



# POWERGADS USER MANUAL

INTEG ENTERPRISE CONSULTING, INC.



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## **Introduction**

This manual is designed to provide the user with a functional reference, and to facilitate the day-to-day usage of the PowerGADS system. Part 1 provides a description of rules and procedures. Part 2 provides a description of the Graphical User Interface.

Having a good understanding of your company's internal GADS reporting procedures, and the NERC GADS and PJM GADS reporting procedures and business logic is a pre-requisite for understanding this manual.

# **PART I Rules and Procedures**

## **2.0 Versioning**

This manual is for PowerGADS Version 4.0.

## **3.0 Business Process Rules**

### **3.1 Who Does What**

While NERC GADS data reporting is a voluntary effort, most utility companies have strict policies in place to track generator performance and reliability. To this end, all PowerGADS users must report data as defined in the NERC Generating Availability Data System (GADS), which PJM fully supports using the eGADS system (PJM is the only ISO who deviates slightly from the NERC rules. All other ISOs conform to the NERC rules).

It is the responsibility of the users to enter accurate event and performance data into PowerGADS according the schedule determined by each individual company. All data should be 100% complete and accurate at that time (all data should have passed the level 2 checks).

It is the responsibility of the Central Administrator to submit an edited outage report to the ISOs or NERC according to each company's policies and obligations.

### **3.2 Data to Be Collected**

Three types of data are to be collected:

- Event Data - Each time a unit experiences a change in operating status or capability, an *event* is recorded. From these event reports a unit's operational history can be reconstructed.
- Generation Performance Data - A unit's actual generation data for the month must be reported.
- Fuel Performance Data - A unit's actual fuel consumption data for the month must be reported.

### **3.3 Data Security and Access Control**

PowerGADS is designed to ensure data confidentiality. Security measures are implemented to encrypt the data with 128-bit-key encryption during communication (when data is communicated outside the company's firewall). The communication channels can be secured by server-side authentication certificates. Data provided by each user are clearly identified when stored in the database. Carefully designed access rights restrictions are enforced by the system to ensure security and audit-capability.

PowerGADS can be setup to house an umbrella of member companies, representing multiple utilities a main company may own through out the nation.



What information each user can manipulate or access is strictly controlled by the Central Administrator. System access is controlled at two levels:

- 1) At the member companies' level, access to each generating unit's data can be assigned to one or multiple member companies with all, none, or read-only access
- 2) At the user level, each individual user automatically inherits his or her member company's general access rights. In addition, a user's access can be further restricted to always read-only on a screen-by-screen basis, thus preventing him or her from any upload, insert, update or delete operation.

An ID and a password are issued to each user by the Central Administrator. The original password is expired immediately after the first successful login. The user must supply a new password with seven to twelve places wide containing at least one numeric character and one non-numeric character. Passwords are expired every 90 days.

### ***3.4 System Lockout***

Users are free to manipulate the current month's Card 95, 97 and 99 data up to the lockout day determined by the Central Administrator; usually a number of days after the end of the operating month. After that day, the system will not accept any insertion, deletion or modification to the data.

### ***3.5 Exception to the System Lockout Rule***

The only exception to the rule stated above is when a user tries to close an open outage event that was started before the reporting month. In this case a previously entered event record with a blank Event End Date must already exist in the PowerGADS database. User will not be able to modify other values of the open event.

It is important to remember that open events that were entered prior to the current report period can be closed only if the event end date is within the current report period. If the user wants to submit an event end date prior to the current report period, permission must be granted by the Central Administrator.

### ***3.6 Overriding the System Lockout***

The Central Administrator has the ability to "unlock" the system to allow a user to make changes to the data. This lock release mechanism can be executed on a unit-by-unit basis or on a member company basis. The administrator has the ability to monitor all changes made by each member during the grace period.

## **4.0 Event Reporting (Card 97)**

### **4.1 General Information**

There are five basic types of events:

- Outages
- Deratings
- Reserve Shutdowns
- Noncurtailing (Equipment) Outages
- Inactive

Outages and deratings have been subdivided to define their urgency or postponability. The Event Report Form detailed in this section is utilized to report these types of events and the magnitude of their effect on the unit.

### **4.2 Optional Data**

While the reporting of all data elements is suggested, each reporting utility must determine if they can reasonably provide the optional data requested for each data element. Optional data elements consist of work started, work ended, man-hours worked and verbal description for the event. Each company should communicate a guideline on this topic to all PowerGADS users.

### **4.3 Event Reporting Format**

The Event Reporting Format is divided into four sections.

1. *Event Identification* - This information permits each unit's data to be individually tracked and tabulated.
2. *Event Data* - This section uniquely identifies the time frame for each event and its impact upon the unit. It also allows the reporter to attribute the cause of an event to a specific system or component.
3. *Optional Event Data* - This section indicates the start and end time of the work performed and the man-hours associated with the work.
4. *Optional Verbal Description* - This section allows the data reporter to more fully describe the work done.

### **4.4 Event Identification**

Name	Columns (Legacy Format)	Description
Utility Code	1-3	NERC assigned identification code
Unit Code	4-6	A unique identification number assigned to each Company's unit
Data Code	7-8	97 - This code uniquely identifies this form as a event reporting form.
Year Event Started	9-12	The four digits years of the Event Start Date
Event Number	13-16	Each event must have a unique identification number. Ideally these would be sequential. Should you discover that you missed reporting an event, use the next sequential number available after the last event reported for that unit to identify this misplaced event. It is not necessary that the event numbers and dates be sequential. The programs which analyze the data will sort the events by their time sequence. The first event of the year identified for each unit would be reported as <u>1</u> , the second <u>2</u> , and so throughout the year. Zero (0) is not a valid event number. Numbers may be skipped. Events which extend from one month to the next should be submitted in the month they originate and in the month they terminate. However, if you elect to resubmit the open ended outage, the event I.D. section (columns 1-19) and the remaining information must be the same as the original reported data. A Report Revision Code of "R" must be submitted in this case
Event Index	17 -18	This is a unique event identifier. The primary cause of the event must be coded as event index 01. Additional cards 02-48 may be included to indicate other components worked on during a full outage (PO, MO, U1, U2, U3, SF, SE) event. Deratings may only have index number 1 for each event number.
Format Control	19-19	This field is used to identify the data in columns 21-97 to be either Event Data (statistical) or Event Verbal Description. If BLANK or '0' the data in column 21-97 will be Event Data. If 'A' or 'B' the data from columns 21-51 on "A" and 21-75 on "B" will be a Verbal Description.
Revision Code	20-20	Enter the code, shown below, appropriate for this report. <ul style="list-style-type: none"> <li>• Enter 0 or blank - If this is the original report.</li> <li>• Enter R to replace a previously submitted event. <b>To change any single entry or series of entries it is necessary to resubmit all data previously reported for this event.</b> The "R" stands for Replace. The system will take your new event and completely replace the old one. Columns 1-19 will be used to locate the previously</li> </ul>

		<p>submitted record.</p> <ul style="list-style-type: none"> <li>• Enter D and complete columns 1-18 with an 01 in cc 17-18 to delete an entire event. Format control (cc 19) should be blank. <u>All records entered for this event will be deleted (event index 1-48), including verbal and ramps if any exist.</u> Individual event indexes (2-48) may be deleted by completing column 1-18 with the proper index number (cc 17 &amp; 18). Only the specified index and associated information including any verbal will be deleted. To delete the verbal description for an event index, repeat columns 1-18 as previously reported and enter an 'A' in column 19 and a 'D' in column 19. <u>All verbal (format control A + B) will be deleted.</u> To delete only verbal (format control B) repeat columns 1-18 and enter a 'B' in column 19 and a 'D' in column 20. Only verbal (format control B) will be deleted.</li> </ul> <p>Note: The first 19 columns are completely unique. To make any corrections to columns 1-19, the card must be deleted and resubmitted</p>
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## 4.5 Event Data

If the Card format control (column 19) is blank the following format is used:

Name	Columns	Description
Event Type	21-22	If index number is 2-48 leave event type blank. From the table below, enter the code that best identifies the basic event type and the urgency or postponability of the event.

Event Type Table

Event Type	Code	Basic Event Types
Planned Outage	PO	Full Outage
Maintenance Outage	MO	Full Outage
Scheduled Outage Extension	SE	Full Outage (Being phase-out)
Planned Outage Extension	PE	Full Outage
Maintenance Outage Extension	ME	Full Outage
Startup Failure	SF	Full Outage
Unplanned Outage - Immediate	U1	Full Outage
Unplanned Outage - Delayed	U2	Full Outage
Unplanned Outage - Postponed	U3	Full Outage
Reserve Shutdown	RS	Reserve Shutdown
Planned Derating	PD	Partial Reduction
Maintenance Derating	D4	Partial Reduction
Derating Extension	DE	Partial Reduction (Being phase-out)
Planned Derating Extension	DP	Partial Reduction
Maintenance Derating Extension	DM	Partial Reduction
Unplanned Derating - Immediate	D1	Partial Reduction
Unplanned Derating - Delayed	D2	Partial Reduction
Unplanned Derating - Postponed	D3	Partial Reduction
Non-Curtailing Equipment Outage	PD D1-D4 DM,DP NC	Non-Curtailing
Inactive Reserve	IR	Inactive
Mothballed	MB	Inactive
Retired	RU	Inactive

## 4.6 Outage Event Types - Detailed Review

An outage exists whenever the unit is not synchronized and is not in a Reserve Shutdown or Inactive status. There are eight distinct types of outages, each depending on the extent to which the outage could have been postponed. These outages are PO, MO, PE, ME, SF, U1, U2, and U3.

### **4.6.1 Planned Outages (Code PO)**

Planned Outages are scheduled well in advance and are of a predetermined duration. Turbine and boiler overhauls or inspections, testing, and nuclear refuelings are typical planned outages. Characteristically, planned outages are planned well in advance and usually occur during those seasons of the year when the peak demand on the system is lowest, have flexible start dates, have a predetermined duration, last for several weeks, and occur only once or twice a year.

### **4.6.2 Planned Outages General Information**

In order to be classified as a planned outage, an outage must have been well in advance prior to the starting date of the outage.

Note that while the duration of a planned outage is limited to the duration specified in the Planned Schedule issued prior to the start of the outage, the exact start and end dates may be shifted as required by system conditions. For example, a company may wish to take consecutive planned outages at two similar units at a station. If the return of the first unit is delayed, the company could delay the removal of the second unit from service and still claim the originally specified planned outage duration for the second unit, so long as the ISO had ensured that adequate reserve levels still existed during the revised planned outage period. Alternately, a company may experience an unplanned (forced) outage on a unit shortly before the expected start of a planned outage period. The company could request that the start date of the planned outage be moved up if unplanned (forced) outage repairs and planned outage work could be carried on concurrently. The ISO would have to review the adequacy of system reserves during the new planned outage period before approving a request to move the planned outage forward. Note that the unplanned (forced) outage cannot be terminated until the transfer of a previously scheduled planned outage period has been approved by the ISO and, in any case, the unplanned (forced) outage duration can be reduced to no less than one day. The rules in each ISO may vary. It is best to follow company guideline when changing the schedule of a planned event.

### **4.6.3 Maintenance Outages (Code MO)**

This is an outage which can be deferred beyond the next weekend but requires that the unit be removed from service before the next Planned Outage. Characteristically, these Maintenance Outages may occur throughout the year, have flexible start dates, are much shorter than planned outages, and have a predetermined duration established at the start of the outage.

### **4.6.4 Maintenance General Information**

The weekend is defined from Friday, 2200 to Monday, 0800. Therefore, during the week, an outage will be considered a maintenance outage if, at the time of the request to the IO, the unit would be able to carry load at its present capacity beyond the next Monday morning at 0800. If the release of a unit is requested during the weekend, the outage will be considered a maintenance outage if, at the time of the request to the ISO, the unit would be able to carry load at its present capacity beyond the following weekend. Three examples are given as follow:

1. If an outage request is postponable, it is the responsibility of the ISO to decide, as dictated by the system conditions, whether the outage should be postponed. If the ISO decides that the outage should be postponed beyond the next weekend and the unit fails before the next Monday, the outage will be considered an unplanned (forced) outage.

2. If the ISO decides that the outage should be postponed beyond the next weekend and the unit fails beyond that weekend, but before the scheduled starting time of the outage, the outage will be considered an unplanned (forced) outage provided that the component which failed is the component which would have been repaired as specified in the original request. The outage request must be properly documented to explain this situation.
3. If the ISO decides that the outage should not be postponed but the outage is postponed by the company and the unit fails, the outage will be considered an unplanned (forced) outage.

A LOCKOUT, sometimes referred to as a ½ hour clearance, is a period during which minor repairs or inspections are being made to minor unit components without disabling the unit. Lockouts are part of the reserve shutdown state and should be able to meet all the criteria of an available unit. Lockouts for steam units must not impair the units' ability to be placed in service within the usually specified next to go time. For CT's and hydro units for which lockouts are taken, the unit must be able to start and reach full load within 30 minutes of any system request. This 30 minute clearance time is only for CT or Hydro units that are operating (Reserve Shutdown).

If the unit on reserve shutdown as a lockout (1/2 clearance) fails to be placed in service within the specified next to go time for steam units or within a half hour for CT's and hydro, a start failure (SF) event must be reported as described below.

#### **4.6.5 Planned or Maintenance Outage Extension (Code PE or ME)**

This is the extension of a Planned Outage (PO) or Maintenance Outage (MO) beyond its originally estimated completion date, such date being established at the start of these outages. A Planned or Maintenance Outage extension (PE or ME) must start at the same time the PO or MO (being extended) ends.

A Planned or Maintenance Outage Extension may be used in those instances where the original scope of work requires more time to complete than originally scheduled. The PE or ME should not be used for those instances where unexpected problems or delays are encountered to render the unit in question out of service past the expected end date of the PO or MO. These unexpected events should be reported as either Unplanned Outage Immediate (U1), or Startup Failure (SF) as appropriate.

#### **4.6.6 Startup Failure (Code - SF)**

This is an outage that results from the unsuccessful attempt to place the unit in service following the unit's being in an outage or reserve shutdown state. The unit is considered to be in a Startup Failure state if the unit cannot be placed in service within the utility specified time for that specific startup and/or requires significant repairs to the equipment or control systems which halted the normal startup cycle. Repeated failures to start for the same reason are considered as part of the same Startup Failure. The Startup Failure begins when the unit is no longer able to continue its startup cycle or surpasses the originally estimated synchronization time. The Startup Failure ends when the unit is synchronized or enters some other (permissible) outage or shutdown state. A Startup Failure (SF) must start at the same time the previous full outage (PO, MO, SE, SF, U1, U2, U3, RS) ends.

The number of SF events must equal the difference between the attempted and actual starts reported on the performance form.

#### **4.6.7 Unplanned Outage - Immediate (Code - U1)**

This is an outage that required immediate removal of a unit from service such as immediate mechanical/electrical/hydraulic control system trips and immediate operator initiated trips/shutdowns in response to unit alarms.

#### **4.6.8 Unplanned Outage - Delayed (Code - U2)**

This is an outage which does not require immediate removal of a unit from service but required that a unit be removed from service within six hours.

#### **4.6.9 Unplanned Outage - Postponed (Code - U3)**

This is an outage which can be postponed beyond six hours but which requires the unit to be removed from service before the end of the next weekend.

#### **4.6.10 Testing Following Outage**

Testing following an outage is to be reported as described below. The starting and ending of these testing outages are based upon the synchronous condition of the unit.

Following many outages the equipment which was repaired or replaced is tested. In some cases, the testing can be done with the unit off-line (desynchronized). In this instance, the testing would be reported as other work done during the event. When reporting as separate event(s), the testing must begin at the same time the original event (PE and ME are not considered original outages) ended and ends when the unit is synchronized.

In other cases, the unit must be on-line (synchronized) and in service at some load. This testing would be reported as a separate (PD) or D4. Testing may begin from a few minutes to several days from the time the original event ended and ends when the testing is finished. Any generation produced during this testing must be reported.

If the unit must come off for testing following synchronizing after a PO, MO, PE or ME, and work is within the original scope of the outage, a mini PO or MO can be coded.

### ***4.7 Derating Event Types - Detailed Review***

A derating exists whenever a unit is limited to some power level that is less than the unit's Net Maximum Capacity. Deratings may not begin when a full event is in effect, however, such a limitation may occur during a Reserve Shutdown. The cause of the limitation can be equipment failures, regulatory restrictions, or any other operating constraints. Ambient deratings are not individually reported; rather, they are averaged for the report period, subtracted from the Net Maximum Capacity and reported in Card 95 as the Net Dependable Capacity. See the example in the Notes below.

Note: Ambient Related Losses



Ambient related losses, such as high cooling water intake temperatures, high air temperatures to cooling towers, etc., are not to be reported as individual deratings. The magnitude of these losses will be determined from the difference in the Net Maximum Capacity and Net Dependable Capacity reported for the unit during the period.

