

## Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes

### COMBINED CYCLE STEAM TURBINE UNITS

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## BALANCE OF PLANT

TABLE B02-1 Balance of Plant: Auxiliary Systems - Auxiliary Steam					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3830	Auxiliary boiler
CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3831	Auxiliary steam piping
CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3832	Auxiliary steam valves
CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3833	Auxiliary steam controls and instruments
CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3834	Auxiliary boiler tube leaks
CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3835	Auxiliary boiler burner management system

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CC steam units	Balance of Plant	Auxiliary Systems	Auxiliary Steam	3836	Steam transfer to other unit
CC 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)

**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 B02-2 Balance of Plant: Auxiliary Systems - Closed Cooling Water Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3820	Closed cooling water pumps and motors
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3821	Closed cooling water piping
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3822	Closed cooling water valves
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3823	Closed cooling water heat exchangers
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3824	Closed cooling water system fouling
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3825	Closed cooling water instrumentation
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3826	Closed cooling water strainer
CC steam units	Balance of Plant	Auxiliary Systems	Closed Cooling Water Systems	3829	Other closed cooling 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 B02-3 Balance of Plant: Auxiliary Systems - Fire Protection System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3860	Fire protection system pumps
CC steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3861	Fire protection system piping
CC steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3862	Fire protection system valves
CC steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3863	Fire protection system fouling
CC steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3864	Fire protection system instrumentation and controls
CC steam units	Balance of Plant	Auxiliary Systems	Fire Protection System	3869	Other fire protection 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 B02-4 Balance of Plant: Auxiliary Systems - Instrument Air**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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CC steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3850	Instrument air compressors
CC steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3851	Instrument air piping
CC steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3852	Instrument air valves
CC steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3853	Instrument air dryers
CC steam units	Balance of Plant	Auxiliary Systems	Instrument Air	3854	N2 backup to instrument air
CC 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 B02-5 Balance of Plant: Auxiliary Systems - Low-pressure Gas Compression System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3870	Fuel Gas Compressor and Motors
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3871	Fuel Gas Compressor Piping
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3872	Fuel Gas Compressor Valves
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3873	Fuel Gas Compressor Heat Exchangers
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3874	Fuel Gas Compressor Controls and Instrumentation
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3875	Fuel Gas Compressor Filters
CC steam units	Balance of Plant	Auxiliary Systems	Low-pressure Gas Compression System	3876	Fuel Gas Compressor Fire System
CC 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 B02-6 Balance of Plant: Auxiliary Systems - Miscellaneous (Auxiliary Systems)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	3898	Miscellaneous plant auxiliary process and services instrumentation and controls
CC steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	3899	Other miscellaneous auxiliary system problems

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CC 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.)
CC steam units	Balance of Plant	Auxiliary Systems	Miscellaneous (Auxiliary Systems)	6399	Other coal gasification equipment 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 B02-7 Balance of Plant: Auxiliary Systems - Open Cooling Water System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3800	Open cooling water pumps and motors
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3801	Open cooling water piping
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3802	Open cooling water valves
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3803	Open cooling water heat exchangers
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3804	Open cooling water system fouling
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3805	Open cooling water system instrumentation
CC steam units	Balance of Plant	Auxiliary Systems	Open Cooling Water System	3806	Open cooling water strainer
CC 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 B02-8 Balance of Plant: Auxiliary Systems - Seal Air Fans**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3880	Seal air fan
CC steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3881	Seal air fan drive - motor
CC steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3882	Seal air control dampers and drives
CC steam units	Balance of Plant	Auxiliary Systems	Seal Air Fans	3883	Seal air filters
CC 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 B02-9 Balance of Plant: Auxiliary Systems - Service Air**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Auxiliary Systems	Service Air	3840	Service air compressors
CC steam units	Balance of Plant	Auxiliary Systems	Service Air	3841	Service air piping

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CC steam units	Balance of Plant	Auxiliary Systems	Service Air	3842	Service air valves
CC steam units	Balance of Plant	Auxiliary Systems	Service Air	3843	Service air dryers
CC steam units	Balance of Plant	Auxiliary Systems	Service Air	3849	Other service air 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 B02-10 Balance of Plant: Auxiliary Systems - Service Water (Open System)</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3810	Service water pumps and motors
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3811	Service water piping
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3812	Service water valves
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3813	Service water heat exchangers
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3814	Service water system fouling
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3815	Service water strainer
CC steam units	Balance of Plant	Auxiliary Systems	Service Water (Open System)	3819	Other service water 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 B02-11 Balance of Plant: Circulating Water Systems</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Circulating Water Systems		3210	Circulating water pumps
CC steam units	Balance of Plant	Circulating Water Systems		3211	Circulating water pump motors
CC steam units	Balance of Plant	Circulating Water Systems		3220	Circulating water piping
CC steam units	Balance of Plant	Circulating Water Systems		3221	Circulating water piping fouling
CC steam units	Balance of Plant	Circulating Water Systems		3230	Circulating water valves
CC steam units	Balance of Plant	Circulating Water Systems		3231	Waterbox
CC steam units	Balance of Plant	Circulating Water Systems		3232	Condenser tube cleaning system including debris filter
CC steam units	Balance of Plant	Circulating Water Systems		3233	Circulating water priming system
CC steam units	Balance of Plant	Circulating Water Systems		3235	Cooling tower booster pump
CC steam units	Balance of Plant	Circulating Water Systems		3236	Cooling tower booster motor
CC steam units	Balance of Plant	Circulating Water Systems		3238	Cooling tower fan motors
CC steam units	Balance of Plant	Circulating Water Systems		3239	Cooling tower fan motors - variable speed
CC steam units	Balance of Plant	Circulating Water Systems		3240	Cooling tower fans
CC steam units	Balance of Plant	Circulating Water Systems		3241	Cooling tower efficiency below design
CC steam units	Balance of Plant	Circulating Water Systems		3242	Cooling tower fill damage
CC steam units	Balance of Plant	Circulating Water Systems		3243	Cooling tower icing

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CC steam units	Balance of Plant	Circulating Water Systems		3244	Cooling tower fires
CC steam units	Balance of Plant	Circulating Water Systems		3245	Other cooling tower problems
CC steam units	Balance of Plant	Circulating Water Systems		3246	Cooling tower fouling
CC steam units	Balance of Plant	Circulating Water Systems		3247	Cooling tower instrumentation
CC steam units	Balance of Plant	Circulating Water Systems		3248	Cooling Tower Overhaul
CC steam units	Balance of Plant	Circulating Water Systems		3250	Circulating water system instruments and controls
CC steam units	Balance of Plant	Circulating Water Systems		3260	Traveling screens
CC steam units	Balance of Plant	Circulating Water Systems		3261	Traveling screen fouling
CC steam units	Balance of Plant	Circulating Water Systems		3269	Circulating water biological conditions (ie, zebra mussels)
CC steam units	Balance of Plant	Circulating Water Systems		3270	Intake system problems other than traveling screens
CC steam units	Balance of Plant	Circulating Water Systems		3271	Intake grating fouling
CC steam units	Balance of Plant	Circulating Water Systems		3272	Circulating water screenwash system
CC steam units	Balance of Plant	Circulating Water Systems		3273	Debris in circulating water from outside sources (leaves, mud, etc.)
CC 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)
CC steam units	Balance of Plant	Circulating Water Systems		3281	Circulating water tempering system
CC steam units	Balance of Plant	Circulating Water Systems		3282	Circulating water cooling ponds
CC steam units	Balance of Plant	Circulating Water Systems		3285	Circulating water chemistry
CC 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.**

<b>TABLE B02-12 Balance of Plant: Condensate System - Low/Intermediate Pressure Heater and Deaerators</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3339	LP heater head leaks
CC steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3340	LP heater tube leaks
CC steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3341	Other LP heater - general



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CC steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3342	IP heater tube leaks
CC steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3343	Other IP heater - general
CC steam units	Balance of Plant	Condensate System	Low/Intermediate Pressure Heater and Deaerators	3344	Deaerator (including level control)
CC 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 B02-13 Balance of Plant: Condensate System - Miscellaneous (Condensate System)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3360	Condensate makeup and return (including storage tanks)
CC 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).
CC steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3380	Condensate coolers
CC steam units	Balance of Plant	Condensate System	Miscellaneous (Condensate System)	3399	Other miscellaneous condensate 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 B02-14 Balance of Plant: Condensate System - Polishers/Chemical Addition**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensate System	Polishers/Chemical Addition	3350	Condensate polishing and filtering systems
CC steam units	Balance of Plant	Condensate System	Polishers/Chemical Addition	3351	Chemical addition systems
CC steam units	Balance of Plant	Condensate System	Polishers/Chemical Addition	3352	Feedwater chemistry (not specific to condenser, polishers, or chemical addition)

