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Anita M. Schafer
Sr. Paralegal

VIA OVERNIGHT DELIVERY

October 30, 2008

Ms. Stephanie Stumbo
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602-0615

Re: Case No. 2008-00287

Dear Ms. Stumbo:

Enclosed please find an original and seven copies each of the Responses to the Commission's Supplemental Request for information in the above captioned case.

Please date-stamp the extra two copies and return to me in the enclosed envelope.

Sincerely,

Anita M. Schafer
Senior Paralegal

cc: Dennis G. Howard

VERIFICATION

STATE OF OHIO)
) SS:
COUNTY OF HAMILTON)

The undersigned, John D. Swez, being duly sworn, deposes and says that he is employed by the Duke Energy Corporation affiliated companies as Director, Bulk Power Marketing and Trading for Duke Energy Business Services, LLC; that on behalf of Duke Energy Kentucky, Inc., he has supervised the preparation of the responses to the foregoing information requests; and that the matters set forth in the foregoing response to information requests are true and accurate to the best of his knowledge, information and belief after reasonable inquiry.

John D. Swez

Subscribed and sworn to before me by John D. Swez on this 29th day of October, 2008.

NOTARY PUBLIC

My Commission Expires:

NOTARY PUBLIC STATE OF OHIO

ANITA M. SCHAFER
Notary Public, State of Ohio
My Commission Expires
November 4, 2009

Duke Energy Kentucky, Inc.
Case No. 2008-00287
Kentucky Public Service Commission
Supplemental Set of Data Requests
Request Date: October 23, 2008
Response Due Date: November 2, 2008

KyPSC-SUPP-01-001

REQUEST:

Does Duke Kentucky classify outages as scheduled or forced in accordance with the Generating Availability Data System ("GADS') definitions issued by the North American Electric Reliability Council?

a. If yes, provide the definition of a scheduled and forced outage according to GADS.

b. If no, state what guideline the utility uses when classifying outages and provide the definition of a scheduled outage and a forced outage under that guideline.

c. Did Duke Kentucky classify outages in accordance with the definition provided in the response to Item 1(a) or 1(b) above, whichever is applicable, during the period under review? If no, provide all instances in which outages were not classified according to that definition.

RESPONSE:

Yes. Duke Energy classifies all outages using the North American Reliability Council (NERC) Generating Availability Data System (GADS) definitions.

a. See Attachment KyPSC-SUPP-01-001, pp. III-7 through III-10.
b. N/A
c. All outages were classified using the definitions set forth by NERC GADS per a) above.

PERSON RESPONSIBLE: John Swez

SECTION III

EVENT REPORTING

An "event" occurs any time a generating unit's operating status or capability changes. Four general classifications of events are reported to GADS: outages, deratings, reserve shutdowns, and noncurtailing events. Reporting event data, in addition to performance and design data, provides all the information needed to evaluate generating unit availability. Event data are especially useful since they are often used to do specialized unit and equipment operation and design analyses.

Participation in the GADS program is voluntary, but once committed, each utility should report as much detailed information as it can. Reporting the level of detail requested in these *Data Reporting Instructions* enables you and other industry analysts to perform detailed, useful analyses. Figure III-1, below, suggests the classes of events utilities should report for different types and sizes of units.

Figure III-1
Event Reporting Requirements vs. Unit Type/Size

Unit		Event Classifications			
Type	Size (MWe)	Outage	Derating	Reserve Shutdown	Noncurtailing
Fossil (Steam)	All	Required	Required	Required	Optional
Nuclear	All	Required	Required	Required	Optional
Hydro & Pumped Storage with automatic data recording equipment	All	Required	Required	Required	Optional
Hydro & Pumped Storage without automatic data recording equipment	All	Required	Required	Optional	Optional
Gas Turbines/Jet Engines	All	Required	Required	Required	Optional
Combined Cycle/ Co-generators	All	Required	Required	Required	Optional
Diesel	All	Required	Required	Required	Optional
Fluidized Bed Combustion	All	Required	Required	Required	Optional
Miscellaneous	All	Required	Required	Required	Optional

Detailed event data reporting for larger units is suggested and is indicated by the term "required." The term "optional" implies that each utility must determine if it can reasonably provide the detailed data. We encourage all electric generating organizations to report all event data information currently collected for their units and any additional information they can reasonably provide.

Starting January 1, 2004 all units except hydro and pumped storage units without automatic data recording equipment, no matter its size or technology, is required to report reserve shutdown events. GADS encourages that all events (forced, maintenance, and planned) for all units be reported for providing complete reporting. GADS interprets this as 1 MW or larger with other sizes optional.

EVENT REPORT (97 AND 07 FORMATS)

Report event data to GADS in the Event Report (97 and 07) format, described in this section. Submit the data quarterly to GADS **within 30 days after the end of the calendar quarter**.

There are four distinct sections of the Event Report: A) Event Identification; B) Event Magnitude; C) Primary Cause of Event; and, D) Additional Cause of Event or Components Worked During Event. Together, these sections provide a complete description of each event experienced by a unit.

The Event Report (97 and 07) format is based on a series of 82-character images called "records." The different sections of the Event Report are on different records: Sections A and B on Record 01, Section C on Records 02 and 03, and Section D on Records 04 and 05 through 98 and 99. Unless otherwise stated, it is not necessary to zero-fill or asterisk-fill unused data fields of any section of the Event Report (97 and 07 formats).

Starting January 1, 2006, GADS will introduce the collecting Event Records in a new (07) format. There is a need by several Independent System Operators (ISO) groups to collect derating data on units smaller than 1 MW in size. Therefore, the GADS database is expanding the Gross Available Capacity (GAC) and Net Available Capacity (NAC) to include two decimal places such as XXXX.DD. As a result, a new GADS record will be created to allow this expansion. The new records entitled "07 Format" will remain 82-character format but will expand the GAC and NAC fields for more detailed data collection.

PLEASE NOTE that the purpose of the added decimal fields is for accuracy in reporting. We are not asking for generating units of 0.01 MW size to report to GADS. Historically speaking, the smallest units reported to GADS are 1 MW. With the introduction of the 07 format, GADS can accept deratings smaller than 1 MW for units less than 1 MW in size.

AGAIN PLEASE NOTE: The historical 82-character event record (97 format) will continue to be accepted by GADS. Therefore, if a reporting company's internal programs can not or will not be modified to follow the new 07 format, then GADS will continue to accept the 82-character event records. However, the older 97 format will be converted internally by GADS into the new 07 format.

Throughout this section, the combined 97 (82-character) and the 07 (82-character) formats will be presented where the two formats are the same. In Figures III-5A and III-5B, these two formats are different. In this case, the historical 97 format will be presented first followed by the 07 format.

A description of each section and the data elements within it follows. Included are detailed instructions for reporting each event data element.

A. EVENT IDENTIFICATION

There are seven data elements, referred to as "fields," in this section. (See Figure III-2.) These elements form a "key" — an identifier that makes each event card unique from all others in the database. This key is referenced at the beginning of every event record.

You must complete every data element in Section A. *If you use the GADS Editing Programs to verify your data, you must zero-fill any unused columns within each data field in Section A.* This is necessary to allow proper sorting, updating, and editing of the data. If you are not using the GADS Editing Programs, check with your data processing department to see if zero filling is necessary.

Figure III-2 – Both 97 and 07 Formats
A – Record Layout of Event Identification

Column ID	Number of Columns	Starting Position of Data
Record Code	2	1
Utility Code	3	3
Unit Code	3	6
Year	4	9
Event Number	4	13
Report Revision Code	1	17
Event Type	2	18

Record Code (All Records, columns 1-2)
This code uniquely identifies these data as an Event Report. A "97" here indicates that the older, historical record layout (without decimal values) is being used. If you are using the newer record layout, then place a "07" here.

PLEASE NOTE: If you report data in the 97 format, you must report ALL UNITS AND ALL RECORDS in the same format. Same conditions are for the 07 format!

Utility (Company) Code (All Records, columns 3-5)
Enter the three-digit code NERC assigned to your utility. Appendix C contains a complete list of the utilities participating in GADS and their assigned utility codes.

Unit Code (All Records, columns 6-8)
Enter the three-digit code your utility assigned for the unit that you are reporting. This code distinguishes one unit from another in your utility. Appendix C, Page C-2, contains a guide for selecting unit codes.

Year (All Records, columns 9-12)
Enter the four-digit year in which the event occurred. Note, this is not necessarily the year you reported the event to GADS, as demonstrated in the following example:

> An event occurred on December 2, 1999 and was reported to GADS on January 31, 2000. Complete columns 9-12 as 1999. (Refer to Page III-24 for instructions on reporting events that begin in one year and continue into the next.)

Event Number (All Records, columns 13-16)
Each time a unit experiences an event, assign it a unique "event number" and enter it in this field. Two events occurring in the same year cannot have the same event number.

You do not have to assign event numbers sequentially, although it is preferred. If, after gathering all the events to submit for a quarter, you find you have omitted one, do not renumber all the events for the year. Simply assign the next available event number to the omitted event.

An event that continues through multiple months during the same year keeps the originally assigned event number. An event that continues from one year into the next is assigned a new event number in the new year. Refer to Page III-24 for further instructions.