Note: Deratings That Vary in Magnitude with Time

Certain deratings, such as thermal discharge limits, stack emissions limits, nuclear fuel limits, etc., vary in magnitude with time. These deratings may be averaged over a week or month and be reported once during that period rather than at each occurrence. When reporting these types of deratings the data reporter must recognize that these limitations still could exist if the unit is not shut down, limited by a more severe derating, or masked by a reserve shutdown. As an example: a 1000 MW unit experienced a continuous derating which, over a ten day (240 hour) period, varied in magnitude as follows: (1) 30 hours at 30 MW, (2) 10 hours at 50 MW, (3) 10 hours at 20 MW and (4) 80 hours at 40 MW. The total is 130 hours with four different deratings. During the other 110 hours of the ten day period, the unit experienced an Unplanned Outage-Immediate (90 hours) and a Reserve Shutdown (20 hours). Each of these two outages would be reported as separate events. The losses attributable to the deratings are computed as follows: (30 hours X 30 MW) + (10 hours X 50MW) + (10 hours X 20 MW) + (80 hours X 40 MW) = 4,800 MWHRS. The time reported for the start/end of the derating would be the start/end of the overall ten-day (240 hours) period: The average derating over the four varying derating periods would be: 4,800 MWHR/130 hours = 37 MW. Note that the average energy lost is divided by the operating hours not the total hours. If this derating were not averaged over the ten day period, the reporting of four (4) separate deratings would have been required.

As stated above, utilities which do not wish to report varying magnitude continuous deratings as a single averaged derating may submit separate event reports for each variance in the magnitude of the derating. The series of reported events must, however, be continuous (i.e., the end date of first derating period must be exactly equal to the start date of the next derating period, and so on). A new Event Number must be reported for each of the variances reported. The System Component Cause Code should be the same in each report. In the example noted above, the deratings would carry through the intermediate outages (shutdowns).

There are six types of deratings, each depending on the degree to which the initiation of the derating could have been postponed. Note that the criterion is based upon the level of postponability which could have occurred.

#### **4.7.1 Planned Derating (Code - PD)**

A derating that is scheduled well in advance and is of a predetermined duration. The actual start dates of the planned deratings are flexible, since they are usually coordinated with periods of low peak or seasonal demands.

Periodic deratings for tests, such as weekly turbine tests, would not be reported as planned deratings since there is no control over the season in which they occur. These types of deratings would be classified as Unplanned Derating - Deferred (Code - D4).

#### **4.7.2 Maintenance Derating - Deferred (Code - D4).**

A derating which can be deferred beyond the end of the next weekend, but requires a reduction in capacity before the next planned outage. These deratings have flexible start dates and have a predetermined duration established at the start of the derating.

#### **4.7.3 Planned or Maintenance Derating Extension (Code – DP or DM)**

This is the extension of a Planned Derating (PD) or Unplanned Derating Deferred (D4) beyond its originally estimated completion date, such date being established at the start of these outages.

A Planned or Maintenance Derating Extension (DP or DM) may be used in those instances where the original scope of work requires more time to complete than originally scheduled. The DP or DM should not be used for those instances where unexpected problems or delays are encountered that render the equipment in question out of service past the expected end date of the PD or D4. These unexpected events should be reported as Unplanned Derating Immediate (D1). A Planned or Maintenance Derating Extension must start at the same time the PD or D4 being extended ends.

#### **4.7.4 Unplanned Derating - Immediate Code (D1)**

A derating which requires immediate action for the reduction of capacity.

#### **4.7.5 Unplanned Derating - Detailed (Code - D2)**

A derating which does not require an immediate reduction of capacity but which requires a reduction of capacity within six hours.

#### **4.7.6 Unplanned Derating - Postponed (Code D3)**

A derating which can be postponed beyond six hours, but requires a reduction of capacity before the end of the next weekend.

### ***4.8 Other Event Types - Detailed Review***

#### **4.8.1 Reserve Shutdowns (Code - RS)**

A reserve shutdown exists whenever a unit is available, but is not synchronized. This event is sometimes referred to as an economy shutdown or economy outage. When reporting a Reserve Shutdown, cause code 0000 should be used.

Notes on Reserve Shutdowns:

1. If a unit is shut down on the basis of some equipment problem(s), the outages should be a maintenance, planned or unplanned outage rather than a reserve shutdown, even though the unit is not needed by the system. If, while a unit is shut down for service purposes, work is performed which would have required that the unit be shut down, this work must be reported as an outage, also see note 3.
2. Any work done during a reserve shutdown which results in a derating of the unit should also be reported as a new event with its appropriate derating type identified. The reserve shutdown should continue and a derating event started.

3. Often while a unit is on Reserve Shutdown maintenance work is done which normally would have required that the unit be shut down or derated. If this maintenance work requires the unit to be shut down, the reserve shutdown must end and a new event started.

#### **4.8.2 Non-Curtailing Equipment Outage (Code - D1-D4, PD, DP, DM, with NC in Available Capacity Columns 49 and 50)**

The removal of a system, equipment or major component from service for repairs which results in no unit derating or outage.

A non-curtailing outage can also exist when a generating unit is operating at less than full capacity due to system dispatch requirements (operational limitation). During this period, equipment may be removed from service for maintenance, testing or other reasons and reported as a non-curtailing equipment outage IF: (a) the Available Capacity of the unit is not further reduced and, (b) should the unit be called back to service, the repairs can be completed and would not prevent the unit from reaching the desired capacity level, or effect the units normal rate of response.

A non-curtailing derating is coded like any derating except that NC is placed in the available capacity columns 49 and 50.

#### **4.8.3 Inactive Status (Code IR, MB, RU)**

There are three event types that indicate a unit is inactive.

Mothballed (MB) event indicates a unit is inactive but can be brought back into service after some repairs with appropriate amount of notification. It typically takes weeks or months to bring a mothballed unit back online.

During an MB event, the clock stops ticking. The outage factors and rates associated with the unit are frozen in time and they neither improve nor decay during the MB event. The hours incurred during a MB event are counted as inactive hours

Inactive Reserve (IR) event indicates a unit is inactive but can be brought back into service after some repairs in a relatively short duration of time. It typically takes days to bring an inactive reserve unit back online.

IR event is similar to MB but shorter in duration. The hours incurred during an IR event are counted as inactive hours. Outage rates and factors are not affected by the IR events. Most importantly, EFORD is unaffected by this type of reserve.

Retired Unit (RU) event is used to retire a unit. The start date of the event will become the retirement date of the unit.

#### 4.9 Event Data (Continue)

Name	Columns (Legacy Format)	Description
IO (Interconnection Office) Code	23-24	If index number is 2-48 leave ISO Code blank. The only valid ISO Code allow by the system is 0. 0 means no special consideration.
Start date and time	25-36	<p>For index number 2-48 leave blank.</p> <p>The format expected by the system is YYYYMMDDHHMI A 24-hour clock is to be used when reporting time; i.e., 8:30 p.m. is 2030, 8:30 a.m. is 0830, etc. Midnight is 2359 for the day ending; 0000 is the initial time entry for a new day. July 31 1999 at 3:26 p.m. would be reported as <u>1 9 9 9 0 7 3 1 1 5 2 6 .</u></p> <p>The start of the event is the actual time that the event was initiated, either equipment or operator activated. If two events follow each other and are for two identical but separate components, the start date of the second component should be increased by the minute such that the two events are clearly understood to be for two separate components. For each of the event types the start of the event would be initiated as shown below.</p> <p>Outages and Reserve Shutdowns start when the unit is removed from service and desynchronized with the system. Startup failures start when the unit is not longer able to continue and complete its startup cycle within the specified time and requires a significant amount of repair effort. These startup cycle times will vary from unit to unit.</p> <p>RS are considered full outages. Deratings may start during RS events but not during other full events.</p> <p>Deratings start when a unit is limited, for whatever the reason, to some level of load carrying capability that is greater than zero, but less than the Maximum Capacity of the unit. Deratings begin when a system's piece of</p>

		<p>equipment or major component is removed from service such that full power operation would no longer be possible, even if this occurred during a reserve shutdown, another derating, or load-following. If during a full unit outage other equipment/components/systems are taken out of service for repairs and these repairs are completed during the full unit outage, then these are to be reported as Major Items Worked using additional cause codes for this event number. They are not to be reported as deratings.</p> <p>If during a full unit outage other equipment/components/systems were taken out of service for repairs and these repairs extend beyond the completion of the full unit outage and result in a subsequent derating, then these repairs are to be reported as other work done during the full outage event and derating starts (with a new event number) after the full event ends.</p> <p>Deratings which begin prior to a full unit outage and are terminated during a full unit outage shall report the actual time the derating is terminated. Thus a derating can terminate at any point in time, including the time period during a full outage.</p> <p>“Non curtailing Equipment Outages” (deratings with NC in columns 49 and 50) start when the component becomes unavailable (tripped. Declared inoperable or tagged out, whichever occurs first).</p> <p>Start times <u>must not</u> coincide with the end time of previous events for those event type changes indicated by a “No” in the “Allowable Coding Table” in the next section. For “Yes” type changes start date may, but does not have to, equal end date of previous event. Certain event type changes, however, must start at the end of previous event. See event types for details.</p>
End date and Time	37-48	<p>For index number 2-48 leave blank.</p> <p>The format expected by the system is          YYYYMMDDHHMI          End time for a full outage is defined as the time a unit is synchronized to the station bus. <u>Operation on test is not considered part of the outage.</u> If a unit is not to be started for economic operation immediately after a</p>

		<p>period of unavailability, the outage is considered ended when work has been completed and the unit could theoretically have been started <u>and synchronized</u>.</p> <p>For each of the event types the end of the event would be initiated as shown below.</p> <p>“Outages, Startup Failures and Reserve Shutdowns” end with the synchronization of the unit to the system or when the unit could have been synchronized if left off for economy.</p> <p>Testing of turbines following their return to normal service (e.g., synchronized for load carrying purposes) are to be reported as separate events (i.e., Planned Outages).</p> <p>“Deratings” end with the actual or potential increase in unit capacity from that to which it was restricted because of the derating. Deratings do not necessarily end when another event is initiated.</p> <p>“Noncurtailing Outages” (deratings with NC in columns 49 and 50) end when the component becomes available (is declared operable, tagged-in, etc., whichever occurs first).</p> <p><u>Events which extend through multiple months</u>          Leave the End of Event and Time; end of Work Completed blank if the event extends into the next month. When the event ends, resubmit the event report with the same information as the original report had in Columns 1-19. The Report Revision Code R should be coded in column 20. The rest of the fields are not changeable unless authorization is obtained from the Central Administrator.</p> <p>If an event ends after the end of the month but before the forms are submitted, it is permissible to submit the final information at that time.</p>
Available Capability	49-54 (2 implied decimals)	<p>For index number 2-48 leave blank.</p> <p>Enter the <u>net</u> operating capacity at which the unit could operate with the reduction imposed by the event being reported. Enter 0 for a full outage. It is important to remember that this number represents the next actual</p>

		<p>operating conditions at the time of the reduction.</p> <p>For deratings, the following data entry criteria should be observed.</p> <ul style="list-style-type: none"> <li>a) Enter the actual available capacity to which the unit was derated as a result of the event</li> <li>b) Deratings which are masked for part of their duration by deratings of larger magnitude may be reported as separate events.</li> <li>c) Deratings, which for their full duration, are masked by a reserve shutdown <u>must</u> be reported as separate events. The available capability must be estimated.</li> <li>d) If the actual or estimated available capacity due to a derating is changed during its duration due to the termination of an existing derating, the derating in which the capability is being changed is halted. A new derating event is reported showing the change in the available capacity associated with this derating. The start date for this new derating must be the same as the end time of the halted derating. The component cause code must be the same as the halted derating.</li> <li>e) Deratings which vary in magnitude with time may be reported either as separate events as noted in (d) above, or as a single event with an average capability over the duration.</li> <li>f) Enter NC in columns 49-50 for noncurtailing deratings.</li> </ul>
Blank	55-56	Blank
Event Cause Code	57-60	<p>Enter the four digit numeric code that best describes the system or component being reported for this event. The problems noted below must be reported. Up to 48 cause codes may be used to describe work done during a full event.</p> <p>Reportable Problems</p> <ol style="list-style-type: none"> <li>1. Principal or contributing cause of event.</li> <li>2. Any work on a major component during the event.</li> <li>3. Affected the startup/ramping of the unit.</li> </ol>

		4. Caused extension of the event.										
Amplification Code	61-62	Amplification code is used to further identify the cause of a derate or outage event. Each code describes the failure mode that leads to the event. This code is mandatory for event type U1 and D1 starting in 2011.										
Event Contribution Code	63-63	<p>Enter the code below that best describes the impact or contribution that this cause or component had on the event.</p> <table border="0"> <thead> <tr> <th><u>Impact/Contribution</u></th> <th><u>Code</u></th> </tr> </thead> <tbody> <tr> <td>The primary cause of the event. Multiple 1's may be reported only if the original event type was MO or PO.</td> <td>1</td> </tr> <tr> <td>Systems or major components which contributed to the initiation of the event. These could include other systems, major components, external conditions or human factors.</td> <td>2</td> </tr> <tr> <td>System, equipment or major component work that was performed during event, but was not a cause and did not extend the event.</td> <td>3</td> </tr> <tr> <td>After startup, delayed unit from reaching load point.</td> <td>5</td> </tr> </tbody> </table> <p>Notes: - Contribution Codes 2, 3 and 5 may be repeated as often as necessary.</p>	<u>Impact/Contribution</u>	<u>Code</u>	The primary cause of the event. Multiple 1's may be reported only if the original event type was MO or PO.	1	Systems or major components which contributed to the initiation of the event. These could include other systems, major components, external conditions or human factors.	2	System, equipment or major component work that was performed during event, but was not a cause and did not extend the event.	3	After startup, delayed unit from reaching load point.	5
<u>Impact/Contribution</u>	<u>Code</u>											
The primary cause of the event. Multiple 1's may be reported only if the original event type was MO or PO.	1											
Systems or major components which contributed to the initiation of the event. These could include other systems, major components, external conditions or human factors.	2											
System, equipment or major component work that was performed during event, but was not a cause and did not extend the event.	3											
After startup, delayed unit from reaching load point.	5											
Failure Mode	64-67	This is similar to the amplification code. This code is not mandatory and it provides the user another way to describe the failure in case the amplification code is insufficient.										

#### Optional Data

<b>Name</b>	<b>Columns (Legacy Format)</b>	<b>Description</b>
Work Started Date	68-79	<p>The format expected by the system is YYYYMMDDHHMI</p> <p>If work started is not entered, application programs will default to start of event when calculating hours per</p>



		<p>cause code.</p> <p>Enter the date and time the system or component became unavailable for service or was made inoperable. The time period during which preparatory work was being done (prior to the system or component being physically taken out of service) is not to be considered.</p>
Work Completed	80-91	<p>The format expected by the system is YYYYMMDDHHMI</p> <p>If work started and completed is not entered application programs will default to the start and end of event when calculating hours per cause code. Enter the date and time the work was completed on the system or component such that the system or component was again available for service. (refer to description of work started).</p>
Blank	92-93	Blank
Man-hours Worked	94-97	Enter the number of man-hours worked to repair the component or to correct the cause
Verbal Description ("A" 21-51, "B" 21-75)		<p>Enter a description of the event being reported. This description aids in amplifying the meaning of the system/component cause code reported for this event. The description should include a balanced description of the event's major aspects including discussions in the following key areas: (a) failure description and appearance, (b) cause of immediate failure and contributing factors and (c) corrective actions. As the total field of alphanumeric characters is limited, we would suggest that the data reporter place more emphasis on the failure description and appearance. This will allow events to be further classified by their failure modes. Where repetitive events are reported during the year, the data reporter may wish to place greater emphasis on the contributing factors or corrective actions taken. The use of abbreviations in describing the events is suggested.</p> <p><u>Note:</u> When reporting the verbal description, only two sequential cards (A+B) may be used to provide the description.</p> <p>The following are several guidelines the DATA</p>

		REPORTERS may use in preparing each of the three key areas (noted above) of a verbal description:
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#### 4.10 Allowable Coding Table (Allowable Event Transition)

To → ↓ From	PO	MO	PE ME	SF	U1	U2 U3	RS	D1-4 PD	DP DM	IR, MB RU
PO	YES	NO	YES*	YES*	YES	NO	YES	YES	NO	YES
MO	YES	YES	YES*	YES*	YES	NO	YES	YES	NO	YES
PE, ME	NO	NO	YES*	YES*	YES	NO	YES	YES	NO	YES
SF	YES	YES	NO	YES*	YES	NO	YES	YES	NO	YES
U1	YES	YES	NO	YES*	YES	NO	YES	YES	NO	YES
U2,U3	YES	YES	NO	YES*	YES	NO	YES	YES	NO	YES
RS	YES	YES	NO	YES*	YES	NO	YES	YES	NO	YES
D1,D2,D3	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES
PD,D4,DP, DM	YES	YES	YES	YES	YES	YES	YES	YES	YES*	YES
IR, MB, RU	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

#### Notes:

1. “Coincides,” as used below, is defined as follows:  
Two events are said to coincide when the end time of the first event is exactly the same, to the minute, as the start time of the second event.
2. A “NO” in the table above means that an event with the type in the “TO” heading must not coincide with an event of the type in the “FROM” column.
3. A “YES” in the table above means that an event with the type in the “TO” heading may, but does not have to, coincide with an event of the type in the “FROM” column.
4. A “YES\*” in the table above means that an event with the type in the “TO” heading must coincide with an event of the type in the “FROM” column.
5. The Level 2 program checks for compliance with this table. Error Number 22 checks Start Failures (events with type code “SF”) for events that change “TO” them. Error Number 24 checks event changes which have an entry of “NO” in the table. Error Number 28 checks event changes which have an entry of “YES\*” in the table.