**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 B02-15 Balance of Plant: Condensate System - Pumps, Piping, and Valves**

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UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3300	Condensate water pre-treatment
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3310	Condensate/hotwell pumps
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3311	Condensate/hotwell pump motor
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3312	Condensate booster pump
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3313	Condensate booster pump motor
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3314	Condensate booster pump motor - variable speed
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3315	Condensate booster pump drive (other than 3313 and 3314)
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3320	Condensate piping
CC steam units	Balance of Plant	Condensate System	Pumps, Piping, and Valves	3330	Condensate valves

**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 B02-16 Balance of Plant: Condensing System - Condenser Casing or Shell and Internals**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3120	Tube sheets
CC steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3121	Expansion joint
CC steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3122	Gaskets and seals
CC steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3123	Hot well
CC steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3124	Tube sheet fouling
CC steam units	Balance of Plant	Condensing System	Condenser Casing or Shell and Internals	3129	Other condenser 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 B02-17 Balance of Plant: Condensing System - Condenser Controls**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensing System	Condenser Controls	3150	Hot well level controls
CC steam units	Balance of Plant	Condensing System	Condenser Controls	3151	Vacuum pump and air ejector controls
CC steam units	Balance of Plant	Condensing System	Condenser Controls	3152	Air-cooled condenser controls

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Condensing System	Condenser Controls	3159	Other condensing system controls and instruments
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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 B02-18 Balance of Plant: Condensing System - Condenser Tubes and Support Equipment**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3110	Condenser tube leaks
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3111	Condenser tube fouling shell side
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3112	Condenser tube fouling tube side
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3113	Condenser tube and water box cleaning (including circulating water flow reversal)
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3114	Air-cooled condenser tubes
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3115	Air-cooled condenser pumps
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3116	Air-cooled condenser fans
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3117	Air-cooled condenser fan motors
CC steam units	Balance of Plant	Condensing System	Condenser Tubes and Support Equipment	3118	Other Air-cooled condenser problems
CC 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 B02-19 Balance of Plant: Condensing System - Miscellaneous (Condensing System)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3170	Condenser inspection (use code 3110 to report looking for tube leaks)
CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3171	Air-cooled condenser inspections
CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3180	Major condenser overhaul
CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3185	Water side cathodic protection

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3186	Auxiliary condenser and associated equipment
CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3190	Air leakage (for losses not attributable to previously noted equipment related codes)
CC steam units	Balance of Plant	Condensing System	Miscellaneous (Condensing System)	3199	Other miscellaneous condensing 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 B02-20 Balance of Plant: Condensing System - Vacuum Equipment</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3130	Air ejectors
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3131	Air ejector piping and valves
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3132	Inter and after condensers
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3133	Vacuum pumps
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3134	Vacuum pump piping and valves
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3135	Vacuum pump motor and auxiliaries
CC steam units	Balance of Plant	Condensing System	Vacuum Equipment	3139	Other air extraction system problems - general
CC 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.
<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 B02-21 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>
CC steam units	Balance of Plant	Electrical		3600	Switchyard transformers and associated cooling systems - external (OMC)
CC steam units	Balance of Plant	Electrical		3601	Switchyard transformers and associated cooling systems - external (not OMC)
CC steam units	Balance of Plant	Electrical		3610	Switchyard circuit breakers - external (not OMC)

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Electrical		3611	Switchyard circuit breakers - external (OMC)
CC steam units	Balance of Plant	Electrical		3612	Switchyard system protection devices - external (OMC)
CC steam units	Balance of Plant	Electrical		3613	Switchyard system protection devices - external (not OMC)
CC steam units	Balance of Plant	Electrical		3618	Other switchyard equipment - external (not OMC)
CC steam units	Balance of Plant	Electrical		3619	Other switchyard equipment - external (OMC)
CC steam units	Balance of Plant	Electrical		3620	Main transformer
CC steam units	Balance of Plant	Electrical		3621	Unit auxiliaries transformer
CC steam units	Balance of Plant	Electrical		3622	Station service startup transformer
CC steam units	Balance of Plant	Electrical		3623	Auxiliary generators
CC steam units	Balance of Plant	Electrical		3624	Auxiliary generator voltage supply system
CC steam units	Balance of Plant	Electrical		3629	Other switchyard or high voltage system problems - external
CC steam units	Balance of Plant	Electrical		3630	400-700 volt transformers
CC steam units	Balance of Plant	Electrical		3631	400-700 volt circuit breakers
CC steam units	Balance of Plant	Electrical		3632	400-700 volt conductors and buses
CC steam units	Balance of Plant	Electrical		3633	400-700 volt insulators
CC steam units	Balance of Plant	Electrical		3634	400-700 volt protection devices
CC steam units	Balance of Plant	Electrical		3639	Other 400-700 volt problems
CC steam units	Balance of Plant	Electrical		3640	AC instrument power transformers
CC steam units	Balance of Plant	Electrical		3641	AC Circuit breakers
CC steam units	Balance of Plant	Electrical		3642	AC Conductors and buses
CC steam units	Balance of Plant	Electrical		3643	AC Inverters
CC steam units	Balance of Plant	Electrical		3644	AC Protection devices
CC steam units	Balance of Plant	Electrical		3649	Other AC instrument power problems
CC steam units	Balance of Plant	Electrical		3650	DC instrument power battery chargers
CC steam units	Balance of Plant	Electrical		3651	DC circuit breakers
CC steam units	Balance of Plant	Electrical		3652	DC conductors and buses
CC steam units	Balance of Plant	Electrical		3653	DC protection devices
CC steam units	Balance of Plant	Electrical		3659	Other DC power problems
CC steam units	Balance of Plant	Electrical		3660	4000-7000 volt transformers
CC steam units	Balance of Plant	Electrical		3661	4000-7000 volt circuit breakers
CC steam units	Balance of Plant	Electrical		3662	4000-7000 volt conductors and buses

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Electrical		3663	4000-7000 volt insulators
CC steam units	Balance of Plant	Electrical		3664	4000-7000 volt protection devices
CC steam units	Balance of Plant	Electrical		3669	Other 4000-7000 volt problems
CC steam units	Balance of Plant	Electrical		3670	12-15kV transformers
CC steam units	Balance of Plant	Electrical		3671	12-15kV circuit breakers
CC steam units	Balance of Plant	Electrical		3672	12-15kV conductors and buses
CC steam units	Balance of Plant	Electrical		3673	12-15kV insulators
CC steam units	Balance of Plant	Electrical		3674	12-15kV protection devices
CC steam units	Balance of Plant	Electrical		3679	Other 12-15kV problems
CC steam units	Balance of Plant	Electrical		3680	Other voltage transformers
CC steam units	Balance of Plant	Electrical		3681	Other voltage circuit breakers
CC steam units	Balance of Plant	Electrical		3682	Other voltage conductors and buses
CC steam units	Balance of Plant	Electrical		3683	Other voltage insulators
CC steam units	Balance of Plant	Electrical		3684	Other voltage protection devices
CC steam units	Balance of Plant	Electrical		3689	Other voltage problems
CC steam units	Balance of Plant	Electrical		3690	Station Service Power Distribution System, General

**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 B02-22 Balance of Plant: Extraction Steam</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Extraction Steam		3520	HP Extraction steam piping
CC steam units	Balance of Plant	Extraction Steam		3521	HP Extraction steam valves
CC steam units	Balance of Plant	Extraction Steam		3522	HP Extraction steam instruments and controls
CC steam units	Balance of Plant	Extraction Steam		3529	Other HP extraction steam system problems
CC steam units	Balance of Plant	Extraction Steam		3530	IP Extraction steam piping
CC steam units	Balance of Plant	Extraction Steam		3531	IP Extraction steam valves
CC steam units	Balance of Plant	Extraction Steam		3532	IP Extraction steam instruments and controls
CC steam units	Balance of Plant	Extraction Steam		3539	Other IP extraction steam system problems
CC steam units	Balance of Plant	Extraction Steam		3540	LP Extraction steam piping
CC steam units	Balance of Plant	Extraction Steam		3541	LP Extraction steam valves
CC steam units	Balance of Plant	Extraction Steam		3542	LP Extraction steam instruments and controls

Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes

CC steam units	Balance of Plant	Extraction Steam		3549	Other LP extraction steam system 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 B02-23 Balance of Plant: Feedwater System**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Feedwater System		3401	Startup feedwater pump
CC steam units	Balance of Plant	Feedwater System		3402	Startup feedwater pump drives - all types
CC steam units	Balance of Plant	Feedwater System		3407	Feedwater pump suction screens
CC steam units	Balance of Plant	Feedwater System		3408	Feedwater pump drive - local controls
CC steam units	Balance of Plant	Feedwater System		3409	Feedwater pump drive motor - variable speed
CC steam units	Balance of Plant	Feedwater System		3410	Feedwater pump
CC steam units	Balance of Plant	Feedwater System		3411	Feedwater pump drive - motor
CC steam units	Balance of Plant	Feedwater System		3412	Feedwater pump drive - steam turbine
CC steam units	Balance of Plant	Feedwater System		3413	Feedwater pump coupling and drive shaft
CC steam units	Balance of Plant	Feedwater System		3414	Feedwater pump local controls
CC steam units	Balance of Plant	Feedwater System		3415	Feedwater pump/drive lube oil system
CC steam units	Balance of Plant	Feedwater System		3416	Other feedwater pump problems
CC steam units	Balance of Plant	Feedwater System		3417	Feedwater pump drive - main shaft
CC steam units	Balance of Plant	Feedwater System		3418	Feedwater pump drive - other
CC steam units	Balance of Plant	Feedwater System		3419	Feedwater pump drive - gear
CC steam units	Balance of Plant	Feedwater System		3420	Feedwater piping and supports
CC steam units	Balance of Plant	Feedwater System		3430	Feedwater regulating (boiler level control) valve
CC steam units	Balance of Plant	Feedwater System		3431	Other feedwater valves
CC steam units	Balance of Plant	Feedwater System		3439	HP heater head leaks
CC steam units	Balance of Plant	Feedwater System		3440	High pressure heater tube leaks
CC steam units	Balance of Plant	Feedwater System		3441	Other high pressure heater problems (see condensate system for LP and IP heater codes)
CC steam units	Balance of Plant	Feedwater System		3451	Feedwater booster pump suction screens
CC steam units	Balance of Plant	Feedwater System		3452	Feedwater booster pump drive - local controls

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Feedwater System		3453	Feedwater booster pump drive motor - variable speed
CC steam units	Balance of Plant	Feedwater System		3454	Feedwater booster pump
CC steam units	Balance of Plant	Feedwater System		3455	Feedwater booster pump drive - motor
CC steam units	Balance of Plant	Feedwater System		3456	Feedwater booster pump drive - steam turbine
CC steam units	Balance of Plant	Feedwater System		3457	Feedwater booster pump coupling and drive shaft
CC steam units	Balance of Plant	Feedwater System		3458	Feedwater booster pump local controls
CC steam units	Balance of Plant	Feedwater System		3459	Feedwater booster pump/drive lube oil system
CC steam units	Balance of Plant	Feedwater System		3460	Other feedwater booster pump problems
CC steam units	Balance of Plant	Feedwater System		3461	Feedwater booster pump drive - main shaft
CC steam units	Balance of Plant	Feedwater System		3462	Feedwater booster pump drive - other
CC steam units	Balance of Plant	Feedwater System		3463	Feedwater booster pump drive - gear
CC steam units	Balance of Plant	Feedwater System		3499	Other feedwater 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) Excluding extraction or drain systems.</b>					

<b>TABLE B02-24 Balance of Plant: Heater Drain Systems</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Heater Drain Systems		3501	Heater drain pumps
CC steam units	Balance of Plant	Heater Drain Systems		3502	Heater level control
CC steam units	Balance of Plant	Heater Drain Systems		3503	Heater drain piping
CC steam units	Balance of Plant	Heater Drain Systems		3504	Heater drain valves
CC steam units	Balance of Plant	Heater Drain Systems		3505	Heater drain pump drive
CC steam units	Balance of Plant	Heater Drain Systems		3509	Other heater drain 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 B02-25 Balance of Plant: Miscellaneous (Balance of Plant)</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3950	Process computer



**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3960	Thermal derating (thermal efficiency losses in balance of plant when specific cause(s) unknown)
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3970	Distributive Control System (DCS) - process computer
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3971	DCS - data highway
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3972	DCS - hardware problems (including card failure)
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3973	DCS - internal and termination wiring
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3974	DCS - logic problems
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3975	DCS - upgrades
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3979	Other DCS problems
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3980	Programmable Logic Controller (PLC)
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3981	PLC - data highway
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3982	PLC - hardware problems (including card failure)
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3983	PLC - internal and termination wiring
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3984	PLC - logic problems
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3985	PLC - upgrades
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3989	Other PLC problems
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3995	Powerhouse heating and ventilating systems
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3996	Air conditioning systems - rooms and areas
CC steam units	Balance of Plant	Miscellaneous (Balance of Plant)		3998	Balance of plant overhaul/outage
CC 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 B02-26 Balance of Plant: Power Station Switchyard**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Power Station Switchyard		3700	Power Station switchyard (non generating unit equipment)
CC steam units	Balance of Plant	Power Station Switchyard		3710	Transmission line (connected to powerhouse switchyard to 1st Substation)

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Balance of Plant	Power Station Switchyard		3720	Transmission equipment at the 1st substation (see code 9300 if applicable)
CC 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 B02-27 Balance of Plant: Waste Water (zero discharge) Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Balance of Plant	Waste Water (zero discharge) Systems		3290	Waste water (zero discharge) tanks, pumps, and motors
CC steam units	Balance of Plant	Waste Water (zero discharge) Systems		3291	Waste water (zero discharge) system fouling
CC steam units	Balance of Plant	Waste Water (zero discharge) Systems		3292	Waste water (zero discharge) piping
CC steam units	Balance of Plant	Waste Water (zero discharge) Systems		3293	Waste water (zero discharge) valves
CC steam units	Balance of Plant	Waste Water (zero discharge) Systems		3294	Waste water (zero discharge) controls and instrumentation
CC 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 B02-28 Expander Turbine: Expander Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Expander Turbine	Expander Turbine		7800	Couplings
CC steam units	Expander Turbine	Expander Turbine		7810	Shaft
CC steam units	Expander Turbine	Expander Turbine		7820	Bearings
CC steam units	Expander Turbine	Expander Turbine		7830	Blades
CC steam units	Expander Turbine	Expander Turbine		7840	Discs
CC steam units	Expander Turbine	Expander Turbine		7850	Spacers
CC steam units	Expander Turbine	Expander Turbine		7860	Nozzles/vanes
CC steam units	Expander Turbine	Expander Turbine		7870	Heat shields
CC steam units	Expander Turbine	Expander Turbine		7880	Exhaust diffusers

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CC steam units	Expander Turbine	Expander Turbine		7890	Seal oil system and seals
CC steam units	Expander Turbine	Expander Turbine		7900	Inner casing
CC steam units	Expander Turbine	Expander Turbine		7910	Outer exhaust casing
CC steam units	Expander Turbine	Expander Turbine		7920	Lube oil system
CC steam units	Expander Turbine	Expander Turbine		7930	Controls and instrumentation
CC steam units	Expander Turbine	Expander Turbine		7940	Evactor
CC steam units	Expander Turbine	Expander Turbine		7950	Major overhaul
CC 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 B02-29 External: Catastrophe**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	External	Catastrophe		9000	Flood
CC steam units	External	Catastrophe		9001	Drought
CC steam units	External	Catastrophe		9010	Fire including wildfires, not related to a specific component
CC steam units	External	Catastrophe		9020	Lightning
CC steam units	External	Catastrophe		9025	Geomagnetic disturbance
CC steam units	External	Catastrophe		9030	Earthquake
CC steam units	External	Catastrophe		9031	Tornado
CC steam units	External	Catastrophe		9035	Hurricane
CC steam units	External	Catastrophe		9036	Storms (ice, snow, etc)
CC steam units	External	Catastrophe		9040	Other catastrophe

**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 B02-30 External: Economic**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	External	Economic		0	Reserve shutdown
CC steam units	External	Economic		9130	Failure of fuel supplier to fulfill contractual obligations or a pre-

