

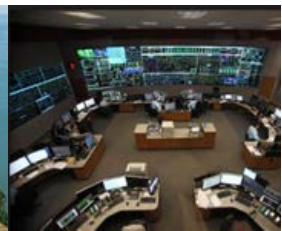


RELIABILITY FIRST

NERC Generator Availability Data System (GADS)

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GADS History

- The electric utility industry initiated GADS to expand voluntary data collection activities that it began in 1963. Today, NERC's GADS maintains complete operating histories on more than 7,700 generating units that represent more than 90 percent of the installed generating capacity of the United States and Canada.
 - As of January 1, 2012, GADS became a mandatory industry program for conventional generating units that are 50 MW and larger.
 - As of January 1, 2013, GADS became a mandatory industry program for conventional generating units that are 20 MW and larger.
- GADS is recognized as a valuable source of reliability information for total unit and major equipment groups and is widely used by industry analysts in a variety of applications. Through GADS, NERC collects information about the performance of electric generating equipment and provides assistance to those researching information on power plant outages. GADS also supports equipment availability analyses and other decision-making processes in the industry. GADS data is also used in conducting assessments of generation resources and improving their performance.



GADS Database

- **Fundamentals of the three GADS data types:**
 - **Design** - equipment descriptions.
 - **Performance** - summaries of generation produced, fuels units, start ups, etc.
 - **Event** - description of equipment failures.
- **Delegated Reporting Entity (DRE)** – will report data on behalf of the reporting company. For instance, if you report GADS data to either PJMs' eGADS program or MISOs' PowerGADS program with prior coordination, PJM/MISO can submit for you the GADS data into the NERC database.
- Data submission for performance and event data requirements follow a quarterly schedule. When a quarter ends, registered entities have 45 days to submit their data into the NERC GADS database. For example, Q1 ends on March 31 and all registered entities reporting to GADS have until May 15 to report their event and performance data.



Design

- Design data is essential for many generating plant analyses. Generating companies are required to review and update their design data annually or as recommended using the design time-stamping process. Annual design data to be input in first quarter.
- The GADS Task Force recommended that the design data requirement be nine (9) elements per unit, regardless of unit type.



Design – the Nine Elements

- GADS utility code (assigned by GADS Services)
- GADS unit code (assigned by the reporting company following the guidelines in appendix C of the *GADS Data Reporting Instructions*)
- NERC Regional Entity where the unit is located
- Name of the unit
- Commercial operating date
- Type of generating unit (fossil, combined cycle, etc.)
- MW nameplate rating
- State or province location of the unit
- Energy Information Administration (EIA) Plant Code (US units only)
 - <https://www.eia.gov/electricity/data/eia860m/>



Performance

- **Provides summary of unit operation during a particular month of the year.**
 - Unit Identification
 - Utility Code, Unit code, Year, Reporting Period
 - Unit Generation Performance
 - Net Maximum Capacity, Net Dependable Capacity, Net Actual Generation
 - Unit Starting Characteristics
 - Attempted Starts, Actual Unit Starts
 - Unit Time Information
 - Unit Service Hours, Reserve Shutdown, Pumping Hours
 - Primary Fuel and Secondary Fuel
 - Fuel Code



Events

- **Event** - occurs any time a generating unit's operating status or capability changes
 - **Event identification**
 - Utility Code, Unit code, Year, Event Number, Event Type
 - **Event magnitude**
 - Start/End of event, Net Available Capacity,
 - **Primary cause of event / Additional cause of event or components worked during event**
 - System/Component Cause Code, Cause Code Amplification Code, Verbal Description (strongly recommended)



GADS Data Uses

➤ NERC uses of GADS data

- Conduct special studies, such as seasonal reliability assessments, etc.
- Reporting generating availability (i.e., NERC State of Reliability report)
- Perform benchmarking services
- Dashboards displays on NERC website:
 - [Generating Availability Data System \(GADS\)](#)

➤ RF uses of GADS data

- Conduct special studies
- Seasonal “waterfall” charts
- Winter preparation - plant on-site visits
- Summer readiness



Internal RF Report



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Generation Availability in 2015