## 5.0 Rampback Event Reporting (Card 96)

Rampback event reporting has been eliminated.

## 6.0 Generation Performance Reporting (Card 95)

Name	Columns (Legacy Format)	Description
Utility Code	1-3	NERC assigned identification code
Unit Code	4-6	A unique identification number assigned to each Company's unit
Data Code	7-8	95 - This code uniquely identifies this form as a monthly performance reporting form.
Year	9-12	The four digits of the reporting year.
Month	13-14	Month being reported (01-12). Jan.=01, Feb=02, etc.
Revision Code	15-15	Enter the code, shown below, appropriate for this report. <ul style="list-style-type: none"> <li>• Enter 0 or blank - If this is the original report .</li> <li>• Enter R to replace a previously submitted event. <b>To change any single entry or series of entries it is necessary to resubmit all data previously reported.</b> The "R" stands for Replace. The system will take your new record and completely replace the old one. Columns 1-14 will be used to locate the previously submitted record.</li> <li>• Enter D - To delete an <u>entire</u> record, repeat columns 1-14 as previously reported.</li> </ul>
Net Maximum Capacity	16-21 (2 implied decimals)	The maximum capacity which a unit can sustain over a specified period of time. To establish this value, formal demonstration is required by performing unit testing as is required by GCRPTF. Maximum capacity of a unit may change slightly from time to time as a result of new tests. However, MC should be not changed due to equipment problems, even if these problems persist for a lengthy period of time.
Net Dependable Capacity	22-27 (2 implied decimals)	The average unit <u>net</u> capability during a given month, assuming that the generator output was limited only by ambient air and cooling water temperatures. One way to determine this value is, first obtain a list of the peak hours for each weekday in the month, excluding holidays. Find the temperature of the ambient air or cooling water for each of these peak hours. (Note: This temperature

		should be measured at the station or, if this is not possible, at a representative location for stations located in the same area.) Average these temperatures, then determine the unit NDC from available charts and tables of MW vs. air temperature and/or MW vs. cooling water temperature using the average temperature as determined above. If it is more convenient to determine the MW value daily after the peak is specified and then average the daily MW values directly at the end of the month, this method is also acceptable. If the unit is retired during the month, use the average value for the time it was installed. If it was re-rated, use the weighted average for the month.
Net Actual Generation	28-36 (2 implied decimals)	The actual number of net electric megawatt hours. The actual number of net electric megawatt hours. If value is negative, enter a negative sign prior to the value.
Typical Unit Loading Characteristics	37-37	Enter the code from the list below that best describes how the unit was operated or loaded during the month during the month. 1) Base Loaded Minor Load Following 2) Periodic Start-up Load Follow Daily 3) Weekly Start-up Load Follow Daily Reduce Load Nightly 4) Daily Start-up Load Follow Daily Of-Line Nightly 5) Start-up chiefly to meet Daily Peaks 6) Other Describe in Columns 40-58 If #6 is entered, a verbal description must be given in Fields 42-60.
Blank	38-38	Blank
Attempted Unit Starts	39-41	The number of attempts made to bring the unit from shutdown to synchronism during the month. Repeated failures to start the same cause without attempting corrective action are to be considered a single attempt. If start up attempts are abandoned and the unit shutdown for repairs and then started at a future time, two start-up attempts should be reported. Do not include as a start attempt any SF event that continues from the previous year.
Actual Unit Starts	42-44	The number of times the unit was actually synchronized during the month. The number of starts must be less than or equal to the number of attempted units starts.
Blank	45-47	Blank
Verbal Description of	48-66	If Code 6 was entered for the typical unit characteristics

Loading		as noted above in column 29, verbally describe the type of loading experienced by the units.
Unit Service Hours	67-71 (2 implied decimals)	The number of hours that the unit was synchronized to the system no matter what the load level of the unit. <u>Do not include synchronous condensing or pumping hours.</u> Note: this field contains an <u>assumed</u> decimal point between columns 63 and 64. Report hours to the nearest 1/100 <sup>th</sup> of an hour (not hours and minutes). For multiple generator equipped units, count only those hours when at least one of the generators was synchronized to the system, whether or not one or more generators were actually in service. Include any time the unit was on line for test.
Reserve Shutdown Hour	72-76 (2 implied decimals)	The number of hours to the 1/100 <sup>th</sup> of an hour that the unit was available to the system but not synchronized for economy reasons.
Pumping Hours	77-81 (2 implied decimals)	The number of hours to the 1/100 <sup>th</sup> of an hour that a hydro turbine/generator was operated as a pump/motor.
Synchronous Condensing Hours	82-86 (2 implied decimals)	The number of hours to the 1/100 <sup>th</sup> of an hour that a unit was operated in the synchronous condensing mode.

## 7.0 Fuel Performance Report Form (Card 99)

This monthly report contains fuel information. THIS SECTION DOES NOT APPLY TO HYDRO AND PUMPED STORAGE, WIND OR SOLAR UNITS.

It is possible to have more than one form for each unit. The first form is coded with a “1” in field 82 and contains primary and secondary fuel data. The second card will have a “2” in field 82 and contain additional tertiary and quaternary fuel data, in the same format as the first card.

Name	Columns (Legacy Format)	Description												
Utility Code	1-3	NERC assigned identification code												
Unit Code	4-6	A unique identification number assigned to each Company’s unit												
Data Code	7-8	99 - This code uniquely identifies this form as a monthly fuel performance reporting form.												
Year	9-12	The four digits of the reporting year.												
Month	13-14	Month being reported (01-12). Jan.=01, Feb=02, etc.												
Revision Code	15-15	<p>Enter the code, shown below, appropriate for this report.</p> <ul style="list-style-type: none"> <li>• Enter 0 or blank - If this is the original report .</li> <li>• Enter R to replace a previously submitted event. <b>To change any single entry or series of entries it is necessary to resubmit all data previously reported.</b> The “R” stands for Replace. The system will take your new record and completely replace the old one. Columns 1-14 will be used to locate the previously submitted record.</li> <li>• Enter D - To delete an <u>entire</u> record, repeat columns 1-14 as previously reported. To delete all 99 information it is only necessary to delete the 01 form. Any information on the 02 form will be deleted also</li> </ul>												
Fuel Code Primary/Tertiary Sec/Quart.	16-17 49-50	<p>Should contain a code that best describes the fuel consumed or would have been consumed during the report period.</p> <table> <thead> <tr> <th><u>CODE</u></th> <th><u>DESCRIPTION</u></th> </tr> </thead> <tbody> <tr> <td>CC</td> <td>Coal</td> </tr> <tr> <td>LI</td> <td>Lignite</td> </tr> <tr> <td>PE</td> <td>peat</td> </tr> <tr> <td>WD</td> <td>Wood</td> </tr> <tr> <td>OO</td> <td>Oil</td> </tr> </tbody> </table>	<u>CODE</u>	<u>DESCRIPTION</u>	CC	Coal	LI	Lignite	PE	peat	WD	Wood	OO	Oil
<u>CODE</u>	<u>DESCRIPTION</u>													
CC	Coal													
LI	Lignite													
PE	peat													
WD	Wood													
OO	Oil													

		DI Distillate Oil (No.2 ) KE Kerosene JP JP4 or JP5 WA Water GG Gas PR Propane SL Sludge Gas GE Geothermal NU Nuclear WM Wind SO Solar WH Waste Heat OS Other - Solid (Tons) OL Other - Liquid (BBL) OG Other - Gas (CU Ft)
Quantity Burned Primary/Tertiary Sec/Quart.	18-24 51-56	Enter the quantity of this type fuel consumed during the quarter. A decimal point is indicated on the form and will be recognized by the computer program. Do <u>not</u> attempt to enter a decimal. If the fuel code is CC, LI, PE, WD, or OS, this value is thousands of tons to the nearest hundred. If the fuel code OO, DI, KE, JP, WA or OL, this value is thousands of barrels (42 gal. Per barrel) to the nearest hundred. If the fuel code is GG, PR, SL or OG, this value is millions of cubic ft. to the nearest hundred. For GE value is millions of pounds of steam. X1,000 tons-solids X1,000 bbl (42 gal) liquid X1,000,000 cu. Ft. - gas If the quantity of fuel burned were 900 tons of coal it would be entered as         .9 0 . The computer will insert the decimal place. If the unit burned 900000 tons of coal it would be entered as  _ 9 00 0 .0 0 . The multipliers applied to the data will be 1000 short tons (2000 lbs.), 1000 barrels (42 gallons/barrel) or 1,000,000 cubic feet of gas.  NU, WM, SO, WH leave blank.
Average Heat Primary/Tertiary Sec/Quart.	25-30 57-62	Should contain the weighted average heat content in BTU's for the fuel reported in 16-17 and 49-50, to the nearest BTU/LB of solid fuel, BTU/GAL of liquid fuel and BTU/CU ft. of gaseous fuel. Nuclear Units: Enter the gross plant heat rate (BTU/KWHR).



% Ash Primary/Tertiary Sec/Quart.	31-33 63-65	Enter the average ash content for this type of fuel to the nearest 0.1% (by weight). This factor is to be obtained from an ultimate analysis of the fuel.
% Moisture Primary/Tertiary Sec/Quart.	34-36 66-68	Enter the average moisture content for this type of fuel to the nearest 0.1% (by weight). This factor is to be obtained from an ultimate analysis of the fuel.
% Sulfur Primary/Tertiary Sec/Quart.	37-38 59-70	Enter the average sulfur content for this type of fuel to the nearest 0.1% (by weight). This factor is to be obtained from an ultimate analysis of the fuel.
Blank	39-48 71-81	Blank
Card Number	82-82	01 must be entered to report one primary and one secondary fuel data. If more than two fuels are to be reported, code a 2 for the second form and complete data fields for tertiary and quaternary fields.

## **PART II Graphical User Interface**

## 8.0 Getting Started

### 8.1 Setup Requirements to run the system

To access the PowerGADS system, you must have a personal computer with access to the intranet website using Microsoft Internet Explorer 5.0 or higher.

### 8.2 Login Procedure

The User ID and temporary password are both issued by the Central Administrator.

The temporary password is always “GADS123”. This password is case-sensitive.

The temporary password expires immediately after the user’s first successful login. The user must supply a new password seven-to-twelve characters in length, containing at least one numeric and one non-numeric character. The password is encrypted by the system before storing it into the database. No one, including the Central Administrator, can see what the password is.

Password is invalidated after three failed attempts to log into the system. Only the Central Administrator can reset the password.

The password expires every 90 days.

Both the user ID and the password are **case sensitive**.

#### 8.2.1 Access Rights

eGADS maintains a user ID and password Access Control List (ACL) to secure the access into the system. Each ID belongs to one of the following two categories.

- Central Administrator (Admin) – Full access to all areas of the system including security
- User (User) – Limited access as determined by the Admin

User Access rights are granted on a screen-by-screen basis. On each screen, a user may be assigned to one of these three access levels: Limited Read-Write, Unlimited Read-Write, and Read-only. Unlimited R/W users have access to all features on the screen while Limited R/W users may not be able to access certain functions.

All users are subject to Data Lock Check, a mechanism that prevents users from modifying historical data. For example, it can prevent users from submitting or changing data after the

20<sup>th</sup> day of the month. The Central Administrator is not subjected to this lock and has the ability to release the lock upon request.

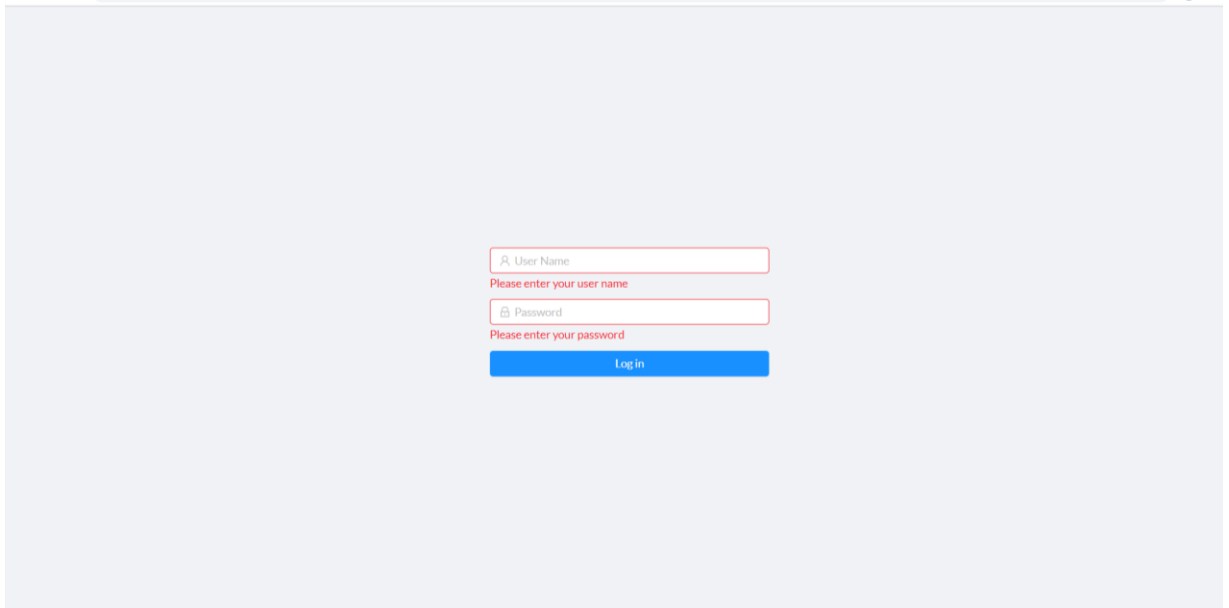
## **8.2.2 Security**

eGADS has the following security restrictions in place:

- The same user account cannot be logged into the system more than once.
- Users are tracked when they are logged into the system. The user's IP address, the date and time of the last log-off are recorded.
- A user account is invalidated after 3 failed attempts to log into the system. eGADS will maintain a count of each failed login attempt. This field is reset back to 0 each time a successful login occurs. Once the failed login attempts are greater than 3, the user status is set to "Revoked". The user has to contact the Central Administrator to restore the user status back to "Active" before gaining access again.

### 8.2.3 Invoking the System

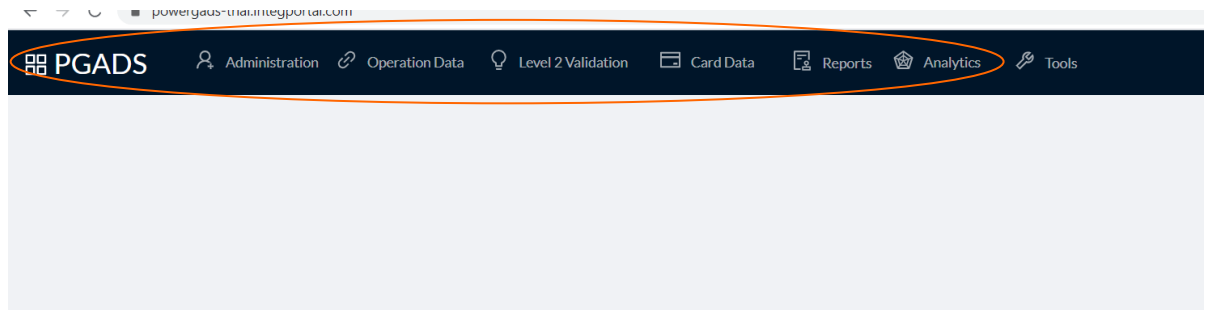
- *Launch Google Chrome*
- *Type the PowerGADS URL address into the address box (Contact the administrator for the correct URL)*
- *You will see the below screen*



- *Type the Login ID in the “User Name” box*
- *Tab or click to the “Password” box*
- *Type the password*
- *Click “LOG ON” or press the Return Key*

## 8.2.4 Menu Options

Once the user successfully logs into the system, the main system screen then appears with a Horizontal menu bar to the top. The Horizontal Menu Bar allows the user to choose data to view, analyze, and edit.



The following shows a typical mapping of the menu structure:

- Operation Data

- Data Import
- Daily Operation View
- Monthly Operation View
- Data Export

- Validation

- Level 2 Validation
- Level 2 Validation Error Log
- Level 2 Validation Status

- Card Data

- Card95 - Performance Data
- Card97 - Event Data
- Card99 - Fuel Data
- Data Modification History
  - Card 95 Modification History
  - Card 97 Modification History
  - Card 99 Modification History

- Reports

- GADS Reports
  - Cause Code
  - Event Data
  - GORP
  - Outage Statistics
  - Performance
  - Statistics

- Tools

- Cause Code Lookup
- Change User Password

- Logout

- Help

** VERY IMPORTANT NOTES**

- ❖ Before going to a different Website or closing the browser, the user should logout from the system. PowerGADS tries to detect unusual termination of the application and logout the user automatically. However, abrupt termination (closing the browser while the application is running) may cause the user account to remain “in-use” for up to two minutes. If the user tries to login during this time the following message is displayed:

“User is already logged in”. The user must wait a few minutes before trying to login again.