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					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.)
CC 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.
CC steam units	External	Economic		9134	Fuel conservation
CC steam units	External	Economic		9136	Problems with Primary Fuel for Units with Secondary Fuel Operation
CC steam units	External	Economic		9137	Ground water or other water supply problems
CC steam units	External	Economic		9140	Plant modifications to burn different fuel that are not regulatory mandated
CC 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.
CC steam units	External	Economic		9151	Labor strikes direct plant management grievances that result in a walkout or strike are under plant management control.
CC steam units	External	Economic		9160	Other economic problems
CC steam units	External	Economic		9180	Economic (for internal use at plants only)
CC steam units	External	Economic		9181	Economic (for internal use at plants only)
CC steam units	External	Economic		9182	Economic (for internal use at plants only)
CC steam units	External	Economic		9183	Economic (for internal use at plants only)
CC steam units	External	Economic		9184	Economic (for internal use at plants only)
CC steam units	External	Economic		9185	Economic (for internal use at plants only)

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CC steam units	External	Economic		9186	Economic (for internal use at plants only)
CC steam units	External	Economic		9187	Economic (for internal use at plants only)
CC steam units	External	Economic		9188	Economic (for internal use at plants only)
CC steam units	External	Economic		9189	Economic (for internal use at plants only)
CC steam units	External	Economic		9190	Economic (for internal use at plants only)
CC steam units	External	Economic		9191	Economic (for internal use at plants only)
CC steam units	External	Economic		9192	Economic (for internal use at plants only)
CC steam units	External	Economic		9193	Economic (for internal use at plants only)
CC steam units	External	Economic		9194	Economic (for internal use at plants only)
CC steam units	External	Economic		9195	Economic (for internal use at plants only)
CC steam units	External	Economic		9196	Economic (for internal use at plants only)
CC steam units	External	Economic		9197	Economic (for internal use at plants only)
CC steam units	External	Economic		9198	Economic (for internal use at plants only)
CC 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.**

<b>TABLE B02-31 External: Fuel Quality</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	External	Fuel Quality		9200	High ash content (OMC)
CC steam units	External	Fuel Quality		9201	High ash content (not OMC)
CC steam units	External	Fuel Quality		9205	Poor quality natural gas fuel, low heat content
CC steam units	External	Fuel Quality		9220	High sulfur content (OMC)
CC steam units	External	Fuel Quality		9221	High sulfur content (not OMC)

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	External	Fuel Quality		9230	High vanadium content (OMC)
CC steam units	External	Fuel Quality		9231	High vanadium content (not OMC)
CC steam units	External	Fuel Quality		9240	High sodium content (OMC)
CC steam units	External	Fuel Quality		9241	High sodium content (not OMC)
CC steam units	External	Fuel Quality		9260	Low BTU oil (OMC)
CC steam units	External	Fuel Quality		9261	Low BTU oil (not OMC)
CC steam units	External	Fuel Quality		9290	Other fuel quality problems (OMC)
CC 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 B02-32 External: Miscellaneous (External)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC 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)
CC steam units	External	Miscellaneous (External)		9310	Operator training
CC steam units	External	Miscellaneous (External)		9320	Other miscellaneous external problems
CC steam units	External	Miscellaneous (External)		9340	Synchronous Condenser Operation

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

## GAS TURBINE

**TABLE B02-33 Gas Turbine: Auxiliary Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Gas Turbine	Auxiliary Systems		5110	Lube oil system - general
CC steam units	Gas Turbine	Auxiliary Systems		5111	Lube oil pumps
CC steam units	Gas Turbine	Auxiliary Systems		5112	Lube oil coolers
CC steam units	Gas Turbine	Auxiliary Systems		5113	Lube oil valves/piping
CC steam units	Gas Turbine	Auxiliary Systems		5114	Lube oil filters
CC steam units	Gas Turbine	Auxiliary Systems		5115	Oil vapor extractor
CC steam units	Gas Turbine	Auxiliary Systems		5116	Power Augmentation System Equipment
CC steam units	Gas Turbine	Auxiliary Systems		5117	Power augmentation piping
CC steam units	Gas Turbine	Auxiliary Systems		5118	Power augmentation valves

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Gas Turbine	Auxiliary Systems		5119	Power augmentation controls
CC steam units	Gas Turbine	Auxiliary Systems		5120	Hydraulic oil system
CC steam units	Gas Turbine	Auxiliary Systems		5121	Hydraulic oil system pumps
CC steam units	Gas Turbine	Auxiliary Systems		5122	Hydraulic oil system piping/valves
CC steam units	Gas Turbine	Auxiliary Systems		5130	Starting system (including motor)
CC steam units	Gas Turbine	Auxiliary Systems		5140	Battery and charger system
CC steam units	Gas Turbine	Auxiliary Systems		5150	Turning gear and motor
CC steam units	Gas Turbine	Auxiliary Systems		5151	Load gear compartment
CC steam units	Gas Turbine	Auxiliary Systems		5160	Cooling and seal air system
CC steam units	Gas Turbine	Auxiliary Systems		5170	Cooling water system
CC steam units	Gas Turbine	Auxiliary Systems		5180	Anti-icing system
CC steam units	Gas Turbine	Auxiliary Systems		5190	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 B02-34 Gas Turbine: Exhaust Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Gas Turbine	Exhaust Systems		5100	Chamber
CC steam units	Gas Turbine	Exhaust Systems		5101	Hoods
CC steam units	Gas Turbine	Exhaust Systems		5102	Vanes/nozzles
CC steam units	Gas Turbine	Exhaust Systems		5103	Silencer
CC steam units	Gas Turbine	Exhaust Systems		5104	Cones
CC steam units	Gas Turbine	Exhaust Systems		5105	Diverter Dampers
CC steam units	Gas Turbine	Exhaust Systems		5106	Exhaust Stack
CC steam units	Gas Turbine	Exhaust Systems		5108	High engine exhaust temperature
CC 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 B02-35 Gas Turbine: Fuel, Ignition, and Combustion Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5040	Fuel tanks
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5041	Fuel piping and valves

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5042	Fuel nozzles/vanes
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5043	Fuel filters
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5044	Liquid fuel oil pump
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5046	Liquid fuel oil transfer/forwarding pump
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5047	Liquid fuel purge system
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5048	Gas fuel system including controls and instrumentation
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5049	Other fuel system problems
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5050	Ignition system
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5051	Pilot fuel piping and valves
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5052	Pilot fuel nozzles/vanes
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5053	Pilot fuel filters
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5054	Water injection system
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5060	Atomizing air system
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5065	NOx water injection system including pump
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5066	NOx steam injection system
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5070	Combustor casing
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5071	Combustor liner
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5072	Combustor caps
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5073	Flame scanners



**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5074	Flashback including instrumentation
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5075	Blade path temperature spread
CC steam units	Gas Turbine	Fuel, Ignition, and Combustion Systems		5079	Other combustor 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 B02-36 Gas Turbine: Inlet Air System and Compressors - Compressors</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5010	High pressure shaft
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5011	High pressure bearings
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5012	High pressure blades/buckets
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5013	Compressor casing and bolts
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5014	Compressor diaphragms
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5015	Compressor seals
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5016	High pressure compressor bleed valves
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5017	Low pressure compressor bleed valves
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5019	Other high pressure problems
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5020	Low pressure shaft
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5021	Low pressure bearings
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5022	Low pressure blades/buckets
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5029	Other low pressure problems
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5030	Supercharging fans
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5035	Compressor washing
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5036	Compressor shaft and bearings for two-shaft machines
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5037	Inlet bleed heat valve
CC steam units	Gas Turbine	Inlet Air System and Compressors	Compressors	5039	Other compressor 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 B02-37 Gas Turbine: Inlet Air System and Compressors - Ducts and Filters</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5000	Inlet air ducts

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5001	Inlet air vanes/nozzles
CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5002	Inlet air filters
CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5003	Inlet cone
CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5004	Inlet air chillers
CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5005	Inlet air evaporative coolers
CC steam units	Gas Turbine	Inlet Air System and Compressors	Ducts and Filters	5006	Inlet air foggers
CC 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 B02-38 Gas Turbine: Miscellaneous (Gas Turbine)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5200	Reduction gear
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5201	Load shaft and bearings
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5205	Main coupling between the turbine and generator
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5206	Clutch
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5210	Intercoolers
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5220	Regenerators
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5230	Heat shields
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5240	Fire detection and extinguishing system (including hazardous gas detection system)
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5241	Fire in unit
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5245	Gas Turbine Control System - data highway
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5246	Gas Turbine Control System - hardware problems (including card failure)
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5247	Gas Turbine Control System - internal and termination wiring
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5248	Gas Turbine Control System - logic problems
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5249	Gas Turbine Control System - upgrades
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5250	Other controls and instrumentation problems
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5255	Computer

