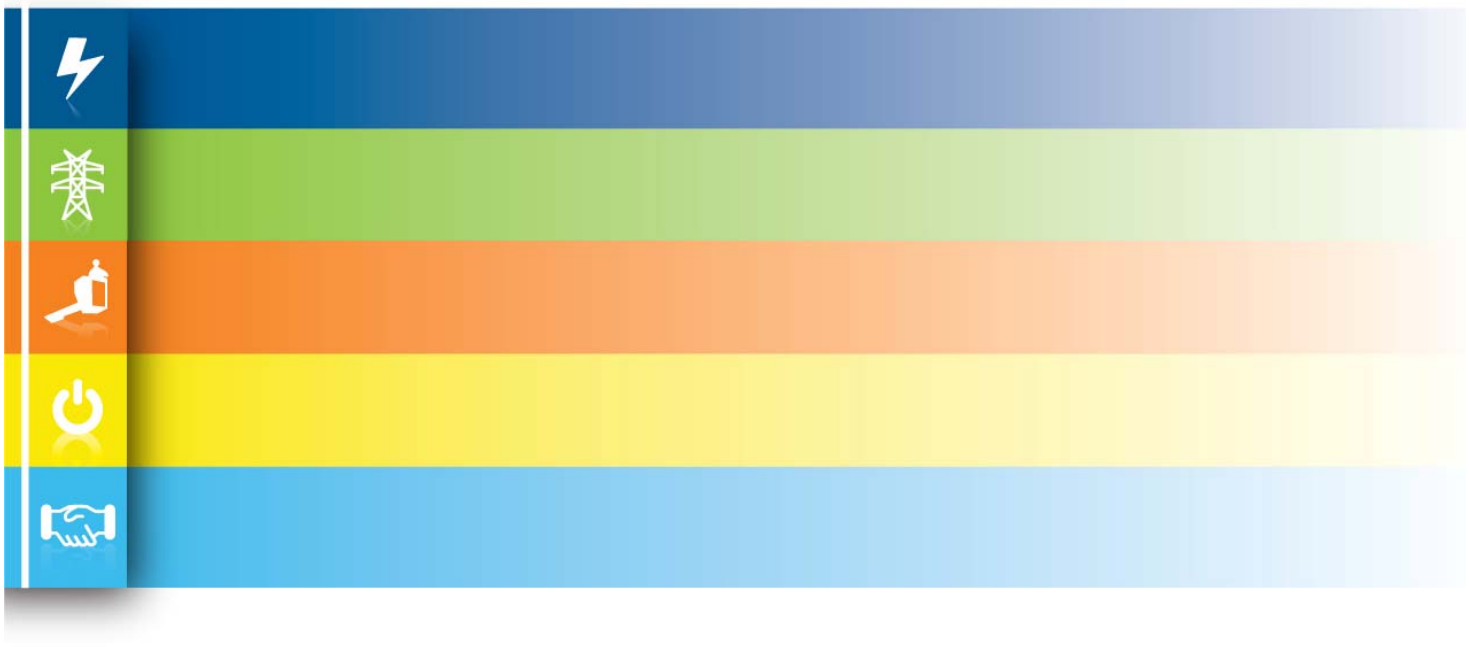
Canadian Electricity Association | Association canadienne de l'électricité

2007

GENERATION EQUIPMENT STATUS

ANNUAL REPORT

EQUIPMENT RELIABILITY INFORMATION SYSTEM



Acknowledgements

The Canadian Electricity Association gratefully acknowledges the support of the participant utilities whose data was used in the preparation of this report. We also wish to thank the Generation Consultative Committee on Outage Statistics (CCOS) and in particular its' new chair Joe Renna (Ontario Power Generation) and its' past Chair, Dr. Roy Billinton (University of Saskatchewan), for their support and guidance throughout the year.

Canadian Electricity Association
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EXECUTIVE SUMMARY

- The 2007 Generation Equipment Status report contains information on the performance of Electrical Generating Units in Canada
- Information from this report can be used by utility companies for benchmarking Generating Unit performance, to make decisions regarding new Generating Unit Construction and existing Unit upgrades and to focus resources for maintenance programs and system planning in order to **maximize performance**
- In 2007, information was provided by participating utilities on
    - 456 Hydraulic Units resulting in total forced outage time of 8.4 years
    - 80 Fossil Units(Coal, Oil, Natural Gas) resulting in total forced outage time of 3.3 years
    - 29 Combustion Turbine Units resulting in total forced outage time of 109 days
    - 11 Nuclear Units resulting in total forced outage time of 1.7 years
- Key causes of forced outages and deratings for Generating Units in 2007 include:
    - Hydraulic Units – (1)Telecom and Communications, (2) Excitation
    - Fossil Units – (1) Waterwalls, (2) Superheater
    - Combustion Turbine Units – (1) Combustion Turbine, (2) Controls and Instrumentation
    - Nuclear – (1) Reactor Reactivity Control Units, (2) Main Heat Transport Circuit
- Top performers by Incapability Factor (Total Equivalent Outage Time/Total Unit Hours) are:
    - Hydraulic - Kelsey (Manitoba Hydro)
    - Fossil – Point Tupper (Nova Scotia Power)
    - Combustion Turbine – Tufts Cove (Nova Scotia Power)
    - Nuclear – Darlington (Ontario Power Generation)
- Top performers by Operating Factor (Total Operating Time/Total Unit Hours) are:
    - Hydraulic – Charlot River (SaskPower)
    - Fossil – Point Tupper (Nova Scotia Power)
    - Combustion Turbine – Fort Nelson Gas (BC Hydro)
    - Nuclear – Darlington (Ontario Power Generation)
- 5 Year data trends indicate the following:
    - Hydraulic –Increase of 78% over 5 years in average forced outage duration
    - Fossil – 25% steady decrease in forced outages due to components in Steam Generation Facilities over 5 years
    - Combustion Turbine – Experiencing a decrease in use although available over 5 year period
    - Nuclear – Significant increase of 139% over 5 years in average forced outage duration

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1. INTRODUCTION

The Canadian Electricity Association (CEA) was founded in 1891 and is the voice of the Canadian electricity industry, promoting electricity as the critical enabler of the economy and Canadians' expectations for an enhanced quality of life. A safe, secure, reliable, sustainable and competitively priced supply of electricity is essential to Canada's prosperity. This 2007 Generation Equipment Status Reports contains information that feeds directly into the "reliable" portion of CEA's Mission.

Scope:

This report is the thirty-first annual report on Generating Unit performance in Canada and includes statistics for commercial generating units in Canada of the following specifications:

- Combustion Turbine units with a Maximum Continuous Rating (MCR) > 1 MW
- Fossil units with MCR > 60 MW
- Hydraulic units with MCR > 5 MW
- Nuclear units with MCR > 200 MW
- Fossil units including Coal, Oil and Natural Gas

Use of Information:

Information from this report can be used by utility companies to

- benchmark Generating Unit performance
- make decisions regarding new Generating Unit Construction
- make decisions regarding existing Unit upgrades
- focus resources for maintenance programs and system planning

The goal of using the information is to maximize Generating Unit performance within a company's financial and logistical constraints.

Contributors:

The publication of this report would not be possible without the data contribution of member utilities. These members include:

ATCO Power
BC Hydro
Churchill Falls (Labrador Corp)
EPCOR
FortisBC
Manitoba Hydro
New Brunswick Power
Newfoundland & Labrador Hydro
Nova Scotia Power
Ontario Power Generation
RioTinto Alcan
SaskPower
TransAlta Utilities Corporation

The utilities listed above receive a copy of the report contained herein as well as Summary Statistics for generating unit performance for all participating utilities.

History:

In 1975, the CEA adopted a proposal to create a system for the centralized collection, processing and reporting of reliability and outage statistics for electrical generation, transmission and distribution equipment. To coordinate the development of this system, CEA constituted the Consultative Committee on Outage Statistics (CCOS). In 2007, after many distinguished years of service, Dr. Roy Billinton stepped down as the Chair of this committee although he still participates in the program. Through the work for Dr. Billinton and the CCOS committee, statistics have been generated for the electricity system that have been adopted world-wide. The current chair of the Generation – CCOS program is Joe Renna of Ontario Power Generation. The mission and vision of CCOS are as follows:

Mission:

Provide a comprehensive database of component and system reliability and performance data which will assist member utilities in the optimal utilitization of corporate and financial resources.

Vision:

To be recognized as a world-class reliability database which meets the needs of its member utilities.

2. DATABASE OVERVIEW

CEA has been collecting performance data for Canadian generating units from participating utilities since 1978. This database of information is used to produce this annual report. There is a wealth of information stored in the database including:

- Performance data on over 1000 generating units
- Details of over 7000 equipment components
- Fuel types including hydraulic, fossil, combustion turbine, internal combustion and nuclear
- Details about individual generating units including manufacturers, Maximum Continuous Ratings (MCRs), ages
- Design information including speeds, ratings, temperatures, insulation types, pressures, capacities, diameters
- Component information for fans, pumps, condensers, boilers, generators, turbine reactors

Participating utilities monitor every change in state including:

- normal operation
- derated states – including forced and scheduled
- outage states – including forced and scheduled
- available but not operating

More details about the states monitored can be found in section 4, Definition of Terms, Table of State and Time Codes.

The collection of this data follows a common set of definitions that has been accepted as the global industry standard for over 20 years. This data is reported to CEA annually and CEA follows a rigorous validation process for monitoring data quality to ensure that this report is of a high standard.

To date the database contains over 5,000,000 events.

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3. INDIVIDUAL GENERATING UNIT PERFORMANCE

The tables in this section list the generating units of each type which experienced the lowest Incapability Factors (ICbF) and the highest Operating Factors in the 2007 calendar year.