## 9.0 General Usage

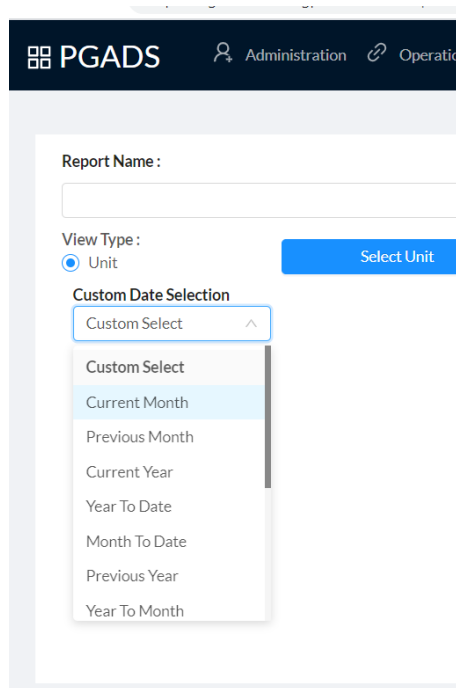
For optimal viewing, screen resolution should be set at 1024 x 760. This setting can be adjusted in the control panel section of your system. In lower resolution, the user will need to use the scroll bar to view areas outside of the displayed screen.

### 9.1 Drop-down List Boxes


Drop-down list boxes are used throughout this application, mostly for choosing the appropriate date.

To make a selection:

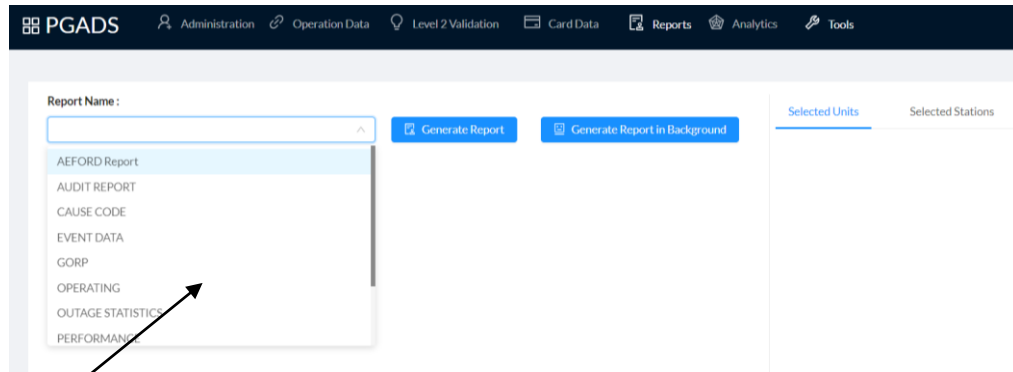
- *Click the arrow to the right of the box. This will drop down a list with multiple selections.*



- *Scroll to the selection you desire*
- *Click the selection*

 **Tip:** For faster searching, type the first letter or number of the selection you wish to select. The system jumps to the first occurrence of the entry that starts with the character entered. You can scroll down further using the scroll bar until the selection you are looking for is found.



## 9.2 List boxes (Single and Multi-Select)



- Choose from a list box by clicking on the selection you desire
- To choose more than 1 entry, hold the Control Key while making your selections
- To choose several entries that are next to one another, click on the top entry of the group, then hold the Shift Key while clicking on the bottom unit of the group
- To de-select a single unit, hold the Control Key while clicking on your selections
- To clear all selections while making a single new selection, just click on the new selection.

☺ Tip: To select all the entries in the list box, look for checkbox labeled “Select All”. It is available on most screens. If this checkbox is not available, click on the first item of the list, press and hold down the shift key, then press the page down key several times to scroll to the bottom of the list.

☺ Tip: To clear all selections in the list box, click on the button labeled “Clear All”.

☺ Tip: To facilitate the searching of selections, increase the size of the list box by clicking on the “expand” button . The “reduce” button  enables you to reduce the list box size back to normal

## 9.3 Text boxes

Text boxes allow for free form entering of data or information.

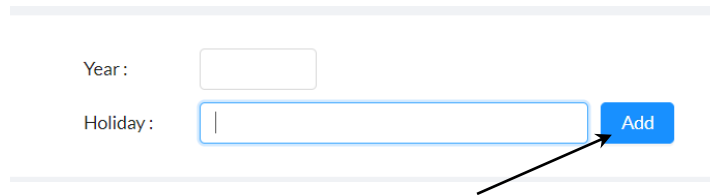
- Click on the text box where you wish to enter information

- Type information

- *Click a confirmation push button such as “Save”, “Enter” or any acknowledgement button available, if necessary.*

## 9.4 Push buttons

Push buttons allow for actions to be initiated by the user.



The image shows a user interface snippet with two text input fields. The first field is labeled 'Year:' and is empty. The second field is labeled 'Holiday:' and contains a vertical cursor. To the right of the 'Holiday' field is a blue button with the text 'Add'. A black arrow points from the bottom right towards the 'Add' button.

- *In this example, enter the desired date values into the text boxes*
- *Click on the button, “Retrieve” to invoke it’s function*

## 9.5 Radio Buttons

Radio buttons are used for “either/or” type selections.



The image shows a 'Sort by' label above two radio button options. The first option is 'Unit' with an unselected radio button. The second option is 'Month' with a selected radio button (indicated by a blue dot inside the circle).

- *Click on selection desired, a dot appears in the circle before the selection.*

## 9.6 Grids

Grids are used to present data in a tabular format. The scroll bar to the right and bottom enables the user to scroll to additional columns or rows.

PGADS Administration Operation Data Level 2 Validation Card Data Reports Analytics Tools

Amplification Code Management Retrieve Insert Save Remove Filter

Amplification Code* ▲	Description	Modifier	Modified Date
01	Alignment/clearance not within limits - axial	System	01/13/2010 14:40:49
02	Alignment/clearance not within limits - radial	System	01/13/2010 14:40:49
03	Arced/flashover - electrical	System	01/13/2010 14:40:49
04	Balance, not within limits	System	01/13/2010 14:40:49
05	Binding - radial related contacts (use F670 if contact is in axial direction)	System	01/13/2010 14:40:49
06	Broken	System	01/13/2010 14:40:49
07	Burned/fire damage - initiated by component (ex. burned motor)	System	01/13/2010 14:40:49
08	Burned/fire damage - not initiated by component (ex. pump fire damage due to motor fire)	System	01/13/2010 14:40:49
09	Calibration, not within limits	System	01/13/2010 14:40:49
10	Carbon, covered	System	01/13/2010 14:40:49
11	Chemical excursion damage	System	01/13/2010 14:40:49
12	Clogged	System	01/13/2010 14:40:49
13	Closed	System	01/13/2010 14:40:49
14	Condensation - oil	System	01/13/2010 14:40:49
15	Condensation - water	System	01/13/2010 14:40:49
16	Connection, loose	System	01/13/2010 14:40:49
17	Contaminated - liquid fluids (use F320 for air contamination)	System	01/13/2010 14:40:49
18	Contaminated - metals and solids	System	01/13/2010 14:40:49
19	Cooling, inadequate - liquid	System	01/13/2010 14:40:49

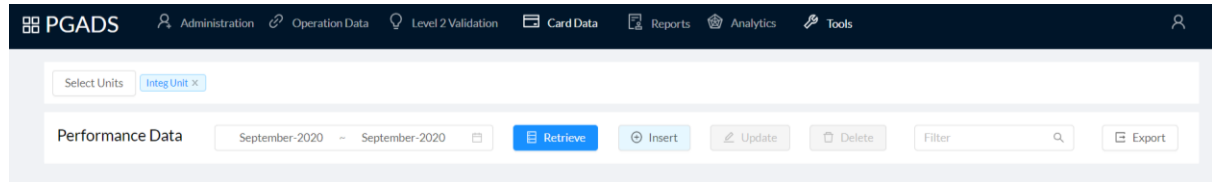
☺ Tip: You can change the way the columns are sorted by clicking any of the headers. The first click causes a sort in ascending order. A second click on the same header causes it to re-sort in descending order. If you click any column but the first, it will sort by that column, then by the columns from left to right.

☺ Tip: Grid heading and box sizes can be adjusted to allow you to have more column width. To “stretch” a column, put your mouse cursor over the header’s right or left edge of the column you wish to “pull”. While holding the right mouse button down, drag the edge to the desired length

☺ Tip: Columns can be moved from the current location to another location by drag and drop. Click and hold down the right mouse button on the column header you want to move and then move the mouse cursor. You will see that the column you clicked on is being “picked-up” and moved. Let go of the right mouse button to “drop” the column into a new location.


## 9.8 Functions Bar


Located below the horizontal Menu Bar is the Function Bar. It enables you to add, modify, or delete records displayed on the screen. Additionally, you can find a record by searching the contents, print out the records, or export them to CSV files.



For example, the following steps describe the usage of the function bar to delete a record.

- *Select the record you would like to remove by clicking on it.*
- *Click the Delete option on the bar*

 **Note:** If the system does not allow you to update a particular item, that item is a database key for the data table. In order to make changes to a key field, you need to delete the record and enter a new one.

 **Tip:** You can double-click on an entry inside a grid to invoke the update function.

## 10.0 Operation Data

Under the Operation Data menu heading, there are three menu items:

- Data Import
- Daily Operation View
- Monthly Operation View
- Data Export

These selections enable the user to add, modify or delete data in PowerGADS.

### 10.1 Data Import

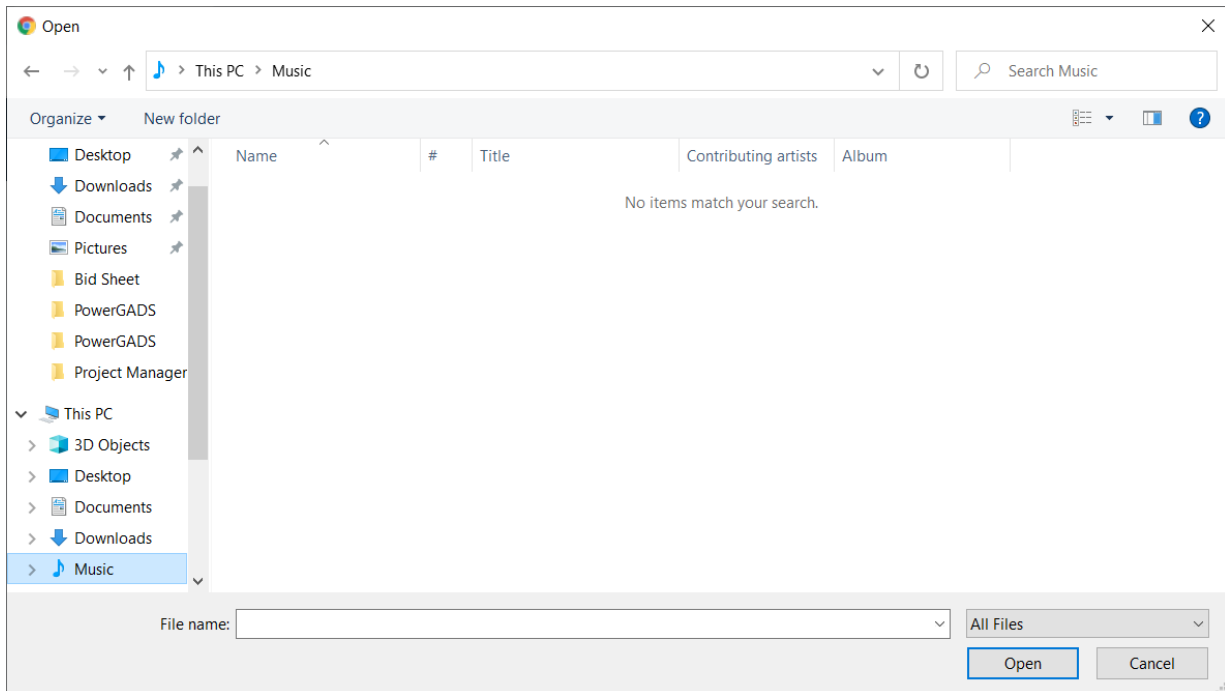
The Data Import screen allows the user to upload data in legacy, NERC, CSV or XML format (see Appendix for descriptions of each format).

Step 1: Select the type of file being imported by clicking on the “Import Type” radio button

Step 2: Click on the Import File button to initiate a dialogue box that helps the user to locate the file to be imported within the users network.

Utility*	Unit*	Card Code	Year	Month	Event Num	Error Code
----------	-------	-----------	------	-------	-----------	------------

The following dialog box appears after the “Import File” button is clicked.



- *Locate the folder where the import file is saved*
- *Click on the file to be imported so that it appears inside the “File name” text box*
- *Click on the “Import Card” button*

Once the system receives the import file, it parses the file content according to the format selected in the Import Type checkbox. Level 1 validation is performed automatically. If an error is encountered during the validation, an error log is displayed on the screen. Each error is displayed on two rows inside the error log grid. The first row describes the error. The second row displays the line of data submitted by the user. Whenever possible, the system tries to highlight the data columns that caused the error in the submitted line. For example, if the user submitted an invalid cause code, the system will highlight the four digits cause code in that line.

☺ Note: If one or more error is encountered during the import, the entire content of the file is rejected.

☺ Note: If all records pass the level 1 check, the error log will not appear on the screen; instead a message will appear in the status bar informing about the success of the import.

☺ Note: Data Import is subject to Data Lock imposed by the administrator. The existing rule specifies that the user can only submit previous month data up to the 20<sup>th</sup> day of the current month. Once passed the deadline, the import mechanism will prevent the user from uploading “lockout” data. However, the administrator has the ability to release the lock upon request.

### 10.3 Monthly Operation

The Monthly Operation screen presents a monthly view of all the events reported by the selected unit. If permission is granted by the administrator, user may use this screen to directly enter events. Here is an overview of the functionality:

Pie chart shows the break down of the total MW into available, reserve, forced, maintenance, planned and extension

The total capacity is the x-axis while day of the month is the y-axis

Events can be added or edited by right-clicking

This legend provides outage type color coding, total MW and percentage associated with type of outage

Monthly Performance Integ Utility (999) / Integ Unit (999) October-2020 [Retrieve]

Unit Type	CT	Primary Fuel	GG
Net Generation	500	Burned(mcf)	
Station Service		Heat(bt/ft3)	
Net Max Cap	12	ASH %	
Net Dep Cap	12	Moisture %	
Gross Max Cap	0	Sulfur %	
Gross Dep Cap	0		
Attmp. Starts	1		
Actual Starts	1		
Service Hrs	336		
Reserve Hrs	0		
Unavlb/OMC Hrs	408		

Start	End	T	Days of the month	Cause Description	Description		
10/01/2020 00:00:00	10/02/2020 00:00:00	U1	1	0	7800	Couplings	ok
10/05/2020 00:00:00	10/08/2020 00:00:00	D4	2	6	5110	Lube oil system - general	
10/15/2020 00:00:00	10/16/2020 00:00:00	NC	3	0	5510	Lube oil system	
10/16/2020 00:00:00		U1	4	0	3830	Auxiliary boiler	ok

Name	MWH	%
Forced	4896	54.84
Planned	0	0
Maintenance	432	4.84
Extension	0	0
Reserve	0	0
Available	3600	40.32

KPI Config

KPI (Last 12 Mon.)	Value
Forced Outage Ftr (	0.00
EFORd	0.00
# Force Outages	0.00
# Maint. Outages	0.00

White cells inside the grid are editable while gray cells are system calculated

When the Save button is pressed, daily values are totaled by the system and stored into card 95 and card 99



### 10.3.3 Card 97 – Event Data panel

The Card 97 – Event Data panel is invoked whenever the user wants to review, add, modify or delete Card 97 data. These functions are available in the Daily Operation View, Monthly Operation View and the Card 97 – Event Data screen. Depending on the Data Lock status of the event, the user may or may not be able to gain access to this panel.

