

Appendix B15: Index To Pumped Storage/Hydro Unit Cause Codes

PUMPED STORAGE/HYDRO UNITS

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BALANCE OF PLANT

TABLE B15-1 Balance of Plant: Auxiliary Systems - Auxiliary Steam					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3830	Auxiliary boiler
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3831	Auxiliary steam piping
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3832	Auxiliary steam valves
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3833	Auxiliary steam controls and instruments

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Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3834	Auxiliary boiler tube leaks
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3839	Other auxiliary steam problems
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-2 Balance of Plant: Auxiliary Systems - Closed Cooling Water Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3820	Closed cooling water pumps and motors
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3821	Closed cooling water piping
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3822	Closed cooling water valves
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3823	Closed cooling water heat exchangers
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3824	Closed cooling water system fouling
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3829	Other closed cooling water system problems
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-3 Balance of Plant: Auxiliary Systems - Fire Protection System					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Fire Protection System	3860	Fire protection system pumps
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Fire Protection System	3861	Fire protection system piping
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Fire Protection System	3862	Fire protection system valves
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Fire Protection System	3863	Fire protection system fouling
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Fire Protection System	3869	Other fire protection system problems
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-4 Balance of Plant: Auxiliary Systems - Instrument Air					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Instrument Air	3850	Instrument air compressors
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Instrument Air	3851	Instrument air piping
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Instrument Air	3852	Instrument air valves
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Instrument Air	3853	Instrument air dryers
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Instrument Air	3854	N2 backup to instrument air
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Instrument Air	3859	Other instrument air problems
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-5 Balance of Plant: Auxiliary Systems - Miscellaneous (Auxiliary Systems)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	3898	Miscellaneous plant auxiliary process and services instrumentation and controls

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Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	3899	Other miscellaneous auxiliary system problems
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Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-6 Balance of Plant: Auxiliary Systems - Service Air

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Air	3840	Service air compressors
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Air	3841	Service air piping
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Air	3842	Service air valves
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Air	3843	Service air dryers
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Air	3849	Other service air problems

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-7 Balance of Plant: Auxiliary Systems - Service Water (Open System)

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3810	Service water pumps and motors
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3811	Service water piping
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3812	Service water valves
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3813	Service water heat exchangers
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3814	Service water system fouling
Pumped Storage/Hydro	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3819	Other service water problems

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-8 Balance of Plant: Electrical

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Electrical		3600	Switchyard transformers and associated cooling systems - external (OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3601	Switchyard transformers and associated cooling systems - external (not OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3610	Switchyard circuit breakers - external (not OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3611	Switchyard circuit breakers - external (OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3612	Switchyard system protection devices - external (OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3613	Switchyard system protection devices - external (not OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3618	Other switchyard equipment - external (not OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3619	Other switchyard equipment - external (OMC)
Pumped Storage/Hydro	Balance of Plant	Electrical		3620	Main transformer