August 2016

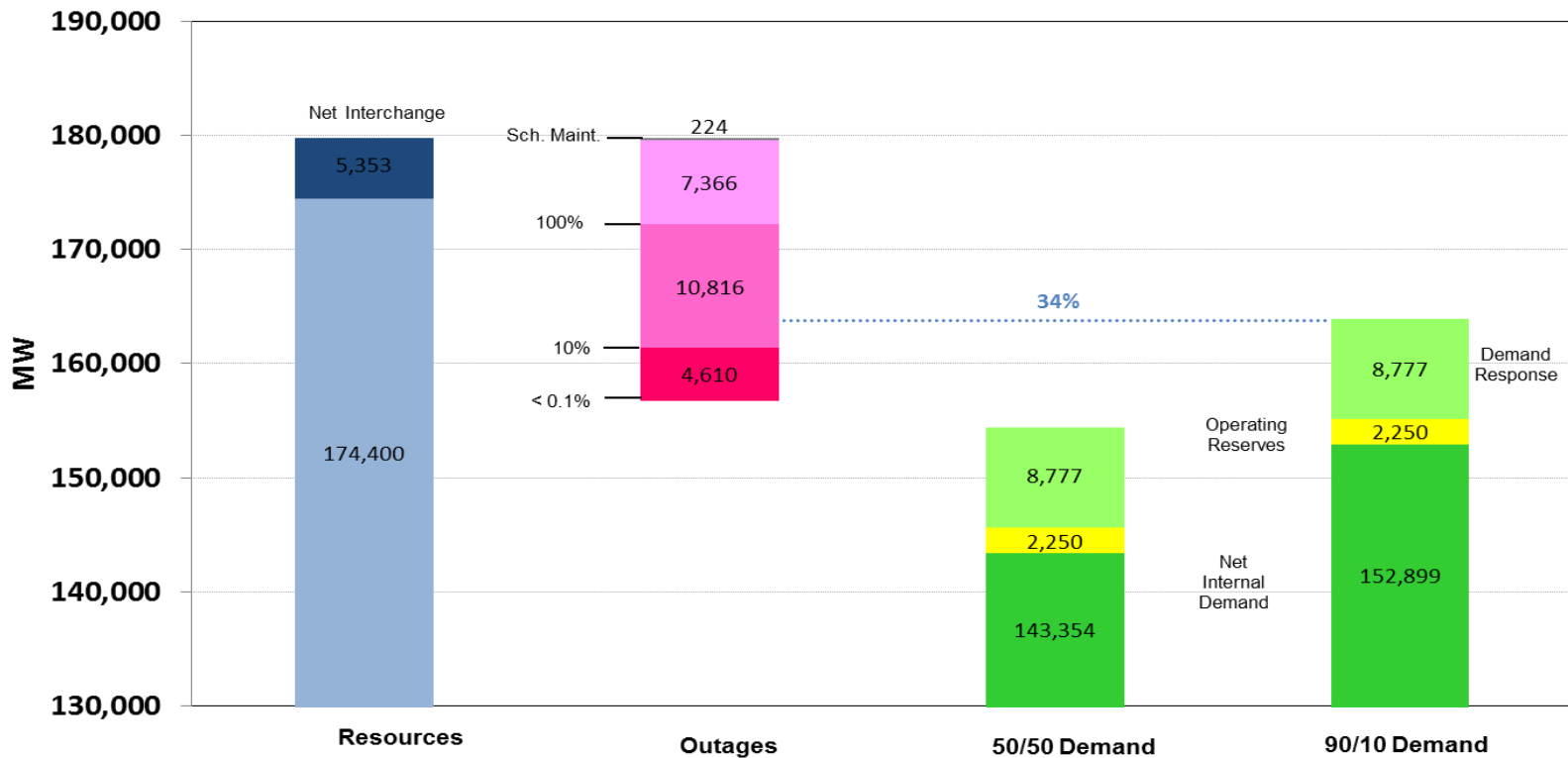
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GADS Data Uses – RF Waterfall Charts

Exhibit 2 - 2016 Summer PJM Outage Risk Chart



GADS Data Uses

Below is an example of how RF takes the GADS data and uses it to help identify cold weather issues with generating units within our footprint.

Cause Code	Amplification Code	Verbal Description
5054 - Water Injection System (Gas Turbine)	T2 - Tripped/shutdown grid separation - manual	Frozen water li
5002 - Inlet air filters A	T2 - Tripped/shutdown grid separation - manual	CT1/CT2 Inlet Filter High dP due to major snow event
5002 - Inlet air filters A	T2 - Tripped/shutdown grid separation - manual	CT1 Inlet Filter High dP due to major snow event
5002 - Inlet air filters A	T2 - Tripped/shutdown grid separation - manual	CT2 Inlet Filter High dP due to major snow event
1760 - Feedwater instrumentation (not local controls)	T1 - Tripped/shutdown grid separation - automatic	unit trip-loss of fw flow indication due to frozen sensing line at fw
5002 - Inlet air filters A	T1 - Tripped/shutdown grid separation - automatic	Clogged inlet filters due to snowfall. This is a result of marginal des
5019 - Other high pressure problems A	T2 - Tripped/shutdown grid separation - manual	Snow storm - buildup on the inlet filters causing Low CT inlet suction pressure.
5019 - Other high pressure problems A	T2 - Tripped/shutdown grid separation - manual	Snow storm - buildup on the inlet filters causing Low CT inlet suction pressure.
5019 - Other high pressure problems A	T2 - Tripped/shutdown grid separation - manual	Snow storm - buildup on the inlet filters causing Low CT inlet suction pressure.
0690 - Other feedwater problems downstream of feedwater regulation	T1 - Tripped/shutdown grid separation - automatic	Drum Level Trip due to Instrument Freezing
5002 - Inlet air filters A	T1 - Tripped/shutdown grid separation - automatic	icing on filter
5409 - Other inlet air problems B	T1 - Tripped/shutdown grid separation - automatic	Snow clogged inlet filters and tripped unit on high filter DP
3149 - Loss of vacuum not attributable to a particular component such	T1 - Tripped/shutdown grid separation - automatic	False loss of vacuum indication due to frozen transmitter
3149 - Loss of vacuum not attributable to a particular component such	T1 - Tripped/shutdown grid separation - automatic	False loss of vacuum indication due to frozen transmitter.
3149 - Loss of vacuum not attributable to a particular component such	T1 - Tripped/shutdown grid separation - automatic	False loss of vacuum indication due to frozen transmitter
1400 - Forced draft fans	T2 - Tripped/shutdown grid separation - manual	TRIPPED DUE ETO FD FANS (AIR FLOW FROZE)



RF Contact Information

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Questions & Answers

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