Report Revision Code (All Records, column 17)
This one-character data field signals that a change must be made to an event already submitted to GADS. Changes can be corrections, additions, or deletions of existing events.

The first time you submit an event to GADS it is called an "original" event. All original events have a revision code of zero (0).

Use the following codes when making changes to an original event:

1, 2, . . . 9 Use these codes when making **corrections or additions** to original events. Each time you make a change, you must increase the revision code by one. Up to nine corrections and additions to an original event can be made.

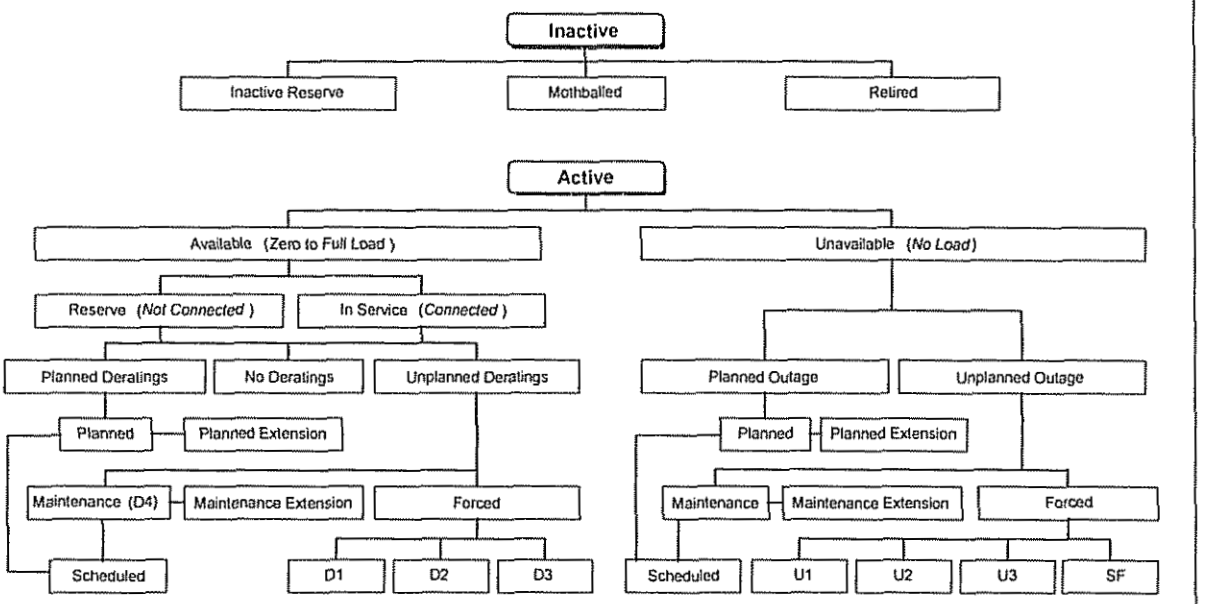
When making **corrections or additions** to an original event, you need to send NERC all records relating to that event on which the changes are to be made. On the record:

1. Complete columns 1-16, repeating the information from the original event; and,
2. Increase the revision code in column 17 by one.
3. Make sure the same record number used in the original report is in columns 81-82. DO NOT LEAVE THE RECORD NUMBER BLANK; and
4. Enter the correct or additional information in the appropriate field.

To delete data from one or more data fields, GADS RECOMMENDS that you resubmit the entire data set — year-to-date — for that unit (or all units you report) to GADS. This procedure will insure that both you and the GADS database have the same records on file. You have the option to find the record that has the highest revision code and then increase this number by one or set all revision codes back to zero.

Event Type (All Records, columns 18-19)
There are two "Unit States" defined by IEEE 762: Inactive and Active. Inactive States are shown on pages III-5-6; "Active States" on pages III-7-9 and Pages III-14-15. Enter the two-character code which best describes the event (inactive, outage, derating, reserve shutdown, or noncurtailing) experienced by the unit. For outages and deratings, the event type codes also define the urgency (or postponability) of the event.

Figure III-3
Unit States Diagram



Inactive States

The two most general unit states are shown at the top of the diagram: active and inactive. Inactive State is called "Deactivated Shutdown" in IEEE 762 and is defined as "The State in which a unit is unavailable for service for an extended period of time for reasons not related to the equipment." GADS interprets this to include:

- **Inactive Reserve – IR.** IR is defined by IEEE 762 and GADS as "the State in which a unit is unavailable for service but can be brought back into service after some repairs in a relatively short duration of time, typically measured in days." GADS added "after some repairs" and defines the phrase "after some repairs" to mean that some action may be needed to prepare the unit for service because it had been sitting idle for a period of time and some equipment parts have deteriorated or need replacing before the unit can be operated. The unit should be operable at the time the IR begins. This does not include units that may be idle because of a failure **and** dispatch did not call for operation. A unit that is not operable or is not capable of operation at a moments notice should be on a forced, maintenance or planned outage and remain on that outage until the proper repairs are completed and the unit can operate. The unit **must be** on RS a minimum of 60 days before it can move to IR status. Use Cause Code "0002" (three zeros plus 2) for these events.

- **Mothballed – MB.** MB is defined by IEEE 762 and GADS as "the State in which a unit is unavailable for service but can be brought back into service after some repairs with appropriate amount of notification, typically weeks or months." GADS added "after some repairs" and defines the phrase "after some repairs" to mean that some action may be needed to prepare the unit for service because it had been sitting idle for a period of time and some equipment parts have deteriorated or need replacing before the unit can be operated. The unit may have also experienced a series of mechanical problems for which management may wish to wait for a period of time to determine if the unit should be repaired or retired. A unit that is not operable or is not capable of operation at a moments notice **must be** on a forced, maintenance or planned outage and remain on that outage for at least 60 days before it is moved to the MB state. If repairs are being made on the unit in order to restore the unit to operating status before the 60-day period expires, then the outage **must remain** a forced, maintenance or planned outage and not MB. If unit repairs for restoring the unit to operation are made after the 60-day period, then the first 60 days **must be** a forced, maintenance or planned outage and the time after the 60-days including the repair time on the unit up to operation shall be the MB event. Use Cause Code "9991" for these events.

- **Retired – RU.** RU is defined by IEEE 762 and GADS as "the State in which a unit is unavailable for service and not expected to return to service in the future." RU should be the last event for the remainder of the year (up through December 31 at 2400). The unit must not be reported to GADS in any future submittals. Use Cause Code "9990" for these events

Active States

Tracing down the diagram, more detail is added to more precisely describe the operating state of a unit at any given time. The fourth level shows the most detailed operating states. This is the level of detail incorporated into the GADS program. The codes in the blocks are the GADS event types.

Notice on the diagram that D4 (maintenance derating) and MO (maintenance outage) are classified as both "unplanned" and "scheduled." Standard 762 classifies these types of events as "unplanned." GADS recognizes that, historically, many utilities referred to these events as "scheduled" and continue to do so. Both classifications are shown here to illustrate the relationship between unplanned and scheduled events. The evaluation of unit availability is not affected by the difference in terminology.

1. Outages

An outage exists whenever a unit is not synchronized to the grid system and not in a Reserve Shutdown state. The general outage event classification is divided into seven distinct event types. Special instructions for reporting testing during and following outages are shown in Figure III-3.

An outage starts when the unit is either desynchronized from the grid or when it moves from one unit state to another (for example, goes from a reserve shutdown to a maintenance outage.) The outage ends when the unit is synchronized to the grid or moves to another unit state.

In the case of moving from one unit state to another, the exact date and time that one outage ends will be the same as the next outage starts. The unit state can only be changed if the first outage ends. For example, if the unit is forced off line due to a water wall tube leak (just before it was to come off line for a planned outage), then the forced outage leak repair must be completed before the unit state can be changed from a U1 to a PO. The maintenance crew can start the PO work, but it will not be a PO until the U1 outage work is complete and the unit could be put back in service.

PO - Planned Outage

An outage that is scheduled well in advance and is of a predetermined duration, lasts for several weeks, and occurs only once or twice a year. Turbine and boiler overhauls or inspections, testing, and nuclear refueling are typical Planned Outages.

MO - Maintenance Outage

An outage that can be deferred beyond the end of the next weekend (Sunday at 2400 hours), but requires that the unit be removed from service, another outage state, or Reserve Shutdown state before the next Planned Outage (PO). Characteristically, a MO can occur any time during the year, has a flexible start date, may or may not have a predetermined duration, and is usually much shorter than a PO.

If an outage occurs before Friday at 2400 hours, the above definition applies. But if the outage occurs after Friday at 2400 hours and before Sunday at 2400 hours, the MO will only apply if the outage can be delayed passed the next, not current, weekend. If the outage can not be deferred, the outage shall be a forced event.

ME - Maintenance Outage Extension

ME is a new event type starting January 1, 2006. However, ME will be accepted for all prior years if the reporting company wishes to change the scheduled outage extension (SE) to ME.

GADS defines a maintenance outage extension as an extension of a Maintenance Outage (MO) beyond its estimated completion date. This means that at the start of the MO, the outage had an estimated duration (time period) for the work and a date set for the unit to return to service. All work during the MO is scheduled (part of the original scope of work) and all repair times are determined before the outage started.

For more information on ME rules and regulations, see "Scheduled Outage Extensions (SE) below.