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Pumped Storage/Hydro	Balance of Plant	Electrical		3621	Unit auxiliaries transformer
Pumped Storage/Hydro	Balance of Plant	Electrical		3622	Station service startup transformer
Pumped Storage/Hydro	Balance of Plant	Electrical		3623	Auxiliary generators
Pumped Storage/Hydro	Balance of Plant	Electrical		3624	Auxiliary generator voltage supply system
Pumped Storage/Hydro	Balance of Plant	Electrical		3629	Other switchyard or high voltage system problems - external
Pumped Storage/Hydro	Balance of Plant	Electrical		3630	400-700 volt transformers
Pumped Storage/Hydro	Balance of Plant	Electrical		3631	400-700 volt circuit breakers
Pumped Storage/Hydro	Balance of Plant	Electrical		3632	400-700 volt conductors and buses
Pumped Storage/Hydro	Balance of Plant	Electrical		3633	400-700 volt insulators
Pumped Storage/Hydro	Balance of Plant	Electrical		3634	400-700 volt protection devices
Pumped Storage/Hydro	Balance of Plant	Electrical		3639	Other 400-700 volt problems
Pumped Storage/Hydro	Balance of Plant	Electrical		3640	AC instrument power transformers
Pumped Storage/Hydro	Balance of Plant	Electrical		3641	AC Circuit breakers
Pumped Storage/Hydro	Balance of Plant	Electrical		3642	AC Conductors and buses
Pumped Storage/Hydro	Balance of Plant	Electrical		3643	AC Inverters
Pumped Storage/Hydro	Balance of Plant	Electrical		3644	AC Protection devices
Pumped Storage/Hydro	Balance of Plant	Electrical		3649	Other AC instrument power problems
Pumped Storage/Hydro	Balance of Plant	Electrical		3650	DC instrument power battery chargers
Pumped Storage/Hydro	Balance of Plant	Electrical		3651	DC circuit breakers
Pumped Storage/Hydro	Balance of Plant	Electrical		3652	DC conductors and buses
Pumped Storage/Hydro	Balance of Plant	Electrical		3653	DC protection devices
Pumped Storage/Hydro	Balance of Plant	Electrical		3659	Other DC power problems
Pumped Storage/Hydro	Balance of Plant	Electrical		3660	4000-7000 volt transformers
Pumped Storage/Hydro	Balance of Plant	Electrical		3661	4000-7000 volt circuit breakers
Pumped Storage/Hydro	Balance of Plant	Electrical		3662	4000-7000 volt conductors and buses
Pumped Storage/Hydro	Balance of Plant	Electrical		3663	4000-7000 volt insulators
Pumped Storage/Hydro	Balance of Plant	Electrical		3664	4000-7000 volt protection devices
Pumped Storage/Hydro	Balance of Plant	Electrical		3669	Other 4000-7000 volt problems
Pumped Storage/Hydro	Balance of Plant	Electrical		3670	12-15kV transformers
Pumped Storage/Hydro	Balance of Plant	Electrical		3671	12-15kV circuit breakers
Pumped Storage/Hydro	Balance of Plant	Electrical		3672	12-15kV conductors and buses
Pumped Storage/Hydro	Balance of Plant	Electrical		3673	12-15kV insulators
Pumped Storage/Hydro	Balance of Plant	Electrical		3674	12-15kV protection devices
Pumped Storage/Hydro	Balance of Plant	Electrical		3679	Other 12-15kV problems
Pumped Storage/Hydro	Balance of Plant	Electrical		3680	Other voltage transformers
Pumped Storage/Hydro	Balance of Plant	Electrical		3681	Other voltage circuit breakers
Pumped Storage/Hydro	Balance of Plant	Electrical		3682	Other voltage conductors and buses
Pumped Storage/Hydro	Balance of Plant	Electrical		3683	Other voltage insulators
Pumped Storage/Hydro	Balance of Plant	Electrical		3684	Other voltage protection devices
Pumped Storage/Hydro	Balance of Plant	Electrical		3689	Other voltage problems
Pumped Storage/Hydro	Balance of Plant	Electrical		3690	Station Service Power Distribution System, General

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Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-9 Balance of Plant: Miscellaneous (Balance of Plant)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3950	Process computer
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3970	Distributive Control System (DCS) - process computer
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3971	DCS - data highway
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3972	DCS - hardware problems (including card failure)
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3973	DCS - internal and termination wiring
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3974	DCS - logic problems
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3975	DCS - upgrades
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3979	Other DCS problems
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3980	Programmable Logic Controller (PLC)
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3981	PLC - data highway
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3982	PLC - hardware problems (including card failure)
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3983	PLC - internal and termination wiring
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3984	PLC - logic problems
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3985	PLC - upgrades
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3989	Other PLC problems
Pumped Storage/Hydro	Balance of Plant	Miscellaneous (Balance of Plant)		3999	Other miscellaneous balance of plant problems

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-10 Balance of Plant: Power Station Switchyard					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Balance of Plant	Power Station Switchyard		3700	Power Station switchyard (non generating unit equipment)
Pumped Storage/Hydro	Balance of Plant	Power Station Switchyard		3710	Transmission line (connected to powerhouse switchyard to 1st Substation)
Pumped Storage/Hydro	Balance of Plant	Power Station Switchyard		3720	Transmission equipment at the 1st substation (see code 9300 if applicable)
Pumped Storage/Hydro	Balance of Plant	Power Station Switchyard		3730	Transmission equipment beyond the 1st substation (see code 9300 if applicable)

Notes: 1) For use with Unit Codes 500-599 and 900-999.

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.

