

## Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

### CO-GENERATOR STEAM TURBINE UNITS

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## BALANCE OF PLANT

TABLE B04-1 Balance of Plant: Auxiliary Systems - Auxiliary Steam					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3830	Auxiliary boiler
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3831	Auxiliary steam piping
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3832	Auxiliary steam valves
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3833	Auxiliary steam controls and instruments
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3834	Auxiliary boiler tube leaks
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3835	Auxiliary boiler burner management system

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CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3836	Steam transfer to other unit
CoG steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3839	Other auxiliary steam problems (also see extraction steam codes 3520 to 3529; startup bypass codes 0630 to 0660; and soot blower steam code 0870)
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-2 Balance of Plant: Auxiliary Systems - Closed Cooling Water Systems</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3820	Closed cooling water pumps and motors
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3821	Closed cooling water piping
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3822	Closed cooling water valves
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3823	Closed cooling water heat exchangers
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3824	Closed cooling water system fouling
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3825	Closed cooling water instrumentation
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3826	Closed cooling water strainer
CoG steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3829	Other closed cooling water system problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-3 Balance of Plant: Auxiliary Systems - Fire Protection System</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3860	Fire protection system pumps
CoG steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3861	Fire protection system piping
CoG steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3862	Fire protection system valves
CoG steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3863	Fire protection system fouling
CoG steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3864	Fire protection system instrumentation and controls
CoG steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3869	Other fire protection system problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-4 Balance of Plant: Auxiliary Systems - Instrument Air</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3850	Instrument air compressors

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CoG steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3851	Instrument air piping
CoG steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3852	Instrument air valves
CoG steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3853	Instrument air dryers
CoG steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3854	N2 backup to instrument air
CoG steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3859	Other instrument air problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-5 Balance of Plant: Auxiliary Systems - Low-pressure Gas Compression System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3870	Fuel Gas Compressor and Motors
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3871	Fuel Gas Compressor Piping
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3872	Fuel Gas Compressor Valves
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3873	Fuel Gas Compressor Heat Exchangers
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3874	Fuel Gas Compressor Controls and Instrumentation
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3875	Fuel Gas Compressor Filters
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3876	Fuel Gas Compressor Fire System
CoG steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3879	Fuel Gas Compressor - other

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-6 Balance of Plant: Auxiliary Systems - Miscellaneous (Auxiliary Systems)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	3898	Miscellaneous plant auxiliary process and services instrumentation and controls
CoG steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	3899	Other miscellaneous auxiliary system problems
CoG steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	6299	Other combined cycle block problems (Use other gas turbine problem codes, other steam turbine codes, etc., whenever appropriate.)

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CoG steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	6399	Other coal gasification equipment problems
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**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-7 Balance of Plant: Auxiliary Systems - Open Cooling Water System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3800	Open cooling water pumps and motors
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3801	Open cooling water piping
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3802	Open cooling water valves
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3803	Open cooling water heat exchangers
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3804	Open cooling water system fouling
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3805	Open cooling water system instrumentation
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3806	Open cooling water strainer
CoG steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3809	Other open cooling water problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-8 Balance of Plant: Auxiliary Systems - Seal Air Fans**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3880	Seal air fan
CoG steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3881	Seal air fan drive - motor
CoG steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3882	Seal air control dampers and drives
CoG steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3883	Seal air filters
CoG steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3889	Other seal air fan problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-9 Balance of Plant: Auxiliary Systems - Service Air**

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

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

TABLE B04-10 Balance of Plant: Auxiliary Systems - Service Water (Open System)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3810	Service water pumps and motors
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3811	Service water piping
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3812	Service water valves
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3813	Service water heat exchangers
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3814	Service water system fouling
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3815	Service water strainer
CoG steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3819	Other service water problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

TABLE B04-11 Balance of Plant: Circulating Water Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Circulating Water Systems		3210	Circulating water pumps
CoG steam units	Balance of Plant	Circulating Water Systems		3211	Circulating water pump motors
CoG steam units	Balance of Plant	Circulating Water Systems		3220	Circulating water piping
CoG steam units	Balance of Plant	Circulating Water Systems		3221	Circulating water piping fouling
CoG steam units	Balance of Plant	Circulating Water Systems		3230	Circulating water valves
CoG steam units	Balance of Plant	Circulating Water Systems		3231	Waterbox
CoG steam units	Balance of Plant	Circulating Water Systems		3232	Condenser tube cleaning system including debris filter
CoG steam units	Balance of Plant	Circulating Water Systems		3233	Circulating water priming system
CoG steam units	Balance of Plant	Circulating Water Systems		3235	Cooling tower booster pump
CoG steam units	Balance of Plant	Circulating Water Systems		3236	Cooling tower booster motor
CoG steam units	Balance of Plant	Circulating Water Systems		3238	Cooling tower fan motors
CoG steam units	Balance of Plant	Circulating Water Systems		3239	Cooling tower fan motors - variable speed
CoG steam units	Balance of Plant	Circulating Water Systems		3240	Cooling tower fans
CoG steam units	Balance of Plant	Circulating Water Systems		3241	Cooling tower efficiency below design
CoG steam units	Balance of Plant	Circulating Water Systems		3242	Cooling tower fill damage
CoG steam units	Balance of Plant	Circulating Water Systems		3243	Cooling tower icing
CoG steam units	Balance of Plant	Circulating Water Systems		3244	Cooling tower fires
CoG steam units	Balance of Plant	Circulating Water Systems		3245	Other cooling tower problems
CoG steam units	Balance of Plant	Circulating Water Systems		3246	Cooling tower fouling
CoG steam units	Balance of Plant	Circulating Water Systems		3247	Cooling tower instrumentation
CoG steam units	Balance of Plant	Circulating Water Systems		3248	Cooling Tower Overhaul

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CoG steam units	Balance of Plant	Circulating Water Systems		3250	Circulating water system instruments and controls
CoG steam units	Balance of Plant	Circulating Water Systems		3260	Traveling screens
CoG steam units	Balance of Plant	Circulating Water Systems		3261	Traveling screen fouling
CoG steam units	Balance of Plant	Circulating Water Systems		3269	Circulating water biological conditions (ie, zebra mussels)
CoG steam units	Balance of Plant	Circulating Water Systems		3270	Intake system problems other than traveling screens
CoG steam units	Balance of Plant	Circulating Water Systems		3271	Intake grating fouling
CoG steam units	Balance of Plant	Circulating Water Systems		3272	Circulating water screenwash system
CoG steam units	Balance of Plant	Circulating Water Systems		3273	Debris in circulating water from outside sources (leaves, mud, etc.)
CoG steam units	Balance of Plant	Circulating Water Systems		3280	High circulating water temperature (not due to season, tower efficiency below design, or other listed equipment problem)
CoG steam units	Balance of Plant	Circulating Water Systems		3281	Circulating water tempering system
CoG steam units	Balance of Plant	Circulating Water Systems		3282	Circulating water cooling ponds
CoG steam units	Balance of Plant	Circulating Water Systems		3285	Circulating water chemistry
CoG steam units	Balance of Plant	Circulating Water Systems		3299	Other circulating water system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-12 Balance of Plant: Condensate System - Low/Intermediate Pressure Heater and Deaerators**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3339	LP heater head leaks
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3340	LP heater tube leaks
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3341	Other LP heater - general
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3342	IP heater tube leaks
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3343	Other IP heater - general
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3344	Deaerator (including level control)
CoG steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3345	IP heater head leaks

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**



TABLE B04-13 Balance of Plant: Condensate System - Miscellaneous (Condensate System)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3360	Condensate makeup and return (including storage tanks)
CoG steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3370	Condensate system controls and instrumentation (not hotwell level, heater level, or deaerator level controls; see codes 3150-3159, 3344, 3502).
CoG steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3380	Condensate coolers
CoG steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3399	Other miscellaneous condensate system problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-14 Balance of Plant: Condensate System - Polishers/Chemical Addition					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensate System	Polishers/Chemical Addition	3350	Condensate polishing and filtering systems
CoG steam units	Balance of Plant	Condensate System	Polishers/Chemical Addition	3351	Chemical addition systems
CoG steam units	Balance of Plant	Condensate System	Polishers/Chemical Addition	3352	Feedwater chemistry (not specific to condenser, polishers, or chemical addition)
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-15 Balance of Plant: Condensate System - Pumps, Piping, and Valves					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3300	Condensate water pre-treatment
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3310	Condensate/hotwell pumps
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3311	Condensate/hotwell pump motor
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3312	Condensate booster pump
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3313	Condensate booster pump motor
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3314	Condensate booster pump motor - variable speed
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3315	Condensate booster pump drive (other than 3313 and 3314)
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3320	Condensate piping
CoG steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3330	Condensate valves
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-16 Balance of Plant: Condensing System - Condenser Casing or Shell and Internals					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3120	Tube sheets
CoG steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3121	Expansion joint
CoG steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3122	Gaskets and seals
CoG steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3123	Hot well
CoG steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3124	Tube sheet fouling
CoG steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3129	Other condenser casing or shell and internal problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-17 Balance of Plant: Condensing System - Condenser Controls					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensing System	Condenser Controls	3150	Hot well level controls
CoG steam units	Balance of Plant	Condensing System	Condenser Controls	3151	Vacuum pump and air ejector controls
CoG steam units	Balance of Plant	Condensing System	Condenser Controls	3152	Air-cooled condenser controls
CoG steam units	Balance of Plant	Condensing System	Condenser Controls	3159	Other condensing system controls and instruments
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-18 Balance of Plant: Condensing System - Condenser Tubes and Support Equipment					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3110	Condenser tube leaks
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3111	Condenser tube fouling shell side
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3112	Condenser tube fouling tube side
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3113	Condenser tube and water box cleaning (including circulating water flow reversal)