PLEASE NOTE: SE (see below) events are still valid and will be accepted by GADS. Therefore, if a reporting company's internal programs can not or will not be modified to follow the new event types, then GADS will continue to accept the SE event types. However, the SE event types will be converted internally by GADS into the new event types for use in unplanned outage calculations and will be stored as a new event type. Historical data will be converted into the new event types for use in pc-GAR and other research work.

PE - Planned Outage Extension

PE is a new event type starting January 1, 2006. However, PE will be accepted for all prior years if the reporting company wishes to change the scheduled outage extension (SE) to PE.

GADS defines a planned outage extension as an extension of a Planned Outage (PO) beyond its estimated completion date. This means that at the start of the PO, the outage had an estimated duration (time period) for the work and a date set for the unit to return to service. All work during the PO is scheduled (part of the original scope of work) and all repair times are determined before the outage started.

For more information on PE rules and regulations, see "Scheduled Outage Extensions (SE) below.

PLEASE NOTE: SE (see below) events are still valid and will be accepted by GADS. Therefore, if a reporting company's internal programs can not or will not be modified to follow the new event types, then GADS will continue to accept the SE event types. However, the SE event types will be converted internally by GADS into the new event types for use in unplanned outage calculations and will be stored as a new event type. Historical data will be converted into the new event types for use in pc-GAR and other research work.

SE - Scheduled Outage Extension

(SEE "PLEASE NOTE" in ME and PE sections above)

GADS defines a scheduled outage extension as an extension of a Planned Outage (PO) or a Maintenance Outage (MO) beyond its estimated completion date. This means that at the start of the PO or MO, the outage had an estimated duration (time period) for the work and a date set for the unit to return to service. All work during the PO and MO is scheduled and all repair times are determined before the outage started.

The "predetermined duration" of outage also determines the "estimated completion date" of the PO or MO. If the unit is scheduled for four weeks of repairs, then the unit is expected back in service at a certain date four weeks after the start of the outage. In cases where the outage is moved up or back according to the needs of the operating company, ISO or power pool, then the start of the outage plus duration of the outage determines the new completion date. As long as the outage is not longer than planned, the expected completion date is moved to coincide with the predetermined duration period.

If the unit is on outage (for example, U1 outage due to a boiler tube leak) at the time the unit is scheduled to start the PO or MO work, then the work on the cause of the outage (tube repairs) must be completed before changing from the U1 outage to the PO or MO outage. PO and MO work can start but not counted as PO or MO work until the U1 repairs are complete.

All work during PO and MO events are determined in advance and is referred to as the "original scope of work." Use SE only in instances where the original scope of work requires more time to complete than originally scheduled. Where applicable, the extension of the planned or maintenance outage may be required to be approved in advance by your power pool or ISO. Advance warning of an extension is very important! However, GADS is not dispatch orientated but equipment-orientated database. The reporting of the SE is based on IEEE 762-GADS rules, not ISO requirements. Therefore, if the extension meets the GADS rules, then report it as a SE and not a U1 when reporting to GADS only.

Do not use SE in those instances where unexpected problems or conditions discovered during the outage which render the unit out of service beyond the estimated end date of the PO or MO. Report these delays as Unplanned (Forced) Outage-Immediate (U1). Do not use SE if unexpected problems occur during unit startup. If a unit completes a PO or MO before the original estimated completion date, then any problems causing outages or deratings up until that date are not usually considered to be part of the PO or MO.

SE or U1 must start at the same time (month/day/hour/minute) that the PO or MO ended. See Appendix G, Example 7, Pages G-26 to G-27.

SF - Startup Failure
An outage that results when a unit is unable to synchronize within a specified startup time following an outage or Reserve Shutdown.

The startup period for each unit is determined by the operating utility. It is unique for each unit, and depends on the condition of the unit at the time of startup (hot, cold, standby, etc.). A startup period begins with the command to start and ends when the unit is synchronized. SF begins when the problem preventing the unit from synchronizing occurs. The SF ends when the unit is synchronized, another SF occurs, or the unit enters another permissible state.

U1 - Unplanned (Forced) Outage — Immediate
An outage that requires immediate removal of a unit from service, another Outage State, or a Reserve Shutdown state. This type of outage usually results from immediate mechanical/electrical/hydraulic control systems trips and operator-initiated trips in response to unit alarms.

U2 - Unplanned (Forced) Outage — Delayed
An outage that does not require immediate removal of a unit from the in-service state but requires removal within six hours. This type of outage can only occur while the unit is in service.

U3 - Unplanned (Forced) Outage — Postponed
An outage that can be postponed beyond six hours but requires that a unit be removed from the in-service state before the end of the next weekend. This type of outage can only occur while the unit is in service.

INTERPRETATION OF OUTAGES AND THEIR REPORTING

The IEEE 762 defines the outage types and when the appropriate outage should be reported. However, the experiences of the industry also dictate interpretations of which outage type is most appropriate for a situation. The following are interpretations of when certain full outages should be reported and the reason for the apparent difference to the IEEE 762 rules. In these examples, we will illustrate the points using fictitious generating units but real life situations.

a. **Scenario #1: Forced Outage to Planned Outage**
Riverglenn #1, a fossil unit, is four days away from its scheduled planned outage when it experiences a boiler tube leak. The unit must come off line within 6 hours for repairs. Since the unit is scheduled for a planned outage, the dispatch (or ISO) allowed the unit to go into its planned outage early.

It normally takes 36 hours to repair a tube leak. Therefore, the first 36 hours of the outage would be forced (U2) outage. After the 36-hour period, the PO outage starts.

b. **Scenario #2: Forced Outage that can wait for repairs until the end of the next weekend.**
On a Thursday, Riverglenn #1 experiences a sudden increase in vibration in its ID Fan. The vibration is not severe enough to trip the unit but there are signs that the unit must be removed from service soon to check the problem and make repairs. After some discussion, management decides Riverglenn can be removed from service next week without further damage to the unit or endangering the safety for personnel. On Friday, dispatch (or ISO) allows Riverglenn to come down for repairs because another unit out for maintenance is now available for operation.

Even though Riverglenn came off line the same week as its problem started, the outage is a Maintenance Outage because it could have remained on line until the end of the next weekend.

c. **Scenario #3: Forced Outage that cannot wait for repairs until the end of the next weekend.**
On Friday, Jumbo #1, a gas turbine, began to vibrate. At first the vibrations were not severe but over the following 4 hours, the mils of vibration increased to where the unit must be removed from serviced. The unit continued to generate until after the peak period was over. Jumbo was not needed again until the following Monday afternoon. Shortly after the peak period, the operator tripped the unit.

Even though the unit was not needed until Monday, the unit could not have operated through the weekend because of vibration problems. Therefore, the outage is a Forced Outage and the FO is enforced until the vibration problem is solved.

d. **Scenario #4: Forced Outage to Reserve Shutdown with Economic Repairs.**
High Top #3, a small fossil unit, experienced a Forced Outage failure in its boiler. However, the unit will not be needed the remainder of the week. It was decided by management to repair the unit on standard work time, no overtime or weekend pay. Working standard 8-hour days, the repairs were completed with 12 hours over a day and a half (36-hour) period.

Although the unit was not need, by management decision, the unit was not available for the full 36 hours and so the forced outage is reported from the time the unit came off line until the unit was available for operation (36 hours later). No part of the 36 hours is RS time. The RS time starts after the repairs and unit is available for operation.

e. **Scenario #5: Extending a Planned/Maintenance Outage when work is part of Original Scope of Work.**
During the Planned Overhaul of Riverglenn #1, the planned repairs to the electrostatic precipitator were more extensive then expected. More parts were ordered and then arrived to complete the repairs. However, unexpected longer repairs to the ESP delayed the return to service for 3 additional days.

Since the ESP repairs were part of the original scope of work and the unit receives the okay for extension from its ISO, the additional 3-day delay is the reason for the Planned Outage Extension.

f. **Scenario #6: Extending a Planned/Maintenance Outage when work is not part of Original Scope of Work.**
Part way through the maintenance outage of Riverglenn #1, the mechanics checked the packing on the boiler startup feed pump and decided it best to replace the packing now. It was not part of the original scope of maintenance work but was determined important to prevent a future unit outage. As a result of the repairs and no packing on site, the MO was delayed from returning to service on time for 12 hours.

All hours of the outage except the last 12 hours are MO. The last 12 hours is a Forced Outage because it 1) delayed the startup of the unit and 2) was not part of the original work scheduled during the outage.

g. **Scenario #7: Unexpected Repairs during Planned/Maintenance Outage But completed within the Scheduled Outage time.**
Riverglenn #1 was in its annual overhaul when it was discovered that several blades on its ID Fan needed replacement. It was not part of the original scope of work to repair the blades but parts were available through the OEM and repairs to the fan were completed during the allotted Planned Outage time. There were no delays in unit startup caused by the ID Fan repairs.

Since the unit was not delayed from scheduled startup due to the fan repairs, there is not penalty to the unit because of the "surprise" repairs. The ID Fan repair was reported as part of the "work completed during the outage" section to GADS.