Table 1A – Hydraulic Units by ICbF with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated by	ICbF (%)
1	Kelsey	3	Manitoba Hydro	0.00
2	Waterloo	1	SaskPower	0.01
3	Kelsey	7	Manitoba Hydro	0.02
4	Charlot River	1	SaskPower	0.02
5	Charlot River	2	SaskPower	0.02
6	Alexander	2	Ontario Power Generation	0.04
7	Kettle	2	Manitoba Hydro	0.07
8	Seven Sisters	6	Manitoba Hydro	0.07
9	Des Joachims	4	Ontario Power Generation	0.08
10	Alexander	4	Ontario Power Generation	0.08

Table 1B – Hydraulic Units by Operating Factor with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated by	Op Fact (%)
1	Charlot River	3	SaskPower	99.98
2	Charlot River	1	SaskPower	99.98
3	Island Falls	7	SaskPower	99.85
4	Seven Sisters	1	Manitoba Hydro	99.81
5	Island Falls	2	SaskPower	99.77
6	Kemano	2	Alcan West	99.72
7	Kemano	2	Alcan West	99.68
8	Nipawin	6	SaskPower	99.6
9	Seven Sisters	4	Manitoba Hydro	99.56
10	Kelsey	4	Manitoba Hydro	99.52

Table 2A – Fossil Units by ICbF with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated by	ICbF (%)
1	Point Tupper	2	Nova Scotia Power	1.53
2	Boundary Dam	4	SaskPower	2.42
3	Genesee	2	EPCOR	2.92
4	Keephills	1	TransAlta	3.53
5	Sheerness	2	ATCO Power	3.66
6	Lingan	1	Nova Scotia Power	4.53
7	Keephills	2	TransAlta	4.63
8	Sundance	6	TransAlta	5.47
9	Genesee	1	EPCOR	5.78
10	Sundance	3	TransAlta	5.85

Table 2B – Fossil Units by Operating Factor with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated by	Op Fact (%)
1	Point Tupper	2	Nova Scotia Power	98.92
2	Boundary Dam	4	SaskPower	98.48
3	Genesee	2	EPCOR	97.5
4	Sundance	6	TransAlta	97.29
5	Keephills	1	TransAlta	97.09
6	Sheerness	1	ATCOPower	96.7
7	Keephills	2	TransAlta	96.41
8	Boundary Dam	2	SaskPower	95.53
9	Lingan	1	Nova Scotia Power	95.47
10	Genesee	1	EPCOR	95.41

Table 3A – Combustion Turbine Units by ICbF with Operating Time more than 100 hrs

Ranking	Plant Name	Unit #	Operated by	ICbF (%)
1	Tufts Cove	4	Nova Scotia Power	1.16
2	Tufts Cove	5	Nova Scotia Power	1.31
3	Fort Nelson	1	BCHydro	3.44
4	Meadow Lake	1	SaskPower	3.72
5	Brandon CT	7	Manitoba Hydro	5.61

Table 3B – Combustion Turbine Units by Operating Factor with Operating Time more than 100 hrs

Ranking	Plant Name	Unit #	Operated by	Op Fact (%)
1	Fort Nelson	1	BCHydro	96.71
2	Tufts Cove	5	Nova Scotia Power	34.81
3	Tufts Cove	4	Nova Scotia Power	31.52
4	Landis	1	SaskPower	7.34
5	Prince Rupert	1	BCHydro	6.62

Table 4A – Nuclear Units by ICbF with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated by	ICbF (%)
1	Darlington	1	Ontario Power Generation	1.65
2	Darlington	3	Ontario Power Generation	5.23
3	Pickering NGSB	8	Ontario Power Generation	13.38
4	Darlington	2	Ontario Power Generation	16.62
5	Pickering NGSB	7	Ontario Power Generation	17.89

Table 4B – Nuclear Units by Operating Factor with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated by	Op Fact (%)
1	Darlington	1	Ontario Power Generation	98.70
2	Darlington	3	Ontario Power Generation	94.89
3	Pickering NGSB	8	Ontario Power Generation	91.50
4	Pickering NGSB	7	Ontario Power Generation	86.07
5	Point Lepreau	1	New Brunswick Power	85.56

4. Definition of Terms

Generating Unit: all equipment up to the high voltage terminals of the generator transformer and the station service transformers.

Maximum Continuous Rating (MCR): the gross maximum electrical output (in megawatts) which a generating unit has been designed for and/or shown by acceptance test to be capable of producing continuously.

The definitions of outages, deratings, states and times are reproduced here from the Instruction Manual on Generation Equipment Status.

4.1 Definition of Outages and Deratings

Forced Outage: the occurrence of a component failure or other condition which requires that the generating unit be removed from service immediately or up to and including the very next weekend.

There are 4 types of Forced Outages:
1. **Sudden Forced Outage**: the occurrence of a component failure or other condition which results in the unit being automatically or manually tripped.
2. **Immediately Deferrable Forced Outage**: the occurrence of a component failure or other condition which requires that the unit be removed from service within 10 minutes.
3. **Deferrable Forced Outage**: the occurrence of a component failure or other condition which requires that the unit be removed from service from 10 minutes up to and including the very next weekend.
4. **Starting-Failure Outage**: the unsuccessful attempt to bring a unit from a shutdown state to synchronism with the electric system within a specified time interval. (The specified time interval may be different for individual units and should allow a reasonable time for the unit to pick up load.) This definition is most commonly associated with stand-by and peak units. *Note: repeated failures to start for the same cause without accomplishing corrective repairs are counted as one failure and the repeated attempts at starting are counted as a single attempt.*

Maintenance Outage: the removal of a generating unit from service to perform work on specific components which could have been postponed past the very next weekend. This is work done to prevent a potential forced outage and which could not be postponed from season to season.

Planned Outage: the removal of a generating unit from service for inspection and/or general overhaul of one or more major equipment groups. This work is usually scheduled well in advance (e.g. annual boiler overhaul, five-year turbine overhaul).

Forced Derating: a reduction (below MCR) of generating unit capacity in excess of 2% of its MCR resulting from a component failure or other condition which requires that the generating unit be derated at once or as soon as possible up to and including the very next weekend.

Scheduled Derating: a reduction (below MCR) of generating unit capacity in excess of 2% of its MCR resulting from a planned or maintenance outage of a piece of equipment.

4.2 Definition of States, (State Codes)

Operating State, (11): the generating unit is spinning and/or synchronized with the system and is capable of operating at MCR under normal operating procedures.

Operating under a Forced Derating, (12): the generating unit is spinning and/or synchronized with the system but not capable of carrying its MCR due to a forced derating being in effect.

Operating under a Scheduled Derating, (13): the generating unit is spinning and/or synchronized with the system but not capable of carrying its MCR due to a scheduled derating being in effect.
Available But Not Operating State, (14): the generating unit can carry its MCR but is not being operated to supply system load.

Available But Not Operating - Forced Derating State, (15): the generating unit can deliver only part of its MCR due to a forced derating but is not being operated to supply system load.

Available But Not Operating - Scheduled Derating State, (16): the generating unit can deliver only part of its MCR due to a
scheduled derating but it is not being operated to supply system load.

Forced Outage State, (21): the generating unit has a forced outage which requires that it be removed from service.

Forced Extension of a Maintenance Outage State, (22): the generating unit has an outage resulting from a condition discovered during a maintenance outage which has forced the extension of the maintenance outage.

Forced Extension of a Planned Outage State, (23): the generating unit has an outage resulting from a condition discovered during a planned outage which has forced the extension of the planned outage.

Maintenance Outage State, (24): the generating unit has a maintenance outage which requires that it be removed from service.

Planned Outage State, (25): the generating unit has a planned outage which requires that it be removed from service.

Not in Commercial Service State, (30): the generating unit is decommissioned, mothballed, or on a prolonged outage to make modifications that will alter its performance beyond the original design and/or provide life extension through rehabilitation. The type codes associated with this state are:

1 - Decommissioned
2 - Mothballed
3 - Refurbishment
4 - Deferred

Operating as a Synchronous Condenser/Spin No-Load: The above state codes can also be used to identify the various modes of synchronous condenser or spin no-load (spinning reserve at 0 MW) operation as follows:

STATE OF THE TURBINE	STATE CODE OF THE UNIT
Spin No-Load	
De-Coupled (hydraulic units only)	11, 12, 13
Synchronous Condenser	
Coupled	11, 12, 13
Unbolted or declutched but available	14, 15, 16
Unbolted or declutched but not available	21,22,23,24, 25

4.3 Definition of Times

O: the number of hours the generating unit was in the Operating State during the period.

O(FD): the number of hours the generating unit was operating under a Forced Derating during the period.

O(SD): the number of hours the generating unit was operating under a Scheduled Derating during the period.

ABNO: the number of hours the generating unit was in the Available But Not Operating State.

ABNO(FD): the number of hours the generating unit was in the Available But Not Operating - Forced Derating State.

ABNO(SD): the number of hours the generating unit was in the Available But Not Operating - Scheduled Derating State.

FO: the number of hours the generating unit was in a Forced Outage State.

FEMO: the number of hours the generating unit was in a Forced Extension of a Maintenance Outage State.

FEPO: the number of hours the generating unit was in a Forced Extension of a Planned Outage State.

MO: the number of hours the generating unit was in the Maintenance Outage State.

PO: the number of hours the generating unit was in the Planned Outage State.