New Data X

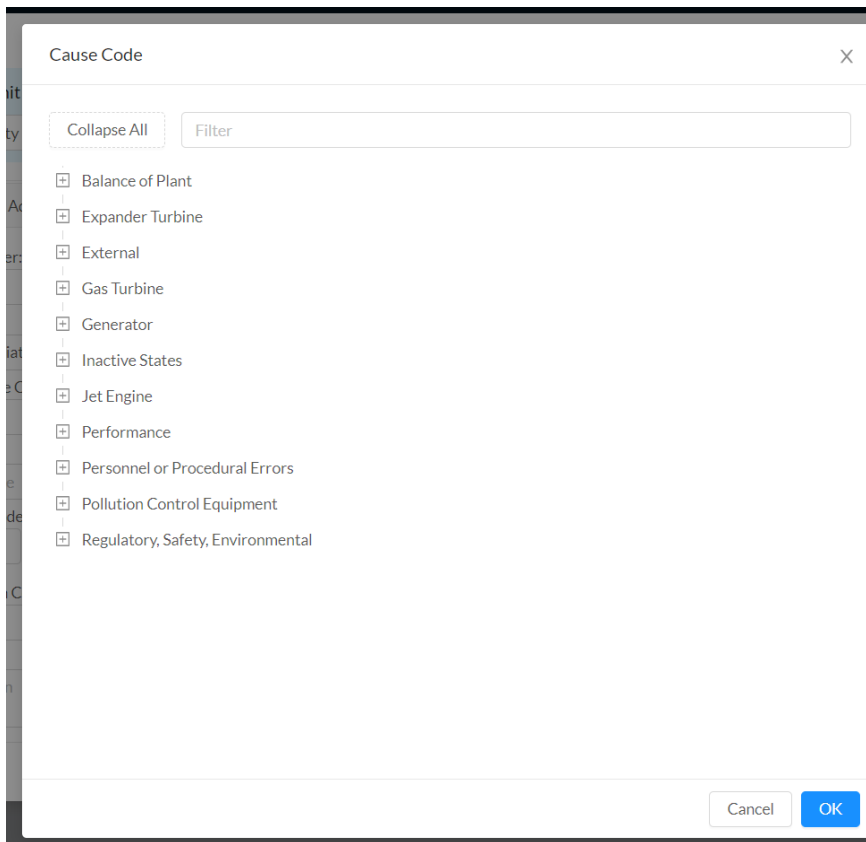
Utility / Unit	Year
Integ Utility (999) / Integ Unit ( 999) <span style="float: right;">v</span>	2020 <span style="float: right;">v</span>

Main
Add More Cause

Event Number: <input type="text" value="0"/>	Event Start: <input type="text" value="Select DateTime"/> <span style="float: right;">v</span>
Event Type: <input type="text" value="U1-Immediate Forced Outage"/> <span style="float: right;">v</span>	Event End: <input type="text" value="Select DateTime"/> <span style="float: right;">v</span>
Net Available Cap: <input type="text" value="0"/>	Work Start: <input type="text" value="Select DateTime"/> <span style="float: right;">v</span>
Cause Code: <input type="text" value="Cause Code"/> <span style="float: right;">Select</span>	Work End: <input type="text" value="Select DateTime"/> <span style="float: right;">v</span>
Fail/Amp. Code: <input type="text" value="Fail Code"/> <input type="text" value="Amp Code"/> <span style="float: right;">Select</span>	Man Hours: <input type="text" value="Man Hours"/>
Contribution Code: <input type="text" value=""/> <span style="float: right;">v</span>	
Description: <input style="width: 100%;" type="text" value="Description"/>	<input type="button" value="Desc. Wizard"/>

- *Enter or modify event data as needed*
- *Use “Reset” buttons to blank out the dates if necessary*
- *The Time designation of “EST” or “EDT” is automatically set by the system all the time except for one special case. Please read section 4.4.1 carefully*

- *The Cause Code field located below the Available Capacity is the Primary cause code of the event. Click on the “Select” button to the right to invoke the Cause Code Selection panel:*

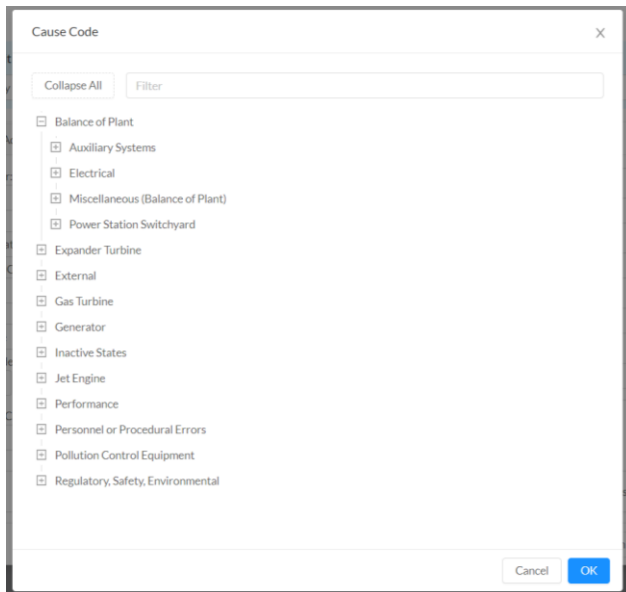


The “Expand” button expands all the branches to let the user browse through all possible selections.

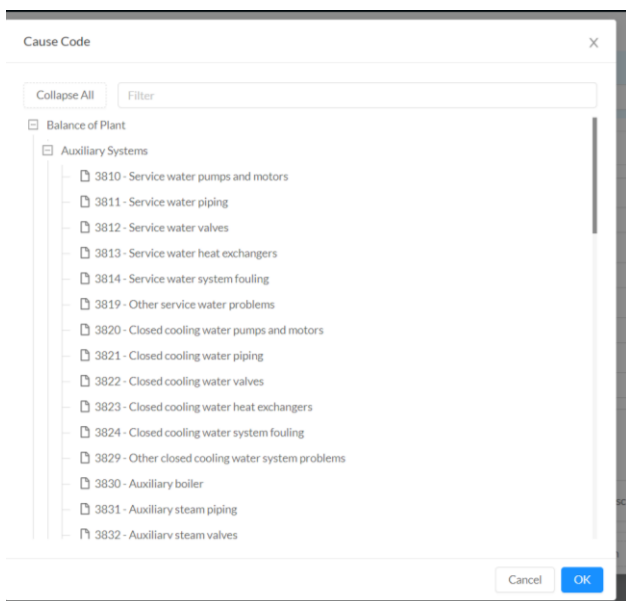
The “Collapse” button retracts all nodes back to the top levels.

The “Filter” button enables the user to search through the description of all the cause codes and return those with the matching phrase entered into this textbox to the left of the button.

To find a cause code, locate the folder of the major system where the problem is originated, such as “Balance of Plant” folder. Double-click on it to reveal the components associated with the selected system.



Locate the component associated with the problem and double-click on it to reveal the cause codes.



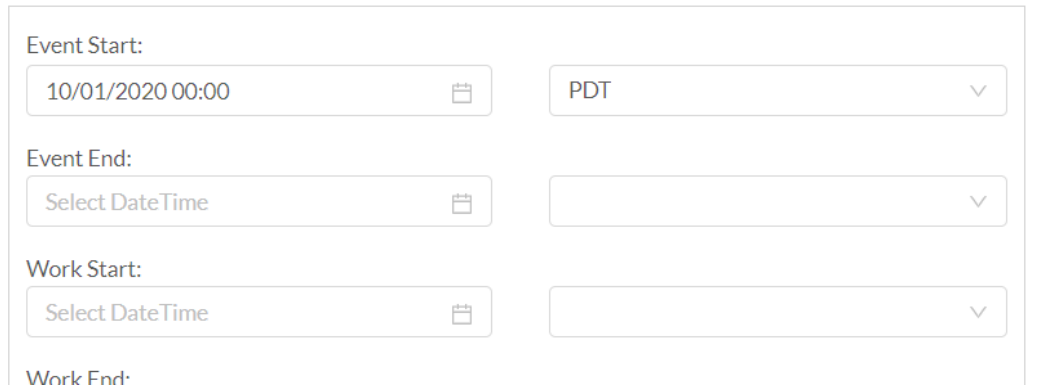
Click to highlight the cause code to be selected and click on the “Select” button.

- *Outside Management Control (OMC) Cause Codes are highlighted in orange.*
- *Additional Cause Codes can be selected in the “Additional Cause Code” grid. A contribution code and description can be entered with each additional Cause code. Each additional cause code will result in one additional event index record.*
- *Click the “Save” button to save the data or “Cancel” to exit without save*

- *The system performs level 1 check after the “Save” button is clicked. If error is encountered, the error messages will be displayed in the “Errors” grid. The system will not save the data as long as the level 1 error is found.*

## Time Designation

The Time designation is displayed to the right of each event date as shown in the example below.



The screenshot shows a form with four rows of input fields. Each row has a date-time input field on the left and a time designation dropdown menu on the right. The first row is labeled 'Event Start:' and shows '10/01/2020 00:00' with a calendar icon and 'PDT' in the dropdown. The second row is labeled 'Event End:' and shows 'Select DateTime' with a calendar icon and an empty dropdown. The third row is labeled 'Work Start:' and shows 'Select DateTime' with a calendar icon and an empty dropdown. The fourth row is labeled 'Work End:' and is partially visible.

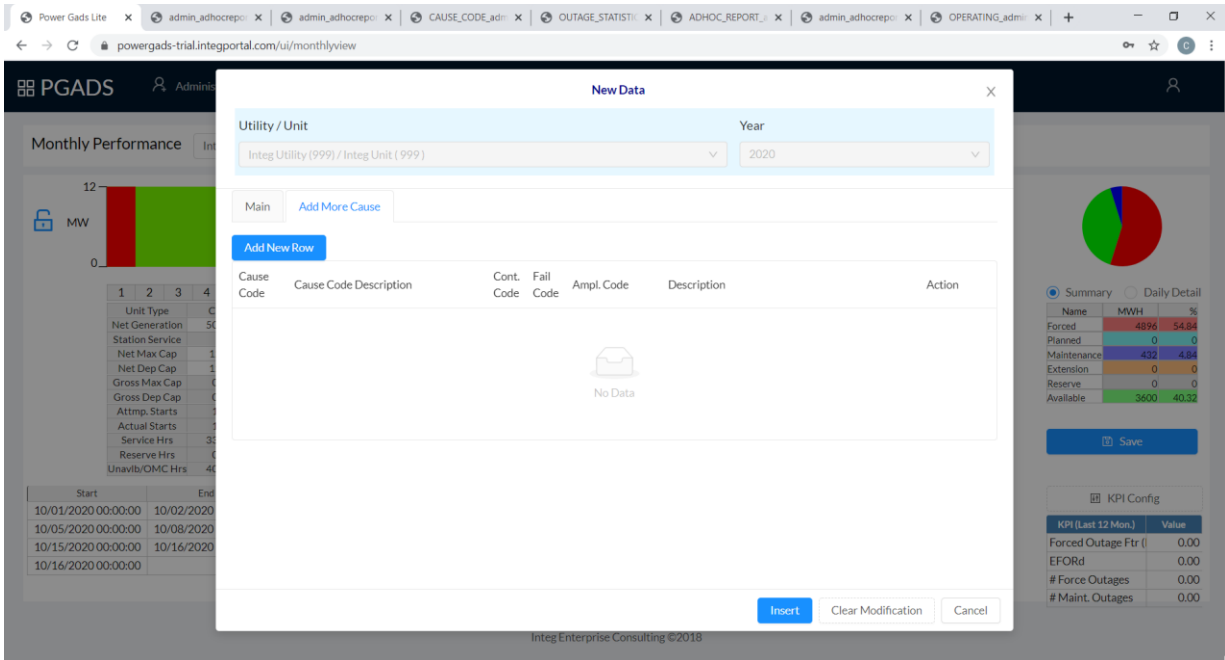
Normally the system automatically set the time designation according to the date selected by the user. There is only one hour in the entire year when the system cannot determine whether the date-time is Standard Time or Daylight Savings Time. It is the second hour of the clock-change day during fall daylight savings. On that day, hour 2 is repeated. It goes from 00:00 am to 01:00am, 01:00am to 02:00am, and then 02:00am to 02:00am again. The difference between the first 02:00am and the second 02:00am is the following:

- First 02:00 is 02:00 EDT
- Second 02:00 is 02:00 EST

Please make a note of this. In the rare occasion when an event started or ended between 02 and 02:59am on the clock-change day of fall daylight savings, the user must make clear which time designation to use.

## Additional Causes

Up to 48 additional sets of cause code, contribution code, failure code and description can be recorded for each event.

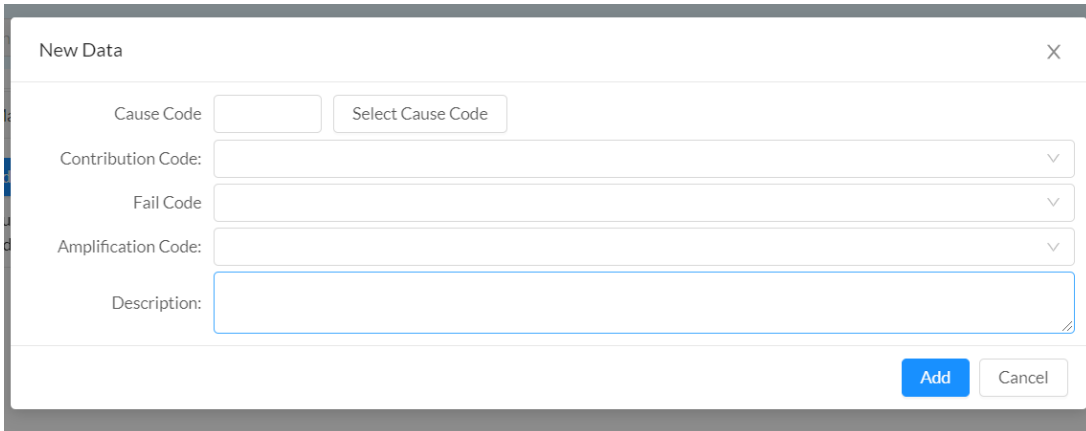


To add or modify cause code and failure code in this grid, click on the “Add New Cause” button of the corresponding row to invoke the Cause Code Selection panel. A contribution code must be selected for each additional cause code. The failure code and description field are optional.

To delete a row, click on the cause code and press the backspace key until the cause code is deleted. Click on the save button when ready. Any row with blank cause code will not be saved.

### Fail Code and Amplification Code

To add or modify Fail Code and Amplification Code, the user can either enter the code directly into the entry textbox (not case sensitive) or click on the “Select” button to the right to invoke a popup selection panel.






## 10.4 Data Export

The Data Export screen allows the user to download card data in the legacy format (see section 3.4 for descriptions of the legacy format).

If the system is successful in creating a file, the file is presented for viewing in a new browser instance. Click on file-save to save the data to a specified folder.

If error is encountered, an error log will appear on the screen with all the errors listed. The system will then give the user an option to either abort the process or create a file with available data.

 Note: Before generating the Legacy file, use the Level 2 Validation Status screen to check if all the data passed the required validations.

## 11.0 Validation

Under the Validation menu heading, there are three menu items:


- Level 2 Validation
- Level 2 Validation Error Log
- Level 2 Validation Status


These selections enable the user to perform level 2 validations, keep track of outstanding errors and find out which units has not passed the validation for a specific period.


### 11.1 Level 2 Validation


The Level 2 Validation screen allows the user to execute level 2 validations. It is the member company's obligation to get all its data validated before the 20<sup>th</sup> day of the month for the previous month. The validation process performs cross checking within the event data and between event data and performance data. When no error is encountered, events are analyzed and converted into outage statistics (Planned Outage Hours, Maintenance Outage Hours, Forced Outage Hours, etc.).

To perform the validation, the user selects a year, a month, and a unit or multiple units. If error is encountered during the validation, an error log is displayed on the screen. The error messages are color coded depending on the severity:

 Fatal errors are colored red. When a fatal error is found, statistics data are not generated for the given unit, year and month, which impedes the calculation of EFORD. All fatal error messages must be corrected before statistics can be generated

 Warnings are colored yellow. Warnings usually are errors that are imposed by NERC but do not impede the calculation of EFORD. Statistics data are generated in spite of the warnings. However, all warnings must eventually be cleared since they impede the process of sending data to NERC

 Notes are colored white. Notes are information that are important to the users but do not indicate problems of any kind.

 Note: When multiple units are selected to run the Level 2 validations, statistics are generated for the units that pass the test. Only the ones that do not pass the test have to be re-validated.

### 11.2 Level 2 Validation Error Log




The Level 2 Validation Error Log screen allows the user to review outstanding errors generated by the Level 2 Validation program. Errors are erased when the validation is executed successfully.

### 11.3 Level 2 Validation Status

The Level 2 Validation status screen allows the user to review which unit has passed validation and which unit has not. This screen is useful for the reviewing submission status of different units.

Year	Month	Utility	Unit	Status
2020	10	Integ Utility	Integ Unit	Not Validated

 Note: Validation status is reset whenever modification is made either to the Card 95 or Card 97 data that involves period already validated. The user must re-run the level 2 checks again.

## 12.0 CARD DATA

Under the Card Data menu heading, there are six menu items:

- Card 95 – Performance Data
- Card 97 – Event Data
- Card 99 – Fuel Data
- Card 95 Modification History
- Card 97 Modification History
- Card 99 Modification History

### 12.1 Card95 – Performance Data

The Card 95 – Performance Data screen enables the user to add, modify, or delete Card 95 records.

Unit*	Year*	Month*	Utility*	Gross Maximum Capacity	Gross Dependable Capacity	Gross Actual Generation	Net Maximum Capacity	Net Dependable Capacity	Net Actual Generation	Load Characteristics
Integ Unit	2020	1	Integ Utility							
Integ Unit	2020	2	Integ Utility							
Integ Unit	2020	3	Integ Utility							
Integ Unit	2020	4	Integ Utility							
Integ Unit	2020	5	Integ Utility							
Integ Unit	2020	6	Integ Utility							
Integ Unit	2020	7	Integ Utility							
Integ Unit	2020	8	Integ Utility							

#### 12.1.1 Adding a New Card 95 Record

- To add a new record, select the Month, the Year, the Utility and the Unit for which the record is to be added
- Click on the “New” option on the function bar at the upper portion of the screen
- A Card 95 – Performance data panel appears (See section 12.1.4)
- Enter data and click on the “Save” button to store the new record, or click on “Cancel” to exit without save.