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5260	Major overhaul (use for non-specific overhaul only; see page B-CCGT-2)
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5261	Gas turbine/compressor washing
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5262	Gas turbine exchange
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5269	Combustion Inspection (CI)
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5270	Hot end inspection
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5272	Boroscope inspection
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5274	General unit inspection
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5280	Vibration (not engine) in unit not attributable to bearings or other components
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5285	Gas turbine vibration
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5286	Gas turbine lockout
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5290	Gas turbine performance testing - individual engines (use code 9999 for total unit performance testing)
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5292	Turbine Overspeed Trip Test - Gas Turbine
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5295	Synchronous condenser equipment
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5298	Main gas filter
CC steam units	Gas Turbine	Miscellaneous (Gas Turbine)		5299	Other miscellaneous gas 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 B02-39 Gas Turbine: Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Gas Turbine	Turbine		5080	High pressure shaft
CC steam units	Gas Turbine	Turbine		5081	High pressure bearings
CC steam units	Gas Turbine	Turbine		5082	High pressure blades/buckets
CC steam units	Gas Turbine	Turbine		5083	High pressure nozzles/vanes
CC steam units	Gas Turbine	Turbine		5084	High pressure casing/expansion joints
CC steam units	Gas Turbine	Turbine		5085	Interstage gas passages - HP
CC steam units	Gas Turbine	Turbine		5086	High pressure shaft seals
CC steam units	Gas Turbine	Turbine		5087	Thrust bearing
CC steam units	Gas Turbine	Turbine		5088	Gas turbine cooling system
CC steam units	Gas Turbine	Turbine		5089	Other high pressure problems
CC steam units	Gas Turbine	Turbine		5090	Low pressure shaft

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Gas Turbine	Turbine		5091	Low pressure bearings
CC steam units	Gas Turbine	Turbine		5092	Low pressure blades/buckets
CC steam units	Gas Turbine	Turbine		5093	Low pressure nozzles/vanes
CC steam units	Gas Turbine	Turbine		5094	Low pressure casing/expansion joints
CC steam units	Gas Turbine	Turbine		5095	Interstage gas passages - LP
CC steam units	Gas Turbine	Turbine		5096	Low pressure shaft seals
CC steam units	Gas Turbine	Turbine		5097	Other low pressure problems
CC steam units	Gas Turbine	Turbine		5098	Expansion joints
CC 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 B02-40 Generator: Controls**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Generator	Controls		4700	Generator voltage control
CC steam units	Generator	Controls		4710	Generator metering devices
CC steam units	Generator	Controls		4720	Generator synchronization equipment
CC steam units	Generator	Controls		4730	Generator current and potential transformers
CC steam units	Generator	Controls		4740	Emergency generator trip devices
CC 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 B02-41 Generator: Cooling System**

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

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Generator	Cooling System		4630	Liquid cooling system
CC steam units	Generator	Cooling System		4640	Seal oil system and seals
CC 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 B02-42 Generator: Exciter**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Generator	Exciter		4600	Exciter drive - motor
CC steam units	Generator	Exciter		4601	Exciter field rheostat
CC steam units	Generator	Exciter		4602	Exciter commutator and brushes
CC steam units	Generator	Exciter		4603	Solid state exciter element
CC steam units	Generator	Exciter		4604	Exciter drive - shaft
CC steam units	Generator	Exciter		4605	Exciter transformer
CC 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 B02-43 Generator: Generator**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Generator	Generator		4500	Rotor windings (including damper windings and fan blades on hydro units)
CC steam units	Generator	Generator		4510	Rotor collector rings
CC steam units	Generator	Generator		4511	Rotor, General
CC steam units	Generator	Generator		4512	Retaining Rings
CC steam units	Generator	Generator		4520	Stator windings, bushings, and terminals
CC steam units	Generator	Generator		4530	Stator core iron
CC steam units	Generator	Generator		4535	Stator, General
CC steam units	Generator	Generator		4536	Generator Heaters
CC steam units	Generator	Generator		4540	Brushes and brush rigging
CC steam units	Generator	Generator		4550	Generator bearings and lube oil system (including thrust bearings on hydro units)
CC steam units	Generator	Generator		4551	Generator bearings
CC steam units	Generator	Generator		4552	Generator lube oil system

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Generator	Generator		4555	Bearing cooling system
CC steam units	Generator	Generator		4560	Generator vibration (excluding vibration due to failed bearing and other components)
CC steam units	Generator	Generator		4570	Generator casing
CC 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 B02-44 Generator: Miscellaneous (Generator)</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Generator	Miscellaneous (Generator)		4800	Generator main leads
CC steam units	Generator	Miscellaneous (Generator)		4805	Generator Bus Duct Cooling System
CC steam units	Generator	Miscellaneous (Generator)		4810	Generator output breaker
CC steam units	Generator	Miscellaneous (Generator)		4830	Major generator overhaul (720 hours or longer) (use for non-specific overhaul only; see page B-CCGT-2)
CC steam units	Generator	Miscellaneous (Generator)		4831	Minor generator overhaul (less than 720 hours) (use for non-specific overhaul only; see page B-CCGT-2)
CC steam units	Generator	Miscellaneous (Generator)		4840	Inspection
CC steam units	Generator	Miscellaneous (Generator)		4841	Generator dole testing
CC steam units	Generator	Miscellaneous (Generator)		4842	Reactive and capability testing
CC steam units	Generator	Miscellaneous (Generator)		4850	Core monitor alarm
CC steam units	Generator	Miscellaneous (Generator)		4860	Generator neutral grounding equipment
CC steam units	Generator	Miscellaneous (Generator)		4899	Other miscellaneous generator 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>					

## **HEAT RECOVERY STEAM GENERATOR (HRSG)**

**(Waste Heat Boiler)**

<b>TABLE B02-45 Heat Recovery Steam Generator (HRSG): HRSG Boiler Air and Gas Systems - Air Supply</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1400	Forced draft fans

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1401	Forced draft fan dampers
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1407	Forced draft fan lubrication system
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1410	Forced draft fan motors
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1411	Forced draft fan motors - variable speed
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1412	Forced draft fan drives (other than motor)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1415	Forced draft fan controls
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Air Supply	1420	Other forced draft fan problems
CC 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 B02-46 Heat Recovery Steam Generator (HRSG): HRSG Boiler Air and Gas Systems - Miscellaneous (Boiler Air and Gas Systems)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Miscellaneous (Boiler Air and Gas Systems)	1591	Stack damper and linkage
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Air and Gas Systems	Miscellaneous (Boiler Air and Gas Systems)	1592	Stack damper linkage motors
CC 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 B02-47 Heat Recovery Steam Generator (HRSG): HRSG Boiler Control Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC 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)

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1720	Desuperheater/attemperator controls
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1730	Boiler explosion or implosion
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1740	Boiler drum gage glasses / level indicator
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1750	Burner management system
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1760	Feedwater instrumentation (not local controls)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1761	Combustion/Steam condition instrumentation (not local controls)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1762	Desuperheater/attemperator instrumentation (not local controls)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Control Systems		1799	Other boiler instrumentation and control 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) Including instruments which input to the controls.**

**TABLE B02-48 Heat Recovery Steam Generator (HRSG): HRSG Boiler Design Limitations**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Design Limitations		1900	Improper balance between tube sections not due to fouling or plugging
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Design Limitations		1910	Inadequate air not due to equipment 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 B02-49 Heat Recovery Steam Generator (HRSG): HRSG Boiler Fuel Supply - Burners (Duct Burners)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	358	Oil burner piping and valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	359	Gas burner piping and valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	360	Burners
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	361	Burner orifices
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	370	Burner instruments and controls (except light off)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	380	Light off (igniter) systems (including fuel supply)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	385	Igniters
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Burners (Duct Burners)	410	Other burner 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 B02-50 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
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	440	Fuel oil pumps (general)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	441	Fuel oil pumps (burner supply)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	442	Fuel oil pumps (forwarding/transfer)
CC 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
CC 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
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	450	Fuel oil heaters
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	460	Fuel oil atomizers
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Fuel Supply	Oil and Gas Systems (except light off)	470	Oil and gas fires

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CC 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)
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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 B02-51 Heat Recovery Steam Generator (HRSG): HRSG Boiler Internals and Structures**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		800	Drums and drum internals (single drum only)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		801	HP Drum (including drum level trips not attributable to other causes)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		802	IP Drum (including drum level trips not attributable to other causes)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		803	LP Drum (including drum level trips not attributable to other causes)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		810	Boiler supports and structures (use code 1320 for tube supports)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		820	Casing
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		830	Doors
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		840	Refractory and insulation
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		845	Windbox expansion joints
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		847	Other expansion joints
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		848	Inlet panel
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		850	Other internal or structural problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		855	Drum relief/safety valves (single drum only)