Table of State and Time Codes
(Summary of Section 4.2 and 4.3)

States	State Codes	Duration (hours)
Available States:		
Operating	11	O
Operating under a Forced Derating	12	O(FD)
Operating under a Scheduled Derating	13	O(SD)
Available But Not Operating	14	ABNO
Available But Not Operating – Forced Derating	15	ABNO(FD)
Available But Not Operating – Scheduled Derating	16	ABNO(SD)
Not-Available States:		
Forced Outage	21	FO
Forced Extension of Maintenance Outage	22	FEMO
Forced Extension of Planned Outage	23	FEPO
Maintenance Outage	24	MO
Planned Outage	25	PO
Not-in-Commercial Service	30	NICS

The Concept of Adjusted Time:
To take into account the derated levels of a generating unit, the operating time at these levels is transformed into an equivalent outage time. Thus, the time of X% of MCR, called O(FD)x, is converted to an equivalent outage time, called O(FD)adj according to the transformation.

$$O(FD)adj = \left(\frac{100 - X}{100}\right) O(FD)x$$

For example, if a generating unit is derated to 80 percent of its MCR for 5 hours, that would be equivalent to a full outage of the generating unit for 1 hour. O(SD), ABNO(FD) and ABNO(SD) are treated in the same manner.

4.4 Definition of Headings Used on the Tables of Sections 5 and 6

4.4.1 Column Headings

UNIT YEARS (A): the number of Unit Hours divided by 8760. The number of Unit Hours is the sum of the durations of all states (i.e. O + O(FD) + O(SD) + ABNO + ABNO(FD) + ABNO(SD) + FO + FEMO + FEPO + MO + PO) of the generating units being considered.

ABNOF (%): the Available But Not Operating Factor. It is calculated by dividing ABNO + ABNO(FD) + ABNO(SD) by Unit Hours times 100.

OP FACTOR (%): Operating Factor. It is calculated by dividing the Total Operating Time by Unit Hours times 100. Total Operating Time means the sum of O + O(FD) + O(SD).

NO. OF FORCED OUTAGES: the number of occurrences of State Codes 21, 22 and 23.

TOTAL F.O.T. (A): Total Forced Outage Time expressed in years. It is FO + FEMO + FEPO divided by 8760.

MAXIMUM F.O.D. (H): the longest single residence in hours of one of the forced outage states 21, 22 and 23 in the study period.

TOTAL EQ. OUT. TIME (A): the Total Equivalent Outage Time expressed in years. It is the Total Forced Outage Time plus planned and maintenance outage times plus adjusted derated times (i.e. FO + FEMO + FEPO + MO + PO + O(FD) adj + O(SD) adj + ABNO(FD) adj + ABNO(SD) adj all divided by 8760). This equivalent time is used when calculating ICbF.

ICbF (%): the Incapability Factor. It is the ratio of Total Equivalent Outage Time, in hours, to number of Unit Hours times 100.

CbF (%) is the complement of the Incapability Factor. It is calculated by subtracting ICbF from 100. This index is not listed in the report tables.

WEIGHTED CAPABILITY FACTOR (%) is the Capability Factor of a unit weighted by its MCR

Weighted Capability Factor = 1- weighted ICbF

$$= 1 - \frac{\Sigma ICbF*MCR}{\Sigma MCR}$$

FAIL RATE: the Failure Rate. It is the rate at which a generating unit encounters a forced outage. It is computed by dividing the Number of Transitions from an Operating State (11, 12 and 13) to a Forced Outage (21) by the Total Operating Time times 8760.

MEAN F.O.D. (H): the mean duration of a forced outage. It is computed by dividing the Total Forced Outage Time by the Number of Forced Outages.

FOR (%): the Forced Outage Rate. It is the ratio of Total Forced Outage Time to Total Forced Outage Time plus Total Operating Time times 100.

$$FOR = \frac{FO + FEMO + FEPO}{FO + FEMO + FEPO + O + O(FD) + O(SD)} X\,100$$

Cautionary Note: The Forced Outage Rate obtained by the above equation is not equal to Lambda over Lambda + Mu (l/l+m) where Lambda (l) is the Fail Rate and Mu (m) is the reciprocal of Mean F.O.D.

DAFOR (%): the Derated Adjusted Forced Outage Rate. It is the ratio of Equivalent Forced Outage Time (i.e. FO + FEMO + FEPO + O(FD) adj + ABNO(FD) adj) to Equivalent Forced Outage Time plus Total Equivalent Operating Time (i.e. O + O(SD) + (O(FD) - 0(FD)adj)). This can be written as follows:

$$DAFOR = \frac{FO + FEMO + FEPO + O(FD)adj + ABNO(FD)adj}{FO + FEMO + FEPO + ABNO(FD)adj + O + O(FD) + O(SD)} X\,100$$

MOF (%): the Maintenance Outage Factor. It is computed by dividing the number of maintenance outage hours by the number of Unit Hours times 100.

POF (%): the Planned Outage Factor. It is computed by dividing the number of planned outage hours by the number of Unit Hours times 100.

SYN. CD. FACTOR (%): the Synchronous Condenser Factor. It is the total hours spent as a synchronous condenser divided by the number of Unit Hours times 100.

SR: the Starting Reliability. It gives the ratio of successful starts to start attempts.

$$SR = \frac{\text{Total Attempted Starts - Total Start Failures}}{\text{Total Attempted Starts}}$$

Total Start Failures= Total number of occurences of State 21 type 4

Total Attempted Starts = Total Start Failures plus the number of transitions to states 11, 12 and 13 from any of the remaining states plus the number of transitions into a synchronous condenser mode from a not operating state.

UFOP (%): the Utilization Forced Outage Probability. It is the probability that a generating unit will not be available when required.

$$UFOP = \frac{f(FO + FEMO + FEPO)}{f(FO + FEMO + FEPO) + O + O(SD) + O(FD)}$$

where f = Demand Factor

$$= \left(\frac{1}{r} + \frac{1}{T}\right) \Big/ \left(\frac{1}{D} + \frac{1}{r} + \frac{1}{T}\right)$$

where r = Average Forced Outage Time (see above)
D = average in-service time per occasion of demand

$$= \frac{0 + O(FD) + O(SD)}{SR \times \text{Total Attempted Starts}}$$

T = average reserve shutdown time between periods of need, exclusive of periods for maintenance or other planned unavailability.

$$D + T = \frac{O + O(FD) + O(SD) + ABNO + ABNO(FD) + ABNO(SD)}{\text{Total Attempted Starts}}$$

DAUFOP (%): the Derated Adjusted Utilization Forced Outage Probability. It is the probability that a generating unit will not be available when required (derating included). It can be calculated as follows:

$$DAUFOP = \frac{f(FO + FEMO + FEPO) + O(FD)adj}{f(FO + FEMO + FEPO) + O + O(FD) + O(SD)}$$

4.4.2 Row Headings

The row headings indicate the data for which the statistics in that row have been calculated.

YEARS 0 UNIT: all year zero data for a particular generating unit type over the specified time interval. For example, in the combined 1998-02 report, this row would have the 2002 data for the generating units commissioned in 2002 and the 2001 data for the generating units commissioned in 2001 and so on.

EXCL YR 0: all data for a particular generating unit type minus the year 0 data.

ALL UNITS: the data for all generating units of a particular type.

CLASSIFICATION BY MCR (MW): the data for all generating units whose MCR's fall within the indicated range.

CLASSIFICATION BY YEAR OF SERVICE: the data for all generating units in the indicated year or years of service. For example, a generating unit that was commissioned in 1994 would have its 1994 data grouped in the "0" row and its 1995 data in the "1st" row.

CLASSIFICATION BY OPERATING FACTOR: the data for all generating units with operating factors in the indicated ranges over the specified time interval.

4.5 Calculation of Cumulative Normalized Unit Years

Cumulative Normalized Unit Years is plotted on one of the graphs in Section 5-1 of this report. The information to produce the figure was taken from the Classification By Operating Factor sections of Tables 6.1.1, 6.2.1, 6.3.1 and 6.4.1. The calculation of the Cumulative Normalized Unit Years corresponding to the Operating Factor of 50% for combustion turbine units is given below to illustrate the method of calculation. Referring to Table 6.3.1, the sum of the unit years with operating factor equal to or less than 50% is 34 unit years. As the total for all units is 36.0 unit years, the percentage of unit years with operating factor equal to or less than 50% is (34/36) x 100 or 94.4% as is plotted on the graph.

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5.
All Unit Types Summary Statistics

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ALL CANADA Summary

Table 5.1

External Causes Excluded, 2007 Data

	UNIT YEARS (A)	ABNOF (%)	OP TIME (A)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D (H)	FOR (%)	DAFOR (%)	TOT.EQ. OUT.TI. (A)	ICBF (%)	FAIL RATE	ATTEMPTED STARTS	SUCCESSFUL STARTS	MOF (%)	POF (%)
Combustion Turbine Generating Unit																	
YEAR 0 UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXC. YEAR 0	29	87.55	2	6.83	131	0.3	1,036.46	22.6	14.57	31.88	2.2	7.64	25.74	1,796	1,768	0.63	3.83
ALL UNITS	29	87.55	2	6.83	131	0.3	1,036.46	22.6	14.57	31.88	2.2	7.64	25.74	1,796	1,768	0.63	3.83
Fossil Generating Unit																	
YEAR 0 UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXC. YEAR 0	80	19.65	51.7	64.63	667	3.3	1,868.38	43.15	5.98	8.66	14.4	18	10.62	1,705	1,700	2.34	9.27
ALL UNITS	80	19.65	51.7	64.63	667	3.3	1,868.38	43.15	5.98	8.66	14.4	18	10.62	1,705	1,700	2.34	9.27
Hydraulic Generating Unit																	
YEAR 0 UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXC. YEAR 0	455.9	18.33	338.2	74.19	1,134	8.4	6,912.00	64.97	2.43	2.7	35.5	7.79	1.97	43,408	43,320	0.96	4.67
ALL UNITS	455.9	18.33	338.2	74.19	1,134	8.4	6,912.00	64.97	2.43	2.7	35.5	7.79	1.97	43,408	43,320	0.96	4.67
Nuclear Generating Unit																	
YEAR 0 UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXC. YEAR 0	11	0	8.5	77.11	29	1.7	1,282.85	518.98	16.84	18.95	2.9	25.95	2.48	30	29	0	7.27
ALL UNITS	11	0	8.5	77.11	29	1.7	1,282.85	518.98	16.84	18.95	2.9	25.95	2.48	30	29	0	7.27