Notes on Reporting Outages

Testing Following Outages

Typically following outages, equipment that was repaired or replaced is tested. These testing periods must be reported to GADS. The reporting procedure to follow depends on whether or not the unit was synchronized during the testing period:

a. On-line testing (synchronized)

If the unit must be on line and in service at some reduced load to perform testing following a Planned Outage (PO), Maintenance Outage (MO), or Unplanned (Forced) Outage (U1, U2, U3, SF), report the testing as a Planned Derating (PD), Maintenance Derating (D4), or Unplanned (Forced) Derating (D1), respectively. The PD, D4, or D1 starts when the testing begins, and ends when testing is completed. Report any generation produced while the unit was on line during the testing period on the Performance Report (see Page IV-4).

b. Off-line testing (not synchronized)

In cases where the unit does not have to be synchronized after the outage to perform testing, you can report the testing as part of the outage event using Section D of the Event Report. The outage ends when the testing is completed and the unit is placed in service or enters another state.

If you wish, you may report this type of testing separate from the outage event. In this case, the testing period becomes a new event, the outage ending when the testing period begins. You must use the same event type for the testing event as you did for the original outage (an SE is not considered an original outage — use the PO or MO event type, as appropriate). The testing event ends when the unit is synchronized or placed in another Unit State.

Outside Management Control Outages

There are outages from outside sources that result in generating units restricted in generating capabilities or in full outages. Such outages include (but are not limited to) ice storms, hurricanes, tornados, poor fuels, interruption of fuel supplies, etc. A list of causes and their cause codes are presented in Appendix K of these Instructions. Appendix K also sets special limits to the Outside Management Control (OMC) uses of the cause codes.

REPORT ALL OMC events to GADS. They should not be classified as reserve shutdown or non-curtailing events. The GADS software in Appendix F will allow calculations of events with and without OMC events. The use of equations without OMC events is left to the decision of plant and corporate management.

Special Comment Regarding the Reporting Pumped Storage Units to GADS

GADS collects data on all unit types, including pumped storage units. Pumped storage units provide two types of service: generating and non-generating. In the generating mode, the unit acts like a generator to provide electric power. In the non-generating mode, the pumped storage unit acts as a motor and pump to move water back into the reservoir for reuse in the future. The 2006 version of IEEE 762 credits pumped storage units in several statistics whether the unit is in the generating or non-generating mode.

In reporting pumped storage units to GADS, GADS is interested in the generating aspect of pumped storage units more than the non-generating mode. Therefore, if the unit is prevented for generating power, then those events must be reported to GADS using the standard procedures.

In the case where the pumped storage unit cannot operate in the non-generating mode but can operate in the generating mode, then the operator can report the problem in either one of two ways: 1) report the non-generating mode equipment failure as a non-curtailing (NC) event, or 2) don't report the problem to GADS. GADS prefers option #1 but it is up to the reporter to choose to report the NC events or not.

If the case where the pumped storage unit cannot operate in the generating mode but either can or cannot operating in the non-generating mode, then the event must be reported using the normal outage procedure. NC event types are not appropriate in this case. The event should describe the reason why it cannot generate electricity. All outages that limit or prevent generating power must be reported to GADS.

2. Deratings

A derating exists whenever a unit is limited to some power level less than the unit's Net Maximum Capacity. Similar to outages, the general derating event classification is divided into distinct event types, based on IEEE Standard 762.

A derating starts when the unit is not capable of reaching 100% capacity. The available capacity is based on the output of the unit and not on dispatch requirements. The derating ends when the equipment that caused the derating is returned to service, whether it is used at that time by the operators or not.

More than one derate can occur at one time. The reporter chooses the order of reporting. Events are sorted on the date and time the event starts.

If a derating is less than 2% of the unit's Net Maximum Capacity (NMC) and less than 30 minutes in duration, then the derating can be reported at your discretion (optional). Otherwise, all other deratings (greater/less than 2% NMC or shorter/longer than 30 minutes) shall be reported to GADS. For example, a derate that is 10% of the NMC but last 10 minutes should be reported to GADS; a derate that is 1% of the NMC but last 6 hours should be reported to GADS.

Do not report deratings caused by ambient-related conditions or system dispatch requirements (see Notes on Reporting Deratings, Page III-16).

PD - Planned Derating

A derating that is scheduled well in advance and is of a predetermined duration.

Periodic deratings for tests, such as weekly turbine valve tests, should not be reported as PD's. Report deratings of these types as Maintenance Deratings (D4).

D4 - Maintenance Derating

A derating that can be deferred beyond the end of the next weekend but requires a reduction in capacity before the next Planned Outage (PO). A D4 can have a flexible start date and may or may not have a predetermined duration.

If an derating occurs before Friday at 2400 hours, the above definition applies. But if the derating occurs after Friday at 2400 hours and before Sunday at 2400 hours, the D4 will only apply if the derating can be delayed passed the next, not current, weekend. If the derating can not be deferred, the derating shall be a forced derating event

DM - Maintenance Derating Extension

DM is a new event type starting January 1, 2006. However, DM will be accepted for all prior years if the reporting company wishes to change the derating extension (DE) to DM.

GADS defines a maintenance derating extension as an extension of a maintenance derate (D4) beyond its estimated completion date. This means that at the start of the D4 event, the derate has an estimated work time and a set date for the unit for returning to service. All work during the D4 is scheduled (part of the original scope of work) and all repair times are determined before the outage started.

For more information on DM rules and regulations, see "Derating Extensions (DE) below.

PLEASE NOTE: DE (see below) events are still valid and will be accepted by GADS. Therefore, if a reporting company's internal programs can not or will not be modified to follow the new event types, then GADS will continue to accept the DE event types. However, the DE event types will be converted internally by GADS into the new event types for use in unplanned outage calculations and will be stored as a new event type. Historical data will be converted into the new event types for use in pc-GAR and other research work.

DP - Planned Derating Extension

DP is a new event type starting January 1, 2006. However, DP will be accepted for all prior years if the reporting company wishes to change the derating extension (DE) to DP.

GADS defines a planned outage extension as an extension of a Planned Derate (PD) beyond its estimated completion date. This means that at the start of the PD, the derate had an estimated duration (time period) for the work and a date set for the unit to return to service. All work during the PD is scheduled (part of the original scope of work) and all repair times are determined before the outage started.

For more information on DP rules and regulations, see "Derating Extensions (DE) below.

PLEASE NOTE: DE (see below) events are still valid and will be accepted by GADS. Therefore, if a reporting company's internal programs can not or will not be modified to follow the new event types, then GADS will continue to accept the DE event types. However, the DE event types will be converted internally by GADS into the new event types for use in unplanned outage calculations and will be stored as a new event type. Historical data will be converted into the new event types for use in pc-GAR and other research work.

DE - Derating Extension

A Derating Extension is an extension of a Planned Derating (PD) or a Maintenance Derating (D4) beyond its estimated completion date.

Use a DE only in instances where the original scope of work requires more time to complete than originally scheduled. Do not use a DE in those instances where unexpected problems or delays outside the scope of work are encountered which render the unit incapable of full load beyond the estimated end date of the PD or D4. The DE must start at the same time (month/day/hour/minute) that the PD or D4 ended.

D1 - Unplanned (Forced) Derating — Immediate

A derating that requires an immediate reduction in capacity.

D2 - Unplanned (Forced) Derating — Delayed

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

D3 - Unplanned (Forced) Derating — Postponed

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

Notes on Reporting Deratings

Ambient-related Losses

Do not report ambient-related losses, such as those caused by high cooling water intake temperatures (other than regulatory-imposed discharge limits — cause code 9660, etc.), as derating events to GADS. There are two reasons for this. First, the level of record keeping required to track these types of losses as events is excessive. Second, ambient-related losses are easily computed using the information you supply to GADS on the Performance Report, specifically Maximum Capacity and Dependable Capacity. The difference in these two values reflects losses due to ambient conditions only (see Pages IV-5 to IV-6). To determine ambient losses in megawatthours (MWh), simply multiply the difference between Maximum Capacity and Dependable Capacity by the total number of hours in the study period.

System Dispatch Requirements

Sometimes units operate at less than full capacity for reasons other than ambient-related conditions or equipment failures. This operating mode, imposed by system dispatch requirements, is referred to as "load following." Load following is not reported to GADS. These data are not relevant to unit availability and, therefore, are beyond the scope of the GADS program.

Although load following is not reported to GADS, any maintenance, testing, etc. done during the load following period should be reported as an event. Under certain conditions, this work can be reported as a noncurtailing event (NC). See Page III-20 for details.

Figure III-4 describes the relationships between Maximum Capacity, Dependable Capacity, and Available Capacity as a result of deratings, and system dispatch requirements.

Ramping Up at Unit Startup and Down at Unit Shutdown

Each unit has a "standard" or "normal" time for reaching full load capabilities after a full outage or ramping down (coming off line) to a full outage state. GADS doesn't set time periods for each unit; the operators know the units and can judge if a unit is taking longer than normal to ramp up after an outage or coast down for removal from service.