TABLE B15-11 External: Catastrophe					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	External	Catastrophe		9000	Flood
Pumped Storage/Hydro	External	Catastrophe		9001	Drought
Pumped Storage/Hydro	External	Catastrophe		9010	Fire including wildfires, not related to a specific component
Pumped Storage/Hydro	External	Catastrophe		9020	Lightning
Pumped Storage/Hydro	External	Catastrophe		9025	Geomagnetic disturbance
Pumped Storage/Hydro	External	Catastrophe		9030	Earthquake
Pumped Storage/Hydro	External	Catastrophe		9031	Tornado
Pumped Storage/Hydro	External	Catastrophe		9035	Hurricane
Pumped Storage/Hydro	External	Catastrophe		9036	Storms (ice, snow, etc)
Pumped Storage/Hydro	External	Catastrophe		9040	Other catastrophe
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-12 External: Economic					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	External	Economic		0	Reserve shutdown
Pumped Storage/Hydro	External	Economic		9130	Failure of fuel supplier to fulfill contractual obligations or a pre-arranged deal due to physical fuel disruptions or operational impairments (e.g. force majeure on a pipeline or compressor down; making the pipeline incapable of making its firm deliveries.)
Pumped Storage/Hydro	External	Economic		9135	Lack of water
Pumped Storage/Hydro	External	Economic		9137	Ground water or other water supply problems
Pumped Storage/Hydro	External	Economic		9138	High Water Level in Tailrace (too much water)
Pumped Storage/Hydro	External	Economic		9140	Plant modifications to burn different fuel that are not regulatory mandated
Pumped Storage/Hydro	External	Economic		9150	Labor strikes company-wide problems or strikes outside the company's jurisdiction such as manufacturers (delaying repairs) or transportation (fuel supply) problems.
Pumped Storage/Hydro	External	Economic		9151	Labor strikes direct plant management grievances that result in a walkout or strike are under plant management control.
Pumped Storage/Hydro	External	Economic		9160	Other economic problems
Pumped Storage/Hydro	External	Economic		9180	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9181	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9182	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9183	Economic (for internal use at plants only)

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Pumped Storage/Hydro	External	Economic		9184	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9185	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9186	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9187	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9188	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9189	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9190	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9191	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9192	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9193	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9194	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9195	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9196	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9197	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9198	Economic (for internal use at plants only)
Pumped Storage/Hydro	External	Economic		9199	Economic (for internal use at plants only)

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-13 External: Miscellaneous (External)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	External	Miscellaneous (External)		9300	Transmission system problems other than catastrophes (do not include switchyard problems in this category; see codes 3600 to 3629, 3720 to 3730)
Pumped Storage/Hydro	External	Miscellaneous (External)		9310	Operator training
Pumped Storage/Hydro	External	Miscellaneous (External)		9320	Other miscellaneous external problems
Pumped Storage/Hydro	External	Miscellaneous (External)		9340	Synchronous Condenser Operation
Pumped Storage/Hydro	External	Miscellaneous (External)		9345	Pumping Operations
Pumped Storage/Hydro	External	Miscellaneous (External)		9350	Public Safety (water hazard or river rescue)

Notes: 1) For use with Unit Codes 500-599 and 900-999.

GENERATOR

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

TABLE B15-14 Generator: Controls					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Generator	Controls		4700	Generator voltage control
Pumped Storage/Hydro	Generator	Controls		4710	Generator metering devices
Pumped Storage/Hydro	Generator	Controls		4720	Generator synchronization equipment
Pumped Storage/Hydro	Generator	Controls		4730	Generator current and potential transformers

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Pumped Storage/Hydro	Generator	Controls		4740	Emergency generator trip devices
Pumped Storage/Hydro	Generator	Controls		4741	Frequency Trip (81 relay)
Pumped Storage/Hydro	Generator	Controls		4750	Other generator controls and metering problems

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-15 Generator: Cooling System

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Generator	Cooling System		4610	Hydrogen cooling system piping and valves
Pumped Storage/Hydro	Generator	Cooling System		4611	Hydrogen coolers
Pumped Storage/Hydro	Generator	Cooling System		4612	Hydrogen storage system
Pumped Storage/Hydro	Generator	Cooling System		4613	Hydrogen seals
Pumped Storage/Hydro	Generator	Cooling System		4619	Other hydrogen system problems
Pumped Storage/Hydro	Generator	Cooling System		4620	Air cooling system
Pumped Storage/Hydro	Generator	Cooling System		4630	Liquid cooling system
Pumped Storage/Hydro	Generator	Cooling System		4640	Seal oil system and seals
Pumped Storage/Hydro	Generator	Cooling System		4650	Other cooling system problems

Notes: 1) For use with Unit Codes 500-599 and 900-999. 2) Report failures caused by water leaks into generator as codes 4500, 4510, etc.