TOTAL NUMBER OF COMBUSTION GENERATING UNITS:	29
TOTAL NUMBER OF FOSSIL GENERATING UNITS:	80
TOTAL NUMBER OF HYDRAULIC UNITS:	456
TOTAL NUMBER OF NUCLEAR GENERATING UNITS:	11

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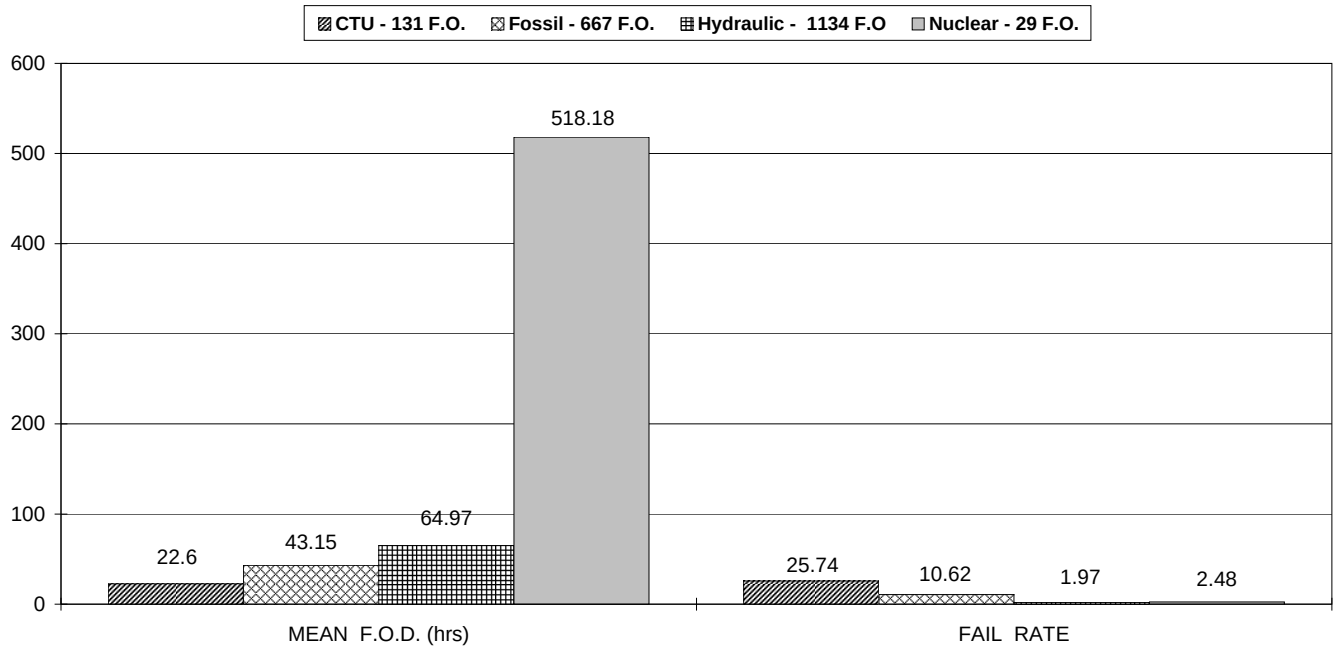
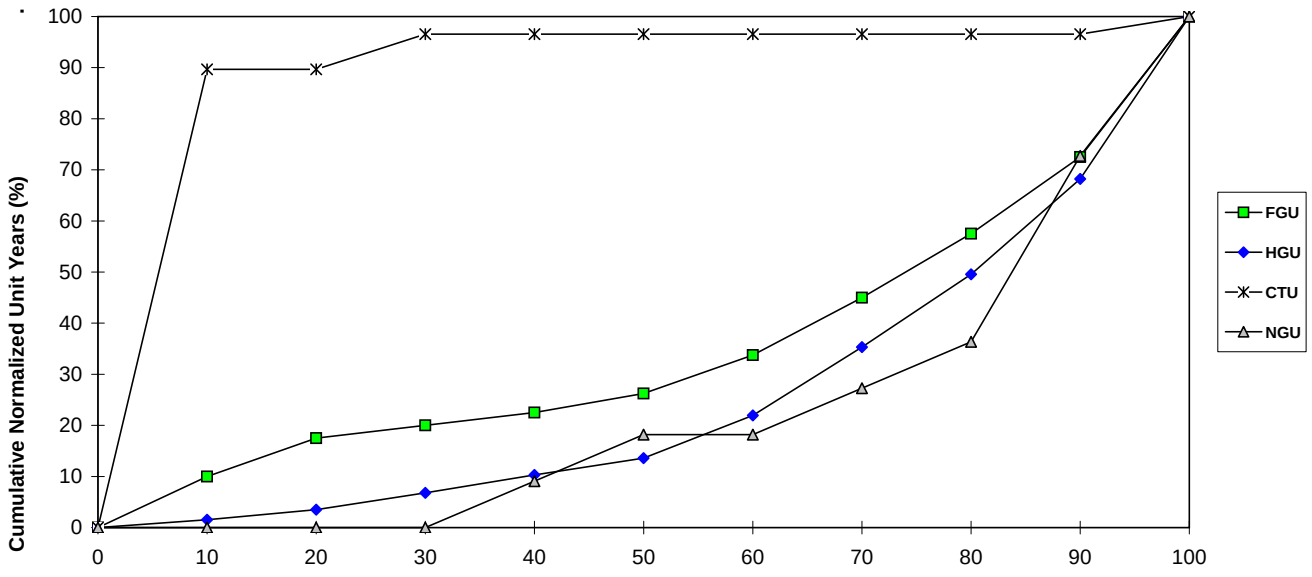
ALL CANADA Summary

External Causes Excluded, 2007 Data

Table 5.1
(Continued)



Comparison of Failure Rate & Mean Forced Outage Duration for different generating unit types based on 2007 data.

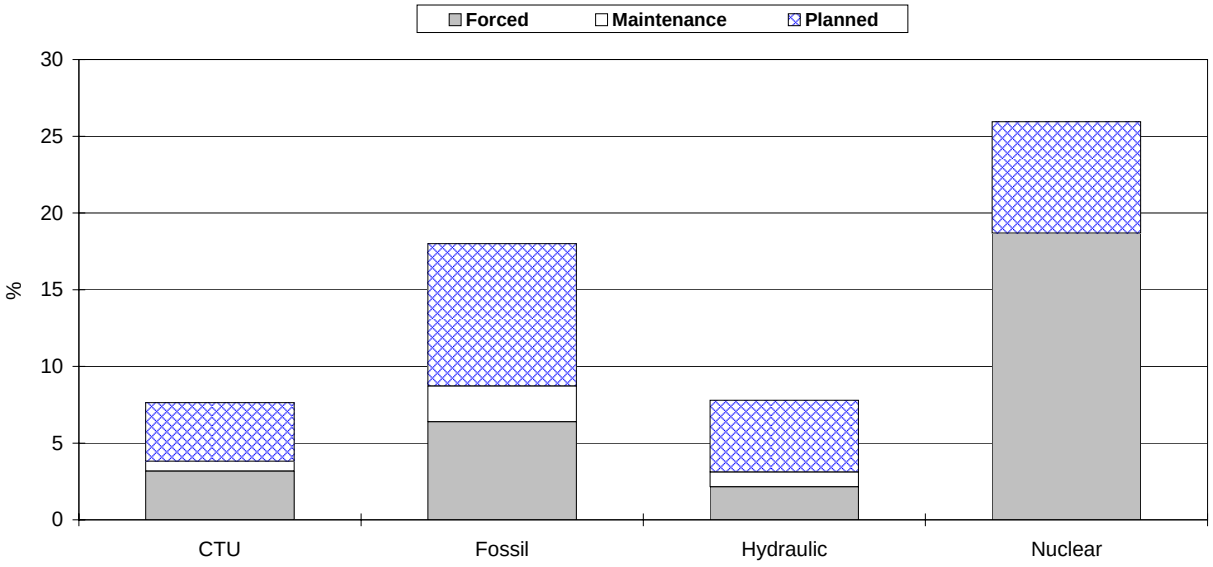


Cumulative Normalized Unit Years vs. Operating Factor for different generating unit types based on 2007 data.