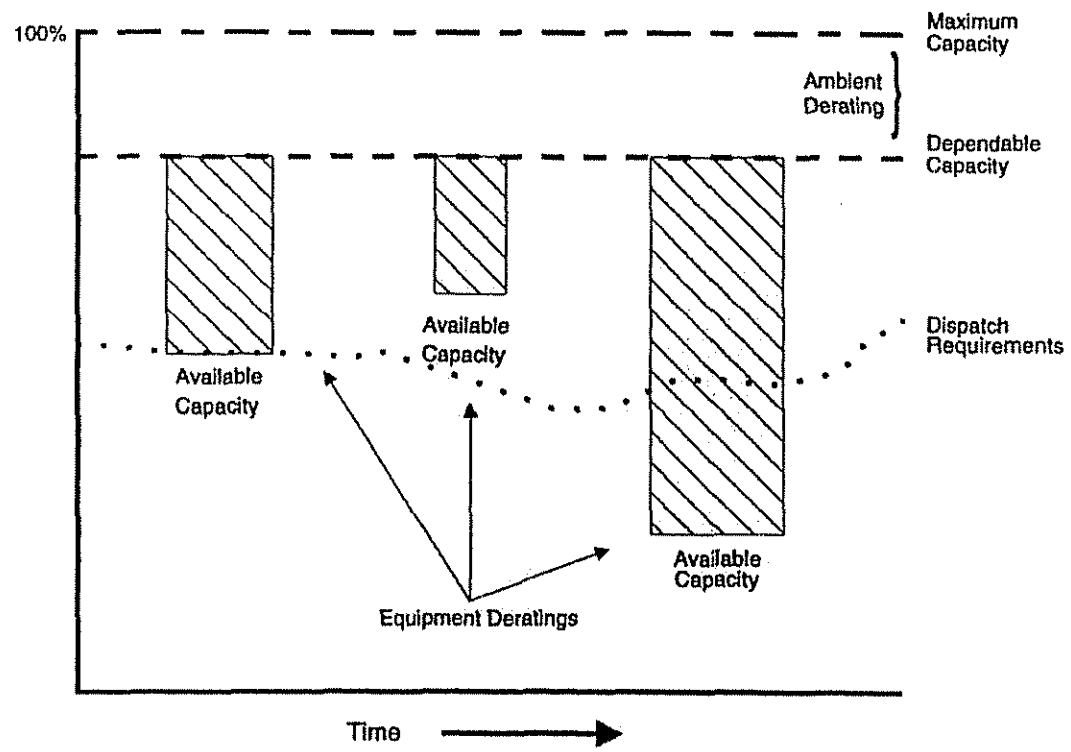
If a unit ramps up to the full load level OR up to the level of required load within the "normal" time period — set by the operators of the unit — following a full outage, there is no derating on the unit from the time of synchronization to the load point.

If the unit takes longer than normal ramp up time to the full load level OR up to the required load, then there is a derating. The generating capacity of the unit at the end of the normal period will be the level of the derate and the derate will last until the unit can either reach full load capability or level of required load.

FOR ALL UNITS EXCEPT NUCLEAR: There is no derating for unit shutdown. Each unit must be shutdown safely, with damaging equipment or posing a safety hazard to personnel. Some shutdowns are quick as in a unit trip; others are slower such as coast down to unit planned outages. In either case, the unit is not derated.

FROM NUCLEAR UNITS: Coast down to refueling may take weeks, depending on the operation of the unit. If the unit can recover from coast down and can still produce 100% capability during coast down, there is no derating. If the unit is not capable of 100% capacity, the derate is at the level of capability until the unit is taken off line.

Figure III-4
Possible Derating Situations



Overlapping Deratings

Deratings often overlap each other in duration. GADS considers all deratings additive except those which are masked (shadowed) by an outage or a larger derating for their entire duration. This means the derating that started first is assumed to be the primary cause of the load reduction until it terminates or a full outage begins. Follow the criteria described below when reporting overlapping deratings:

a) Deratings that are masked (shadowed) for their full duration by outages or larger deratings are considered noncurtailing in nature; that is, they do not affect the available capacity of the unit. Report these situations using one of the two options shown below:

   Report deratings of this type as derating events. If you choose this option, the available capacity resulting from the derating (see Page III-19) must be estimated, since it cannot be readily observed. The calculation of equivalent derated hours will not be affected if shadowed deratings are reported in this manner.

   Instead of reporting these kinds of deratings as events, you may report them on Section D of the Event Report that describes the outage or larger derating. See Appendix G, Example 4, Pages G-18 to G-19.

b) Deratings that are masked (shadowed) due to operation in a load-following mode must be reported as individual events. The available capacity (see below and Page III-19) must be estimated, because it cannot be readily observed.

c) Because of the additive assumption, GADS computer programs automatically increase the available capacity of a unit when one derating ends while another is still in progress. See Appendix G, Example 3C, Pages G-12 to G-14. If the available capacity of the unit cannot be increased because of the severity of the derating still in progress, you must indicate this by "artificially" ending the derating in progress and reporting a "new" derating. For further discussion, see Appendix G, Example 3D, Pages G-15 to G-17.

Occasionally, two or more individual components will fail at the same time month/day/hour/minute). There are two ways to report occurrences like these:

1. Report each component failure as a separate derating. Use engineering judgment to determine the available capacity as a result of each. NERC processes the data first sorting by start date then event number. This means that when start dates are identical, the derating with the lower event number will be processed first.
2. Report one derating, showing one component as the primary cause of event and the other(s) using Section D of the Event Report.

Deratings that Vary in Magnitude with Time

Certain deratings vary in magnitude over time, such as those caused by stack emission, thermal discharge, and fuel limitations. You may use one of two methods to report these types of deratings to GADS.

1. Report a new derating to GADS each time the available capacity of the unit changes.
2. Determine the unit's average available capacity during the entire restricted period and reporting only one continuous averaged derating event to GADS. The start and end dates of the averaged derating event would be the start and end of the overall restricted period.

The averaging technique used to determine the unit's available capacity involves first calculating the megawatthours (MWh) lost at each level of the derating, summing them, and then dividing by the number of hours in the overall derating period. This calculation yields the average megawatts (MW) lost during the period, from which the average available capacity of the unit during the period is determined. This is the only number you report in Section B of the Event Report (see Page III-19).

The following example demonstrates this averaging technique:

A 1000 MW unit experienced a derating, caused by a stack emission limitation, over a ten-day period (240 hours). During this period, the magnitude of the derating varied as follows:

1) 40 hours at 30 MW; 2) 10 hours at 50 MW;
3) 110 hours at 20 MW; and 4) 80 hours at 40 MW.

During this time, the unit also experienced an Unplanned (Forced) Outage- Immediate (U1) event for 90 hours and a Reserve Shutdown (RS) event for 20 hours.

First, the total megawatthours (MWh) lost at each derating level are calculated and summed:

(40 hours x 30 MW) + (10 hours x 50 MW) + (110 hours x 20 MW) + (80 hours x 40 MW) = 7100 total MWh lost.

Next, the average megawatts (MW) lost over the 10-day period is calculated by dividing the total MWh lost by the number of hours in the entire derating period:

7100/240 = 30 average MW lost

Finally, the available capacity for the unit over the 10-day derating period is calculated by subtracting the average MW lost from the unit's Dependable Capacity.

1000 MW - 30 MW = 970 MW Available Capacity

Again, the start and end dates of this derating would be the start and end dates of the entire period. The Available Capacity as a Result of the Event to be reported on the Event Report is 970.

Notice in the example that one outage and one Reserve Shutdown event also occurred during the period of the stack emission limitation. As a data reporter, you must realize that deratings of the type described above exist even if the unit is shut down, limited by a more severe derating, or masked by a Reserve Shutdown. For this reason, in the example, the average megawatts lost over the 10-day period is calculated based on the total number of hours in the period (240), not just the number of hours the unit was synchronized. NERC computer programs recognize any full power outages that occur during a continuous derating period and do not double-count the overlapping periods when calculating performance indexes.

Dominant Derating Reporting

(See page III-25 for details)

3. Reserve Shutdown - RS

An event that exists whenever a unit is available for load but is not synchronized due to lack of demand. This type of event is sometimes referred to as an economy outage or economy shutdown. If a unit is shut down due to any equipment-related problems, whether or not the unit was needed by the system, report an Unplanned (Forced) Outage, Maintenance Outage, or Planned Outage, **not** a Reserve Shutdown.

While a unit is on RS, maintenance work is often performed that would have resulted in a unit outage or derating had the unit been on line. This work can be reported as part of the RS event if, at anytime, the work can be stopped or completed without preventing the unit from:

a) Synchronizing after a normal startup cycle; and,

b) Reaching its available capacity after a normal loading cycle.

This criterion remains the same whether or not the unit was needed by the system.

If the above criterion is met, report maintenance work done during the RS on the Event Report, Section D (beginning with Record 04), using an Event Contribution Code 3-Other Components Worked During Event.

If maintenance work cannot be stopped or completed the Reserve Shutdown condition of the unit is altered and an outage or derating must be reported. If the unit cannot be synchronized while the work is being performed, an outage exists and the RS must end. If the unit cannot attain its available capacity while the work is being performed, a derating exists. The RS event does not end, but report the derating too. Estimate the available capacity as a result of the derating.

4. Noncurtailing Event - NC

An event that exists whenever equipment or a major component is removed from service for maintenance, testing, or other purposes that does not result in a unit outage or derating.

An NC also can exist when a generating unit is operating at less than full capacity due to system dispatch requirements. During this period, equipment can be removed from service for maintenance, testing, or other reasons and be reported as an NC if both the following conditions are met:

a) The available capacity of the unit is not reduced below that required by system dispatch; and,

b) Maintenance work can be stopped or completed and the units reach its net dependable capacity (NDC) level within its normal ramp-up time, if and when the unit was needed by the system.