### 12.1.2 Editing a New Card 95 Record

- *To edit a record, select the Month, the Year, the Utility and the Unit for which the record is to be edited*
- *Click on the “Retrieve” button at the left side of the screen. The system retrieves the record from the database and displays it inside the data grid. The user may select multiple units and/or multiple months to review them all at once*
- *Select the entry to be edited by clicking on it. This causes the entry to be highlighted in blue*
- *Click on the update option on the function bar at the upper portion of the screen; or simply double-click on the entry to be edited*
- *A Card 95 – Performance data panel appears (See section 12.1.4)*
- *Edit the data and click on the “Save” button to store the changes, or click on “Cancel” to exit without save.*

### 12.1.3 Deleting a New Card 95 Record

- *To delete a record, select the Month, the Year, the Utility and the Unit for which the record is to be deleted*
- *Click on the “Retrieve” button at the left side of the screen. The system retrieves the record from the database and displays it inside the data grid. The user may select multiple units and/or multiple months to review them all at once*
- *Select the entry to be deleted by clicking on it. This causes the entry to be highlighted in blue*
- *Click on the delete option on the function bar at the upper portion of the screen*
- *A Confirmation window appears, if sure, click on the ‘Yes’ button, or click on “No” to exit.*

#### **⚠VERY IMPORTANT NOTES**

When deleting an event, “Confirm” panel serves as a confirmation screen. When the delete button on that panel is clicked, the event is immediately deleted.

## 12.1.4 Card 95 – Performance Data Panel

The Card 95 – Performance Data panel is invoked whenever the user wants to review, add, modify or delete Card 95 data. These functions are available in the Card 95 – Performance Data screen. Depending on the Data Lock status of the event, the user may or may not be able to gain access to this panel.

Unit	Year	Month	Utility	Gross Maximum Capacity	Gross Dependable Capacity	Gross Actual Generation	Net Maximum Capacity	Net Dependable Capacity	Net Actual Generation	Load Characteristics
Integ Unit	2020	1	Integ Utility							
Integ Unit	2020	2	Integ Utility							
Integ Unit	2020	3	Integ Utility							
Integ Unit	2020	4	Integ Utility							
Integ Unit	2020	5	Integ Utility							
Integ Unit	2020	6	Integ Utility							
Integ Unit	2020	7	Integ Utility							
Integ Unit	2020	8	Integ Utility							

- Enter or modify event data as needed
- Click the “Save” button to save the data or “Cancel” to exit without save
- The system performs level 1 check after the “Save” button is clicked. If error is encountered, the error messages will be displayed in the “Errors” grid. The system will not save the data as long as the level 1 error is found.

## 12.2 Card97 – Event Data

The Card 97 – Event Data screen enables the user to add, modify, or delete Card 97 records.

Unit*	Year*	Event Number*	Event Index*	Event Type*	Utility*	Event Start Date*	Event End Date*	Available Capacity	Cause Code	Contribution Code
Integ Unit	2020	1	1	U1	Integ Utility	10/01/2020 00:00	10/02/2020 00:00	0	7800	1
Integ Unit	2020	2	1	D4	Integ Utility	10/05/2020 00:00	10/08/2020 00:00	6	5110	1
Integ Unit	2020	3	1	NC	Integ Utility	10/15/2020 00:00	10/16/2020 00:00	0	5510	
Integ Unit	2020	4	1	U1	Integ Utility	10/16/2020 00:00		0	3830	1

### 12.2.1 Adding a New Card 97 Record

- To a new record, select the Year, the Utility and the Unit for which the record is to be added
- Click on the “New” option on the function bar at the upper portion of the screen
- A Card 97 – Event data panel appears (See section 10.3.3)
- Enter data and click on the “Save” button to store the new record, or click on “Cancel” to exit without save.

### 12.2.2 Editing a New Card 97 Record

- To edit a record, select the Year, the Utility and the Unit for which the record is to be edited
- Click on the “Retrieve” button at the left side of the screen. The system retrieves the records from the database and displays them inside the data grid. The user may select multiple units to review them all at once
- Select the entry to be edited by clicking on it. This causes the entry to be highlighted in blue
- Click on the update option on the function bar at the upper portion of the screen; or simply double-click on the entry to be edited

- *A Card 97 – Event data panel appears (See section 10.3.3)*
- *Edit the data and click on the “Save” button to store the changes, or click on “Cancel” to exit without save.*

### **12.2.3 Deleting a New Card 97 Record**

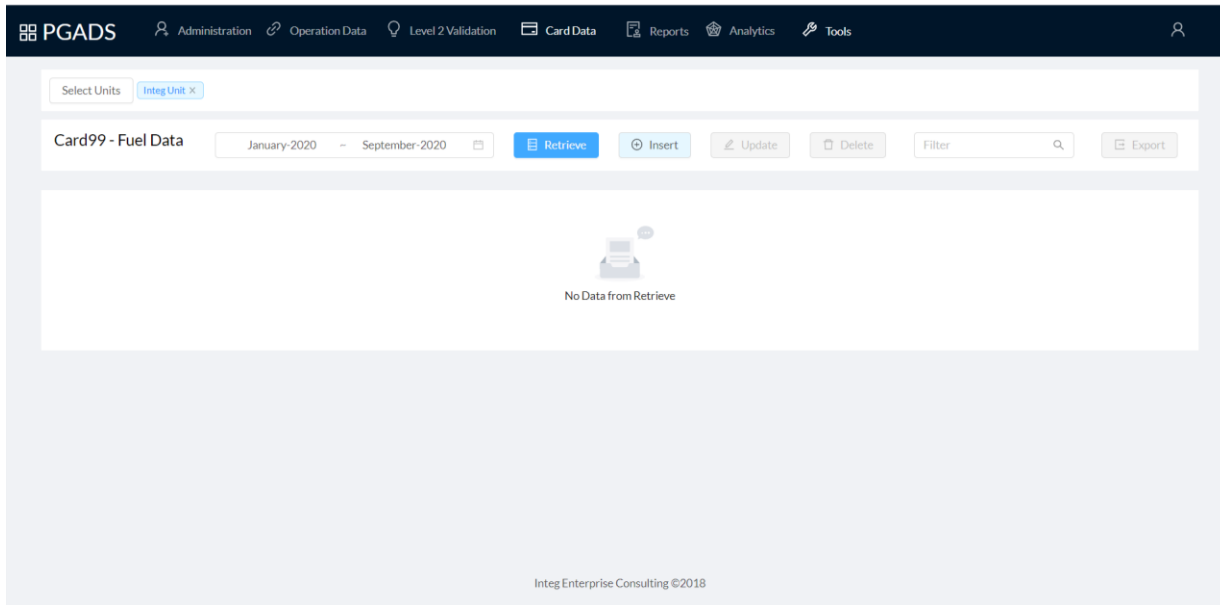
- *To delete a record, select the Year, the Utility and the Unit for which the record is to be deleted*
- *Click on the “Retrieve” button at the left side of the screen. The system retrieves the records from the database and displays them inside the data grid. The user may select multiple units and to review them all at once*
- *Select the entry to be deleted by clicking on it. This causes the entry to be highlighted in blue*
- *Click on the delete option on the function bar at the upper portion of the screen*
- *A Confirmation window appears, if sure, click on the ‘Yes’ button, or click on “No” to exit.*

#### **Ⓢ VERY IMPORTANT NOTES**

When deleting an event, the “Confirm” panel serves as a confirmation screen. When the yes button on that panel is clicked, the event is immediately deleted.

### **12.3 Card99 – Fuel Data**

The Card 99 – Fuel Data screen enables the user to add, modify, or delete Card 99 records.



### 12.3.1 Adding a New Card 99 Record

- To a new record, select the Month, the Year, the Utility and the Unit for which the record is to be added
- Click on the “New” option on the function bar at the upper portion of the screen
- A Card 99 – Fuel data panel appears (See section 12.3.4)
- Enter data and click on the “Save” button to store the new record, or click on “Cancel” to exit without save

### 12.3.2 Editing a New Card 99 Record

- To edit a record, select the Month, the Year, the Utility and the Unit for which the record is to be edited
- Click on the “Retrieve” button at the left side of the screen. The system retrieves the record from the database and displays it inside the data grid. The user may select multiple units and/or multiple months to review them all at once
- Select the entry to be edited by clicking on it. This causes the entry to be highlighted in blue
- Click on the update option on the function bar at the upper portion of the screen; or simply double-click on the entry to be edited
- A Card 99 – Fuel data panel appears (See section 12.3.4)
- Edit the data and click on the “Save” button to store the changes, or click on “Cancel” to exit without save.

### 12.3.3 Deleting a New Card 99 Record

- *To delete a record, select the Month, the Year, the Utility and the Unit for which the record is to be deleted*
- *Click on the “Retrieve” button at the left side of the screen. The system retrieves the record from the database and displays it inside the data grid. The user may select multiple units and/or multiple months to review them all at once*
- *Select the entry to be deleted by clicking on it. This causes the entry to be highlighted in blue*
- *Click on the delete option on the function bar at the upper portion of the screen*
- *A Confirmation window appears, if sure, click on the ‘Yes’ button, or click on “No” to exit.*

### **⚠ VERY IMPORTANT NOTES**

When deleting an event, the “Confirm” panel serves as a confirmation screen. When the yes button on that panel is clicked, the event is immediately deleted.

## **12.1.4 Card 99 – Fuel Data Panel**

The Card 99 – Fuel Data panel is invoked whenever the user wants to review, add, modify or delete Card 99 data. These functions are available in the Card 99 – Fuel Data screen. Depending on the Data Lock status of the event, the user may or may not be able to gain access to this panel.



**New Data** X

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Utility / Unit: Integ Utility (999) / Integ Unit ( 999) Month: January-2020 📅

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Primary Fuel	Secondary Fuel	Tertiary Fuel	Quaternary Fuel
Fuel: <input type="text"/>	Fuel: <input type="text"/>	Fuel: <input type="text"/>	Fuel: <input type="text"/>
Fuel Burned: <input type="text"/>	Fuel Burned: <input type="text"/>	Fuel Burned: <input type="text"/>	Fuel Burned: <input type="text"/>
Avg Heat: <input type="text"/>	Avg Heat: <input type="text"/>	Avg Heat: <input type="text"/>	Avg Heat: <input type="text"/>
Ash Content %: <input type="text"/>	Ash Content %: <input type="text"/>	Ash Content %: <input type="text"/>	Ash Content %: <input type="text"/>
Moisture Content %: <input type="text"/>	Moisture Content %: <input type="text"/>	Moisture Content %: <input type="text"/>	Moisture Content %: <input type="text"/>
Sulfur Content %: <input type="text"/>	Sulfur Content %: <input type="text"/>	Sulfur Content %: <input type="text"/>	Sulfur Content %: <input type="text"/>

LOI %:

Notes:

---

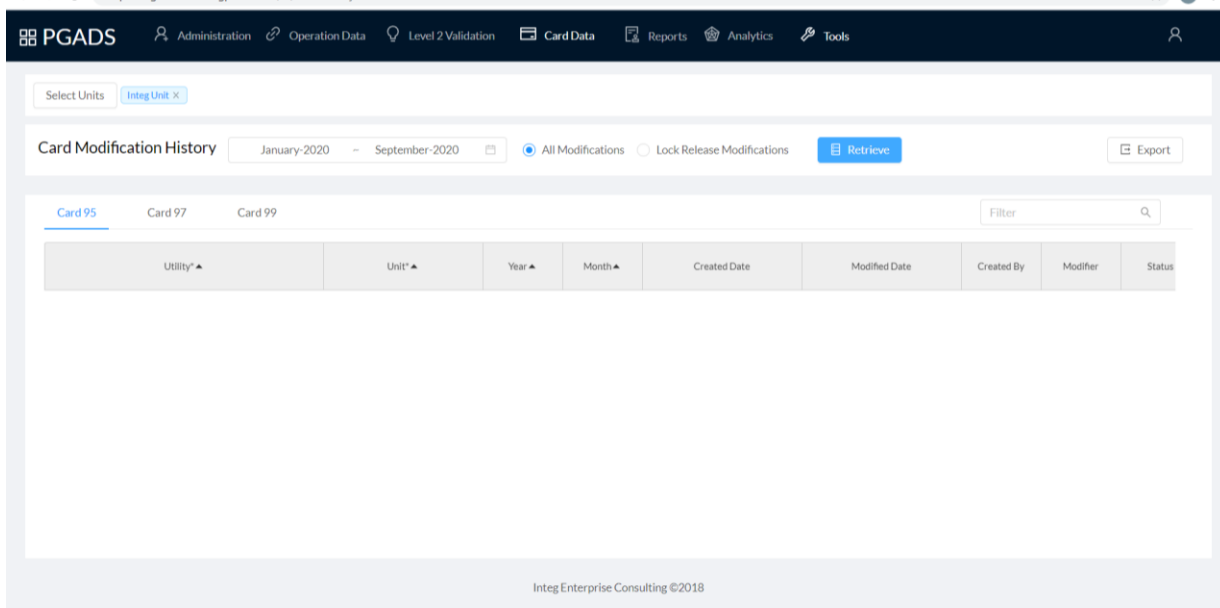
- *Enter or modify event data as needed*
- *Click the “Save” button to save the data or “Cancel” to exit without save*
- *The system performs level 1 check after the “Save” button is clicked. If error is encountered, the error messages will be displayed in the “Errors” grid. The system will not save the data as long as the level 1 error is found.*

## 13.0 Modification History

These data types are available on the Modification History screen:

- Card 95
- Card 97
- Card 99

All three screens function exactly the same way. These screens enable the user to find out changes that were made during a specific time period. The changes include adding, modifying or deleting of data.



- *Select the Starting and Ending Period, and the Utility for which history is to be displayed. The system will look for changes that were made between the Starting Year-Month and the Ending Year-Month. For example, to find out what was added, modified, or deleted during the first six months of 2003, select Jan 2003 to Jun 2003.*
- *Choose between “All Modifications” or “Lock Release Modifications”. The later one will only select changes that were made after the data have been locked.*
- *The result is displayed inside the data grid. The entries are color coded. Entries with white background are the current or latest record. Entries with gray background are records that have been replaced or deleted.*
- *If the user scrolls the grid all the way to the right, the person who made the change, the date and time of the modification and the status of each record is displayed.*



## 14.0 GADS Reports

The GADS Reports screen enables the user to view or print reports in PDF format, or download the report data into CSV files. There are five reports on this screen:

- Cause Code
- Event Data
- GORP
- Outage Statistics
- Performance
- Statistics

To select a report, click on the Report Names dropdown list box. Once a report is selected, the other selections may appear or disappear. For example, some reports allow the user to specify a start and an end date, while others allow the selection of a single year and month.

If the user has access to units belonging to multiple utility/operator, the user may choose “ALL” for all accessible utilities, or select one specific utility. The selection in the Utility Name dropdown list box causes the program to populate the Unit/Station Names list box.

Since the concept of station is not implemented in this version of PowerGADS, the View Type is always set to Unit Name and the Unit/Station list box always contains unit names.

The Quick Select dropdown list box enables the user to quickly select all units, all CT units or all steam units.

The Horizontal Format directs the program to generate report in a spreadsheet friendly format, in which the data is presented in wide-tabular fashion without page breaks and repeated headers.

The Vertical Format is the default option, which directs the program to generate report in print-friendly format.

Some reports have “Include OMC” and “Exclude OMC” option. This option enables the user to generate statistics based on treating OMC events as normal outages or excluding OMC events as if they never occurred.

Some reports have “Detail” or “Rollup” option. This feature is explained in later section for each report that offers it.

Similarly, some reports have “Group by Month” or “Group by Unit” option. This feature is also explained in later section for each report that offers it.

### ***14.1 Cause Code Report***

The Cause Code Report generates a summary of events group by cause code. Duration hour, equivalent duration hour, average reduction, and Loss MWH are listed per event and totaled by cause code, cause code category and unit.

The following report criteria is available to the user

- Report Start and End Date
- One or Multiple Units (see section 9.2 on multi-selection method)
- Include/Exclude OMC events
- A set cause codes or all the cause codes
- A set of event types or all the event types

Report Layout:

Cause Code	Description	Event Type	Start Date	End Date	Duration (HOURS)	Duration (EQ HRS)	Reduction (AVG MW)	Loss (MWH)
820		D1	07/09/02 04:00 PM	07/22/02 04:48 AM	300.80	23.72	22.0	7139.4
1	OCCURANCES FOR CAUSE CODE	820 casing hot spots boiler furnace		TOTAL	300.80	23.72	22.0	7139.4
				AVERAGE	300.80	23.72	22.0	7139.4
1000	Tube leak	U1	07/22/02 04:48 AM	07/24/02 11:30 PM	66.70	66.70	279.0	18609.3
1000	Tube leak	U1	07/25/02 07:00 PM	07/27/02 09:02 PM	50.03	50.03	279.0	13959.2
1000	Boiler work	D1	07/27/02 09:02 PM	10/11/02 10:00 PM	98.97	7.80	22.0	2349.0
3	OCCURANCES FOR CAUSE CODE	1000 furnace wall tube water wall tube leak		TOTAL	215.70	124.53	580.0	34917.5
				AVERAGE	71.90	41.51	193.3	11639.2
4	OCCURANCES FOR CATEGORY OF	Boiler		TOTAL	516.50	148.25	602.0	42056.9
				AVERAGE	129.12	37.06	150.5	10514.2

Events are grouped together by cause code and cause code category

Subtotals and averages are Given for each cause code, Cause code category, and Unit

## 14.2 Event Data Report

The Event Data Report generate a listing of all events for a specified period. Duration hour, equivalent duration hour, event number, event index, event type, MW reduction, available capacity, cause code and event description are listed per event.