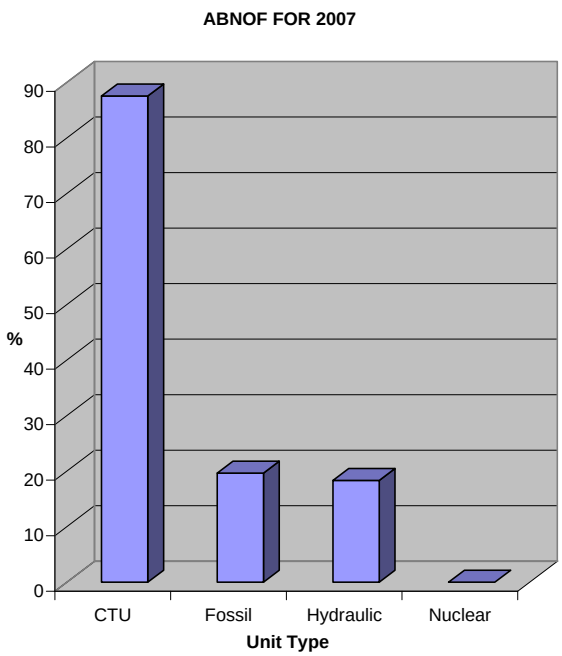
ALL CANADA Summary

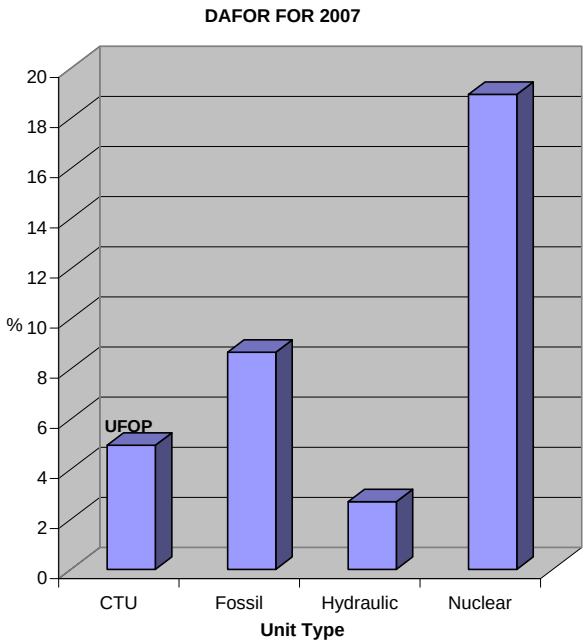
External Causes Excluded, 2007 Data

Table 5.1
(Continued)



Comparison of ICbF for different generating unit types based on 2007 data.





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ALL CANADA Summary

Table 5.2

External Causes Excluded, 2003 to 2007 Data

	UNIT YEARS (A)	ABNOF (%)	OP TIME (A)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D (H)	FOR (%)	DAFOR (%)	TOT.EQ. OUT.TI. (A)	ICBF (%)	FAIL RATE	ATTEMPTED STARTS	SUCCESSFUL STARTS	MOF (%)	POF (%)
Combustion Turbine Generating Unit																	
YEAR 0 UNITS	2.6	69.8	0.4	17.44	46	0.2	1,318.45	34.5	28.72	28.72	0.3	12.77	44.47	681	679	2.83	2.91
EXC. YEAR 0	178.1	78.09	21	11.8	592	8.6	8,040.00	127.38	29.06	31.88	20	11.23	11.75	6,935	6,795	0.9	4.38
ALL UNITS	180.7	77.97	21.5	11.88	638	8.8	8,040.00	120.69	29.05	31.82	20.3	11.25	12.44	7,616	7,474	0.93	4.36
Fossil Generating Unit																	
YEAR 0 UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXC. YEAR 0	395.2	21.38	250.8	63.45	3,022	16.8	3,688.95	48.7	6.28	9.4	69.5	17.6	9.85	8,968	8,923	2.6	8.32
ALL UNITS	395.2	21.38	250.8	63.45	3,022	16.8	3,688.95	48.7	6.28	9.4	69.5	17.6	9.85	8,968	8,923	2.6	8.32
Hydraulic Generating Unit																	
YEAR 0 UNITS	9.3	9.64	6.8	72.99	77	0.1	218.58	16.56	2.11	2.13	1.6	17.42	6.22	676	645	1.62	14.17
EXC. YEAR 0	3,448.90	17.92	2,524.40	73.19	10,209	54	6,912.00	46.38	2.1	2.19	309.8	8.98	2.24	293,765	291,058	0.64	6.68
ALL UNITS	3,458.20	17.89	2,531.20	73.19	10,286	54.2	6,912.00	46.15	2.1	2.19	311.4	9	2.25	294,441	291,703	0.64	6.7
Nuclear Generating Unit																	
YEAR 0 UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXC. YEAR 0	52.4	0.45	42	80.13	143	4.9	2,018.48	299.75	10.43	12.07	11.2	21.42	2.52	156	155	0	10.08
ALL UNITS	52.4	0.45	42	80.13	143	4.9	2,018.48	299.75	10.43	12.07	11.2	21.42	2.52	156	155	0	10.08

TOTAL NUMBER OF COMBUSTION GENERATING UNITS:	45
TOTAL NUMBER OF FOSSIL GENERATING UNITS:	86
TOTAL NUMBER OF HYDRAULIC UNITS:	773
TOTAL NUMBER OF NUCLEAR GENERATING UNITS:	12

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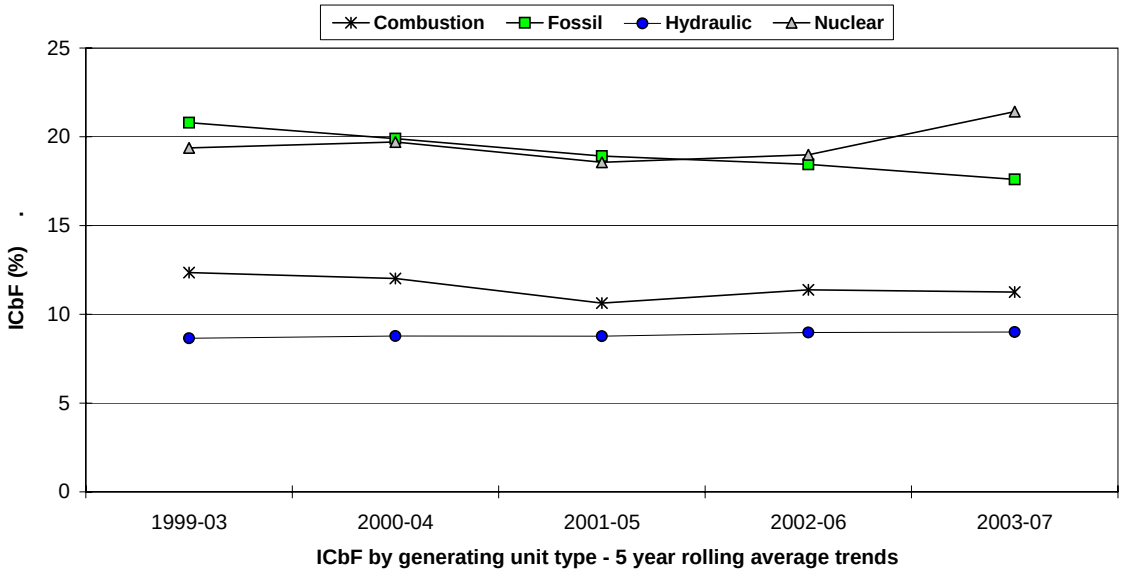
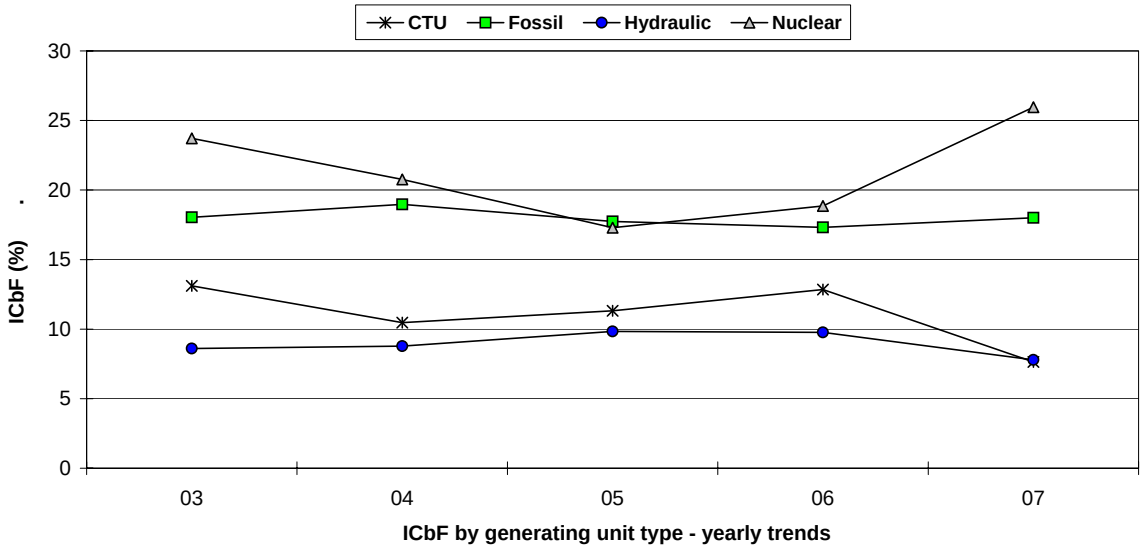
ALL CANADA Summary

External Causes Excluded, 2003-2007 Data

Table 5.2
(Continued)



