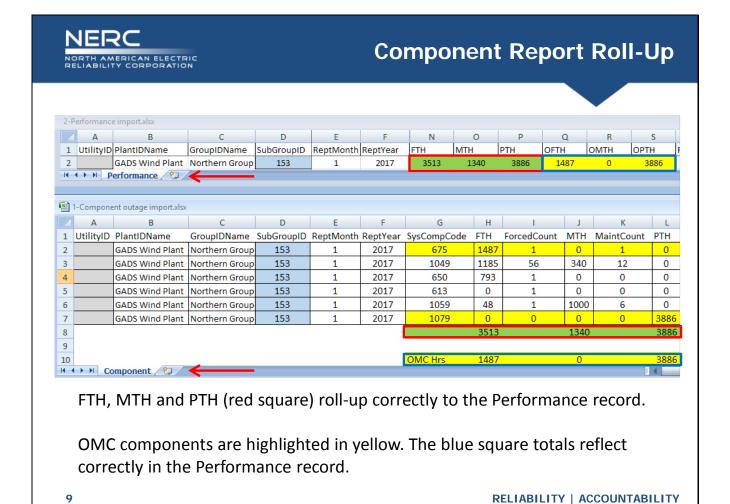
OMC = Out of Management Control
- Catastrophic – Tornado, floods, fires, earthquakes, hurricanes and etc.
- Economic – This is labor strikes outside of the plant that impact delivery of goods and services (Truck union strike)
- External Communication – Some interconnect agreements require constant communications with the plant. When this is interrupted due to external issues (phone line down) and the plant is required to be shut down, use this code.
- Legal, Contractual or Environment. Sometimes during the development process or later, contracts may require turbines to be shut-off. Examples: Bat migration, birds, noise, flicker.
- Off-Taker Transmission & Distribution. – This is usually an event that takes place on the Off-Takers line that shuts turbines down. This could include line constraints.
- Weather – Ice – usually ice on blades, wind vane or anemometer but could also be a safety shut-down for ice.
- Weather – Lightning – Often causes brown outs (voltage dips) and may cause turbine outages. Safety shut-down for lightning also.

•Weather – Temperature – This is hot or cold temperatures that are beyond the operating envelope of the turbine.

•Weather – Turbulence – Very high turbulent end can cause shut-downs due to blade bending, yaw run always and over speeds.

•Security – Occasionally turbines are broken into and damaged occurs (Copper theft). This could also be a cyber shut-down.

•Execution Delays – Special code that can be used 60 days after an event starts. The extended downtime must be due to Weather, labor, equipment or parts.

Component Report Roll-Up

2-Performance import.xlsx

	A	B	C	D	E	F	N	O	P	Q	R	S
1	UtilityID	PlantIDName	GroupIDName	SubGroupID	ReptMonth	ReptYear	FTH	MTH	PTH	OFTH	OMTH	OPTH
2		GADS Wind Plant	Northern Group	153	1	2017	3513	1340	3886	1487	0	3886

Performance

1-Component outage import.xlsx

	A	B	C	D	E	F	G	H	I	J	K	L
1	UtilityID	PlantIDName	GroupIDName	SubGroupID	ReptMonth	ReptYear	SysCompCode	FTH	ForcedCount	MTH	MaintCount	PTH
2		GADS Wind Plant	Northern Group	153	1	2017	675	1487	1	0	1	0
3		GADS Wind Plant	Northern Group	153	1	2017	1049	1185	56	340	12	0
4		GADS Wind Plant	Northern Group	153	1	2017	650	793	1	0	0	0
5		GADS Wind Plant	Northern Group	153	1	2017	613	0	1	0	0	0
6		GADS Wind Plant	Northern Group	153	1	2017	1059	48	1	1000	6	0
7		GADS Wind Plant	Northern Group	153	1	2017	1079	0	0	0	0	3886
8								3513		1340		3886
9												
10							OMC Hrs	1487		0		3886

Component

FTH, MTH and PTH (red square) roll-up correctly to the Performance record.

OMC components are highlighted in yellow. The blue square totals reflect correctly in the Performance record.

•When reporting component records, the FTH, MTH and PTH hours must roll-up to match the previously entered Performance data. Notice that OMC hours (yellow) are included in this total.
•OMC hours are identified using specific component codes which are highlighted in yellow in the above Component record. The total of the yellow lines is reflected in the blue square and equals what was reported in the Performance record
•The non-OMC hours can be calculated by subtracting the OMC hours from the total. (Non-OMC FTH=FTH-OFTH)

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