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3114	Air-cooled condenser tubes
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3115	Air-cooled condenser pumps
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3116	Air-cooled condenser fans
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3117	Air-cooled condenser fan motors
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3118	Other Air-cooled condenser problems
CoG steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3119	Other condenser tube casing or shell and internal problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-19 Balance of Plant: Condensing System - Miscellaneous (Condensing System)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3170	Condenser inspection (use code 3110 to report looking for tube leaks)
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3171	Air-cooled condenser inspections
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3180	Major condenser overhaul
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3185	Water side cathodic protection
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3186	Auxiliary condenser and associated equipment
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3190	Air leakage (for losses not attributable to previously noted equipment related codes)
CoG steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3199	Other miscellaneous condensing system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-20 Balance of Plant: Condensing System - Vacuum Equipment**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3130	Air ejectors
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3131	Air ejector piping and valves
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3132	Inter and after condensers
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3133	Vacuum pumps
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3134	Vacuum pump piping and valves

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3135	Vacuum pump motor and auxiliaries
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3139	Other air extraction system problems - general
CoG steam units	Balance of Plant	Condensing System	Vacuum Equipment	3149	Loss of vacuum not attributable to a particular component such as air ejectors or valves, or high back pressure not attributable to high circulating water temperature, or vacuum losses from a known cause.

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

<b>TABLE B04-21 Balance of Plant: Electrical</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Balance of Plant	Electrical		3600	Switchyard transformers and associated cooling systems - external (OMC)
CoG steam units	Balance of Plant	Electrical		3601	Switchyard transformers and associated cooling systems - external (not OMC)
CoG steam units	Balance of Plant	Electrical		3610	Switchyard circuit breakers - external (not OMC)
CoG steam units	Balance of Plant	Electrical		3611	Switchyard circuit breakers - external (OMC)
CoG steam units	Balance of Plant	Electrical		3612	Switchyard system protection devices - external (OMC)
CoG steam units	Balance of Plant	Electrical		3613	Switchyard system protection devices - external (not OMC)
CoG steam units	Balance of Plant	Electrical		3618	Other switchyard equipment - external (not OMC)
CoG steam units	Balance of Plant	Electrical		3619	Other switchyard equipment - external (OMC)
CoG steam units	Balance of Plant	Electrical		3620	Main transformer
CoG steam units	Balance of Plant	Electrical		3621	Unit auxiliaries transformer
CoG steam units	Balance of Plant	Electrical		3622	Station service startup transformer
CoG steam units	Balance of Plant	Electrical		3623	Auxiliary generators
CoG steam units	Balance of Plant	Electrical		3624	Auxiliary generator voltage supply system

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Electrical		3629	Other switchyard or high voltage system problems - external
CoG steam units	Balance of Plant	Electrical		3630	400-700 volt transformers
CoG steam units	Balance of Plant	Electrical		3631	400-700 volt circuit breakers
CoG steam units	Balance of Plant	Electrical		3632	400-700 volt conductors and buses
CoG steam units	Balance of Plant	Electrical		3633	400-700 volt insulators
CoG steam units	Balance of Plant	Electrical		3634	400-700 volt protection devices
CoG steam units	Balance of Plant	Electrical		3639	Other 400-700 volt problems
CoG steam units	Balance of Plant	Electrical		3640	AC instrument power transformers
CoG steam units	Balance of Plant	Electrical		3641	AC Circuit breakers
CoG steam units	Balance of Plant	Electrical		3642	AC Conductors and buses
CoG steam units	Balance of Plant	Electrical		3643	AC Inverters
CoG steam units	Balance of Plant	Electrical		3644	AC Protection devices
CoG steam units	Balance of Plant	Electrical		3649	Other AC instrument power problems
CoG steam units	Balance of Plant	Electrical		3650	DC instrument power battery chargers
CoG steam units	Balance of Plant	Electrical		3651	DC circuit breakers
CoG steam units	Balance of Plant	Electrical		3652	DC conductors and buses
CoG steam units	Balance of Plant	Electrical		3653	DC protection devices
CoG steam units	Balance of Plant	Electrical		3659	Other DC power problems
CoG steam units	Balance of Plant	Electrical		3660	4000-7000 volt transformers
CoG steam units	Balance of Plant	Electrical		3661	4000-7000 volt circuit breakers
CoG steam units	Balance of Plant	Electrical		3662	4000-7000 volt conductors and buses
CoG steam units	Balance of Plant	Electrical		3663	4000-7000 volt insulators
CoG steam units	Balance of Plant	Electrical		3664	4000-7000 volt protection devices
CoG steam units	Balance of Plant	Electrical		3669	Other 4000-7000 volt problems
CoG steam units	Balance of Plant	Electrical		3670	12-15kV transformers
CoG steam units	Balance of Plant	Electrical		3671	12-15kV circuit breakers
CoG steam units	Balance of Plant	Electrical		3672	12-15kV conductors and buses
CoG steam units	Balance of Plant	Electrical		3673	12-15kV insulators
CoG steam units	Balance of Plant	Electrical		3674	12-15kV protection devices
CoG steam units	Balance of Plant	Electrical		3679	Other 12-15kV problems
CoG steam units	Balance of Plant	Electrical		3680	Other voltage transformers
CoG steam units	Balance of Plant	Electrical		3681	Other voltage circuit breakers
CoG steam units	Balance of Plant	Electrical		3682	Other voltage conductors and buses
CoG steam units	Balance of Plant	Electrical		3683	Other voltage insulators
CoG steam units	Balance of Plant	Electrical		3684	Other voltage protection devices
CoG steam units	Balance of Plant	Electrical		3689	Other voltage problems

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Electrical		3690	Station Service Power Distribution System, General
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**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-22 Balance of Plant: Extraction Steam**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Extraction Steam		3520	HP Extraction steam piping
CoG steam units	Balance of Plant	Extraction Steam		3521	HP Extraction steam valves
CoG steam units	Balance of Plant	Extraction Steam		3522	HP Extraction steam instruments and controls
CoG steam units	Balance of Plant	Extraction Steam		3529	Other HP extraction steam system problems
CoG steam units	Balance of Plant	Extraction Steam		3530	IP Extraction steam piping
CoG steam units	Balance of Plant	Extraction Steam		3531	IP Extraction steam valves
CoG steam units	Balance of Plant	Extraction Steam		3532	IP Extraction steam instruments and controls
CoG steam units	Balance of Plant	Extraction Steam		3539	Other IP extraction steam system problems
CoG steam units	Balance of Plant	Extraction Steam		3540	LP Extraction steam piping
CoG steam units	Balance of Plant	Extraction Steam		3541	LP Extraction steam valves
CoG steam units	Balance of Plant	Extraction Steam		3542	LP Extraction steam instruments and controls
CoG steam units	Balance of Plant	Extraction Steam		3549	Other LP extraction steam system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-23 Balance of Plant: Feedwater System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Feedwater System		3401	Startup feedwater pump
CoG steam units	Balance of Plant	Feedwater System		3402	Startup feedwater pump drives - all types
CoG steam units	Balance of Plant	Feedwater System		3407	Feedwater pump suction screens
CoG steam units	Balance of Plant	Feedwater System		3408	Feedwater pump drive - local controls
CoG steam units	Balance of Plant	Feedwater System		3409	Feedwater pump drive motor - variable speed
CoG steam units	Balance of Plant	Feedwater System		3410	Feedwater pump