ICbF by generating unit type - 5 year rolling average trends

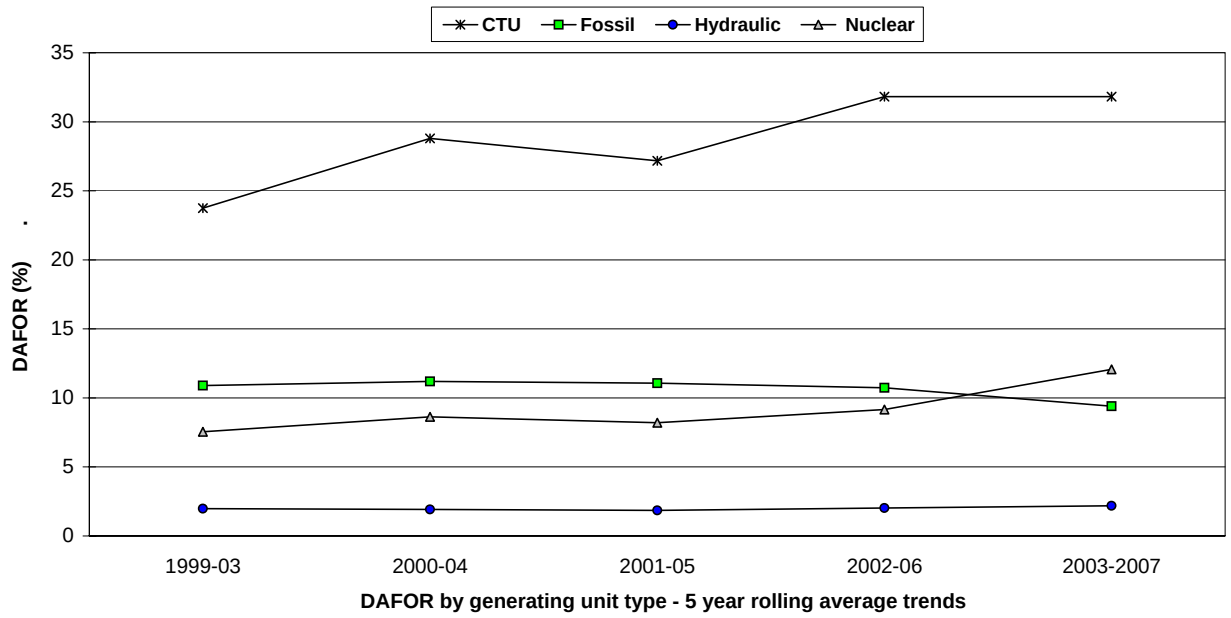


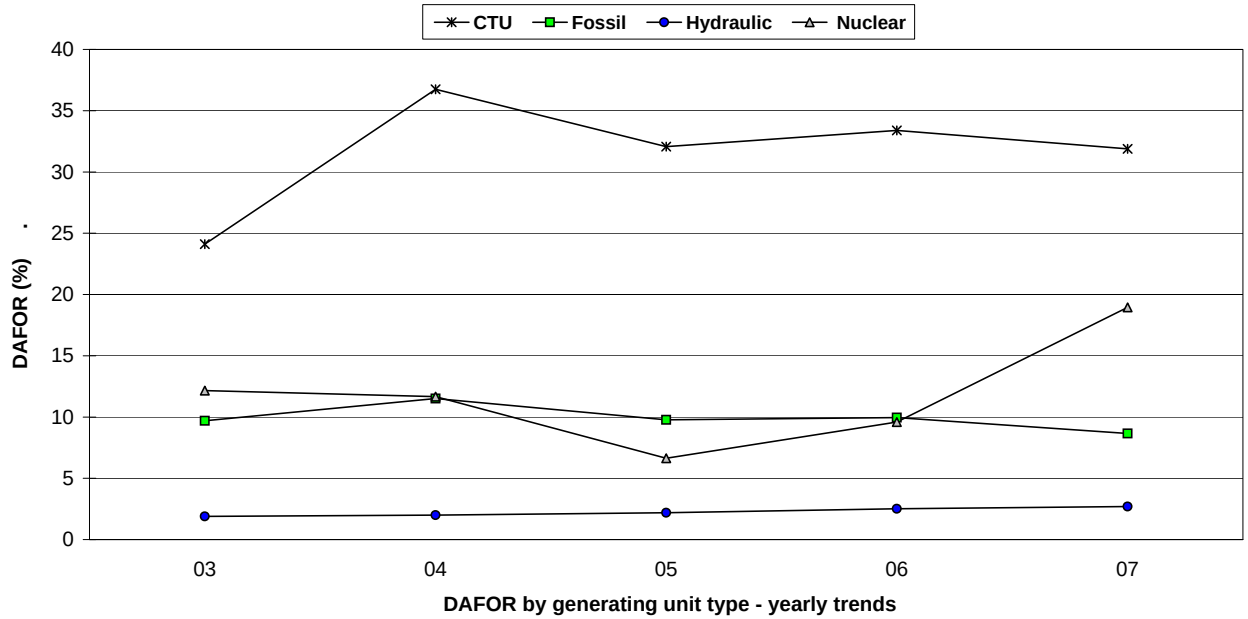
ICbF by generating unit type - yearly trends

ALL CANADA Summary

External Causes Excluded, 2003-2007 Data

Table 5.2
(Continued)

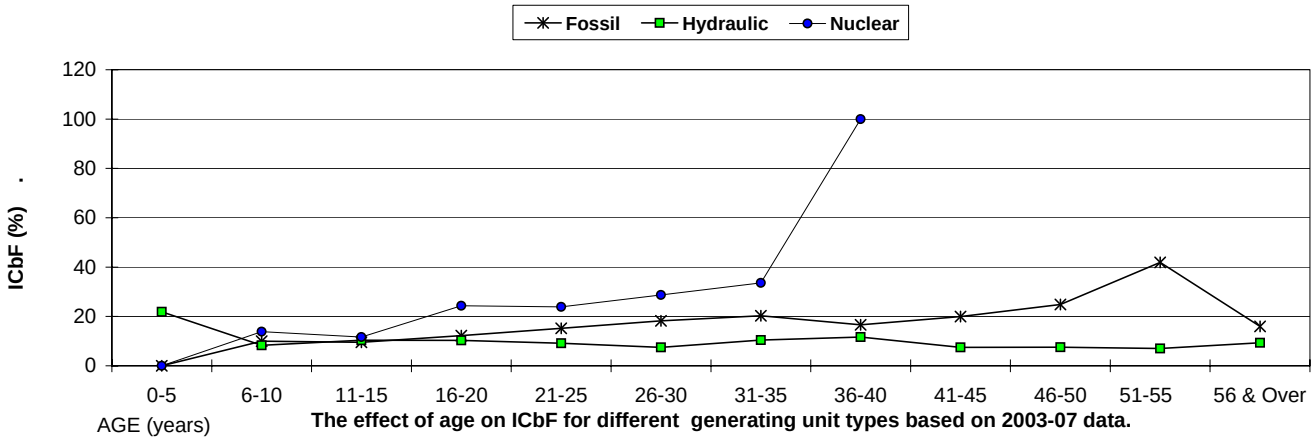




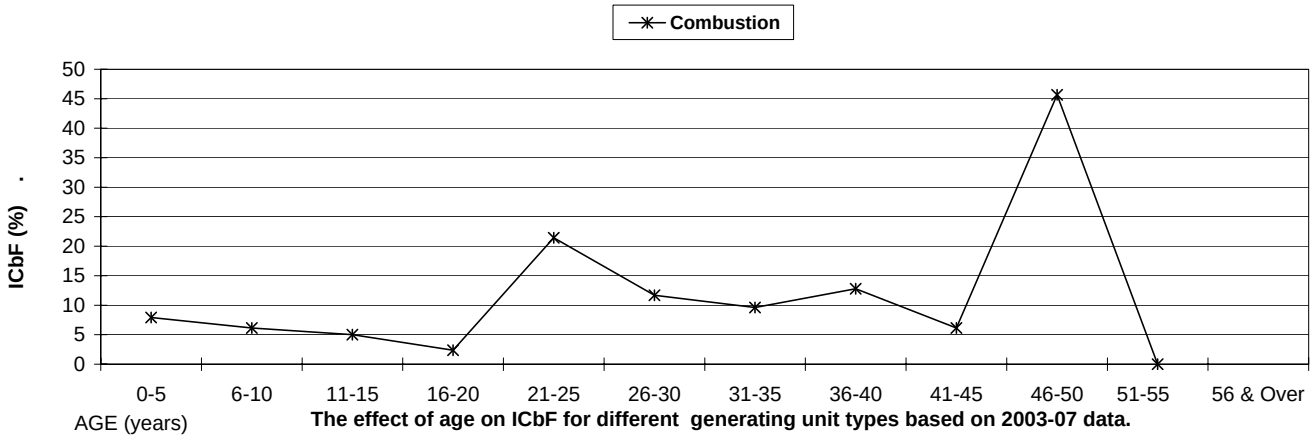
ALL CANADA Summary

External Causes Excluded, 2003-2007 Data

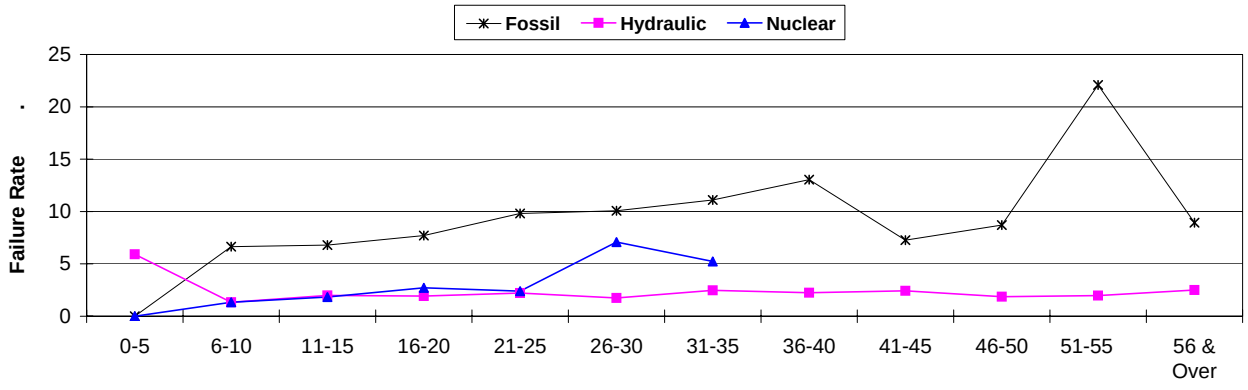
Table 5.2
(Continued)



The effect of age on ICbF for different generating unit types based on 2003-07 data.