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CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		856	HP Drum relief/safety valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		857	IP Drum relief/safety valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Internals and Structures		858	LP Drum relief/safety valves
CC 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 B02-52 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>
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1801	Minor boiler overhaul (less than 720 hours) (use for non-specific overhaul only; see page B-CCGT-2)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1810	Other boiler inspections
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1811	Boiler Inspections - problem identification / investigation
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1812	Boiler Inspections - scheduled or routine
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Overhaul and Inspections		1820	Chemical cleaning/steam blows
<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 B02-53 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - Boiler Recirculation</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	740	Boiler recirculation pumps

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CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	741	Boiler recirculation pumps - motors
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	750	Boiler recirculation piping including downcomers
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	760	Boiler recirculation valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Boiler Recirculation	770	Other boiler recirculation 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 B02-54 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - Feedwater and Blowdown</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	670	Feedwater piping downstream of feedwater regulating valve
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	680	Feedwater valves (not feedwater regulating valve)
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	700	Blowdown system valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	710	Blowdown system piping
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Feedwater and Blowdown	720	Blowdown system controls / instrumentation
CC 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 B02-55 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>

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CC 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
CC 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
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	550	Reheat steam relief/safety valves
CC 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)
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Cold and Hot Reheat Steam	570	Other reheat steam 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 B02-56 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - HRSG Desuperheaters/Attemperators**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6140	HP Desuperheater/attemperator piping - Greater than 600 PSIG.
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6141	HP Desuperheater/attemperator valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6142	HP Desuperheater/attemperator spray nozzles
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6143	HP Desuperheater/attemperator drums
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6144	Other HP desuperheater/attemperator problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6145	IP Desuperheater/attemperator piping - Between 200-600 PSIG
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6146	IP Desuperheater/attemperator valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6147	IP Desuperheater/attemperator spray nozzles
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6148	IP Desuperheater/attemperator drums

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CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6149	Other IP desuperheater/attemperator problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6150	LP Desuperheater/attemperator piping - Less than 200 PSIG
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6151	LP Desuperheater/attemperator valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6152	LP Desuperheater/attemperator spray nozzles
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6153	LP Desuperheater/attemperator drums
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Desuperheaters/Attemperators	6154	Other LP desuperheater/attemperator 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.**

<b>TABLE B02-57 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>
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	500	Main steam piping up to turbine stop valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	510	Main steam relief/safety valves off superheater
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	520	Other main steam valves (including vent and drain valves but not including the turbine stop valves)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	530	Other main steam system problems
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6111	HP steam relief/safety valves
CC 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

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					including the turbine stop valves)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6113	Other HP steam system problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6114	HP steam isolation/boundary valves
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6121	IP steam relief/safety valves
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6123	Other IP steam system problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6124	IP steam isolation/boundary valves
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6131	LP steam relief/safety valves
CC 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 including the turbine stop valves)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6133	Other LP steam system problems
CC 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)
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Main Steam	6135	LP steam isolation/boundary valves

**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 B02-58 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - HRSG Startup Bypass					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC 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
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6161	HP Startup bypass system valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6162	HP Startup bypass tanks or flash tanks
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6163	Other HP startup bypass system problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6164	HP startup bypass instrumentation and controls
CC 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
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6171	IP Startup bypass system valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6172	IP Startup bypass tanks or flash tanks
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6173	Other IP startup bypass system problems
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6174	IP startup bypass instrumentation and controls
CC 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
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6181	LP Startup bypass system valves
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6182	LP Startup bypass tanks or flash tanks
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	HRSG Startup Bypass	6183	Other LP startup bypass system problems
CC 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 B02-59 Heat Recovery Steam Generator (HRSG): HRSG Boiler Piping System - Miscellaneous (Piping)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	775	Economizer piping
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	780	Headers between tube bundles
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	782	Headers and caps
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Piping System	Miscellaneous (Piping)	790	Pipe hangers, brackets, supports (general)
CC 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 B02-60 Heat Recovery Steam Generator (HRSG): HRSG Boiler Tube Leaks**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6005	HP Evaporator tubes
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6006	IP Evaporator tubes
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6007	LP Evaporator tubes
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6010	HP superheater
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6011	HP reheater
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6012	HP economizer
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6020	IP superheater
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6021	IP reheater

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CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6022	IP economizer
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6030	LP reheater
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6031	LP superheater
CC steam units	Heat Recovery Steam Generator (HRSG)	HRSG Boiler Tube Leaks		6032	LP economizer
CC 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 B02-61 Heat Recovery Steam Generator (HRSG): HRSG Boiler Water Condition**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC 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 B02-62 Heat Recovery Steam Generator (HRSG): Miscellaneous (HRSG Boiler)**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		1980	Boiler safety valve test
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		1990	Boiler performance testing (use code 9999 for total unit performance testing)
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous (HRSG Boiler)		1999	Boiler, miscellaneous
CC 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.
CC 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 B02-63 Heat Recovery Steam Generator (HRSG): Miscellaneous HRSG Boiler Tube Problems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1300	Water side fouling
CC 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.
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1310	Water side cleaning (acid cleaning)
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1320	Tube supports/attachments
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1330	Slag fall damage
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1340	Tube modifications (including addition and removal of tubes)
CC steam units	Heat Recovery Steam Generator (HRSG)	Miscellaneous HRSG Boiler Tube Problems		1350	Other miscellaneous boiler tube problems
CC 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 B02-64 Inactive States: Inactive States**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Inactive States	Inactive States		2	Inactive Reserve Shutdown
CC steam units	Inactive States	Inactive States		9990	Retired unit
CC 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 B02-65 Jet Engine: Auxiliary Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
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**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Jet Engine	Auxiliary Systems		5510	Lube oil system
CC steam units	Jet Engine	Auxiliary Systems		5516	Power Augmentation System Equipment
CC steam units	Jet Engine	Auxiliary Systems		5520	Hydraulic oil system
CC steam units	Jet Engine	Auxiliary Systems		5530	Starting system (including motor)
CC steam units	Jet Engine	Auxiliary Systems		5540	Battery and charger system
CC steam units	Jet Engine	Auxiliary Systems		5550	Turning gear and motor
CC steam units	Jet Engine	Auxiliary Systems		5551	Load gear compartment
CC steam units	Jet Engine	Auxiliary Systems		5560	Cooling and seal air system
CC steam units	Jet Engine	Auxiliary Systems		5570	Cooling water system
CC steam units	Jet Engine	Auxiliary Systems		5580	Anti-icing system
CC 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 B02-66 Jet Engine: Exhaust Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Jet Engine	Exhaust Systems		5500	Chamber
CC steam units	Jet Engine	Exhaust Systems		5501	Hoods
CC steam units	Jet Engine	Exhaust Systems		5502	Vanes/nozzles
CC steam units	Jet Engine	Exhaust Systems		5503	Silencer
CC steam units	Jet Engine	Exhaust Systems		5504	Cones
CC steam units	Jet Engine	Exhaust Systems		5505	Diverter Dampers
CC steam units	Jet Engine	Exhaust Systems		5508	High engine exhaust temperature
CC steam units	Jet Engine	Exhaust Systems		5509	Other exhaust problems (including high exhaust 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 B02-67 Jet Engine: Fuel, Ignition, and Combustion Systems**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5440	Fuel tanks
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5441	Fuel piping and valves
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5442	Fuel nozzles/vanes

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5443	Fuel filters
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5444	Liquid fuel oil pump
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5445	Liquid fuel oil transfer/forwarding pump
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5446	Liquid fuel purge system
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5447	Gas fuel system including controls and instrumentation
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5449	Other fuel system problems
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5450	Ignition system
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5451	Pilot fuel piping and valves
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5452	Pilot fuel nozzles/vanes
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5453	Pilot fuel filters
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5454	Water injection system
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5455	Fuel nozzle/vane cooling air system
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5460	Atomizing air system
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5470	Combustor casing
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5471	Combustor liner
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5472	Combustor caps
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5473	Flame scanners
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5474	Flashback (including instrumentation)
CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5475	Blade path temperature spread