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Feedwater System		3411	Feedwater pump drive - motor
CoG steam units	Balance of Plant	Feedwater System		3412	Feedwater pump drive - steam turbine
CoG steam units	Balance of Plant	Feedwater System		3413	Feedwater pump coupling and drive shaft
CoG steam units	Balance of Plant	Feedwater System		3414	Feedwater pump local controls
CoG steam units	Balance of Plant	Feedwater System		3415	Feedwater pump/drive lube oil system
CoG steam units	Balance of Plant	Feedwater System		3416	Other feedwater pump problems
CoG steam units	Balance of Plant	Feedwater System		3417	Feedwater pump drive - main shaft
CoG steam units	Balance of Plant	Feedwater System		3418	Feedwater pump drive - other
CoG steam units	Balance of Plant	Feedwater System		3419	Feedwater pump drive - gear
CoG steam units	Balance of Plant	Feedwater System		3420	Feedwater piping and supports
CoG steam units	Balance of Plant	Feedwater System		3430	Feedwater regulating (boiler level control) valve
CoG steam units	Balance of Plant	Feedwater System		3431	Other feedwater valves
CoG steam units	Balance of Plant	Feedwater System		3439	HP heater head leaks
CoG steam units	Balance of Plant	Feedwater System		3440	High pressure heater tube leaks
CoG steam units	Balance of Plant	Feedwater System		3441	Other high pressure heater problems (see condensate system for LP and IP heater codes)
CoG steam units	Balance of Plant	Feedwater System		3451	Feedwater booster pump suction screens
CoG steam units	Balance of Plant	Feedwater System		3452	Feedwater booster pump drive - local controls
CoG steam units	Balance of Plant	Feedwater System		3453	Feedwater booster pump drive motor - variable speed
CoG steam units	Balance of Plant	Feedwater System		3454	Feedwater booster pump
CoG steam units	Balance of Plant	Feedwater System		3455	Feedwater booster pump drive - motor
CoG steam units	Balance of Plant	Feedwater System		3456	Feedwater booster pump drive - steam turbine
CoG steam units	Balance of Plant	Feedwater System		3457	Feedwater booster pump coupling and drive shaft
CoG steam units	Balance of Plant	Feedwater System		3458	Feedwater booster pump local controls
CoG steam units	Balance of Plant	Feedwater System		3459	Feedwater booster pump/drive lube oil system
CoG steam units	Balance of Plant	Feedwater System		3460	Other feedwater booster pump problems

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Feedwater System		3461	Feedwater booster pump drive - main shaft
CoG steam units	Balance of Plant	Feedwater System		3462	Feedwater booster pump drive - other
CoG steam units	Balance of Plant	Feedwater System		3463	Feedwater booster pump drive - gear
CoG steam units	Balance of Plant	Feedwater System		3499	Other feedwater system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Excluding extraction or drain systems.**

**TABLE B04-24 Balance of Plant: Heater Drain Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Heater Drain Systems		3501	Heater drain pumps
CoG steam units	Balance of Plant	Heater Drain Systems		3502	Heater level control
CoG steam units	Balance of Plant	Heater Drain Systems		3503	Heater drain piping
CoG steam units	Balance of Plant	Heater Drain Systems		3504	Heater drain valves
CoG steam units	Balance of Plant	Heater Drain Systems		3505	Heater drain pump drive
CoG steam units	Balance of Plant	Heater Drain Systems		3509	Other heater drain system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-25 Balance of Plant: Miscellaneous (Balance of Plant)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3950	Process computer
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3960	Thermal derating (thermal efficiency losses in balance of plant when specific cause(s) unknown)
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3970	Distributive Control System (DCS) - process computer
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3971	DCS - data highway
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3972	DCS - hardware problems (including card failure)
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3973	DCS - internal and termination wiring
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3974	DCS - logic problems
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3975	DCS - upgrades
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3979	Other DCS problems
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3980	Programmable Logic Controller (PLC)
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3981	PLC - data highway



**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3982	PLC - hardware problems (including card failure)
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3983	PLC - internal and termination wiring
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3984	PLC - logic problems
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3985	PLC - upgrades
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3989	Other PLC problems
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3995	Powerhouse heating and ventilating systems
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3996	Air conditioning systems - rooms and areas
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3998	Balance of plant overhaul/outage
CoG steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3999	Other miscellaneous balance of plant problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-26 Balance of Plant: Power Station Switchyard**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Power Station Switchyard		3700	Power Station switchyard (non generating unit equipment)
CoG steam units	Balance of Plant	Power Station Switchyard		3710	Transmission line (connected to powerhouse switchyard to 1st Substation)
CoG steam units	Balance of Plant	Power Station Switchyard		3720	Transmission equipment at the 1st substation (see code 9300 if applicable)
CoG steam units	Balance of Plant	Power Station Switchyard		3730	Transmission equipment beyond the 1st substation (see code 9300 if applicable)

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-27 Balance of Plant: Waste Water (zero discharge) Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Balance of Plant	Waste Water (zero discharge) Systems		3290	Waste water (zero discharge) tanks, pumps, and motors
CoG steam units	Balance of Plant	Waste Water (zero discharge) Systems		3291	Waste water (zero discharge) system fouling

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Balance of Plant	Waste Water (zero discharge) Systems		3292	Waste water (zero discharge) piping
CoG steam units	Balance of Plant	Waste Water (zero discharge) Systems		3293	Waste water (zero discharge) valves
CoG steam units	Balance of Plant	Waste Water (zero discharge) Systems		3294	Waste water (zero discharge) controls and instrumentation
CoG steam units	Balance of Plant	Waste Water (zero discharge) Systems		3295	Other waste water (zero discharge) problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

## EXPANDER TURBINE

**TABLE B04-28 Expander Turbine: Expander Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Expander Turbine	Expander Turbine		7800	Couplings
CoG steam units	Expander Turbine	Expander Turbine		7810	Shaft
CoG steam units	Expander Turbine	Expander Turbine		7820	Bearings
CoG steam units	Expander Turbine	Expander Turbine		7830	Blades
CoG steam units	Expander Turbine	Expander Turbine		7840	Discs
CoG steam units	Expander Turbine	Expander Turbine		7850	Spacers
CoG steam units	Expander Turbine	Expander Turbine		7860	Nozzles/vanes
CoG steam units	Expander Turbine	Expander Turbine		7870	Heat shields
CoG steam units	Expander Turbine	Expander Turbine		7880	Exhaust diffusers
CoG steam units	Expander Turbine	Expander Turbine		7890	Seal oil system and seals
CoG steam units	Expander Turbine	Expander Turbine		7900	Inner casing
CoG steam units	Expander Turbine	Expander Turbine		7910	Outer exhaust casing
CoG steam units	Expander Turbine	Expander Turbine		7920	Lube oil system
CoG steam units	Expander Turbine	Expander Turbine		7930	Controls and instrumentation
CoG steam units	Expander Turbine	Expander Turbine		7940	Evactor
CoG steam units	Expander Turbine	Expander Turbine		7950	Major overhaul
CoG steam units	Expander Turbine	Expander Turbine		7960	Other expander turbine problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

## 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 B04-29 External: Catastrophe**

Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	External	Catastrophe		9000	Flood
CoG steam units	External	Catastrophe		9001	Drought
CoG steam units	External	Catastrophe		9010	Fire including wildfires, not related to a specific component
CoG steam units	External	Catastrophe		9020	Lightning
CoG steam units	External	Catastrophe		9025	Geomagnetic disturbance
CoG steam units	External	Catastrophe		9030	Earthquake
CoG steam units	External	Catastrophe		9031	Tornado
CoG steam units	External	Catastrophe		9035	Hurricane
CoG steam units	External	Catastrophe		9036	Storms (ice, snow, etc)
CoG steam units	External	Catastrophe		9040	Other catastrophe
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-30 External: Economic					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	External	Economic		0	Reserve shutdown
CoG steam units	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.)
CoG steam units	External	Economic		9131	Lack of fuel – due to contractual or tariff provisions that allow for service interruption or price fluctuations during peak demand periods.
CoG steam units	External	Economic		9134	Fuel conservation
CoG steam units	External	Economic		9136	Problems with Primary Fuel for Units with Secondary Fuel Operation
CoG steam units	External	Economic		9137	Ground water or other water supply problems
CoG steam units	External	Economic		9140	Plant modifications to burn different fuel that are not regulatory mandated

Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

CoG steam units	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.
CoG steam units	External	Economic		9151	Labor strikes direct plant management grievances that result in a walkout or strike are under plant management control.
CoG steam units	External	Economic		9160	Other economic problems
CoG steam units	External	Economic		9180	Economic (for internal use at plants only)
CoG steam units	External	Economic		9181	Economic (for internal use at plants only)
CoG steam units	External	Economic		9182	Economic (for internal use at plants only)
CoG steam units	External	Economic		9183	Economic (for internal use at plants only)
CoG steam units	External	Economic		9184	Economic (for internal use at plants only)
CoG steam units	External	Economic		9185	Economic (for internal use at plants only)
CoG steam units	External	Economic		9186	Economic (for internal use at plants only)
CoG steam units	External	Economic		9187	Economic (for internal use at plants only)
CoG steam units	External	Economic		9188	Economic (for internal use at plants only)
CoG steam units	External	Economic		9189	Economic (for internal use at plants only)
CoG steam units	External	Economic		9190	Economic (for internal use at plants only)
CoG steam units	External	Economic		9191	Economic (for internal use at plants only)
CoG steam units	External	Economic		9192	Economic (for internal use at plants only)
CoG steam units	External	Economic		9193	Economic (for internal use at plants only)