If the conditions cannot be met, report an outage or derating event rather than an NC.

B. EVENT MAGNITUDE

The information in this section is used to determine the impact of the event identified in Section A on the unit. This section is also located on Record 01 of the Event Report. Refer to Figure III-5.

Figure III-5A – 97 Format
B – Record Layout of Event Magnitude – Record 01

Column ID	Number of Columns	Starting Position of Data
Start of Event	8	20
(Blank Columns)	20	28
End of Event	8	48
Gross Available Capacity	4	56
Net Available Capacity	4	60
(Blank Columns)	1	64
Dominant Derating Code	1	65
(Blank Columns)	15	66
Record Number	2	81

Figure III-5B – 07 Format
B – Record Layout of Event Magnitude – Record 01

Column ID	Number of Columns	Starting Position of Data
Start of Event	8	20
(Blank Columns)	20	28
End of Event	8	48
Gross Available Capacity	4 plus 2 decimals	56
Net Available Capacity	4 plus 2 decimals	62
(Blank Columns)	1	68
Dominant Derating Code	1	69
(Blank Columns)	11	70
Record Number	2	81

Start of Event (Record 01, columns 20-27)

Enter the time (month/day/hour/minute) the event began:

Outages — time the unit was desynchronized (either operator or equipment initiated) or entered the outage state from another state.

Deratings — time the system, major component, or piece of equipment became unavailable for service affecting an actual or potential loss of unit capacity.

Reserve Shutdowns — time the unit was desynchronized or entered the reserve Shutdown State from another state.

Noncurtailing Events — time the system, major component, or piece of equipment became unavailable for service (either operator or equipment initiated).

Use a 24-hour clock to record time. Midnight is recorded as **2400** and the beginning of a new day is recorded as **0000**. For an event that began on July 31 at 3:26 p.m., the start of event is recorded as:

07	31	15	26

Event Transitions*

Sometimes events occur in succession with no intervening unit synchronization. These events are considered "related," even though they must be reported separately. The matrix below describes the relationships between events and details permissible event type changes, see Example 9 in Appendix G.

Figure III-6
Allowable Event Type Changes

TO / FROM	U1	U2	U3	SF	MO	PO	SE	ME	PE	RS	DE	DM	DP
U1 – Immediate	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes			
U2 – Delayed	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes			
U3 – Postponed	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes			
SF - Startup Failure	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes			
MO – Maintenance	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes			
PO – Planned	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes			
ME – Maint. Extension	Yes	No	No	Yes	No	No	Yes	Yes	No	Yes			
PE – Planned Extension	Yes	No	No	Yes	No	No	Yes	No	Yes	Yes			
SE – (ME+PE) Extension	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes			
RS – Reserve Shutdown	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes			
D1 – Immediate	*IEEE Standard 762 does not recognize transition to/of deratings from/to other event types except as shown.*										No	No	No
D2 – Delayed											No	No	No
D3 – Postponed											No	No	No
D4 – Maintenance											Yes	Yes	No
PD – Planned											Yes	No	Yes
DE – Derating Extension											Yes	—	—
DM – Maintenance Derating Extension											—	Yes	No
DP – Planned Derating Extension											—	No	Yes

"YES" denotes that a change from one event type to another without intervening synchronization is permissible and the end date of the first event can be the same as the start date of the successive event. "NO" indicates that there is no relationship between the event types and individual events separated by some period of time must be reported.

When there is no intervening synchronization between events, the start time of one event is the same as the end time of the immediately preceding event.

* Effective January 1, 1996 the data fields in Event Report Section B–Event Magnitude relating to change in event type is no longer used to report event transitions. Each event must be reported using a unique event number.

* Effective January 1, 2005, the section "When to Adjust for Startups" (formally Figure III-7) was removed from the GADS DRI. The rule for artificially adding start up times to events moving from one event type to another could not be tested or enforced. The mass majority of reporters were not following the rules and only a few (as surveyed at annual workshops) were. Therefore, to allow equal reporting rules, the section was dropped.

End of Event (Record 01, columns 48-55)

Enter the time (month/day/hour/minute) the event ended:

Outages — time the unit was synchronized or placed in another appropriate unit state.

Deratings — time the system, major component, or piece of equipment became available for service affecting an actual or potential increase in unit capacity.

Reserve Shutdowns — time the unit was synchronized or placed in another appropriate Unit State.

Noncurtailing Events — time the system, major component, or piece of equipment became available for service.

For events that extend through multiple quarters within the same year, DO NOT WAIT until the event is over before reporting it to GADS. Instead, report the event leaving the end date blank. When the event does end, submit the end date as a revision, following the instructions on Pages III-4.

Every event must have an end date at the end of every year. *If an event continues into the new year,* assign a "false" end date. The "XX" indicates that the event carried over into the new year.

12	31	24	XX

Restart the event in the new year, assigning a "false" start date. Take care to change the Year (Section A, columns 9-12) to reflect the current year, and assign a new Event Number (Section A, columns 13-16). The "XX" in the start date links the event back to the prior year to the event containing an "XX" in the end date.

01	01	00	XX

In addition to the year, event number, and start date, the "new" event being carried into the new year must:

- have a revision code of zero (0);
- have the same event type as the previous year's report;
- include all the system/component cause codes used in the previous year, except for those components that were repaired within the previous year;
- include man-hours worked during the current year only.

Gross Available Capacity (GAC) as a Result of the Event
(Record 01, 97 format = columns 56-59; 07 format = 56-61); **AND**

Net Available Capacity (NAC) as a Result of the Event
(Record 01, 97 format = columns 60-63; 07 format = 62-67)

Enter the capacity that is available from the unit given the restriction imposed by the derating event being reported. This is the capacity after the reduction has been taken into account. *Complete these fields only when the event type is a derating.*

The GAC is the greatest capacity at which the unit can operate during the period of restriction caused by the derating. The NAC is the GAC less any capacity utilized for station service or auxiliary loads.

Either the GAC, the NAC, or both must be completed when the event type is a derating. Net data is preferred, but gross data must be reported if it is the only value available. If you report the Gross Available Capacity (GAC) then you must report, Gross Maximum Capacity (GMC), Gross Dependable Capacity (GDC), and Gross Actual Generation (GAG) on the Performance Report (95). Data consistency is necessary to calculate availability statistics.

See *Notes on Reporting Deratings,* Pages III-14 to III-15, for more information concerning the reporting of deratings.

Dominant Derating Code
(Record 01, 97 format = column 65; 07 format = column 69).
All deratings reported to GADS is considered additive unless reported in a more complex manner. When reported in the complex manner, the same events are reported more than once in order to emphasize which derating is more dominate of the two. It thus creates a problem with the frequency and duration of the derate because the same derate is reported more than once.

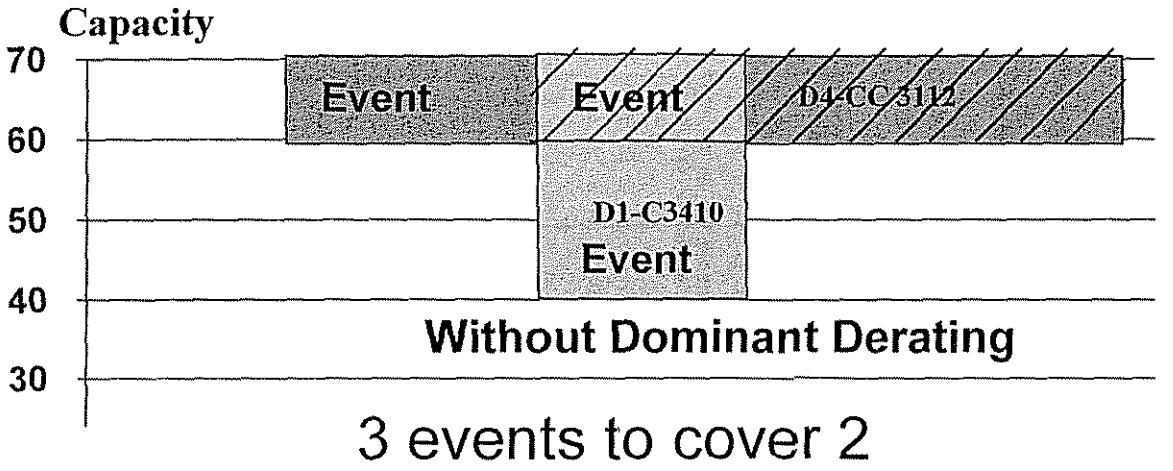
The purpose of the Dominant Derating Code is to mark the dominate derating if more than two deratings are occurring at the same time. By marking the dominate derate, the computer program will process the cause code for that dominate derating for its full impact and not hide part of the impact credited to other derates. Unit performance statistics will not be affected. Cause code statistics will be more accurate by recording the true frequency and impact of the dominate derate.