TABLE B15-16 Generator: Exciter

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Generator	Exciter		4600	Exciter drive - motor
Pumped Storage/Hydro	Generator	Exciter		4601	Exciter field rheostat
Pumped Storage/Hydro	Generator	Exciter		4602	Exciter commutator and brushes
Pumped Storage/Hydro	Generator	Exciter		4603	Solid state exciter element
Pumped Storage/Hydro	Generator	Exciter		4604	Exciter drive - shaft
Pumped Storage/Hydro	Generator	Exciter		4605	Exciter transformer
Pumped Storage/Hydro	Generator	Exciter		4609	Other exciter problems

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-17 Generator: Generator

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Generator	Generator		4500	Rotor windings (including damper windings and fan blades on hydro units)
Pumped Storage/Hydro	Generator	Generator		4510	Rotor collector rings
Pumped Storage/Hydro	Generator	Generator		4511	Rotor, General
Pumped Storage/Hydro	Generator	Generator		4512	Retaining Rings
Pumped Storage/Hydro	Generator	Generator		4520	Stator windings, bushings, and terminals
Pumped Storage/Hydro	Generator	Generator		4530	Stator core iron
Pumped Storage/Hydro	Generator	Generator		4535	Stator, General
Pumped Storage/Hydro	Generator	Generator		4536	Generator Heaters

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Pumped Storage/Hydro	Generator	Generator		4540	Brushes and brush rigging
Pumped Storage/Hydro	Generator	Generator		4550	Generator bearings and lube oil system (including thrust bearings on hydro units)
Pumped Storage/Hydro	Generator	Generator		4551	Generator bearings
Pumped Storage/Hydro	Generator	Generator		4552	Generator lube oil system
Pumped Storage/Hydro	Generator	Generator		4555	Bearing cooling system
Pumped Storage/Hydro	Generator	Generator		4560	Generator vibration (excluding vibration due to failed bearing and other components)
Pumped Storage/Hydro	Generator	Generator		4570	Generator casing
Pumped Storage/Hydro	Generator	Generator		4580	Generator end bells and bolting
Pumped Storage/Hydro	Generator	Generator		4590	Generator brakes
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-18 Generator: Miscellaneous (Generator)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4800	Generator main leads
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4805	Generator Bus Duct Cooling System
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4810	Generator output breaker
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4830	Major generator overhaul (720 hours or longer) (use for non-specific overhaul only; see page B-CCGT-2)
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4831	Minor generator overhaul (less than 720 hours) (use for non-specific overhaul only; see page B-CCGT-2)
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4840	Inspection
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4841	Generator dole testing
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4842	Reactive and capability testing
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4850	Core monitor alarm
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4860	Generator neutral grounding equipment
Pumped Storage/Hydro	Generator	Miscellaneous (Generator)		4899	Other miscellaneous generator problems
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

HYDRO TURBINE/PUMP

TABLE B15-19 Hydro Turbine/Pump: Miscellaneous (Hydro Turbine/Pump)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7200	Major overhaul (use for non-specific overhaul only; see page B-CCGT-2)
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7201	Inspection
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7210	Canals (including siphons, radial gates, and spills)
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7220	Unit out of service due to common penstock with unit under repair
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7230	Pony motor (pumped storage units only)

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Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7240	Powerhouse substructure
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7299	Other miscellaneous hydro turbine/pump problems (use generator codes and balance of plant electrical and auxiliary codes as appropriate)
Pumped Storage/Hydro	Hydro Turbine/Pump	Miscellaneous (Hydro Turbine/Pump)		7300	Routine Hydro Planned Outage (reoccurring schedule) (Use 4840 or 7201 for specific inspections.)