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	External	Economic		9194	Economic (for internal use at plants only)
CoG steam units	External	Economic		9195	Economic (for internal use at plants only)
CoG steam units	External	Economic		9196	Economic (for internal use at plants only)
CoG steam units	External	Economic		9197	Economic (for internal use at plants only)
CoG steam units	External	Economic		9198	Economic (for internal use at plants only)
CoG steam units	External	Economic		9199	Economic (for internal use at plants only)

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-31 External: Fuel Quality**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	External	Fuel Quality		9200	High ash content (OMC)
CoG steam units	External	Fuel Quality		9201	High ash content (not OMC)
CoG steam units	External	Fuel Quality		9205	Poor quality natural gas fuel, low heat content
CoG steam units	External	Fuel Quality		9220	High sulfur content (OMC)
CoG steam units	External	Fuel Quality		9221	High sulfur content (not OMC)
CoG steam units	External	Fuel Quality		9230	High vanadium content (OMC)
CoG steam units	External	Fuel Quality		9231	High vanadium content (not OMC)
CoG steam units	External	Fuel Quality		9240	High sodium content (OMC)
CoG steam units	External	Fuel Quality		9241	High sodium content (not OMC)
CoG steam units	External	Fuel Quality		9260	Low BTU oil (OMC)
CoG steam units	External	Fuel Quality		9261	Low BTU oil (not OMC)
CoG steam units	External	Fuel Quality		9290	Other fuel quality problems (OMC)
CoG steam units	External	Fuel Quality		9291	Other fuel quality problems (not OMC)

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use code 9600 to 9650 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.**

**TABLE B04-32 External: Miscellaneous (External)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

CoG steam units	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)
CoG steam units	External	Miscellaneous (External)		9310	Operator training
CoG steam units	External	Miscellaneous (External)		9320	Other miscellaneous external problems
CoG steam units	External	Miscellaneous (External)		9340	Synchronous Condenser Operation
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

## GAS TURBINE

TABLE B04-33 Gas Turbine: Auxiliary Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Auxiliary Systems		5110	Lube oil system - general
CoG steam units	Gas Turbine	Auxiliary Systems		5111	Lube oil pumps
CoG steam units	Gas Turbine	Auxiliary Systems		5112	Lube oil coolers
CoG steam units	Gas Turbine	Auxiliary Systems		5113	Lube oil valves/piping
CoG steam units	Gas Turbine	Auxiliary Systems		5114	Lube oil filters
CoG steam units	Gas Turbine	Auxiliary Systems		5115	Oil vapor extractor
CoG steam units	Gas Turbine	Auxiliary Systems		5116	Power Augmentation System Equipment
CoG steam units	Gas Turbine	Auxiliary Systems		5117	Power augmentation piping
CoG steam units	Gas Turbine	Auxiliary Systems		5118	Power augmentation valves
CoG steam units	Gas Turbine	Auxiliary Systems		5119	Power augmentation controls
CoG steam units	Gas Turbine	Auxiliary Systems		5120	Hydraulic oil system
CoG steam units	Gas Turbine	Auxiliary Systems		5121	Hydraulic oil system pumps
CoG steam units	Gas Turbine	Auxiliary Systems		5122	Hydraulic oil system piping/valves
CoG steam units	Gas Turbine	Auxiliary Systems		5130	Starting system (including motor)
CoG steam units	Gas Turbine	Auxiliary Systems		5140	Battery and charger system
CoG steam units	Gas Turbine	Auxiliary Systems		5150	Turning gear and motor
CoG steam units	Gas Turbine	Auxiliary Systems		5151	Load gear compartment
CoG steam units	Gas Turbine	Auxiliary Systems		5160	Cooling and seal air system
CoG steam units	Gas Turbine	Auxiliary Systems		5170	Cooling water system
CoG steam units	Gas Turbine	Auxiliary Systems		5180	Anti-icing system
CoG steam units	Gas Turbine	Auxiliary Systems		5190	Other auxiliary system problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

### TABLE B04-34 Gas Turbine: Exhaust Systems

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Exhaust Systems		5100	Chamber
CoG steam units	Gas Turbine	Exhaust Systems		5101	Hoods
CoG steam units	Gas Turbine	Exhaust Systems		5102	Vanes/nozzles
CoG steam units	Gas Turbine	Exhaust Systems		5103	Silencer
CoG steam units	Gas Turbine	Exhaust Systems		5104	Cones
CoG steam units	Gas Turbine	Exhaust Systems		5105	Diverter Dampers
CoG steam units	Gas Turbine	Exhaust Systems		5106	Exhaust Stack
CoG steam units	Gas Turbine	Exhaust Systems		5108	High engine exhaust temperature
CoG steam units	Gas Turbine	Exhaust Systems		5109	Other exhaust problems (including high exhaust system temperature not attributable to a specific problem)

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-35 Gas Turbine: Fuel, Ignition, and Combustion Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5040	Fuel tanks
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5041	Fuel piping and valves
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5042	Fuel nozzles/vanes
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5043	Fuel filters
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5044	Liquid fuel oil pump
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5046	Liquid fuel oil transfer/forwarding pump
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5047	Liquid fuel purge system
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5048	Gas fuel system including controls and instrumentation
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5049	Other fuel system problems
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5050	Ignition system

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5051	Pilot fuel piping and valves
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5052	Pilot fuel nozzles/vanes
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5053	Pilot fuel filters
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5054	Water injection system
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5060	Atomizing air system
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5065	NOx water injection system including pump
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5066	NOx steam injection system
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5070	Combustor casing
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5071	Combustor liner
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5072	Combustor caps
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5073	Flame scanners
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5074	Flashback including instrumentation
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5075	Blade path temperature spread
CoG steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5079	Other combustor problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-36 Gas Turbine: Inlet Air System and Compressors - Compressors**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5010	High pressure shaft
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5011	High pressure bearings
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5012	High pressure blades/buckets
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5013	Compressor casing and bolts
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5014	Compressor diaphragms
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5015	Compressor seals



**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5016	High pressure compressor bleed valves
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5017	Low pressure compressor bleed valves
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5019	Other high pressure problems
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5020	Low pressure shaft
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5021	Low pressure bearings
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5022	Low pressure blades/buckets
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5029	Other low pressure problems
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5030	Supercharging fans
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5035	Compressor washing
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5036	Compressor shaft and bearings for two-shaft machines
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5037	Inlet bleed heat valve
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5039	Other compressor problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-37 Gas Turbine: Inlet Air System and Compressors - Ducts and Filters**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5000	Inlet air ducts
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5001	Inlet air vanes/nozzles
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5002	Inlet air filters
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5003	Inlet cone
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5004	Inlet air chillers
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5005	Inlet air evaporative coolers
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5006	Inlet air foggers
CoG steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5009	Other inlet air problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-38 Gas Turbine: Miscellaneous (Gas Turbine)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5200	Reduction gear
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5201	Load shaft and bearings
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5205	Main coupling between the turbine and generator
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5206	Clutch
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5210	Intercoolers

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5220	Regenerators
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5230	Heat shields
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5240	Fire detection and extinguishing system (including hazardous gas detection system)
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5241	Fire in unit
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5245	Gas Turbine Control System - data highway
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5246	Gas Turbine Control System - hardware problems (including card failure)
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5247	Gas Turbine Control System - internal and termination wiring
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5248	Gas Turbine Control System - logic problems
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5249	Gas Turbine Control System - upgrades
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5250	Other controls and instrumentation problems
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5255	Computer
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5260	Major overhaul (use for non-specific overhaul only; see page B-CCGT-2)
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5261	Gas turbine/compressor washing
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5262	Gas turbine exchange
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5269	Combustion Inspection (CI)
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5270	Hot end inspection
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5272	Borescope inspection
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5274	General unit inspection
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5280	Vibration (not engine) in unit not attributable to bearings or other components
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5285	Gas turbine vibration
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5286	Gas turbine lockout
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5290	Gas turbine performance testing - individual engines (use code 9999 for total unit performance testing)
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5292	Turbine Overspeed Trip Test - Gas Turbine
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5295	Synchronous condenser equipment
CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5298	Main gas filter

Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

CoG steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5299	Other miscellaneous gas turbine problems
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**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-39 Gas Turbine: Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Gas Turbine	Turbine		5080	High pressure shaft
CoG steam units	Gas Turbine	Turbine		5081	High pressure bearings
CoG steam units	Gas Turbine	Turbine		5082	High pressure blades/buckets
CoG steam units	Gas Turbine	Turbine		5083	High pressure nozzles/vanes
CoG steam units	Gas Turbine	Turbine		5084	High pressure casing/expansion joints
CoG steam units	Gas Turbine	Turbine		5085	Interstage gas passages - HP
CoG steam units	Gas Turbine	Turbine		5086	High pressure shaft seals
CoG steam units	Gas Turbine	Turbine		5087	Thrust bearing
CoG steam units	Gas Turbine	Turbine		5088	Gas turbine cooling system
CoG steam units	Gas Turbine	Turbine		5089	Other high pressure problems
CoG steam units	Gas Turbine	Turbine		5090	Low pressure shaft
CoG steam units	Gas Turbine	Turbine		5091	Low pressure bearings
CoG steam units	Gas Turbine	Turbine		5092	Low pressure blades/buckets
CoG steam units	Gas Turbine	Turbine		5093	Low pressure nozzles/vanes
CoG steam units	Gas Turbine	Turbine		5094	Low pressure casing/expansion joints
CoG steam units	Gas Turbine	Turbine		5095	Interstage gas passages - LP
CoG steam units	Gas Turbine	Turbine		5096	Low pressure shaft seals
CoG steam units	Gas Turbine	Turbine		5097	Other low pressure problems
CoG steam units	Gas Turbine	Turbine		5098	Expansion joints
CoG steam units	Gas Turbine	Turbine		5099	HP to LP coupling

