

## DIESEL UNITS INDEX TO SYSTEM/COMPONENT CAUSE CODES

(Unit Codes 400-499)

<b>BALANCE OF PLANT</b>	<b>Cause Code Ranges</b>	<b>Page No.</b>
Electrical	3600-3690	B-DI-2
Power Station Switchyard	3700-3730	B-DI-3
<b>GENERATOR</b>		
Generator	4500-4580	B-DI-4
Exciter	4600-4609	B-DI-4
Cooling System	4610-4650	B-DI-4
Controls	4700-4750	B-DI-5
Miscellaneous (Generator)	4800-4899	B-DI-5
<b>DIESEL ENGINE</b>		
Engine	5700-5799	B-DI-6
Engine Auxiliaries	5800-5849	B-DI-6
Engine Controls	5850-5880	B-DI-6
Miscellaneous (Diesel Engine)	5890-5999	B-DI-6
<b>EXTERNAL</b>		
Catastrophe	9000-9040	B-DI-7
Economic	0000, 9130-9160	B-DI-7
Economic (for internal use at plants only)	9180-9199	B-DI-7
Fuel Quality	9200-9291	B-DI-8
Miscellaneous (External)	9300-9340	B-DI-8
<b>REGULATORY, SAFETY, ENVIRONMENTAL</b>		
Regulatory	9504-9590	B-DI-9
Stack Emission	9605-9655	B-DI-9
Other Operating Environmental Limitations	9665-9695	B-DI-9
Safety	9700-9720	B-DI-9
<b>PERSONNEL OR PROCEDURE ERRORS</b>	9900-9960	B-DI-10
<b>INACTIVE STATE</b>	0002, 9990-9991	B-DI-10
<b>PERFORMANCE</b>	9997-9999	B-DI-10

## BALANCE OF PLANT

### Electrical

3600	Switchyard transformers and associated cooling systems – external (OMC)
3601	Switchyard transformers and associated cooling systems – external (not OMC)
3610	Switchyard circuit breakers – external (not OMC)
3611	Switchyard circuit breakers – external (OMC)
3612	Switchyard system protection devices – external (OMC)
3613	Switchyard system protection devices – external (not OMC)
3618	Other switchyard equipment – external (not OMC)
3619	Other switchyard equipment – external (OMC)
3620	Main transformer
3621	Unit auxiliaries transformer
3622	Station service startup transformer
3623	Auxiliary generators
3624	Auxiliary generator voltage supply system
3629	Other switchyard or high voltage system problems - external
3630	400-700-volt transformers
3631	400-700-volt circuit breakers
3632	400-700-volt conductors and buses
3633	400-700-volt insulators
3634	400-700-volt protection devices
3639	Other 400-700-volt problems
3640	AC instrument power transformers
3641	AC Circuit breakers
3642	AC Conductors and buses
3643	AC Inverters
3644	AC Protection devices
3649	Other AC instrument power problems
3650	DC instrument power battery chargers
3651	DC circuit breakers
3652	DC conductors and buses
3653	DC protection devices
3659	Other DC power problems
3660	4000-7000-volt transformers
3661	4000-7000-volt circuit breakers
3662	4000-7000-volt conductors and buses
3663	4000-7000-volt insulators
3664	4000-7000-volt protection devices
3669	Other 4000-7000-volt problems
3670	12-15kV transformers
3671	12-15kV circuit breakers
3672	12-15kV conductors and buses

**Electrical** (Continued)

3673	12-15kV insulators
3674	12-15kV protection devices
3679	Other 12-15kV problems
3680	Other voltage transformers
3681	Other voltage circuit breakers
3682	Other voltage conductors and buses
3683	Other voltage insulators
3684	Other voltage protection devices
3689	Other voltage problems
3690	Station Service Power Distribution System, General

**Power Station Switchyard**

3700	Powerhouse switchyard (non generating unit equipment)
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)

## GENERATOR

This set of codes contains the generator, exciter, generator cooling systems, and generator controls. Note the main leads up to and including the generator output breaker are included in this set of codes.

### Generator

4500	Rotor windings
4510	Rotor collector rings
4511	Rotor, General
4520	Stator windings, bushings, and terminals
4530	Stator core iron
4535	Stator, General
4540	Brushes and brush rigging
4550	Generator bearings and lube oil system
4551	Generator bearings
4552	Generator lube oil system
4555	Bearing cooling system
4560	Generator vibration (excluding vibration due to failed bearing and other components)
4570	Generator casing
4580	Generator end bells and bolting

### Exciter

4600	Exciter drive - motor
4601	Exciter field rheostat
4602	Exciter commutator and brushes
4603	Solid state exciter element
4604	Exciter drive - shaft
4605	Exciter transformer
4609	Other exciter problems

### Cooling System (report failures caused by water leaks into generator as codes 4500, 4510, etc.)

4610	Hydrogen cooling system piping and valves
4611	Hydrogen coolers
4612	Hydrogen storage system
4613	Hydrogen seals
4619	Other hydrogen system problems
4620	Air cooling system
4630	Liquid cooling system
4640	Seal oil system and seals
4650	Other cooling system problems

**Controls**

- 4700 Generator voltage control
- 4710 Generator metering devices
- 4720 Generator synchronization equipment
- 4730 Generator current and potential transformers
- 4740 Emergency generator trip devices
- 4750 Other generator controls and metering problems