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-20 Hydro Turbine/Pump: Turbine

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7000	Shaft
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7001	Shaft packing
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7003	Lube oil system (use code 7007 to report bearing failures due to lube oil problems)
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7007	Bearings
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7008	Bearing cooling system
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7009	Bearing oil system
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7010	Runner cavitation damage
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7011	Other runner problems
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7012	Casing, wear ring, or liner cavitation damage
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7014	Blade or bucket cracking
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7020	Nozzle assembly
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7030	Vibration (Only for unbalance, report bearing failure, etc., in appropriate category)
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7040	Turbine overhaul
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7050	Turbine governor
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7052	Other turbine control problems (Report specific wicket gate controls, etc., using the code for the appropriate equipment item.)
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7053	Governor oil system
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7070	Speed Increaser
Pumped Storage/Hydro	Hydro Turbine/Pump	Turbine		7099	Other turbine problems

Notes: 1) For use with Unit Codes 500-599 and 900-999.

TABLE B15-21 Hydro Turbine/Pump: Water Supply/Discharge

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7100	Upper reservoir dams and dikes
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7101	Lower reservoir dams and dikes

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Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7102	Auxiliary reservoir dams and dikes
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7110	Intake channel or flume (including trash racks)
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7111	Intake tunnel
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7112	Ice blockages at intake structures including frazil ice, sheets, blocks of ice, etc.
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7120	Headgates
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7121	Shutoff valves
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7123	Shutoff valve bypass line and valve
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7124	Penstock
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7130	Spiral case
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7140	Wicket gate assembly
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7141	Wicket gate operating mechanism or positioner
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7142	Wicket gate shear pin
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7150	Stay vanes
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7160	Pressure regulating valve
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7161	Pressure regulating valve operator or positioner
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7162	Relief valve and vacuum breakers
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7170	Draft tube
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7180	Tailrace
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7181	Tail water depressing equipment
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7190	Dewatering and rewatering equipment
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7191	Equalizing line
Pumped Storage/Hydro	Hydro Turbine/Pump	Water Supply/Discharge		7199	Other water supply/discharge problems (use for equipment related problems; use codes 9135 or 9320 for lack of water or discharge limit related problems)

Notes: 1) For use with Unit Codes 500-599 and 900-999.

INACTIVE STATES

TABLE B15-22 Inactive States: Inactive States					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Inactive States	Inactive States		2	Inactive Reserve Shutdown
Pumped Storage/Hydro	Inactive States	Inactive States		9990	Retired unit
Pumped Storage/Hydro	Inactive States	Inactive States		9991	Mothballed unit

Notes: 1) For use with Unit Codes 500-599 and 900-999.

PERFORMANCE

TABLE B15-23 Performance: Performance					
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UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Performance	Performance		9997	NERC Reliability Standard Requirement
Pumped Storage/Hydro	Performance	Performance		9998	Black start testing
Pumped Storage/Hydro	Performance	Performance		9999	Total unit performance testing (use appropriate codes for individual component testing)

Notes: 1) For use with Unit Codes 500-599 and 900-999.

PERSONNEL OR PROCEDURAL ERRORS

TABLE B15-24 Personnel or Procedural Errors: Personnel or Procedural Errors					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9900	Operator error
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9910	Maintenance personnel error
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9920	Contractor error
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9930	Operating procedure error
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9940	Maintenance procedure error
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9950	Contractor procedure error
Pumped Storage/Hydro	Personnel or Procedural Errors	Personnel or Procedural Errors		9960	Staff shortage

Notes: 1) For use with Unit Codes 500-599 and 900-999.

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.

TABLE B15-25 Regulatory, Safety, Environmental: Other Operating Environmental Limitations					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9676	Noise limits (not for personnel safety) - hydro and pumped storage
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9686	Fish kill - hydro and pumped storage
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9696	Other miscellaneous operational environmental limits - hydro and pumped storage

Notes: 1) For use with Unit Codes 500-599 and 900-999.

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TABLE B15-26 Regulatory, Safety, Environmental: Regulatory					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Regulatory		9504	Regulatory (environmental) proceedings and hearings - regulatory agency initiated
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Regulatory		9506	Regulatory (environmental) proceedings and hearings - intervenor initiated
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Regulatory		9510	Plant modifications strictly for compliance with new or changed regulatory requirements (scrubbers, cooling towers, etc.)
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Regulatory		9520	Oil spill in Gulf of Mexico (OMC)
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Regulatory		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)
Notes: 1) For use with Unit Codes 500-599 and 900-999.					

TABLE B15-27 Regulatory, Safety, Environmental: Safety					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Safety		9700	OSHA-related retrofit or inspection
Pumped Storage/Hydro	Regulatory, Safety, Environmental	Safety		9720	Other safety problems
Notes: 1) For use with Unit Codes 500-599 and 900-999.					