The effect of age on ICbF for different generating unit types based on 2003-07 data.

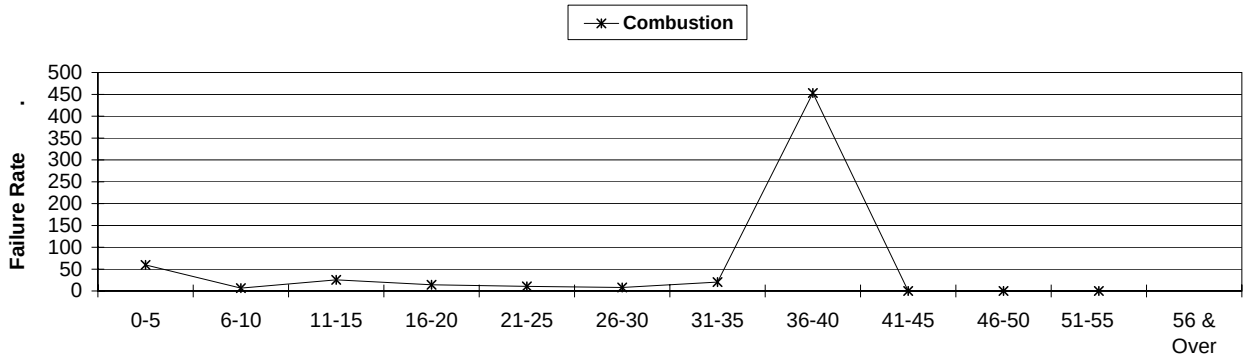


The effect of age on Failure Rate for different generating unit types based on 2003-07 data.

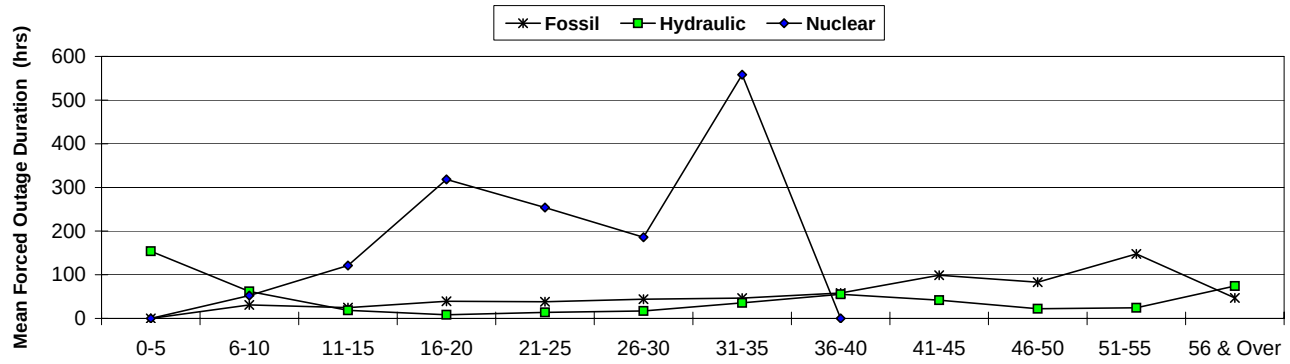
ALL CANADA Summary

External Causes Excluded, 2003-2007 Data

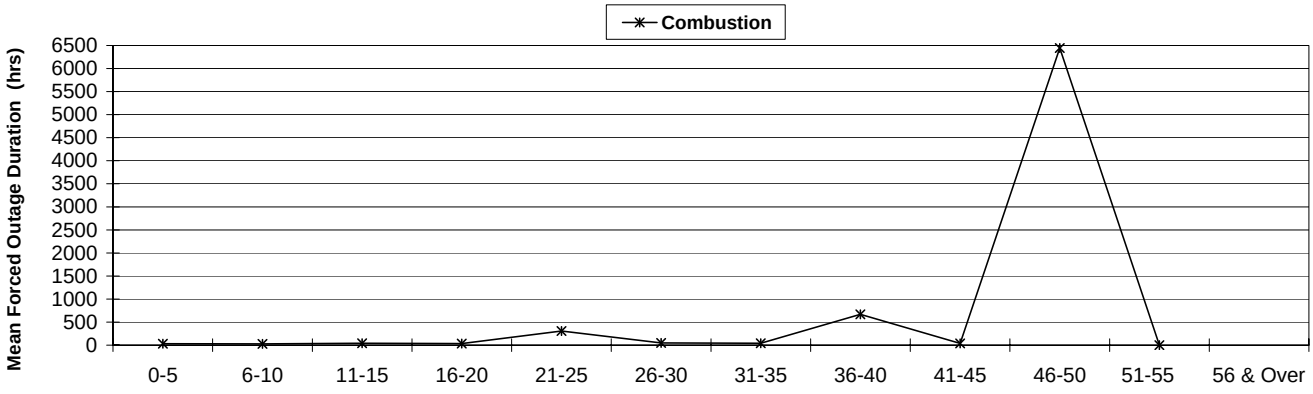
Table 5.2
(Continued)



The effect of age on Failure Rate for different generating unit types based on 2003-07 data.



The effect of age on Mean Forced Outage Duration for different generating unit types based on 2003-07 data.



The effect of age on Mean Forced Outage Duration for different generating unit types based on 2003-07 data.

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6. Generating Unit Statistics

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6.1 Hydraulic Summary Statistics

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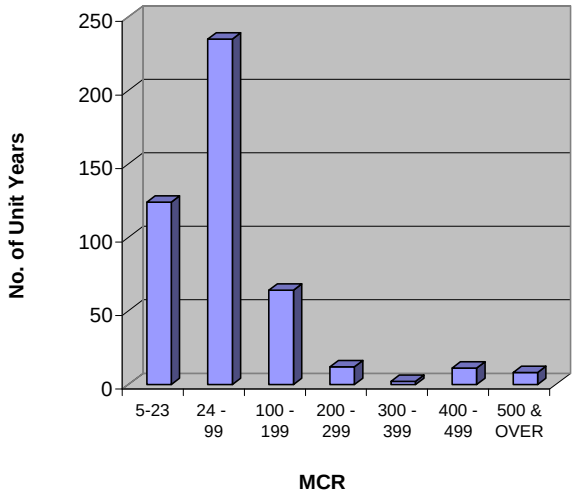
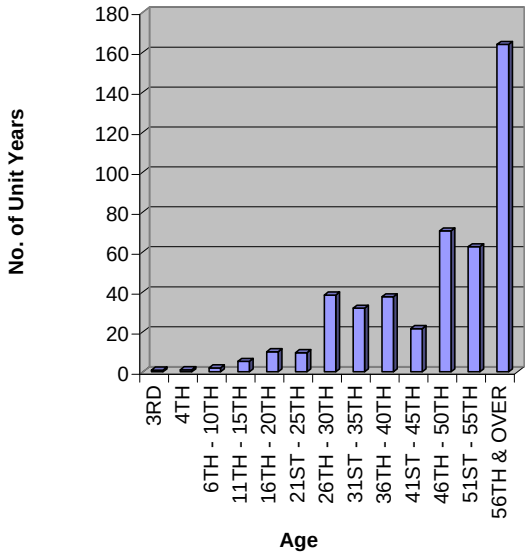
HYDRAULIC UNITS