The following report criteria is available to the user

- Start date
- End Date
- One or Multiple Units (see section 9.2 on multi-selection method)

Report Layout:

Event Start Date/Time	Event End Date/Time	Event Duration	Eq Hrs	Event Num	Event Index	Event Type	Event Red	Event Cap	Cause Code	Event Description
07/09/02 04:00 PM	07/22/02 04:48 AM	300.80	23.72	36	1	D1	22	257	820	
07/11/02 09:00 PM	07/12/02 07:17 AM	10.28	3.21	33	1	D1	87	170	4499	Fan work
07/12/02 08:30 PM	07/14/02 07:44 AM	35.23	9.85	35	1	D1	78	179	4499	High pressure injection lin
07/12/02 09:15 PM	07/13/02 05:40 PM	20.42	0.00	34	1	D1	0	179	3499	Feedwater heater work
07/22/02 04:48 AM	07/24/02 11:30 PM	66.70		37	1	U1	279	0	1000	Tube leak
07/24/02 11:30 PM	07/25/02 01:17 AM	1.78		40	1	RS	0	0	0	
07/25/02 03:06 AM	07/25/02 07:00 PM	15.90		41	1	RS	0	0	0	
07/25/02 07:00 PM	07/27/02 09:02 PM	50.03		38	1	U1	279	0	1000	Tube leak
07/27/02 09:02 PM	10/11/02 10:00 PM	98.97	7.80	39	1	D1	22	257	1000	Boiler work

## 14.3 GORP Report

The GORP Report generates a listing of measures, rates and factors that are most important to PJM and its Users, including EEFORD..

The following report criteria is available to the user

- Start Year-Month and End Year-Month
- One or Multiple Units (see section 9.2 on multi-selection method)
- Include/Exclude OMC events
- Detail or Rollup

If detail is selected, the measures, rates and factors are presented for each month for the specified period. If rollup is selected, figures from different months are rolled into a single value for the entire period.

Report Layout:

	Unit 001	Unit 002	Unit 003	Unit 004	Unit 005	Unit 006
<b>FORCED OUTAGES</b>						
<b>Outage Hours</b>						
Full	14.57	21.00	.00	.00	.00	.00
Partial	.00	.00	.00	.00	.00	.00
Equivalent	14.57	21.00	.00	.00	.00	.00
<b>Demand Outage Rates</b>						
With F Equiv	47.891	32.762	.000	.000	.000	.000
Without F Equiv	91.232	92.025	.000	.000	.000	.000
<b>F Factor</b>						
Full	.088	.042	.037	.037	.000	.040
Partial	.000	.001	.037	.037	.000	.040
EEFORD	47.891	32.762	.000	.000	.000	.000
<b>PLANNED OUTAGES</b>						
Reserve Shutdown Hours	3607.03	3600.18	3488.30	3488.69	.00	3479.58
<b>Outage Factors</b>						
Weeks/ Year Equiv	.000	.000	.000	.000	51.757	.000
<b>MAINT. OUTAGES</b>						
<b>Outage Factors</b>						
Percent Equiv	.000	.000	.000	.000	.000	.000
Weeks/ Year Equiv	.000	.000	.000	.000	.000	.000
<b>Unit Hours</b>						
Available	3608.43	3602.00	3623.00	3623.00	.00	3623.00
Service	1.40	1.82	134.70	134.31	.00	143.42
Synch	.00	.00	.00	.00	.00	.00
<b>OCCURANCES</b>						
<b>Full Outage</b>						
Forced	1	1	0	0	0	0
Maintenance	0	0	0	0	0	0
Planned	0	0	0	0	1	0
<b>Starts</b>						
Attempts	2	3	24	23	0	21
Actual	1	2	24	23	0	21
Equip Available (%)	99.6	99.4	100.0	100.0	.0	100.0
Implied Cap Variance	80.856	198.258	.000	.000	.000	.000
Number of Months Used	5	5	5	5	5	5



## 14.4 Outage Statistics Report

The Outage Statistics Report generates a listing of measures, rates and factors that are common to the utility industry. The following report criteria is available to the user

- Start Year-Month and End Year-Month
- One or Multiple Units (see section 9.2 on multi-selection method)
- Include/Exclude OMC events
- Detail or Rollup
- Group by Month or Group by Unit (see sample layout)

If detail is selected, the measures, rates and factors are presented for each month and each unit. If rollup is selected, figures from different months or units are rolled into a single summary value.

Report Layout (Group by Month):

	Jan-2002	Feb-2002	Mar-2002	Apr-2002	May-2002	Jun-2002
<b>Number of Outages</b>						
Planned	0	0	0	0	0	0
Unplanned	3	0	0	1	0	1
Forced	2	0	0	1	0	1
Maintenance	1	0	0	0	0	0
Reserve Shutdowns	0	0	0	0	0	0
<b>Outage Factors</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	17.37	.00	.00	1.48	.00	10.26
Forced	10.95	.00	.00	1.48	.00	10.26
Maintenance	6.42	.00	.00	.00	.00	.00
Reserve Shutdowns	.00	.00	.00	.00	.00	.00
<b>Outage Rates</b>						
Forced	11.70	.00	.00	1.48	.00	10.26
<b>Eq. Outage Factor</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	17.42	.89	.00	1.62	.23	10.58
Forced	11.01	.09	.00	1.62	.23	10.58
Maintenance	6.42	.80	.00	.00	.00	.00
<b>Actual Full Hours</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	129.22	.00	.00	10.67	.00	73.90
Forced	81.48	.00	.00	10.67	.00	73.90
Maintenance	47.73	.00	.00	.00	.00	.00
Reserve Shutdowns	.00	.00	.00	.00	.00	.00
<b>Eq. Partial Hours</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	.42	5.99	.00	.98	1.67	2.30
Forced	.42	.64	.00	.98	1.67	2.30
Maintenance	.00	5.35	.00	.00	.00	.00

## Report Layout (Group by Unit)

	Unit 001	Unit 002	Unit 003	Unit 004	Unit 005	Unit 006
<b>Number of Outages</b>						
Planned	0	0	0	0	0	0
Unplanned	3	0	0	0	0	0
Forced	2	0	0	0	0	0
Maintenance	1	0	0	0	0	0
Reserve Shutdowns	0	0	0	0	0	0
<b>Outage Factors</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	17.37	.00	.00	.00	.00	.00
Forced	10.95	.00	.00	.00	.00	.00
Maintenance	6.42	.00	.00	.00	.00	.00
Reserve Shutdowns	.00	.00	99.67	99.81	99.67	99.67
<b>Outage Rates</b>						
Forced	11.70	.00	.00	.00	.00	.00
<b>Eq. Outage Factor</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	17.42	.05	.00	.00	.00	.00
Forced	11.01	.05	.00	.00	.00	.00
Maintenance	6.42	.00	.00	.00	.00	.00
<b>Actual Full Hours</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	129.22	.00	.00	.00	.00	.00
Forced	81.48	.00	.00	.00	.00	.00
Maintenance	47.73	.00	.00	.00	.00	.00
Reserve Shutdowns	.00	.00	741.56	742.58	741.56	741.56
<b>Eq. Partial Hours</b>						
Planned	.00	.00	.00	.00	.00	.00
Unplanned	.42	.34	.00	.00	.00	.00
Forced	.42	.34	.00	.00	.00	.00
Maintenance	.00	.00	.00	.00	.00	.00

☺ Note: When rollup calculation is performed to summarize more than one unit's data together, each term involved in the rates and factors calculation are multiplied by a weight ratio. This weight ratio is calculated as:

$$\text{weight ratio} = \frac{\text{unit net dependable capacity}}{\text{total net dependable capacity of all units involved}}$$

## 14.5 Performance Report

The Performance Report generates a listing of data submitted through card95.

The following report criteria is available to the user

- Start Year-Month and End Year-Month
- One or Multiple Units (see section 9.2 on multi-selection method)

Report Layout:

<i>XYZ Power</i>				10/30/03 10:01
<i>Performance</i>				Page 1 of 1
<i>Jan 2003</i>				<i>Detail</i>
	Unit 1	Unit 2	Unit 3	
Net Maximum Capacity	128	130	180	
Net Dependable Capacity	109	103	136	
Net Actual Generation	69665	54297	67681	
Load Characteristics	1	1	1	
Attempted Starts	1	1	5	
Actual Starts	1	1	5	
Load Description				
Service Hours	671.90	632.78	531.23	
Reserve Hours	.00	.00	.00	
Pump Hour	.00	.00	.00	
Synchronous Hours	.00	.00	.00	

## 14.6 Statistics Report

The Statistics Report generates a listing of raw measures obtained from the event analysis of the card97 data and from the data submitted through card95.

The following report criteria is available to the user

- Start Year-Month and End Year-Month
- One or Multiple Units (see section 9.2 on multi-selection method)
- Include/Exclude OMC events
- Detail or Rollup

If detail is selected, the data are presented for each month for the specified period. If rollup is selected, figures from different months are rolled into a single value for the entire period.

Report Layout:

	Unit 001	Unit 002	Unit 003	Unit 004	Unit 005	Unit 006
# of Start Failures	0	0	0	0	0	0
# of Forced Outages	0	0	0	0	0	0
# of Pre-existing FO	0	0	0	0	0	0
# of Maint. Outages	0	0	0	0	0	0
# of Pre-existing MO	0	0	0	0	0	0
# of Planned Outages	0	0	0	0	0	0
# of Pre-existing PO	0	0	0	0	0	0
# of U1, U2 or U3 Outages	0	0	0	0	0	0
# of Maint. Outage Ext.	0	0	0	0	0	0
# of Planned Outage Ext.	0	0	0	0	0	0
Full Forced Outage Hrs	.00	.00	.00	.00	.00	.00
Full Maint. Outage Hrs	.00	.00	.00	.00	.00	.00
Full Planned Outage Hrs	.00	.00	.00	.00	.00	.00
Eq. Forced Derated Hrs	2.37	.00	.00	.00	.00	.00
Eq. Maint. Derated Hrs	.00	.00	.00	.00	.00	.00
Eq. Planned Derated Hrs	.00	.00	.00	.00	.00	.00
Eq. Maint. Drtd Ext Hrs	.00	.00	.00	.00	.00	.00
Eq. Planned Drtd Ext Hrs	.00	.00	.00	.00	.00	.00
Maint. Ext. Hrs	.00	.00	.00	.00	.00	.00
Planned Ext Hrs	.00	.00	.00	.00	.00	.00
Period Hrs	744.00	744.00	744.00	744.00	744.00	744.00
Eq. Frd. Drtd. (Reserve)						
Net Actual Gen. MWH	620986	624088	5	5	6	2
# of Attempted Starts	0	0	2	2	2	1
# of Actual Starts	0	0	2	2	2	1
Service Hrs	744.00	744.00	2.00	2.00	2.00	1.00
Res. Shutdown Hrs	.00	.00	742.00	742.00	742.00	743.00
Pumping Hrs	.00	.00	.00	.00	.00	.00
Synch. Cond. Hrs	.00	.00	.00	.00	.00	.00



## Appendix A: GADS Level 1 and 2 Error Messages

Severity 1 = Fatal Error

Severity 0 = Warning

Error Code	Error Description
8	No Access Right to this unit
9	Records for this period are Locked. Modification is not allowed.
10	Revision Code must be Blank or 0 = Add, D = Delete, R = Replace.
11	Month Entries must be in the range of 1 and 12.
12	Maximum Capacity must be in the range of 0 and 1400 MWHRS.
13	Dependable Capacity must be in the range of 0 and 1400 MWHRS.
14	Max Capacity must be greater than or equal to Dependable Capacity.
15	The Net Dependable Capacity reported is less than the Available Capacity reported in certain event.
17	Loading Characteristics must be within the range of 1 to 7.
18	Nuclear Units can only have a Loading Characteristic of 1.
19	A loading Characteristic of 6 must have a verbal description provided.
20	Attempted Starts cannot be less than 0.
21	Actual Starts cannot be less than 0.
22	Actual Starts cannot be greater than Attempted Starts.
23	Service Hours exceed the total available Period Hours.
24	Hours cannot be negative.
25	If Service and Condensing hours are 0, Actual Starts must also be 0.
26	Reserve Hours exceed the total available Period Hours.
27	If Reserve Hours are greater than 0, the Loading Characteristic cannot be 1.
28	The record unit type is not allowed to have Pumping Hours.
29	Pumping Hours exceed the total available Period Hours.
30	Only Hydro or CT units are allowed to have Condensing Hours.
31	Synchronous Condensing Hours exceed the total available Period Hours.
32	Sum of Service, Reserve, Pumping, C Condensing Hours exceed the Period Hours.
35	The Month entry must be within the range of 1 to 12.
36	Quantity Burned cannot be less than 0.
37	Nuclear units cannot have a Quantity Burned entry.
38	Average Heat Content cannot be less than 0.
40	Invalid Fuel Code.
41	Nuclear fuel is only allowed as the primary fuel for nuclear units.
42	Pumped Storage/Hydro Units cannot have fuel data entries.
43	Fossil Units must use fuel types: CC,DI,GG,JP,KE,OG,OL,OO,OS,PE,PR,SL,SO,WD,WH,WM.
44	Nuclear Units can only use fuel type NU.
45	CT or Diesels must use fuel types: DI,GG,JP,KE,OG,OL and PR.
46	Misc. Units must use CC,DI,GG,JP,KE,OG,OL,OO,OS,PE,PR,SL,SO,WD,WH, or WM.
48	Fuel Type OS must have a heat content between 4,000 and 15,000.
49	Fuel Type CC, LI must have a heat content between 6,000 and 15,000.

50	Fuel Type DI,JP,KE,OL,OO must have a heat content between 100,000 and 154,000.
51	Fuel Type GG,OG,PR,SL must have a heat content between 800 and 5,000.
52	Fuel Type NU must have a heat content between 8,000 and 12,000.
53	Fuel Type CC,LI must have a ash content between 2.0 and 27.0.
54	Fuel Type OS must have a ash content between 0 and 27.0.
55	Fuel Type DI,JP,KE,OL,OO must have a ash content between 0 and 1.0.
56	Fuel Type GG,OG,PR,SL must have an ash content of 0.
57	Fuel Type CC,LI,OS must have a moisture content between 0 and 40.0.
58	Fuel Type DI,JP,KE,OL,OO must have a moisture content between 0 and 3.0.
59	Fuel Type GG,OG,PR,SL must have a moisture content of 0.
60	Fuel Type OS must have a sulfur content between 0 and 9.9.
61	Fuel Type CC,DI,JP,KE,LI,OL,OO must have a sulfur content between 0 and 6.0.
62	Fuel Type GG,OG,PR,SL must have a sulfur content of 0.
63	Fuel Type must be specified if fuel burned, heat, ash, moisture or sulfur content is not 0.
64	The Event Number must be greater than 0.
65	Valid Indexes range from 01 to 48.
66	Event Indexes 02-48 cannot have entries in columns 21-52.
67	Delete cards cannot have values in any non-key fields.
68	Invalid Event Type.
69	Event Index 1 must have an Event Type, Cause Code, and Contribution.
70	Invalid Date and/or Time.
71	The hour entry must be between 0 and 23.
72	The minute entry must be between 0 and 59.
73	When closing an event from past month, only the Event End Date is accepted. All other items must remain the same.
74	Original event (event with index 1) must have a Start Date.
75	Event must end before another full outage begins.
76	End of the Event is before the start of the event.
77	Event Times cannot occur after today's date.
78	Available capacity must be between 0 and 2000.
79	Event Type is not a derating, Available Capacity must be zero.
80	Valid Cause Codes are greater than or equal to zero.
81	A Reserve Shutdown requires a Cause Code of zero.
82	Invalid Causcode for this event type.
83	Valid Contribution Codes are 1, 2, 3 or 5.
84	Event Index 1 must have a Contribution Code of 1.
85	Contribution Code "1" is invalid after index 1, except for MO or PO.
86	For RS events, work times and man hours should not be entered.
87	The Work Completed time is before the Work Started time.
88	Man Hours must be zero or positive.
89	The Year reported must match with the year in Event Start Date.
90	An event cannot be updated to start in a different year. Please delete the old event and insert a new event with the new start date.
91	Available Capacity during an Event exceeds the Maximum Capacity Available during other concurrent events.
93	An event record with format control 0/blank did not precede this "B" card.