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use HP if only one.**

## 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 B04-40 Generator: Controls**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Generator	Controls		4700	Generator voltage control
CoG steam units	Generator	Controls		4710	Generator metering devices

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Generator	Controls		4720	Generator synchronization equipment
CoG steam units	Generator	Controls		4730	Generator current and potential transformers
CoG steam units	Generator	Controls		4740	Emergency generator trip devices
CoG steam units	Generator	Controls		4750	Other generator controls and metering problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-41 Generator: Cooling System**

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

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Report failures caused by water leaks into generator as codes 4500, 4510, etc.**

**TABLE B04-42 Generator: Exciter**

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

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-43 Generator: Generator**

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Generator	Generator		4500	Rotor windings (including damper windings and fan blades on hydro units)
CoG steam units	Generator	Generator		4510	Rotor collector rings
CoG steam units	Generator	Generator		4511	Rotor, General
CoG steam units	Generator	Generator		4512	Retaining Rings
CoG steam units	Generator	Generator		4520	Stator windings, bushings, and terminals
CoG steam units	Generator	Generator		4530	Stator core iron
CoG steam units	Generator	Generator		4535	Stator, General
CoG steam units	Generator	Generator		4536	Generator Heaters
CoG steam units	Generator	Generator		4540	Brushes and brush rigging
CoG steam units	Generator	Generator		4550	Generator bearings and lube oil system (including thrust bearings on hydro units)
CoG steam units	Generator	Generator		4551	Generator bearings
CoG steam units	Generator	Generator		4552	Generator lube oil system
CoG steam units	Generator	Generator		4555	Bearing cooling system
CoG steam units	Generator	Generator		4560	Generator vibration (excluding vibration due to failed bearing and other components)
CoG steam units	Generator	Generator		4570	Generator casing
CoG steam units	Generator	Generator		4580	Generator end bells and bolting
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-44 Generator: Miscellaneous (Generator)</b>					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Generator	Miscellaneous (Generator)		4800	Generator main leads
CoG steam units	Generator	Miscellaneous (Generator)		4805	Generator Bus Duct Cooling System
CoG steam units	Generator	Miscellaneous (Generator)		4810	Generator output breaker
CoG steam units	Generator	Miscellaneous (Generator)		4830	Major generator overhaul (720 hours or longer) (use for non-specific overhaul only; see page B-CCGT-2)
CoG steam units	Generator	Miscellaneous (Generator)		4831	Minor generator overhaul (less than 720 hours) (use for non-specific overhaul only; see page B-CCGT-2)

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Generator	Miscellaneous (Generator)		4840	Inspection
CoG steam units	Generator	Miscellaneous (Generator)		4841	Generator dole testing
CoG steam units	Generator	Miscellaneous (Generator)		4842	Reactive and capability testing
CoG steam units	Generator	Miscellaneous (Generator)		4850	Core monitor alarm
CoG steam units	Generator	Miscellaneous (Generator)		4860	Generator neutral grounding equipment
CoG steam units	Generator	Miscellaneous (Generator)		4899	Other miscellaneous generator problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

## HEAT RECOVERY STEAM GENERATOR (HRSG)

(Waste Heat Boiler)

**TABLE B04-45 Heat Recovery Steam Generator (HRSG): HRSG Boiler Air and Gas Systems - Air Supply**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1400	Forced draft fans
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1401	Forced draft fan dampers
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1407	Forced draft fan lubrication system
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1410	Forced draft fan motors
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1411	Forced draft fan motors - variable speed
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1412	Forced draft fan drives (other than motor)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1415	Forced draft fan controls
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1420	Other forced draft fan problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1456	Induced draft fan dampers

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-46 Heat Recovery Steam Generator (HRSG): HRSG Boiler Air and Gas Systems - Miscellaneous (Boiler Air and Gas Systems)**

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Miscellaneous (Boiler Air and Gas Systems)	1590	Stacks (use code 8430 for stack problems due to pollution control equipment)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Miscellaneous (Boiler Air and Gas Systems)	1591	Stack damper and linkage
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Miscellaneous (Boiler Air and Gas Systems)	1592	Stack damper linkage motors
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Miscellaneous (Boiler Air and Gas Systems)	1599	Other miscellaneous boiler air and gas system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-47 Heat Recovery Steam Generator (HRSG): HRSG Boiler Control Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1700	Feedwater controls (report local controls - feedwater pump, feedwater regulator valve, etc., - with component or system)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1710	Combustion/steam condition controls (report local controls - burners, pulverizers, etc., - with component or system)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1720	Desuperheater/attemperator controls
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1730	Boiler explosion or implosion
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1740	Boiler drum gage glasses / level indicator
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1750	Burner management system
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1760	Feedwater instrumentation (not local controls)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1761	Combustion/Steam condition instrumentation (not local controls)

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CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1762	Desuperheater/attenuator instrumentation (not local controls)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1799	Other boiler instrumentation and control problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Including instruments which input to the controls.</b>					

<b>TABLE B04-48 Heat Recovery Steam Generator (HRSG): HRSG Boiler Design Limitations</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Design Limitations		1900	Improper balance between tube sections not due to fouling or plugging
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Design Limitations		1910	Inadequate air not due to equipment problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-49 Heat Recovery Steam Generator (HRSG): HRSG Boiler Fuel Supply - Burners (Duct Burners)</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	358	Oil burner piping and valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	359	Gas burner piping and valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	360	Burners
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	361	Burner orifices
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	370	Burner instruments and controls (except light off)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	380	Light off (igniter) systems (including fuel supply)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	385	Igniters
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	410	Other burner problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					



TABLE B04-50 Heat Recovery Steam Generator (HRSG): HRSG Boiler Fuel Supply - Oil and Gas Systems (except light off)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	440	Fuel oil pumps (general)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	441	Fuel oil pumps (burner supply)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	442	Fuel oil pumps (forwarding/transfer)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	443	Fuel oil (burner supply) pump drives
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	444	Fuel oil (forwarding/transfer) pump drives
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	450	Fuel oil heaters
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	460	Fuel oil atomizers
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	470	Oil and gas fires
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	480	Other oil and gas fuel supply problems (see codes 0360-0410 for burner problems)
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-51 Heat Recovery Steam Generator (HRSG): HRSG Boiler Internals and Structures					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		800	Drums and drum internals (single drum only)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		801	HP Drum (including drum level trips not attributable to other causes)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		802	IP Drum (including drum level trips not attributable to other causes)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		803	LP Drum (including drum level trips not attributable to other causes)

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CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		810	Boiler supports and structures (use code 1320 for tube supports)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		820	Casing
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		830	Doors
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		840	Refractory and insulation
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		845	Windbox expansion joints
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		847	Other expansion joints
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		848	Inlet panel
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		850	Other internal or structural problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		855	Drum relief/safety valves (single drum only)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		856	HP Drum relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		857	IP Drum relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		858	LP Drum relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		859	Tube external fins/membranes
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-52 Heat Recovery Steam Generator (HRSG): HRSG Boiler Overhaul and Inspections</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1800	Major boiler overhaul (720 hours or longer) (use for non-specific overhaul only; see page B-CCGT-2)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1801	Minor boiler overhaul (less than 720 hours) (use for non-specific

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					overhaul only; see page B-CCGT-2)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1810	Other boiler inspections
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1811	Boiler Inspections - problem identification / investigation
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1812	Boiler Inspections - scheduled or routine
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1820	Chemical cleaning/steam blows

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-53 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - Boiler Recirculation**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	740	Boiler recirculation pumps
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	741	Boiler recirculation pumps - motors
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	750	Boiler recirculation piping including downcomers
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	760	Boiler recirculation valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	770	Other boiler recirculation problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-54 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - Feedwater and Blowdown**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	670	Feedwater piping downstream of feedwater regulating valve
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	680	Feedwater valves (not feedwater regulating valve)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	690	Other feedwater problems downstream of feedwater regulating valve (use codes 3401 to 3499 for remainder of feedwater system)