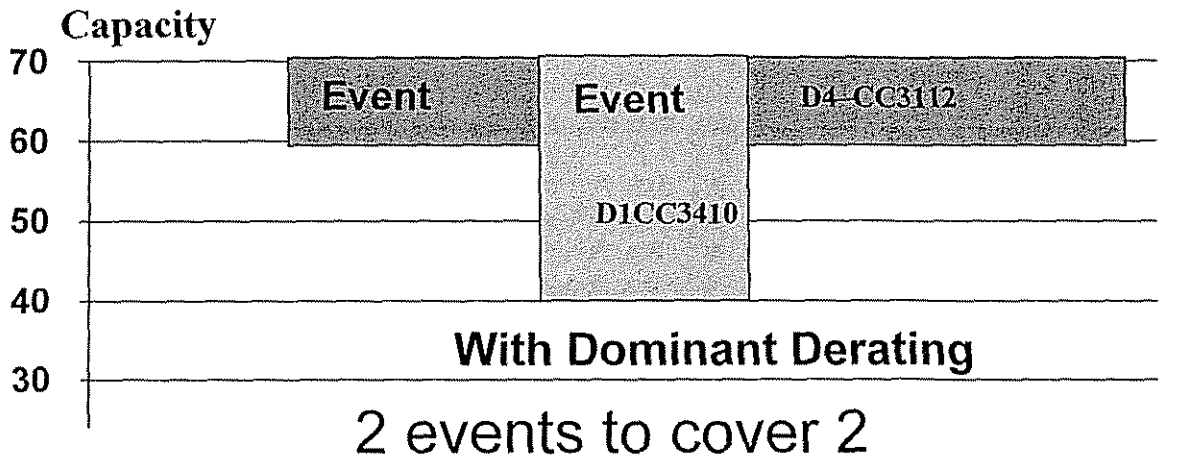
The Dominant Derating Code will be in the unused column 69 of record 1. A dominate derate will be identified by a "D".

See example G-3D for an example of dominant derates.

One example of how two derates would be reported to GADS – one without the Dominant Derating Code and one with the Dominant Derating Code – is shown in Figure III-7.

Figure III-7
Example of Dominant Derating Code Reporting





C. PRIMARY CAUSE OF EVENT; AND
D. ADDITIONAL CAUSE OF EVENT OR COMPONENTS WORKED DURING EVENT

Figure III-8 - Both 97 and 07 Formats
C – Record Layout of Primary Cause of Event – Records 02 and 03

A — EVENT IDENTIFICATION

Column ID	Number of Columns	Starting Position of Data
Record Code	2	1
Utility Code	3	3
Unit Code	3	6
Year	4	9
Event Number	4	13
Report Revision Code	1	17
Event Type	2	18

C — PRIMARY CAUSE OF EVENT

System/Component Cause Code	4	20
Cause Code Amplification Code	2	24
Time Work Started	8	26
Time Work Ended	8	34
(Blank Columns)	2	42
Event Contribution Code	1	44
Primary Alert	1	45
Man-hours Worked	4	46
Verbal Description	31	50
Record Number	2	81

The first 19 characters of Record 02 are identical to that of Record 01. These 19 characters link the two records (Record 01 and Record 02) together. If a Record 03 is used, again the first 19 characters of the Record 03 must be those of Records 01 and 02.

Event Record 03

A — EVENT IDENTIFICATION

Column ID	Number of Column	Starting Position Of Data
Record Code	2	1
Utility Code	3	3
Unit Code	3	6
Year	4	9
Event Number	4	13
Report Revision Code	1	17
Event Type	2	18

C — PRIMARY CAUSE OF EVENT		
Column ID	Number of Columns	Starting Position of Data
System/Component Cause Code	4	20
(Blank Columns)	2	24
Verbal Description	55	26
Record Number	2	81

Section C is used to detail the system, major component, or piece of equipment primarily responsible for causing the event. Section C is located on Records 02 and 03 of the Event Report — refer to Figure III-8. You must complete one Section C for every event submitted to GADS with the exception of Reserve Shutdown events. Because the only "cause" of a reserve shutdown is economic considerations, reporting Section C is optional.

Figure III-9 - Both 97 and 07 Formats
D – Additional Work During Event – Records 04+ and 05+

A — EVENT IDENTIFICATION		
Column ID	Number of Columns	Starting Position Of Data
Record Code	2	1
Utility Code	3	3
Unit Code	3	6
Year	4	9
Event Number	4	13
Report Revision Code	1	17
Event Type	2	18
D — ADDITIONAL WORK DURING EVENT		
System/Component Cause Code	4	20
(Blank Columns)	2	24
Time Work Started	8	26
Time Work Ended	8	34
(Blank Columns)	2	42
Event Contribution Code	1	44
Primary Alert	1	45
Man-hours Worked	4	46
Verbal Description	31	50
Record Number	2	81

Section D of the Event Report is used to report factors contributing to the cause of the event (but are not primarily responsible); additional components worked on while the event was in progress; factors significantly affecting the startup/ramping of the unit; or, problems that extended the event. Sections D begin with Records 04 and 05 of the Event Report — refer to Figure III-9 for details.

Both Sections C and D consist of two cards each, one even-numbered and one odd-numbered. The even-numbered record is used to begin the description of the cause or the contributing factors of the event and contains information like man-hours worked. The odd-numbered record is used *only* to continue the description begun on the even-numbered card. If additional space is not needed for a description, omit the odd-numbered record rather than submit a blank one to GADS.

Only one Section C may be reported for each event. Section D is used for several different reasons, as described above, so multiple Section D cards are allowed. Only one Section D can be used for each system, component, or piece of equipment you are describing. Up to 46 sets of Section D records (numbers 04-99) are allowed, so you can describe up to 46 different items.

Never begin describing a new system, major component, or piece of equipment on an odd-numbered card.

The data elements reported in Sections C and D are the same and will be discussed together.

Fossil	Fluidized Bed	Nuclear	Diesel	Hydro/Pumped Storage	Gas Turbine	Jet Engine	Miscellaneous	Combined Cycle/Co-gen	Geothermal
0010-0130 0200-0480 0500-0920 1000-1090 1100-1200 1300-1350 1400-1599 1700-1820 1850 1900-1910 1980-1999 3110-3199 3210-3299 3310-3399 3401-3499 3501-3509 3520-3529 3600-3689 3700-3750 3810-3899 3950-3999 4000-4899 8000-8590 8600-8790 8800-8835 9000-9040 9130-9160 9180-9290 9300-9320 9504-9590 9600-9650 9660-9690 9700-9720 9900-9999	0010-0121 0130-0156 0160-0174 0200-0480 0500-0920 0930-1090 1100-1200 1300-1350 1400-1599 1700-1820 1850 1900-1910 1980-1999 3110-3199 3210-3299 3310-3399 3401-3499 3501-3509 3520-3529 3600-3689 3700-3750 3810-3899 3950-3999 4000-4899 8000-8590 8600-8790 8800-8835 9000-9040 9130-9160 9180-9290 9300-9320 9504-9590 9600-9650 9660-9690 9700-9720 9900-9999	2010-2090 2110-2160 2170-2799 2805-2890 2900-2999 3110-3199 3210-3299 3310-3399 3401-3499 3501-3509 3520-3529 3600-3689 3700-3750 3810-3899 3950-3999 4000-4899 9000-9040 9110-9160 9180-9199 9300-9320 9500-9590 9660-9690 9700-9720 9900-9999	3600-3689 4500-4899 5700-5880 5890-5999 9000-9040 9130-9160 9180-9199 9220-9290 9300-9320 9504-9590 9605-9655 9665-9695 9700-9720 9900-9999	3600-3689 3810-3899 3950-3999 4500-4899 7000-7299 9000-9040 9135-9160 9180-9199 9300-9320 9504-9590 9676-9696 9700-9720 9900-9999	3600-3689 3810-3899 3950-3999 4500-4899 5000-5030 5040-5190 5200-5299 7800-7960 8700-8790 8800-8835 8840-8845 9000-9040 9130-9160 9180-9290 9300-9320 9504-9590 9603-9653 9663-9693 9700-9720 9900-9999	3600-3689 3810-3899 3950-3999 4500-4899 5400-5430 5440-5590 5600-5699 7800-7960 8700-8790 8800-8835 8840-8845 9000-9040 9130-9160 9180-9290 9300-9320 9504-9590 9604-9654 9664-9694 9700-9720 9900-9999	0000-1999 3110-3999 4000-4899 5000-5299 5400-5699 7800-7960 8000-9999	0036-0480 0540-0570 0670-0859 1300-1599 1700-1820 1850 & 1900-1910 1980-1999 3110-3199 3210-3285 3290-3295 3299 & 3310-3399 3401-3499 3501-3509 3520-3529 3600-3689 3700-3750 3810-3899 3950-3999 4000-4899 5000-5299 5400-5699 6000 & 6005-6090 6100 & 6110-6183 6299& 6399 7800-7960 8700-8790 8800-8835 9000-9040 9130-9160 9200-9290 9300-9320 9504-9590 9600-9650 9660-9690 9700-9720 9900-9999	0500-0799 3110-3199 3210-3299 3310-3399 3520-3529 3600-3689 3700-3750 3810-3899 3950-3999 4200-4250 4260-4319 4400-4580 4600-4650 4700-4750 4800-4899 6410-6499 8000-8499 8700-8790 9000-9040 9130-9160 9180-9199 9300-9320 9504-9590 9700-9720 9900-9999

Figure III-10
Allowable Cause Codes

System/Component Cause Code (Record 02, columns 20-23)

Enter the four-digit code from Appendix B that best identifies the system, major component, or piece of equipment you are describing. Appendix B is divided into several sections for easily locating the appropriate cause codes for each unit type. Figure III-10, identifies the allowable range of System/Component Cause Codes for each type of unit.