94	An event record with format control 0/blank did not precede this "A" card.
95	A verbal description "A" card did not precede this "B" card.
96	Format Control must be Blank/0 = event or A/B = verbal description.
97	Fuel Data Card Number must be 1 or 2.
98	Fuel Data Card number 1 and 2's Revision Code must be the same.
99	The only Card Types are 95 (Performance), 97 (Event), and 99 (Fuel).
100	After 1/1/2006 only ISO Code 0 is accepted
102	The cause code is not valid for the given Unit Type.
105	The amplification code is invalid.
106	The failure code is invalid.
107	Tertiary Quantity burned cannot exceed 6 digits (2 decimal places assumed).
108	A numeric field was found to have non-numeric entries.
109	Fuel type GE is valid, but it is not supported by PJM.
110	D1, D2, D3, D4, PD, DM, DP and RS cannot have indexes of 02-48.
111	The start of DM or DP must equal to the end of a preceding D4 or PD.
112	The start of ME or PE must equal to the end of a preceding MO or PO
113	Warning, No event found which could be extended by the SF.
114	Available Capacity cannot be greater than the Net Dependable Capacity during the record times.
115	The Cause Code is invalid.
116	The work start time is outside the event times.
117	The work end time is outside the event times.
118	PO can only change to PO, RS, PE, SF, U1, D1, D2, D3, D4 or PD.
119	MO can only change to PO, MO, RS, ME, SF, U1, D1, D2, D3, D4 or PD.
120	ME can only change to ME, RS, SF, U1, D1, D2, D3, D4 or PD.
121	SF can only change to PO, MO, RS, SF, U1, D1, D2, D3, D4 or PD.
122	U1 can only change to PO, MO, RS, SF, U1, D1, D2, D3, D4 or PD.
123	U2 / U3 can only change to PO, MO, RS, SF, U1, D1, D2, D3, D4 or PD.
124	RS can only change to PO, MO, RS, SF, U1, D1, D2, D3, D4 or PD.
125	PE can only change to PE, RS, SF, U1, D1, D2, D3, D4 or PD.
126	D1, D2, or D3 cannot change to DM or DP.
128	Event type is not a derating, so available capacity cannot be NC.
129	A verbal description add / replace must have a description provided.
130	No Primary Fuel Code was specified.
131	A particular fuel code appears more than once for this report period.
132	Indexes 02-48 must have a cause code and a contribution.
135	Warning, work start and work end should be specified for ISO Code 9.
136	IO Code 9 is only used for work between 2200 and 0800 (next day).
137	A character was found in a location that should be blank.
138	Cause Code is not valid for Gas Turbines.
139	Cause code is not valid for jet engines.
140	Data not found in a location that should contain data.
141	No valid unit found for the given utility and unit code.
142	Value larger than specification allows.
143	Value must be integer.
150	Warning, number of Actual Start being saved is inconsistent with Event Data
151	Warning, number of Attempted Start being saved is inconsistent with Event Data



153	Event types SE and DE have been replaced by ME, PE, DM and DP
154	All other events must end before Inactive Event begins (IR,MB or RU).
155	The minimum duration of a Mothballed event is 6 months.
156	The minimum duration of an Inactive Reserve event is 1 month.
157	This event type requires a special Cause Code.
200	Card Code Missing
201	Unable to find the record specified to be deleted
202	Unable to insert new record. A duplicate record already exists in the system.
203	Invalid Format
204	Error creating NERC file
205	An event cannot start or end during the missing hour of day light savings.
206	Work cannot start or end during the missing hour of day light savings.
207	Warning! Cannot find data to export
208	Please be reminded to execute a level 2 check for the unit and months affected by this update.
209	Fuel Type CC for Fluidized Bed unit must have a heat content between 4,500 and 7,000.
210	Fuel Type CC for Fluidized Bed unit must have ash content between 40 and 65.
211	Fuel Type CC for Fluidized Bed unit must have moisture content between 5 and 10.
212	Fuel Type CC for Fluidized Bed unit must have sulfur content between 2 and 5.
213	Your file was prepared in an old format that is being phased out. Soon this format will no longer be accepted.
214	This program only accepts NERC Card 05 and Card 07 format.
215	Cause Codes between 9180 and 9199 are reserved for internal company use only.
216	Cause Codes between 9180 and 9199 can only be used as primary cause of an event.
217	Parallel Event (with Cause Codes 9181) must have at least one secondary cause code populated with the true cause of the event.
2001	Monthly Performance Record is missing (Card 95).
2002	Warning. Monthly Fuel Record is missing (Card 99).
2003	The Number of Attempted Starts, less the Number of Successful Starts does not equal the Number of Start Failure Events.
2004	Available Hrs + Unavailable Hrs + Inactive Hrs must equal to the Period Hrs.
2005	The Number of Reserve Shutdown Hours in Card 95 does not equal the Total Duration of RS Events reported in Card 97.
2006	Warning. Loading Characteristic of 1 cannot have Reserve Shutdown Hours.
2007	Warning. Maximum Capacity is inconsistent with value of previous month.
2008	Loading Characteristic is inconsistent with value of previous month.
2009	Available Capacity in this Card 96 event exceeds the Available Capacity during concurrent events in Card 97.
2010	Fuel Quantity Burned is out of range for Actual Generation
2011	Warning. No Event data reported for the year.
2012	Derating or outage cannot begin while a ramp event is in effect.
2013	The unit is in full outage for the entire month but the available hours are not zero.
2014	Warning. This event has a blank End Date.

2015	Two or more Events overlap illegally.
2016	A full outage exists for the entire month but fuel consumption is not zero.
2017	Work Start and End Times fall outside the Event Start and End Times.
2018	Available Capacity during an Event exceeds the Maximum Capacity Available during other concurrent events.
2019	Net Generation must be less than or equal to 110% of (Service Hour * (Net Dep. Capacity + 1))
2021	Cause Code is invalid for this unit type.
2022	Start Failure Outage does not coincide with the End Date of any previous Event or Reserve Shutdown.
2024	Start Time of Event coincides illegally with the End Time of another Event.
2027	The cause code of an extension must match the cause code of the matching preceeding event.
2028	Extension must coincide with a matching preceeding outage (PE to PO, ME to MO, etc.).
2031	The available capacity on a derating exceeds the Net Dependable Capacity during a month into which the derating extends.
2041	Events with Cause Codes between 9180 and 9199 are ignored in the statistics calculation process.
2042	Parallel Events (9181) to be submitted to NERC must have an original event with matching event start and end time.
2043	Parallel Events (9181) to be submitted to NERC cannot have more than one original event with matching event start and end time.
3000	Card type must be 90 for Verification Test Submission
3002	Key identifiers (key columns) cannot be null
3003	Period must be "S" for Summer or "W" for Winter
3004	Test Start Date cannot be before the start of the test period.
3005	Test Start and End Date must be within the normal test period for Test Index 1. Use Index 2 and above.
3006	Difference in MW must equal to Corrected Net Test Capability - Claimed Installed Capacity
3007	Unit Type must be "H" or blank
3008	Total Power MVA must equal to the vector sum of Gross Generation and Reactive Generation
3009	Power Factor must equal Gross Generation / Total Power
3010	Records not found for the selected criteria
3011	Invalid Test Index.
3012	Unable to insert new record. In-Period test result (Teat Index 1) has been submitted previously for this period.
3013	Unable to find the record specified to be updated
3015	Net Test Capability must equal Gross - Station Service - Process Load Served
3016	Utility Code and Unit Code cannot be blank.
3017	Year cannot be blank.
3018	Test Period cannot be blank.
3019	Test Index cannot be blank.
3020	Corrected Net Test Capacity cannot be blank.
3021	Claimed Installed Capacity cannot be blank.
3022	Difference in MW cannot be blank.

3023	Test Start Date cannot be blank.
3024	Test End Date cannot be blank.
3025	Gross Generation MW cannot be blank.
3026	Station Service MW cannot be blank.
3027	Net Test Capability cannot be blank.
3028	Reactive Generation MVAR cannot be blank.
3029	Total Power MVA cannot be blank.
3030	Power Factor cannot be blank.
3031	Dry Bulb Air Temperature Observed cannot be blank.
3032	Dry Bulb Air Temperature Rated cannot be blank.
3033	Relative Humidity Observed cannot be blank.
3034	Relative Humidity Rated cannot be blank.
3035	Cooling Water Temperature Observed cannot be blank.
3036	Cooling Water Temperature Rated cannot be blank.
3040	Dry Bulb Air Temperature Observed should be between -32 and 120.
3041	Dry Bulb Air Temperature Rated should be between -32 and 120.
3042	Relative Humidity Observed should be between 0 and 100.
3043	Relative Humidity Rated should be between 0 and 100.
3044	Cooling Water Temperature Observed should be between 32 and 120.
3045	Cooling Water Temperature Rated should be between 32 and 120.
3046	Corrected Net Test Capability should be between 0 and 2000.
3047	Claimed Installed Capacity should be between 0 and 2000.
3048	Gross Generation should be between 0 and 2000.
3049	Station Service should be between 0 and 200.
3050	Process Load Served should be between 0 and 2000.
3051	Net Test Capability should be between 0 and 2000.
3052	Reactive Generation MVAR should be between -1000 and 1000.
3053	Total Power MVA should be between 0 and 2000.
3054	Power Factor should be between 0 and 2.

## Appendix B: Verification Test Data Level 1 Errors

Severity 1 = Fatal Error

Severity 0 = Warning

Error Code	Error Message	Severity
3000	Card type must be 90 for Verification Test Submission	1
3002	Key identifiers (key columns) cannot be null	1
3003	Period must be "S" for Summer or "W" for Winter	1
3004	Test Start Date cannot be before the start of the test period.	1
3005	Test Start and End Date must be within the normal test period for Test Index 1. Use Index 2 and above.	1
3006	Difference in MW must equal to Corrected Net Test Capability - Claimed Installed Capacity	1
3007	Unit Type must be "H" or blank	1
3008	Total Power MVA must equal to the vector sum of Gross Generation and Reactive Generation	1
3009	Power Factor must equal Gross Generation / Total Power	1
3010	Records not found for the selected criteria	1
3011	Invalid Test Index.	1
3012	Unable to insert new record. In-Period test result (Teat Index 1) has been submitted previously for this period.	1
3013	Unable to find the record specified to be updated	1
3015	Net Test Capability must equal Gross - Station Service - Process Load Served	1
3016	Utility Code and Unit Code cannot be blank.	1
3017	Year cannot be blank.	1
3018	Test Period cannot be blank.	1
3019	Test Index cannot be blank.	1
3020	Corrected Net Test Capacity cannot be blank.	1
3021	Claimed Installed Capacity cannot be blank.	1
3022	Difference in MW cannot be blank.	1
3023	Test Start Date cannot be blank.	1
3024	Test End Date cannot be blank.	1
3025	Gross Generation MW cannot be blank.	1
3026	Station Service MW cannot be blank.	1
3027	Net Test Capability cannot be blank.	1
3028	Reactive Generation MVAR cannot be blank.	1
3029	Total Power MVA cannot be blank.	1
3030	Power Factor cannot be blank.	1
3031	Dry Bulb Air Temperature Observed cannot be blank.	1
3032	Dry Bulb Air Temperature Rated cannot be blank.	1
3033	Relative Humidity Observed cannot be blank.	1
3034	Relative Humidity Rated cannot be blank.	1
3035	Cooling Water Temperature Observed cannot be blank.	1
3036	Cooling Water Temperature Rated cannot be blank.	1
3040	Dry Bulb Air Temperature Observed should be between -32 and 120.	1

3041	Dry Bulb Air Temperature Rated should be between -32 and 120.	1
3042	Relative Humidity Observed should be between 0 and 100.	1
3043	Relative Humidity Rated should be between 0 and 100.	1
3044	Cooling Water Temperature Observed should be between 32 and 120.	1
3045	Cooling Water Temperature Rated should be between 32 and 120.	1
3046	Corrected Net Test Capability should be between 0 and 2000.	1
3047	Claimed Installed Capacity should be between 0 and 2000.	1
3048	Gross Generation should be between 0 and 2000.	1
3049	Station Service should be between 0 and 200.	1
3050	Process Load Served should be between 0 and 2000.	1
3051	Net Test Capability should be between 0 and 2000.	1
3052	Reactive Generation MVAR should be between -1000 and 1000.	1
3053	Total Power MVA should be between 0 and 2000.	1
3054	Power Factor should be between 0 and 2.	1

## APPENDIX C: OMC Cause Codes

The following is published by NERC as of 2011 and may not be compatible with each ISO's list.

- 3600 Switchyard transformers and associated cooling systems - external
- 3611 Switchyard circuit breakers - external
- 3612 Switchyard system protection devices - external
- 3619 Other switchyard equipment - external
- 3710 Transmission line (connected to powerhouse switchyard to 1st Substation)
- 3720 Transmission equipment at the 1st substation) (see code 9300 if applicable)
- 3730 Transmission equipment beyond the 1st substation (see code 9300 if applicable)
- 9000 Flood
- 9010 Fire, not related to a specific component
- 9020 Lightning
- 9025 Geomagnetic disturbance
- 9030 Earthquake
- 9035 Hurricane
- 9036 Storms (ice, snow, etc)
- 9040 Other catastrophe
- 9130 Lack of fuel (water from rivers or lakes, coal mines, gas lines, etc) where the operator is not in control of contracts, supply lines, or delivery of fuels
- 9135 Lack of water (hydro)
- 9150 Labor strikes company-wide problems or strikes outside the company's jurisdiction such as manufacturers (delaying repairs) or transportation (fuel supply) problems.
- 9200 High ash content
- 9210 Low grindability
- 9220 High sulfur content
- 9230 High vanadium content
- 9240 High sodium content
- 9250 Low Btu coal
- 9260 Low Btu oil
- 9270 Wet coal
- 9280 Frozen coal
- 9290 Other fuel quality problems
- 9300 Transmission system problems other than catastrophes (do not include switchyard problems in this category; see codes 3600 to 3629, 3720 to 3730)
- 9320 Other miscellaneous external problems
- 9500 Regulatory (nuclear) proceedings and hearings - regulatory agency initiated
- 9502 Regulatory (nuclear) proceedings and hearings - intervener initiated
- 9504 Regulatory (environmental) proceedings and hearings - regulatory agency initiated
- 9506 Regulatory (environmental) proceedings and hearings - intervenor initiated
- 9510 Plant modifications strictly for compliance with new or changed regulatory requirements (scrubbers, cooling towers, etc.)
- 9520 Oil spill in Gulf of Mexico
- 9590 Miscellaneous regulatory (this code is primarily intended for use with event contribution code 2 to indicate that a regulatory-related factor contributed to the primary cause of the event)

## APPENDIX D: Amplification Codes

- 01 Alignment/clearance not within limits - axial
- 02 Alignment/clearance not within limits - radial
- 03 Arced/flashover - electrical
- 04 Balance, not within limits
- 05 Binding - radial related contacts (use F670 if contact is in axial direction)
- 06 Broken
- 07 Burned/fire damage - initiated by component (ex. burned motor)
- 08 Burned/fire damage - not initiated by component (ex. pump fire damage due to motor fire)
- 09 Calibration, not within limits
- 10 Carbon, covered
- 11 Chemical excursion damage
- C0 Cleaning
- 12 Clogged
- 13 Closed
- 14 Condensation - oil
- 15 Condensation - water
- 16 Connection, loose
- 17 Contaminated - liquid fluids (use F320 for air contamination)
- 18 Contaminated - metals and solids
- 20 Cooling, inadequate - air
- 19 Cooling, inadequate - liquid
- 22 Corrosion - caustic
- 23 Corrosion - fatigue
- 21 Corrosion - general
- 24 Corrosion - high temperature coal ash
- 25 Corrosion - high temperature oil ash
- 26 Corrosion - low temperature
- 27 Corrosion - waterwall fire-side
- 28 Cracked
- 29 Creep, high temperature
- 30 Damaged, foreign object
- 31 Damaged, insulation
- 32 Dirty (use for air contamination or particulate/dirt buildup)
- 33 Disengage, failed to
- E0 Emission/Environmental Restriction
- 34 Engage, failed to
- 35 Erosion - coal particle
- 36 Erosion - falling slag
- 38 Erosion - fly ash
- 37 Erosion - sootblower
- 39 Erosion - cause unknown
- 40 Erratic or unexplained operating behavior
- 41 Erratic, circuit

- 42 Error, operator
- 43 Error, wiring
- 44 Explosion damage - initiated by the component (ex. pump explosion)
- 45 Explosion damage - not initiated by the component (ex. pipe damage due to pump explosion)
- X0 External equipment malfunction (outside plant management control)
- R0 Fire
- 46 Flameout
- 47 Foaming
- F0 Fouling
- 48 Frozen (temperature related)
- 49 Grounded electrical component
- 50 Hydrogen damage
- 51 Impact damage
- 52 Indication, false
- 53 Inspection
- 54 Leaks
- 55 Loose
- 56 Lubrication - excessive
- 57 Lubrication - lack of
- 58 Maintenance - cleaning damage
- 59 Maintenance - general
- 60 Material defects
- 61 Modification(s)
- 62 Noisy
- 63 Open
- 64 Overload
- U0 Parts unavailable
- P0 Personnel error
- 65 Pitting (localized corrosion)
- 66 Pressure, not within limits
- 67 Rubbing damage - axial related contacts (use F050 if contact is in radial direction)
- 68 Secondary damage
- 69 Seized (not moving)
- 71 Short-term overheating
- 70 Shorted electrical component
- A0 Silica restriction
- S0 Slagging
- 72 Sticking
- 73 Stree corrosion cracking
- 74 Temperature - compressor discharge, not within limits
- 75 Temperature - exhaust, not within limits
- 78 Temperature - general, not within limits
- 76 Temperature - oil, not within limits
- 77 Temperature - wheel spacers, not within limits
- 79 Testing



- 80 Thermal fatigue
- 81 Torn
- 82 Tripped/shutdown component - automatic
- 83 Tripped/shutdown component - manual
- T1 Tripped/shutdown grid separation - automatic
- T2 Tripped/shutdown grid separation - manual
- 84 Unknown - investigation underway (change this code once failure mechanism is determined)
- V0 Vibration (other)
- 86 Vibration fatigue, leading to failure
- 85 Vibration, not within limits
- 87 Voltage, not within limits
- D0 Water induction
- 89 Weld failure - broken weld
- 90 Weld failure - dissimilar metals
- 91 Weld failure - weld defects
- 88 Welded relay contacts
- W0 Wet coal/frozen coal/debris
- 92 Wiped
- 93 Worn, excessively