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CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	700	Blowdown system valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	710	Blowdown system piping
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	720	Blowdown system controls / instrumentation
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	730	Other blowdown system problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-55 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - HRSG Cold and Hot Reheat Steam</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	540	Hot reheat steam piping up to turbine stop valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	541	Cold reheat steam piping up to boiler
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	550	Reheat steam relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	560	Other hot reheat steam valves (not including turbine stop or intercept valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	561	Other cold reheat steam valves (not including turbine stop or intercept valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	570	Other reheat steam problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-56 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - HRSG Desuperheaters/Attemperators</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6140	HP Desuperheater/attemperator piping - Greater than 600 PSIG.
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6141	HP Desuperheater/attemperator valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6142	HP Desuperheater/attemperator spray nozzles

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CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6143	HP Desuperheater/attemperator drums
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6144	Other HP desuperheater/attemperator problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6145	IP Desuperheater/attemperator piping - Between 200-600 PSIG
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6146	IP Desuperheater/attemperator valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6147	IP Desuperheater/attemperator spray nozzles
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6148	IP Desuperheater/attemperator drums
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6149	Other IP desuperheater/attemperator problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6150	LP Desuperheater/attemperator piping - Less than 200 PSIG
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6151	LP Desuperheater/attemperator valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6152	LP Desuperheater/attemperator spray nozzles
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6153	LP Desuperheater/attemperator drums
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6154	Other LP desuperheater/attemperator problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-57 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - HRSG Main Steam</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	500	Main steam piping up to turbine stop valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	510	Main steam relief/safety valves off superheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	520	Other main steam valves (including vent and drain valves)

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					but not including the turbine stop valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	530	Other main steam system problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6110	HP steam piping up to turbine stop valves - Greater than 600 PSIG (see 0790 for piping supports)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6111	HP steam relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6112	Other HP steam valves (including vent and drain valves but not including the turbine stop valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6113	Other HP steam system problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6114	HP steam isolation/boundary valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6120	IP steam piping up to turbine stop valves - Between 200 & 600 PSIG (see 0790 for piping supports)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6121	IP steam relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6122	Other IP steam valves (including vent and drain valves but not including the turbine stop valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6123	Other IP steam system problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6124	IP steam isolation/boundary valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6130	LP steam piping up to turbine stop valves - Less than 200 PSIG (see 0790 for piping supports)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6131	LP steam relief/safety valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6132	Other LP steam valves (including vent and drain valves but not

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					including the turbine stop valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6133	Other LP steam system problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6134	Other main steam valves (including vent and drain valves but not including the turbine stop valves)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6135	LP steam isolation/boundary valves
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-58 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - HRSG Startup Bypass</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6160	HP Startup bypass system piping (including drain lines up to heaters or condenser) - Greater than 600 PSIG
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6161	HP Startup bypass system valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6162	HP Startup bypass tanks or flash tanks
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6163	Other HP startup bypass system problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6164	HP startup bypass instrumentation and controls
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6170	IP Startup bypass system piping (including drain lines up to heaters or condenser) - Between 200-600 PSIG
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6171	IP Startup bypass system valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6172	IP Startup bypass tanks or flash tanks
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6173	Other IP startup bypass system problems

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CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6174	IP startup bypass instrumentation and controls
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6180	LP Startup bypass system piping (including drain lines up to heaters or condenser) - Less than 200 PSIG
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6181	LP Startup bypass system valves
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6182	LP Startup bypass tanks or flash tanks
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6183	Other LP startup bypass system problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6184	LP startup bypass instrumentation and controls

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-59 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - Miscellaneous (Piping)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	775	Economizer piping
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	780	Headers between tube bundles
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	782	Headers and caps
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	790	Pipe hangers, brackets, supports (general)
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	799	Other miscellaneous piping system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-60 Heat Recovery Steam Generator (HRSG): HRSG Boiler Tube Leaks**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6005	HP Evaporator tubes
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6006	IP Evaporator tubes



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CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6007	LP Evaporator tubes
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6010	HP superheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6011	HP reheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6012	HP economizer
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6020	IP superheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6021	IP reheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6022	IP economizer
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6030	LP reheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6031	LP superheater
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6032	LP economizer
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6090	Other HRSG tube problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use code 0859 for tube/membrane failures.**

**TABLE B04-61 Heat Recovery Steam Generator (HRSG): HRSG Boiler Water Condition**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Water Condition		1850	Boiler water condition (not feedwater water quality)

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-62 Heat Recovery Steam Generator (HRSG): Miscellaneous (HRSG Boiler)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		1980	Boiler safety valve test

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		1990	Boiler performance testing (use code 9999 for total unit performance testing)
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		1999	Boiler, miscellaneous
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		6000	Heat recovery steam generator to gas turbine connecting equipment. For additional codes, use Fossil Steam Cause Codes 0010 to 1999.
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		6100	Steam turbine to gas turbine coupling. For additional codes, use Fossil Steam Cause Codes 4000 to 4499.

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use more specific codes - other slagging and fouling problems, other control problems, etc. whenever possible. Describe miscellaneous problems in the verbal description.**

**TABLE B04-63 Heat Recovery Steam Generator (HRSG): Miscellaneous HRSG Boiler Tube Problems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1300	Water side fouling
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1305	Fireside cleaning (which requires a full outage) Use code 1200 for cleanings that cause deratings.
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1310	Water side cleaning (acid cleaning)
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1320	Tube supports/attachments
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1330	Slag fall damage
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1340	Tube modifications (including addition and removal of tubes)
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1350	Other miscellaneous boiler tube problems
CoG steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1360	Boiler drains system

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

## INACTIVE STATES

TABLE B04-64 Inactive States: Inactive States					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Inactive States	Inactive States		2	Inactive Reserve Shutdown
CoG steam units	Inactive States	Inactive States		9990	Retired unit
CoG steam units	Inactive States	Inactive States		9991	Mothballed unit

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

## JET ENGINE

TABLE B04-65 Jet Engine: Auxiliary Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Jet Engine	Auxiliary Systems		5510	Lube oil system
CoG steam units	Jet Engine	Auxiliary Systems		5516	Power Augmentation System Equipment
CoG steam units	Jet Engine	Auxiliary Systems		5520	Hydraulic oil system
CoG steam units	Jet Engine	Auxiliary Systems		5530	Starting system (including motor)
CoG steam units	Jet Engine	Auxiliary Systems		5540	Battery and charger system
CoG steam units	Jet Engine	Auxiliary Systems		5550	Turning gear and motor
CoG steam units	Jet Engine	Auxiliary Systems		5551	Load gear compartment
CoG steam units	Jet Engine	Auxiliary Systems		5560	Cooling and seal air system
CoG steam units	Jet Engine	Auxiliary Systems		5570	Cooling water system
CoG steam units	Jet Engine	Auxiliary Systems		5580	Anti-icing system
CoG steam units	Jet Engine	Auxiliary Systems		5590	Other auxiliary system problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

TABLE B04-66 Jet Engine: Exhaust Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Jet Engine	Exhaust Systems		5500	Chamber
CoG steam units	Jet Engine	Exhaust Systems		5501	Hoods
CoG steam units	Jet Engine	Exhaust Systems		5502	Vanes/nozzles
CoG steam units	Jet Engine	Exhaust Systems		5503	Silencer
CoG steam units	Jet Engine	Exhaust Systems		5504	Cones
CoG steam units	Jet Engine	Exhaust Systems		5505	Diverter Dampers
CoG steam units	Jet Engine	Exhaust Systems		5508	High engine exhaust temperature

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Jet Engine	Exhaust Systems		5509	Other exhaust problems (including high exhaust temperature not attributable to a specific problem)
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**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-67 Jet Engine: Fuel, Ignition, and Combustion Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5440	Fuel tanks
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5441	Fuel piping and valves
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5442	Fuel nozzles/vanes
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5443	Fuel filters
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5444	Liquid fuel oil pump
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5445	Liquid fuel oil transfer/forwarding pump
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5446	Liquid fuel purge system
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5447	Gas fuel system including controls and instrumentation
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5449	Other fuel system problems
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5450	Ignition system
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5451	Pilot fuel piping and valves
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5452	Pilot fuel nozzles/vanes
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5453	Pilot fuel filters
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5454	Water injection system
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5455	Fuel nozzle/vane cooling air system

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5460	Atomizing air system
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5470	Combustor casing
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5471	Combustor liner
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5472	Combustor caps
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5473	Flame scanners
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5474	Flashback (including instrumentation)
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5475	Blade path temperature spread
CoG steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5479	Other combustor problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-68 Jet Engine: Inlet Air System and Compressors - Compressors**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5410	High pressure shaft
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5411	High pressure bearings
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5412	High pressure blades/buckets
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5413	Other high pressure problems
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5414	Compressor diaphragms/vanes
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5420	Low pressure shaft
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5421	Low pressure bearings
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5422	Low pressure blades/buckets
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5429	Other low pressure problems
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5430	Supercharging fans
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5435	Compressor washing
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5436	Compressor shaft and bearings for two-shaft machines
CoG steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5439	Other compressor problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use HP compressor if only one.**