Cause Code Amplification Code (Record 02, columns 24-25)

The purpose of the amplification code is to further identify the cause of outage by describing the failure mode. They are alpha-numeric characters place in an unused space following the existing cause code. Failure modes are leaks, corrosion, personnel error, fire, etc. They are almost identical to the GADS Failure Mechanism Codes (See Appendix H) except the Cause Code Amplification Code is just two-characters. Some existing cause codes contain these amplification codes as part of their description. The Cause Code Amplification Code allows all cause codes to be described with the set of failure modes without increasing the number of cause codes. It will also allow analyst to further explore the common causes of outages.

A list of Cause Code Amplification Codes is found in Appendix J.

Time: Work Started (Record 02, columns 26-33)

Enter the date (month/day/hour/minute) the system or component became unavailable for service. This time can be before the start of the event but should not consider time spent during preparatory work before the system or component was physically taken out of service. This field may be left blank, but if you do not provide this information, it is assumed that the work started when the event began.

Time: Work Ended (Record 02, columns 34-41)

Enter the date (month/day/hour/minute) the system or component became available for service. Although this time is normally before or the same as the end of the event, it can be after. This field can be left blank, but if you do not provide this information, it is assumed that the work ended when the event ended.

Event Contribution Code (Record 02, column 44)

Enter the one-digit code that best describes how the system, major component, or piece of equipment identified in columns 20-23 contributed to the event. Choose the appropriate code from the following list:

Codes

1 - **Primary cause of event**
The contribution code 1 must always appear in Section C: Primary Cause of Event. A 1 can only be used on Section D -Additional Cause of Event for a Planned Outage (PO) or a Maintenance Outage (MO) when work on multiple components is scheduled.

2 - **Contributed to primary cause of event**
Use this code to describe other systems, components, external conditions, or human factors that contributed to cause the event but were not primarily responsible for the event.

3 - **Work done during the event**
Use this code to identify systems or components that were worked on during the event but did not contribute to the initiation of the event or cause a delay in startup.

5 - **After startup, delayed unit from reaching load point**

Event Contribution Codes 2, 3, and 5 can be reported on Section D cards, and may be used more than once. Never leave this field blank. A zero or an asterisk will not be accepted.

Problem Alert (Record 02, column 45)
Enter an "X" in this field if you believe the problem with the system or component is generic to its design or operation practices. Because this information may be helpful to others using similar equipment, an "X" alerts the NERC staff to initiate an investigation.

If not entering an "X", leave this field blank — never zero-fill or asterisk-fill.

Man-hours Worked (Record 02, columns 46-49)
Enter the number of man-hours spent correcting the cause of the event or making repairs. Include those hours expended for on-site repairs as well as any off-site work. If man-hours exceed four digits, enter 9999 in this field and describe the actual number of man-hours expended in the Verbal Description. If this situation occurs, consider reporting more detailed cause codes, and subdividing the man-hours into segments associated with each system or component.

Verbal Description (Record 02, columns 50-80 and Record 03, columns 26-80)
This space is provided to give a more detailed explanation of the event and the cause(s) you identified by system/component cause code(s). It can also be used to report the expanded data format as described beginning on Page III-32 (below). Use only two sequential records (02-03, 04-05, etc.) to provide the description for each cause code you report.

Your narrative should include a balanced description of the major aspects of the event, focusing on these key areas: 1) failure description and appearance; 2) cause of immediate failure and contributing factors; and, 3) corrective actions. There is limited space available for your description, so we suggest you abbreviate as much as possible. Following the guidelines below will help you to develop a complete, concise description encompassing the key areas noted below.

1. **Failure Description and Appearance**
   Describe the manner in which the failure occurred. Identify the failure mode in generic terms, not in terms of the failure mechanism or failure effect(s). The following key words may be useful in describing the type and mode of the failure. These lists are by no means comprehensive. You may use these words as well as any others you feel appropriate.

Types of Failure	Typical Failure Modes
Erosion	Leak
Corrosion	Crack
Electrical	Breach
Electronic	Physical Distortion
Mechanical	Physical Displacement
Hydraulic	Collapse
Instruments	Fracture/Break
Operational	Won't Start/Move
	Won't Stop
	Won't Close
	Won't Open
	Won't Hold
	Won't Release
	Out of Limits
	Out of Adjustment
	Spurious Operation, False Response

2. Cause of Immediate Failure and Contributing Factors

The cause code already specifically identifies the primary system/component that caused the failure. It is advantageous, however, to describe other observed factors which contributed to the failure such as non-operational or physical factors (e.g., Engineering, Design, Human Error, etc.). Key words that are useful in describing immediate and contributing factors are shown below. This list is by no means comprehensive. You may use these words as well as any others you feel appropriate.

Typical Contributing Factors

Foreign/Wrong Part
Foreign/Incorrect Material
Particulate Contamination
Normal Wear
Abnormal Wear
Lubrication Problem
Weld Related
Abnormal Load
Abnormal Temperature
Abnormal Pressure
Abnormal Flow
Set Point Drift
Improper Previous Repair
Incorrect Procedure/Instruction
Instrument/Switch Miscalibration
Insulation Breakdown
Short/Grounded
Open Circuit
Contacts Burned/Pitted/Corroded
Connection Defective
Circuit Defective
Burned/Burned Out
Electrical Overload
Material Defect
Excess Vibration
Fire/Explosion
Natural Catastrophe
Cyclic Fatigue

3. Corrective Actions

Record the actions taken to repair and correct the failure problem. If tests or recalibration are made to verify that repairs are successful, they should be noted as well. Key words that can be used to describe corrective actions include the following. This list is by no means comprehensive. You may use these words as well as any others you feel appropriate.

Typical Corrective Actions

Recalibrate
Adjust
Temporary Repair
Temporary Bypass
Redesign
Modify
Repair Part(s)
Replace Part(s)
Repair Component(s)
Replace Component(s)
Reseal
Repack
Request License Revision

As an example, a relay coil wire burns open because of electrical overload and has to be replaced. The failure description would be "relay coil wire," the appearance is "burned open" and the cause is "electrical overload." Corrective action would be "replaced." The verbal description would be completed as follows: "RELAY COIL WIRE BURNED OPEN-ELECTRICAL OVERLOAD REPLACED WIRE"

EXPANDED DATA REPORTING

Some utilities have expressed an interest in reporting more detailed operating and maintenance data to GADS, which will allow them to perform more detailed reliability analyses. Also, by including these new data elements, duplicate reporting to other industry databases can be eliminated. To accommodate this request several new data elements have been added to GADS.

Reporting of this additional information is optional, although strongly encouraged. We believe reporting of these data will enhance the usefulness of our database and benefit the entire utility industry. If you choose to report these data to GADS, follow the instructions below. If you choose not to supply the additional data, report the verbal description as described on Page III-32.

Failure Mechanism Code (Record 02, columns 50-53)
From the list provided in Appendix H, enter the code that best describes the manner in which the component failed. The failure mechanism code must be reported in columns 50-53 on all even-numbered records containing a system/component cause code.

Trip Mechanism (manual or automatic)* (Record 02 column 54)
Enter the code that describes how the unit was shutdown. Use "A" for automatically (control system initiated), or "M" for manually (operator initiated). The trip mechanism must be reported in column 54 of all even-numbered cards containing a contribution code of 1 in column 44.

Cumulative Fired Hours at Time of Event* (Record 02, columns 55-60)
Enter the cumulative number of fired hours experienced by the unit at the time the event began. This data is taken directly from the fired hours meter typically located on the unit's control panel. This meter clocks cumulative operating hours since unit start-up. The fired hours must be reported in columns 55-60 of all even-numbered cards containing a contribution code of 1 in column 44.

Cumulative Engine Starts at Time of Event* (Record 02, columns 61-65)
Enter the cumulative number of engine starts experienced by the unit at the time the event began. This data is taken directly from the engine starts counter typically located on the unit's control panel. This counter clocks cumulative engine starts since unit start-up. The engine starts must be reported in columns 61-65 of all even-numbered cards containing a contribution code of 1 in column 44.

Figure III-11 - Both 97 and 07 Formats
Record Layout of Event Records Using Failure Codes

A — EVENT IDENTIFICATION

Column ID	Number of Columns	Starting Position Of Data
Card Code	2	1
Utility Code	3	3
Unit Code	3	6
Year	4	9
Event Number	4	13
Report Revision Code	1	17
Event Type	2	18

C — PRIMARY CAUSE OF EVENT

System/Component Cause Code	4	20
(Blank Columns)	2	24
Time Work Started	8	26
Time Work Ended	8	34
(Blank Columns)	2	42
Event Confirmation Code	1	44
Primary Alert	1	45
Man-hours Worked	4	46
Failure Mechanism Code	4	50
Trip Mechanism	1	54
Cumulative Fired Hours at Time	6	55
Cumulative Engine Starts at Time	5	61
Verbal Description	15	66
Record Number	2	81
Repeat of columns 1-19 from record numbers 01 and 02		
System/Component Cause Code	4	20
(Blank Columns)	2	23
Verbal Description	55	26
Record Number	2	81

*Gas turbine and jet engine units only.