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Jet Engine	Fuel, Ignition, and Combustion Systems		5479	Other combustor 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 B02-68 Jet Engine: Inlet Air System and Compressors - Compressors**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5410	High pressure shaft
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5411	High pressure bearings
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5412	High pressure blades/buckets
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5413	Other high pressure problems
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5414	Compressor diaphragms/vanes
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5420	Low pressure shaft
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5421	Low pressure bearings
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5422	Low pressure blades/buckets
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5429	Other low pressure problems
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5430	Supercharging fans
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5435	Compressor washing
CC steam units	Jet Engine	Inlet Air System and Compressors	Compressors	5436	Compressor shaft and bearings for two-shaft machines
CC 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 B02-69 Jet Engine: Inlet Air System and Compressors - Ducts and Filters**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5400	Inlet air ducts
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5401	Inlet air vanes/nozzles
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5402	Inlet air filters
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5403	Inlet and exhaust cones
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5404	Inlet air chillers
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5405	Inlet air evaporative coolers
CC steam units	Jet Engine	Inlet Air System and Compressors	Ducts and Filters	5406	Inlet air foggers
CC 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 B02-70 Jet Engine: Miscellaneous (Jet Engine)**

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5600	Reduction gear
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5601	Load shaft and bearings
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5605	Main coupling between the turbine and generator
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5606	Clutch
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5610	Intercoolers
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5620	Regenerators
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5630	Heat shields
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5640	Fire detection and extinguishing system
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5641	Fire in unit
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5645	Jet Engine Control System - data highway
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5646	Jet Engine Control System - hardware problems (including card failure)
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5647	Jet Engine Control System - internal and termination wiring
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5648	Jet Engine Control System - logic problems
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5649	Jet Engine Control System - upgrades
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5650	Other controls and instrumentation problems
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5660	Major overhaul (use for non-specific overhaul only; see page B-CCGT-2)
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5661	Engine/compressor washing
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5662	Engine exchange
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5665	Engine shafts and bearings
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5670	Hot end inspection
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5672	Boroscope inspection
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5674	General unit inspection
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5680	Vibration (not engine) in unit not attributable to bearings or other components
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5685	Engine vibration
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5686	Jet engine lockout

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5690	Engine performance testing - individual engines (use code 9999 for total unit performance testing)
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5692	Turbine Overspeed Trip Test - Jet Engine
CC steam units	Jet Engine	Miscellaneous (Jet Engine)		5695	Synchronous condenser equipment
CC 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 B02-71 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>
CC steam units	Jet Engine	Turbine		5480	High pressure shaft
CC steam units	Jet Engine	Turbine		5481	High pressure bearings
CC steam units	Jet Engine	Turbine		5482	High pressure blades/buckets
CC steam units	Jet Engine	Turbine		5483	High pressure nozzles/vanes
CC steam units	Jet Engine	Turbine		5484	High pressure casing/expansion joint
CC steam units	Jet Engine	Turbine		5485	Interstage gas passages
CC steam units	Jet Engine	Turbine		5486	High pressure shaft seals
CC steam units	Jet Engine	Turbine		5487	Thrust bearing
CC steam units	Jet Engine	Turbine		5489	Other high pressure problems
CC steam units	Jet Engine	Turbine		5490	Low pressure shaft
CC steam units	Jet Engine	Turbine		5491	Low pressure bearings
CC steam units	Jet Engine	Turbine		5492	Low pressure blades/buckets
CC steam units	Jet Engine	Turbine		5493	Low pressure nozzles/vanes
CC steam units	Jet Engine	Turbine		5494	Low pressure casing/expansion joints
CC steam units	Jet Engine	Turbine		5497	Other low pressure problems
CC steam units	Jet Engine	Turbine		5498	Expansion joints
CC steam units	Jet Engine	Turbine		5499	Shaft seals
<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) Use HP if only one.</b>					

## MISCELLANEOUS

<b>TABLE B02-72 Miscellaneous: Instruments and Controls</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>



Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes

CC 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.)
<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>					

## PERFORMANCE

TABLE B02-73 Performance: Performance					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Performance	Performance		9997	NERC Reliability Standard Requirement
CC steam units	Performance	Performance		9998	Black start testing
CC steam units	Performance	Performance		9999	Total unit performance testing (use appropriate codes for individual component testing)
<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>					

## PERSONNEL OR PROCEDURAL ERRORS

TABLE B02-74 Personnel or Procedural Errors: Personnel or Procedural Errors					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9900	Operator error
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9910	Maintenance personnel error
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9920	Contractor error
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9930	Operating procedure error
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9940	Maintenance procedure error
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9950	Contractor procedure error
CC steam units	Personnel or Procedural Errors	Personnel or Procedural Errors		9960	Staff shortage
<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>					

## POLLUTION CONTROL EQUIPMENT

TABLE B02-75 Pollution Control Equipment: CO Reduction					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Pollution Control Equipment	CO Reduction		8840	CO Active catalyst
CC steam units	Pollution Control Equipment	CO Reduction		8841	CO Support materials
CC steam units	Pollution Control Equipment	CO Reduction		8842	CO Plugging
CC steam units	Pollution Control Equipment	CO Reduction		8845	Other CO reduction 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 B02-76 Pollution Control Equipment: Continuous Emissions Monitoring Systems (CEMS)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8700	CEMS Certification and Recertification
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8710	SO2 analyzer problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8720	NOx analyzer problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8730	CO analyzer problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8740	CO2 analyzer problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8750	O2 analyzer problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8760	Opacity monitor problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8770	Flow monitor problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8780	Data acquisition system problems
CC steam units	Pollution Control Equipment	Continuous Emissions Monitoring Systems (CEMS)		8790	Miscellaneous CEMS 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 B02-77 Pollution Control Equipment: NOx Reduction Systems - Catalytic Air Heaters					
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Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8830	CAH NOx Active catalyst
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8831	CAH NOx Support materials
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8832	CAH NOx Plugging
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Catalytic Air Heaters	8835	Other CAH 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 B02-78 Pollution Control Equipment: NOx Reduction Systems - Selective Catalytic Reduction Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8810	SCR NOx Reactor
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8811	SCR NOx Reagent
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8812	SCR NOx Catalyst
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8813	SCR NOx Injection grid piping/valves
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8814	SCR NOx Catalyst support material
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8815	SCR NOx Soot blowers
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8816	SCR NOx Plugging
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8817	SCR NOx Control system
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8820	SCR NOx Ammonia injection grid piping/valves
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8821	SCR NOx Ammonia tanks, piping and valves (not injection)
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8822	SCR NOx Ammonia air blowers
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8823	SCR NOx Other ammonia system problems
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Catalytic Reduction Systems	8825	Other SCR NOx 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 B02-79 Pollution Control Equipment: NOx Reduction Systems - Selective Non-Catalytic Reduction Systems					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8800	SNCR NOx Reagent
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8801	SNCR NOx Carrier gas
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8802	SNCR NOx Control system
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8803	SNCR Performance Testing
CC steam units	Pollution Control Equipment	NOx Reduction Systems	Selective Non-Catalytic Reduction Systems	8809	Other SNCR NOx 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) Use code 0360 for Low NOx Burners.</b>					

## 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 B02-80 Regulatory, Safety, Environmental: Other Operating Environmental Limitations					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9660	Thermal discharge limits - fossil and nuclear
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9663	Thermal discharge limits - gas turbines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9664	Thermal discharge limits - jet engines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9670	Noise limits (not for personnel safety) - fossil and nuclear
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9673	Noise limits (not for personnel safety) - gas turbines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9674	Noise limits (not for personnel safety) - jet engines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9677	Noise limits testing - fossil

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CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9678	Noise limits testing - gas turbines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9679	Noise limits testing - jet engines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9680	Fish kill - fossil and nuclear
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9683	Fish kill - gas turbines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9684	Fish kill - jet engines
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9690	Other miscellaneous operational environmental limits - fossil and nuclear
CC steam units	Regulatory, Safety, Environmental	Other Operating Environmental Limitations		9693	Other miscellaneous operational environmental limits - gas turbines
CC 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 B02-81 Regulatory, Safety, Environmental: Regulatory**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Regulatory, Safety, Environmental	Regulatory		9504	Regulatory (environmental) proceedings and hearings - regulatory agency initiated
CC steam units	Regulatory, Safety, Environmental	Regulatory		9506	Regulatory (environmental) proceedings and hearings - intervenor initiated
CC steam units	Regulatory, Safety, Environmental	Regulatory		9510	Plant modifications strictly for compliance with new or changed regulatory requirements (scrubbers, cooling towers, etc.)
CC steam units	Regulatory, Safety, Environmental	Regulatory		9520	Oil spill in Gulf of Mexico (OMC)
CC 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

Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes

					factor contributed to the primary cause of the event)
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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 B02-82 Regulatory, Safety, Environmental: Safety**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Regulatory, Safety, Environmental	Safety		9700	OSHA-related retrofit or inspection
CC 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 B02-83 Regulatory, Safety, Environmental: Stack Emission**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9600	SO2 stack emissions - fossil
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9603	SO2 stack emissions - gas turbines
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9604	SO2 stack emissions - jet engines
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9610	NOx stack emissions - fossil
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9613	NOx stack emissions - gas turbines
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9614	NOx stack emissions - jet engines
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9616	CO stack emissions - fossil
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9620	Particulate stack emissions - fossil
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9623	Particulate stack emissions - gas turbines
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9624	Particulate stack emissions - jet engines

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CC steam units	Regulatory, Safety, Environmental	Stack Emission		9630	Opacity - fossil
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9633	Opacity - gas turbines
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9634	Opacity - jet engines
CC 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)
CC 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)
CC 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)
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9656	Other stack or exhaust emissions testing - fossil
CC steam units	Regulatory, Safety, Environmental	Stack Emission		9657	Other stack or exhaust emissions testing - gas turbines
CC 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 B02-84 Steam Turbine: Controls					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Steam Turbine	Controls		4290	Hydraulic system pumps

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CC steam units	Steam Turbine	Controls		4291	Hydraulic system coolers
CC steam units	Steam Turbine	Controls		4292	Hydraulic system filters
CC steam units	Steam Turbine	Controls		4293	Hydraulic system pipes and valves
CC steam units	Steam Turbine	Controls		4299	Other hydraulic system problems
CC steam units	Steam Turbine	Controls		4300	Turbine supervisory system (use codes 4290 to 4299 for hydraulic oil)
CC steam units	Steam Turbine	Controls		4301	Turbine governing system
CC steam units	Steam Turbine	Controls		4302	Turbine trip devices (including instruments)
CC steam units	Steam Turbine	Controls		4303	Exhaust hood and spray controls
CC steam units	Steam Turbine	Controls		4304	Automatic turbine control systems - mechanical
CC steam units	Steam Turbine	Controls		4305	Automatic turbine control systems - mechanical - hydraulic
CC steam units	Steam Turbine	Controls		4306	Automatic turbine control systems - electro-hydraulic - analog
CC steam units	Steam Turbine	Controls		4307	Automatic turbine control systems - electro-hydraulic - digital
CC steam units	Steam Turbine	Controls		4308	Automatic turbine control systems - digital control and monitoring
CC steam units	Steam Turbine	Controls		4309	Other turbine instrument and control problems
CC steam units	Steam Turbine	Controls		4310	Steam Turbine Control System - data highway
CC steam units	Steam Turbine	Controls		4311	Steam Turbine Control System - hardware problems (including card failure)
CC steam units	Steam Turbine	Controls		4312	Steam Turbine Control System - internal and termination wiring
CC steam units	Steam Turbine	Controls		4313	Steam Turbine Control System - logic problems
CC 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 B02-85 Steam Turbine: High Pressure Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Steam Turbine	High Pressure Turbine		4000	Outer casing



**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Steam Turbine	High Pressure Turbine		4001	Inner casing
CC steam units	Steam Turbine	High Pressure Turbine		4009	Nozzle bolting
CC steam units	Steam Turbine	High Pressure Turbine		4010	Nozzles and nozzle blocks
CC steam units	Steam Turbine	High Pressure Turbine		4011	Diaphragms
CC steam units	Steam Turbine	High Pressure Turbine		4012	Buckets or blades
CC steam units	Steam Turbine	High Pressure Turbine		4013	Diaphragms unit and shroud type
CC steam units	Steam Turbine	High Pressure Turbine		4014	Bucket or blade fouling
CC steam units	Steam Turbine	High Pressure Turbine		4015	Wheels or spindles
CC steam units	Steam Turbine	High Pressure Turbine		4020	Shaft seals
CC steam units	Steam Turbine	High Pressure Turbine		4021	Dummy rings
CC steam units	Steam Turbine	High Pressure Turbine		4022	Gland rings
CC steam units	Steam Turbine	High Pressure Turbine		4030	Rotor shaft
CC steam units	Steam Turbine	High Pressure Turbine		4040	Bearings
CC steam units	Steam Turbine	High Pressure Turbine		4041	Thrust bearings
CC 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 B02-86 Steam Turbine: Intermediate Pressure Turbine**

UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4100	Outer casing
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4101	Inner casing
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4109	Nozzle bolting
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4110	Nozzles and nozzle blocks
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4111	Diaphragms
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4112	Buckets or blades
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4113	Bucket or blade fouling
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4115	Wheels or spindles
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4120	Shaft seals
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4121	Dummy rings
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4122	Gland rings
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4130	Rotor shaft
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4140	Bearings
CC steam units	Steam Turbine	Intermediate Pressure Turbine		4141	Thrust bearings
CC 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 B02-87 Steam Turbine: Low Pressure Turbine					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Steam Turbine	Low Pressure Turbine		4200	Outer casing
CC steam units	Steam Turbine	Low Pressure Turbine		4201	Inner casing
CC steam units	Steam Turbine	Low Pressure Turbine		4209	Nozzle bolting
CC steam units	Steam Turbine	Low Pressure Turbine		4210	Nozzles and nozzle blocks
CC steam units	Steam Turbine	Low Pressure Turbine		4211	Diaphragms
CC steam units	Steam Turbine	Low Pressure Turbine		4212	Buckets or blades
CC steam units	Steam Turbine	Low Pressure Turbine		4213	Bucket or blade fouling
CC steam units	Steam Turbine	Low Pressure Turbine		4215	Wheels or spindles
CC steam units	Steam Turbine	Low Pressure Turbine		4220	Shaft seals
CC steam units	Steam Turbine	Low Pressure Turbine		4221	Dummy rings
CC steam units	Steam Turbine	Low Pressure Turbine		4222	Gland rings
CC steam units	Steam Turbine	Low Pressure Turbine		4230	Rotor shaft
CC steam units	Steam Turbine	Low Pressure Turbine		4240	Bearings
CC steam units	Steam Turbine	Low Pressure Turbine		4241	Thrust bearings
CC steam units	Steam Turbine	Low Pressure Turbine		4250	Other low pressure 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 B02-88 Steam Turbine: Lube Oil					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC steam units	Steam Turbine	Lube Oil		4280	Lube oil pumps
CC steam units	Steam Turbine	Lube Oil		4281	Lube oil coolers
CC steam units	Steam Turbine	Lube Oil		4282	Lube oil conditioners
CC steam units	Steam Turbine	Lube Oil		4283	Lube oil system valves and piping
CC steam units	Steam Turbine	Lube Oil		4284	Lube oil pump drive
CC 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>					

TABLE B02-89 Steam Turbine: Miscellaneous (Steam Turbine)					
UNIT TYPE	SYSTEM	COMPONENT	SUB-COMPONENT	CAUSE CODE	DESCRIPTION
CC 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)

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4401	Inspection
CC 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)
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4410	Turning gear and motor
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4411	Steam turbine gear box (single shaft configuration)
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4412	Steam turbine clutch (single shaft configuration)
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4415	Shaft coupling mechanism
CC 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)
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4430	Gland seal system
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4450	Water induction
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4460	Turbine overspeed trip test
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4470	Differential expansion
CC steam units	Steam Turbine	Miscellaneous (Steam Turbine)		4490	Turbine performance testing (use code 9999 for total unit performance testing)
CC 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>					

<b>TABLE B02-90 Steam Turbine: Piping</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Steam Turbine	Piping		4270	Crossover or under piping
CC 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>					

<b>TABLE B02-91 Steam Turbine: Valves</b>					
<b>UNIT TYPE</b>	<b>SYSTEM</b>	<b>COMPONENT</b>	<b>SUB-COMPONENT</b>	<b>CAUSE CODE</b>	<b>DESCRIPTION</b>
CC steam units	Steam Turbine	Valves		4260	Main stop valves
CC steam units	Steam Turbine	Valves		4261	Control valves
CC steam units	Steam Turbine	Valves		4262	Intercept valves
CC steam units	Steam Turbine	Valves		4263	Reheat stop valves

**Appendix B02: Index to Combined Cycle Steam Turbine Unit Cause Codes**

CC steam units	Steam Turbine	Valves		4264	Combined intercept valves
CC steam units	Steam Turbine	Valves		4265	Miscellaneous drain and vent valves
CC steam units	Steam Turbine	Valves		4266	Main stop valve testing
CC steam units	Steam Turbine	Valves		4267	Control valve testing
CC steam units	Steam Turbine	Valves		4268	Reheat/intercept valve testing
CC steam units	Steam Turbine	Valves		4269	Other turbine valves (including LP steam admission valves)

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