**TABLE B04-69 Jet Engine: Inlet Air System and Compressors - Ducts and Filters**

Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5400	Inlet air ducts
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5401	Inlet air vanes/nozzles
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5402	Inlet air filters
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5403	Inlet and exhaust cones
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5404	Inlet air chillers
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5405	Inlet air evaporative coolers
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5406	Inlet air foggers
CoG steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5409	Other inlet air problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use HP compressor if only one.**

TABLE B04-70 Jet Engine: Miscellaneous (Jet Engine)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5600	Reduction gear
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5601	Load shaft and bearings
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5605	Main coupling between the turbine and generator
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5606	Clutch
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5610	Intercoolers
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5620	Regenerators
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5630	Heat shields
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5640	Fire detection and extinguishing system
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5641	Fire in unit
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5645	Jet Engine Control System - data highway
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5646	Jet Engine Control System - hardware problems (including card failure)
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5647	Jet Engine Control System - internal and termination wiring
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5648	Jet Engine Control System - logic problems
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5649	Jet Engine Control System - upgrades
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5650	Other controls and instrumentation problems

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5660	Major overhaul (use for non-specific overhaul only; see page B-CCGT-2)
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5661	Engine/compressor washing
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5662	Engine exchange
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5665	Engine shafts and bearings
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5670	Hot end inspection
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5672	Boroscope inspection
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5674	General unit inspection
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5680	Vibration (not engine) in unit not attributable to bearings or other components
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5685	Engine vibration
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5686	Jet engine lockout
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5690	Engine performance testing - individual engines (use code 9999 for total unit performance testing)
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5692	Turbine Overspeed Trip Test - Jet Engine
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5695	Synchronous condenser equipment
CoG steam units	Jet Engine	Miscellaneous (Jet Engine)		5699	Other miscellaneous jet engine problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

<b>TABLE B04-71 Jet Engine: Turbine</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Jet Engine	Turbine		5480	High pressure shaft
CoG steam units	Jet Engine	Turbine		5481	High pressure bearings
CoG steam units	Jet Engine	Turbine		5482	High pressure blades/buckets
CoG steam units	Jet Engine	Turbine		5483	High pressure nozzles/vanes
CoG steam units	Jet Engine	Turbine		5484	High pressure casing/expansion joint
CoG steam units	Jet Engine	Turbine		5485	Interstage gas passages
CoG steam units	Jet Engine	Turbine		5486	High pressure shaft seals
CoG steam units	Jet Engine	Turbine		5487	Thrust bearing
CoG steam units	Jet Engine	Turbine		5489	Other high pressure problems
CoG steam units	Jet Engine	Turbine		5490	Low pressure shaft
CoG steam units	Jet Engine	Turbine		5491	Low pressure bearings
CoG steam units	Jet Engine	Turbine		5492	Low pressure blades/buckets

Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes

CoG steam units	Jet Engine	Turbine		5493	Low pressure nozzles/vanes
CoG steam units	Jet Engine	Turbine		5494	Low pressure casing/expansion joints
CoG steam units	Jet Engine	Turbine		5497	Other low pressure problems
CoG steam units	Jet Engine	Turbine		5498	Expansion joints
CoG steam units	Jet Engine	Turbine		5499	Shaft seals

**Notes:** 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use HP if only one.

## MISCELLANEOUS

**TABLE B04-72** Miscellaneous: Instruments and Controls

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Miscellaneous	Instruments and Controls		6200	Combined cycle instruments and controls. (Report instruments and controls specific to the gas turbine, steam turbine, boiler, generator, or balance of plant using the codes for the appropriate piece of equipment.)

**Notes:** 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.

## PERFORMANCE

**TABLE B04-73** Performance: Performance

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Performance	Performance		9997	NERC Reliability Standard Requirement
CoG steam units	Performance	Performance		9998	Black start testing
CoG steam units	Performance	Performance		9999	Total unit performance testing (use appropriate codes for individual component testing)

**Notes:** 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.

## PERSONNEL OR PROCEDURAL ERRORS

**TABLE B04-74** Personnel or Procedural Errors: Personnel or Procedural Errors

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9900	Operator error
CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9910	Maintenance personnel error
CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9920	Contractor error
CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9930	Operating procedure error
CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9940	Maintenance procedure error
CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9950	Contractor procedure error
CoG steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9960	Staff shortage

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

## POLLUTION CONTROL EQUIPMENT

**TABLE B04-75 Pollution Control Equipment: CO Reduction**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Pollution Control Equipment	CO Reduction		8840	CO Active catalyst
CoG steam units	Pollution Control Equipment	CO Reduction		8841	CO Support materials
CoG steam units	Pollution Control Equipment	CO Reduction		8842	CO Plugging
CoG steam units	Pollution Control Equipment	CO Reduction		8845	Other CO reduction problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-76 Pollution Control Equipment: Continuous Emissions Monitoring Systems (CEMS)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8700	CEMS Certification and Recertification
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8710	SO2 analyzer problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8720	NOx analyzer problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8730	CO analyzer problems

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8740	CO2 analyzer problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8750	O2 analyzer problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8760	Opacity monitor problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8770	Flow monitor problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8780	Data acquisition system problems
CoG steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8790	Miscellaneous CEMS problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-77 Pollution Control Equipment: NOx Reduction Systems - Catalytic Air Heaters**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8830	CAH NOx Active catalyst
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8831	CAH NOx Support materials
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8832	CAH NOx Plugging
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8835	Other CAH problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-78 Pollution Control Equipment: NOx Reduction Systems - Selective Catalytic Reduction Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8810	SCR NOx Reactor
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8811	SCR NOx Reagent
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8812	SCR NOx Catalyst
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8813	SCR NOx Injection grid piping/valves
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8814	SCR NOx Catalyst support material
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8815	SCR NOx Soot blowers

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8816	SCR NOx Plugging
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8817	SCR NOx Control system
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8820	SCR NOx Ammonia injection grid piping/valves
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8821	SCR NOx Ammonia tanks, piping and valves (not injection)
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8822	SCR NOx Ammonia air blowers
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8823	SCR NOx Other ammonia system problems
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8825	Other SCR NOx problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-79 Pollution Control Equipment: NOx Reduction Systems - Selective Non-Catalytic Reduction Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8800	SNCR NOx Reagent
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8801	SNCR NOx Carrier gas
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8802	SNCR NOx Control system
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8803	SNCR Performance Testing
CoG steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8809	Other SNCR NOx problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Use code 0360 for Low NOx Burners.**

## **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 B04-80 Regulatory, Safety, Environmental: Other Operating Environmental Limitations**

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9660	Thermal discharge limits - fossil and nuclear
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9663	Thermal discharge limits - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9664	Thermal discharge limits - jet engines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9670	Noise limits (not for personnel safety) - fossil and nuclear
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9673	Noise limits (not for personnel safety) - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9674	Noise limits (not for personnel safety) - jet engines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9677	Noise limits testing - fossil
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9678	Noise limits testing - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9679	Noise limits testing - jet engines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9680	Fish kill - fossil and nuclear
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9683	Fish kill - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9684	Fish kill - jet engines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9690	Other miscellaneous operational environmental limits - fossil and nuclear
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9693	Other miscellaneous operational environmental limits - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9694	Other miscellaneous operational environmental limits - jet engines

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-81 Regulatory, Safety, Environmental: Regulatory**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Regulatory, Safety, Environmental	Regulatory		9504	Regulatory (environmental) proceedings and hearings - regulatory agency initiated
CoG steam units	Regulatory, Safety, Environmental	Regulatory		9506	Regulatory (environmental) proceedings and hearings - intervenor initiated
CoG steam units	Regulatory, Safety, Environmental	Regulatory		9510	Plant modifications strictly for compliance with new or changed regulatory requirements (scrubbers, cooling towers, etc.)
CoG steam units	Regulatory, Safety, Environmental	Regulatory		9520	Oil spill in Gulf of Mexico (OMC)
CoG steam units	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 Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-82 Regulatory, Safety, Environmental: Safety**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Regulatory, Safety, Environmental	Safety		9700	OSHA-related retrofit or inspection
CoG steam units	Regulatory, Safety, Environmental	Safety		9720	Other safety problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-83 Regulatory, Safety, Environmental: Stack Emission**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9600	SO2 stack emissions - fossil
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9603	SO2 stack emissions - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9604	SO2 stack emissions - jet engines

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9610	NOx stack emissions - fossil
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9613	NOx stack emissions - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9614	NOx stack emissions - jet engines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9616	CO stack emissions - fossil
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9620	Particulate stack emissions - fossil
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9623	Particulate stack emissions - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9624	Particulate stack emissions - jet engines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9630	Opacity - fossil
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9633	Opacity - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9634	Opacity - jet engines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9650	Other stack/exhaust emissions - fossil (use codes 9200 to 9290 if fuel quality causes pollution control equipment problems that result in excess stack emissions)
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9653	Other stack or exhaust emissions - gas turbines (use codes 9200 to 9290 if fuel quality causes pollution control equipment problems that result in excess stack emissions)
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9654	Other stack or exhaust emissions - jet engines (use codes 9200 to 9290 if fuel quality causes pollution control equipment problems that result in excess stack emissions)
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9656	Other stack or exhaust emissions testing - fossil

CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9657	Other stack or exhaust emissions testing - gas turbines
CoG steam units	Regulatory, Safety, Environmental	Stack Emission		9658	Other stack or exhaust emissions testing - jet engines

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Include exhaust emissions.**

## STEAM TURBINE

Besides the turbine, this set includes the steam stop/control valves, turbine control system, and the turbine auxiliaries. The extraction steam codes are contained in the Balance of Plant set.