**Miscellaneous (Generator)**

- 4800 Generator main leads
- 4810 Generator output breaker
- 4805 Generator Bus Duct Cooling System
- 4830 Major generator overhaul (720 hours or longer) (use for non-specific overhaul only; see Page B-1)
- 4831 Minor generator overhaul (less than 720 hours) (use for non-specific overhaul only; see Page B-1)
- 4840 Inspection
- 4841 Generator dole testing
- 4842 Reactive and capability testing
- 4850 Core monitor alarm
- 4860 Generator neutral grounding equipment
- 4899 Other miscellaneous generator problems

## DIESEL ENGINE

### Engine

5700	Drive shaft and bearings
5710	Cylinders
5711	Cylinder heads
5712	Hydraulic lock (water in cylinders)
5720	Pistons
5730	Intake valves
5731	Exhaust valves
5740	Turbo charger
5790	Vibration
5799	Other engine problems

### Engine Auxiliaries

5800	Lube oil system
5805	Cooling system
5810	Heater elements
5815	Fuel system
5820	Start system
5825	Battery and battery charger system
5830	Air filter system
5849	Other engine auxiliaries problems

### Engine Controls

5850	Governor
5855	Engine control system
5860	Control power transformer
5865	Synchronization system
5870	Other engine control problems
5880	Diesel engine unit overhaul

### Miscellaneous (Diesel Engine)

5890	Major overhaul (use for non-specific overhaul only; see Page B-1)
5895	Inspection
5990	Engine performance testing - individual engines (use code 9999 for total unit performance testing)
5999	Other miscellaneous diesel engine problems

## EXTERNAL

Use this set of codes to report events caused by external factors (flood, lightning, etc.); economic factors (lack of fuel, labor strikes, etc.); operator training; and, transmission system problems external to the plant.

### **Catastrophe**

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

### **Economic**

0000	Reserve shutdown
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
9131	Lack of fuel (interruptible supply of fuel part of fuel contract)
9134	Fuel conservation
9136	Problems with Primary Fuel for Units with Secondary Fuel Operation
9140	Plant modifications to burn different fuel that are not regulatory mandated
9150	Labor strikes company-wide problems or strikes outside the company's jurisdiction such as manufacturers (delaying repairs) or transportation (fuel supply) problems.
9151	Labor strikes direct plant management grievances that result in a walkout or strike are under plant management control.
9160	Other economic problems
9180	Economic (for internal use at plants only)
9181	Economic (for internal use at plants only)
9182	Economic (for internal use at plants only)
9183	Economic (for internal use at plants only)
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9198	Economic (for internal use at plants only)
9199	Economic (for internal use at plants only)

**Fuel Quality** (Use code 9605 to 9655 if the fuel quality results in excess stack emissions through no fault)

in the pollution control equipment. Use the appropriate equipment code to report fouling and slagging.)

9200	High ash content (OMC)
9201	High ash content (not OMC)
9205	Poor quality fuel, heat content
9220	High sulfur content (OMC)
9221	High sulfur content (not OMC)
9230	High vanadium content (OMC)
9231	High vanadium content (not OMC)
9240	High sodium content (OMC)
9241	High sodium content (not OMC)
9260	Low BTU oil (OMC)
9261	Low BTU oil (not OMC)
9290	Other fuel quality problems (OMC)
9291	Other fuel quality problems (not OMC)

**Miscellaneous (External)**

9300	Transmission system problems other than catastrophes (do not include switchyard problems in this category; see codes 3600 to 3629)
9310	Operator training
9320	Other miscellaneous external problems
9340	Synchronous Condenser Operation

## REGULATORY, SAFETY, ENVIRONMENTAL

Use these codes only for events not directly attributable to equipment failures. Inspections or testing of certain equipment due to regulation are reported using the appropriate equipment cause codes, and the fact that it was a regulatory requirement noted in the verbal description section.

### Regulatory

- 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 (OMC)
- 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)

### Stack Emission (include exhaust emissions)

- 9605 SO<sub>2</sub> stack emissions – diesel
- 9615 NO<sub>x</sub> stack emissions – diesel
- 9625 Particulate stack emissions – diesel
- 9635 Opacity – diesel
- 9655 Other stack or exhaust emissions – diesel  
(use codes 9220 to 9290 if fuel quality causes pollution control equipment problems that result in excess stack emissions)

### Other Operating Environmental Limitations

- 9665 Thermal discharge limits – diesel
- 9675 Noise limits (not for personnel safety) – diesel
- 9685 Fish kill – diesel
- 9695 Other miscellaneous operational environmental limits – diesel

### Safety

- 9700 OSHA-related retrofit or inspection
- 9720 Other safety problems

## PERSONNEL OR PROCEDURE ERRORS

9900	Operator error
9910	Maintenance personnel error
9920	Contractor error
9930	Operating procedure error
9940	Maintenance procedure error
9950	Contractor procedure error
9960	Staff shortage

## INACTIVE STATES

0002	Inactive Reserve Shutdown
9990	Retired unit
9991	Mothballed unit

## PERFORMANCE

9997	NERC Reliability Standard Requirement
9998	Black start testing
9999	Total unit performance testing (use appropriate codes for individual component testing)