TABLE B04-84 Steam Turbine: Controls					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Steam Turbine	Controls		4290	Hydraulic system pumps
CoG steam units	Steam Turbine	Controls		4291	Hydraulic system coolers
CoG steam units	Steam Turbine	Controls		4292	Hydraulic system filters
CoG steam units	Steam Turbine	Controls		4293	Hydraulic system pipes and valves
CoG steam units	Steam Turbine	Controls		4299	Other hydraulic system problems
CoG steam units	Steam Turbine	Controls		4300	Turbine supervisory system (use codes 4290 to 4299 for hydraulic oil)
CoG steam units	Steam Turbine	Controls		4301	Turbine governing system
CoG steam units	Steam Turbine	Controls		4302	Turbine trip devices (including instruments)
CoG steam units	Steam Turbine	Controls		4303	Exhaust hood and spray controls
CoG steam units	Steam Turbine	Controls		4304	Automatic turbine control systems - mechanical
CoG steam units	Steam Turbine	Controls		4305	Automatic turbine control systems - mechanical - hydraulic
CoG steam units	Steam Turbine	Controls		4306	Automatic turbine control systems - electro-hydraulic - analog
CoG steam units	Steam Turbine	Controls		4307	Automatic turbine control systems - electro-hydraulic - digital
CoG steam units	Steam Turbine	Controls		4308	Automatic turbine control systems - digital control and monitoring
CoG steam units	Steam Turbine	Controls		4309	Other turbine instrument and control problems
CoG steam units	Steam Turbine	Controls		4310	Steam Turbine Control System - data highway

**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Steam Turbine	Controls		4311	Steam Turbine Control System - hardware problems (including card failure)
CoG steam units	Steam Turbine	Controls		4312	Steam Turbine Control System - internal and termination wiring
CoG steam units	Steam Turbine	Controls		4313	Steam Turbine Control System - logic problems
CoG steam units	Steam Turbine	Controls		4314	Steam Turbine Control System - upgrades

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-85 Steam Turbine: High Pressure Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Steam Turbine	High Pressure Turbine		4000	Outer casing
CoG steam units	Steam Turbine	High Pressure Turbine		4001	Inner casing
CoG steam units	Steam Turbine	High Pressure Turbine		4009	Nozzle bolting
CoG steam units	Steam Turbine	High Pressure Turbine		4010	Nozzles and nozzle blocks
CoG steam units	Steam Turbine	High Pressure Turbine		4011	Diaphragms
CoG steam units	Steam Turbine	High Pressure Turbine		4012	Buckets or blades
CoG steam units	Steam Turbine	High Pressure Turbine		4013	Diaphragms unit and shroud type
CoG steam units	Steam Turbine	High Pressure Turbine		4014	Bucket or blade fouling
CoG steam units	Steam Turbine	High Pressure Turbine		4015	Wheels or spindles
CoG steam units	Steam Turbine	High Pressure Turbine		4020	Shaft seals
CoG steam units	Steam Turbine	High Pressure Turbine		4021	Dummy rings
CoG steam units	Steam Turbine	High Pressure Turbine		4022	Gland rings
CoG steam units	Steam Turbine	High Pressure Turbine		4030	Rotor shaft
CoG steam units	Steam Turbine	High Pressure Turbine		4040	Bearings
CoG steam units	Steam Turbine	High Pressure Turbine		4041	Thrust bearings
CoG steam units	Steam Turbine	High Pressure Turbine		4099	Other high pressure turbine problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-86 Steam Turbine: Intermediate Pressure Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4100	Outer casing
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4101	Inner casing
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4109	Nozzle bolting



**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4110	Nozzles and nozzle blocks
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4111	Diaphragms
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4112	Buckets or blades
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4113	Bucket or blade fouling
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4115	Wheels or spindles
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4120	Shaft seals
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4121	Dummy rings
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4122	Gland rings
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4130	Rotor shaft
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4140	Bearings
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4141	Thrust bearings
CoG steam units	Steam Turbine	Intermediate Pressure Turbine		4199	Other intermediate pressure turbine problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-87 Steam Turbine: Low Pressure Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Steam Turbine	Low Pressure Turbine		4200	Outer casing
CoG steam units	Steam Turbine	Low Pressure Turbine		4201	Inner casing
CoG steam units	Steam Turbine	Low Pressure Turbine		4209	Nozzle bolting
CoG steam units	Steam Turbine	Low Pressure Turbine		4210	Nozzles and nozzle blocks
CoG steam units	Steam Turbine	Low Pressure Turbine		4211	Diaphragms
CoG steam units	Steam Turbine	Low Pressure Turbine		4212	Buckets or blades
CoG steam units	Steam Turbine	Low Pressure Turbine		4213	Bucket or blade fouling
CoG steam units	Steam Turbine	Low Pressure Turbine		4215	Wheels or spindles
CoG steam units	Steam Turbine	Low Pressure Turbine		4220	Shaft seals
CoG steam units	Steam Turbine	Low Pressure Turbine		4221	Dummy rings
CoG steam units	Steam Turbine	Low Pressure Turbine		4222	Gland rings
CoG steam units	Steam Turbine	Low Pressure Turbine		4230	Rotor shaft
CoG steam units	Steam Turbine	Low Pressure Turbine		4240	Bearings
CoG steam units	Steam Turbine	Low Pressure Turbine		4241	Thrust bearings
CoG steam units	Steam Turbine	Low Pressure Turbine		4250	Other low pressure turbine problems

**Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.**

**TABLE B04-88 Steam Turbine: Lube Oil**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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**Appendix B04: Index to Co-Generator Steam Turbine Unit Cause Codes**

CoG steam units	Steam Turbine	Lube Oil		4280	Lube oil pumps
CoG steam units	Steam Turbine	Lube Oil		4281	Lube oil coolers
CoG steam units	Steam Turbine	Lube Oil		4282	Lube oil conditioners
CoG steam units	Steam Turbine	Lube Oil		4283	Lube oil system valves and piping
CoG steam units	Steam Turbine	Lube Oil		4284	Lube oil pump drive
CoG steam units	Steam Turbine	Lube Oil		4289	Other lube oil system problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899. 2) Do not include bearing failures due to lube oil.</b>					

<b>TABLE B04-89 Steam Turbine: Miscellaneous (Steam Turbine)</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4400	Major turbine overhaul (720 hours or longer) (use for non-specific overhaul only; see page B-CCGT-2)
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4401	Inspection
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4402	Minor turbine overhaul (less than 720 hours) (use for non-specific overhaul only; see page B-CCGT-2)
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4410	Turning gear and motor
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4411	Steam turbine gear box (single shaft configuration)
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4412	Steam turbine clutch (single shaft configuration)
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4415	Shaft coupling mechanism
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4420	Vibration of the turbine generator unit that cannot be attributed to a specific cause such as bearings or blades (use this code for balance moves)
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4430	Gland seal system
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4450	Water induction
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4460	Turbine overspeed trip test
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4470	Differential expansion
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4490	Turbine performance testing (use code 9999 for total unit performance testing)
CoG steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4499	Other miscellaneous steam turbine problems
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-90 Steam Turbine: Piping					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Steam Turbine	Piping		4270	Crossover or under piping
CoG steam units	Steam Turbine	Piping		4279	Miscellaneous turbine piping
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					

TABLE B04-91 Steam Turbine: Valves					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CoG steam units	Steam Turbine	Valves		4260	Main stop valves
CoG steam units	Steam Turbine	Valves		4261	Control valves
CoG steam units	Steam Turbine	Valves		4262	Intercept valves
CoG steam units	Steam Turbine	Valves		4263	Reheat stop valves
CoG steam units	Steam Turbine	Valves		4264	Combined intercept valves
CoG steam units	Steam Turbine	Valves		4265	Miscellaneous drain and vent valves
CoG steam units	Steam Turbine	Valves		4266	Main stop valve testing
CoG steam units	Steam Turbine	Valves		4267	Control valve testing
CoG steam units	Steam Turbine	Valves		4268	Reheat/intercept valve testing
CoG steam units	Steam Turbine	Valves		4269	Other turbine valves (including LP steam admission valves)
<b>Notes: 1) For use with Gas Turbine Codes 300-399 or 700-799, Steam Turbine Codes 100-199, and Block Identifier Codes 800-899.</b>					