Table 6.1.1

External Causes Excluded, 2007 Data





	UNIT YEARS (A)	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)																
5-23	124	19.82	0.16	73.24	268	5.4	6,912.00	175.22	5.57	5.7	4.67	8.7	7.04	1.86	0.77	1.85
24 - 99	234.9	18.52	6.01	74.02	694	2.4	1,832.20	30.59	1.37	1.77	1.49	18.3	7.79	2.21	1.12	5.32
100 - 199	64	18.5	4.64	75.53	106	0.2	494.36	18.17	0.45	0.55	0.46	4.3	6.7	1.18	0.34	5.29
200 - 299	12	8.08	10.97	75.27	20	0.2	1,886.01	104.85	2.58	3.21	2.91	2.1	17.14	1.99	3.13	11.53
300 - 399	2	6.59	0	80.88	11	0	172	20.91	1.6	1.61	1.54	0.3	12.56	4.95	0.21	11
400 - 499	11	11.69	7.05	77.33	17	0	35.66	7.08	0.16	0.22	0.2	1.2	11.02	1.76	1.19	9.66
500 & OVER	8	15.96	0	75.71	18	0.1	554.3	62.05	2.06	2.06	1.82	0.7	8.34	2.81	0.76	5.98
CLASSIFICATION BY YEAR OF SERVICE																
3RD	0.9	4.63	5.13	88.9	9	0	4.2	1.43	0.19	0.19	0.18	0.1	6.47	7.6	0.19	6.12
4TH	1.1	7.33	13.48	91.12	5	0	21.73	11.22	0.63	0.63	0.6	0	1.55	4.93	0.13	0.85
6TH - 10TH	2	16.75	0	77.28	3	0	5.11	3.07	0.07	0.45	0.25	0.1	6.26	1.29	0.52	5.4
11TH - 15TH	5.3	15.79	0	82.07	4	0	2.35	1.36	0.01	0.01	0.01	0.1	2.14	0	1.25	0.88
16TH - 20TH	10.1	14.84	1.03	83.08	13	0	13.61	5.11	0.09	0.1	0.08	0.2	2.08	0.72	0.34	1.66
21ST - 25TH	9.6	7.52	10.33	87.51	21	0	74.75	6.85	0.2	0.21	0.2	0.5	4.98	2.38	0.22	4.57
26TH - 30TH	38.5	17.54	6.37	75.76	110	0.2	379.98	13.93	0.6	0.64	0.56	2.6	6.74	2.43	0.91	5.34
31ST - 35TH	31.9	20.57	1.21	74.24	45	0.3	554.3	50.21	1.08	1.24	0.98	1.7	5.31	1.27	0.43	3.95
36TH - 40TH	37.6	27.58	6.26	62.46	75	0.5	1,886.01	63.61	2.27	2.51	1.87	3.8	10.12	1.7	1.62	6.89
41ST - 45TH	21.7	20.23	12.8	73.02	120	0.4	1,832.20	31.69	2.67	2.95	2.34	1.5	6.97	4.04	0.71	4.04
46TH - 50TH	70.6	16.65	2.97	76.83	183	0.7	594.26	31.58	1.2	1.36	1.16	4.7	6.65	1.6	0.48	5.1
51ST - 55TH	62.7	14.01	1.85	79.64	106	0.2	760.93	19.28	0.47	0.95	0.82	4.7	7.47	1.48	0.58	5.4
56TH & OVER	164	19.18	4.19	71.62	440	6.1	6,912.00	120.9	4.91	5.27	4.37	15.5	9.47	2.24	1.4	4.1
CLASSIFICATION BY OPERATING FACTOR																
0 - 10	7	49.91	1.23	5.28	24	2.3	6,912.00	830.89	86.04	86.04	39.3	3.1	44.81	24.36	5.2	7.09
11 - 20	9	74.97	1.23	15.39	17	0	85.35	16.61	2.28	2.28	1.13	0.9	9.66	5.06	0.73	8.55
21 - 30	15	59.66	6.74	25.18	47	0.9	1,176.00	166.25	19.11	19.86	7.24	2.3	15.42	4.5	0.45	8.77
31 - 40	16	46.62	6.53	35.46	49	1	5,085.31	186.19	15.51	16.19	8.16	2.9	18.21	3	3.75	7.66
41 - 50	15	38.75	4.25	44.15	50	0.1	148.13	19.88	1.69	1.69	1.14	3	19.85	2.57	2.08	14.25
51 - 60	38	31.82	2.86	55.35	124	0.4	760.93	27.06	1.79	2.02	1.42	5	13.08	3.57	1.8	10.02
61 - 70	61	26.15	2.68	64.21	189	1.5	2,470.00	67.66	3.59	3.64	2.76	5.9	9.66	2.96	0.66	6.58
71 - 80	65	18.77	4.25	75.12	226	1.2	1,649.00	45.03	2.32	2.48	2.07	4	6.23	2.29	0.68	3.64
81 - 90	85	9.85	1.9	85.13	175	0.5	1,056.28	25.52	0.7	1.1	1.01	4.6	5.36	1.51	0.6	3.82
91 - 100	145	1.73	6.48	95.92	233	0.5	379.98	20.33	0.39	0.68	0.65	3.8	2.64	1.36	0.65	1.33
ALL UNITS	**455.9**	**18.33**	**4.25**	**74.19**	**1,134**	**8.4**	**6,912.00**	**64.97**	**2.43**	**2.7**	**2.24**	**35.5**	**7.79**	**1.97**	**0.96**	**4.67**

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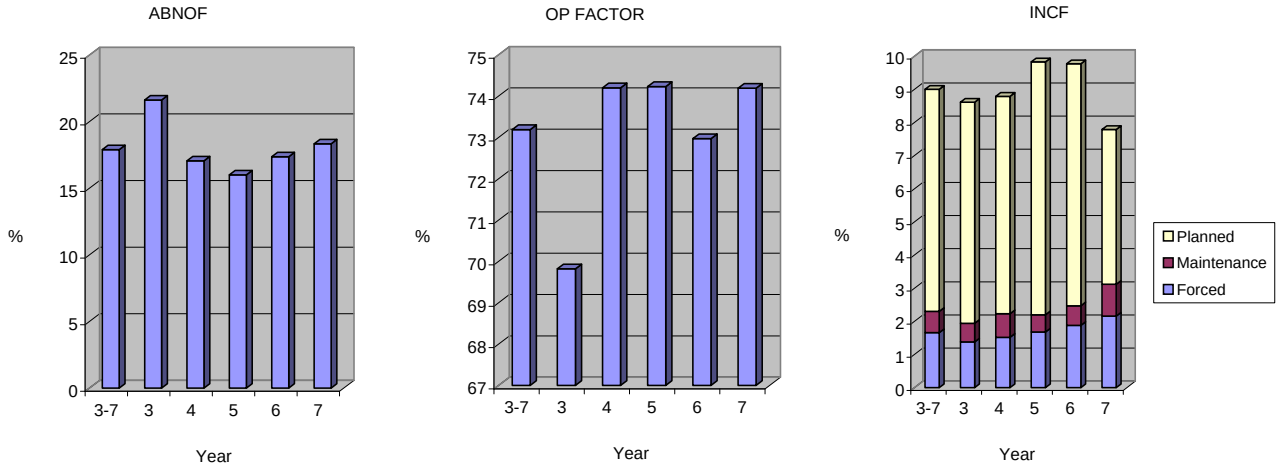
HYDRAULIC UNITS

Table 6.1.2

External Causes Excluded, 2003 to 2007 Data



	UNIT YEARS (A)	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)																
5 - 23	900.6	19.48	0.87	71.18	2,498	28.9	6,912.00	101.21	4.31	4.36	3.67	84.7	9.4	2.46	0.89	5.25
24 - 99	1,621.00	15.62	5.55	76.66	4,539	17.1	3,783.23	32.96	1.36	1.48	1.3	126.8	7.82	2.17	0.6	6.06
100 - 199	602.9	20.43	2.62	69.88	1,761	4.7	3,020.91	23.54	1.11	1.17	0.98	59.3	9.83	1.96	0.35	8.56
200 - 299	134.1	19.95	5.74	65.16	627	2.3	3,480.00	31.91	2.55	2.68	2.21	20.1	14.99	2.69	0.94	12.26
300 - 399	98.1	24.04	0	64.88	658	0.7	371.33	8.72	1.02	1.02	0.89	10.9	11.09	3.16	0.34	10.08
400 - 499	61.5	17.53	9.29	71.73	134	0.4	953.1	23.43	0.81	0.85	0.74	6.6	10.77	2.2	0.63	9.52
500 & OVER	40	15.01	0	77.47	69	0.2	554.3	28.26	0.71	0.71	0.65	3	7.51	1.94	0.97	5.98
CLASSIFICATION BY YEAR OF SERVICE																
0	9.3	9.64	0.98	72.99	77	0.1	218.58	16.56	2.11	2.13	2.01	1.6	17.42	6.22	1.62	14.17
1ST	8.1	9.5	2.05	72.65	50	0.5	1,750.01	82.2	7.4	7.48	6.97	1.4	17.91	6.3	0.62	11.41
2ND	4.8	3.31	2.47	71.49	13	0	88.28	19.15	0.82	0.82	0.8	1.2	25.2	3.22	0.13	24.48
3RD	6.5	18.13	1.98	60.8	30	0.8	4,584.00	240.51	17.24	17.24	14.39	1.4	21.07	3.54	0.22	8.18
4TH	7.1	12.99	2.1	65.89	50	1.1	3,632.25	195.7	19.23	19.23	17.03	1.5	21.13	8.74	0.08	5.36
5TH	6	11.38	0	59.87	37	1.6	3,937.23	368.26	30.22	30.22	27.33	1.7	28.75	7.52	0.17	2.65
6TH - 10TH	83.4	28.94	0	62.79	238	1.7	2,136.43	61.74	3.1	3.11	2.34	6.9	8.28	1.34	0.26	6.01
11TH - 15TH	117.4	25.99	0	63.66	466	1	1,195.10	18.72	1.32	1.32	1.08	12.2	10.36	1.98	0.55	8.95
16TH - 20TH	103.3	21.07	4.5	68.64	328	0.3	169.98	8.43	0.44	0.46	0.41	10.6	10.3	1.92	0.45	9.53
21ST - 25TH	198.2	21.14	2.36	69.75	728	1.2	558.71	13.86	0.83	0.9	0.77	18.1	9.16	2.21	0.39	8.14
26TH - 30TH	207.6	21.71	3.53	70.86	542	1.1	475.8	16.98	0.71	0.73	0.62	15.5	7.45	1.75	0.59	6.34
31ST - 35TH	253.8	22.02	3.05	67.56	783	3.2	3,480.00	35.58	1.82	1.88	1.53	26.6	10.46	2.48	0.66	8.51
36TH - 40TH	257.3	23.22	7.61	65.18	734	4.6	3,783.23	55.26	2.69	2.77	2.19	30	11.66	2.25	0.75	9.06
41ST - 45TH	290.1	15.8	4.83	76.86	917	4.4	2,953.96	41.75	1.92	2.01	1.73	21.7	7.47	2.42	0.5	5.33
46TH - 50TH	443.9	13.21	2.41	79.32	1,140	2.9	1,694.50	22.19	0.81	0.86	0.78	33.5	7.55	1.86	0.39	6.43
51ST - 55TH	376.1	13.08	4.78	80.14	940	2.6	2,259.18	24.48	0.86	0.97	0.88	26.4	7.01	1.97	0.48	5.61
56TH & OVER	1,085.30	16.73	3.65	74.07	3,213	27.2	6,912.00	74.07	3.27	3.42	3	101.1	9.32	2.5	0.92	5.77
CLASSIFICATION BY OPERATING FACTOR																
0 - 10	12	33.05	0	2.61	6	3.7	6,912.00	5,344.23	92.12	92.12	92.12	7.7	64.34	0	0	33.79
11 - 20	37	72.16	1.15	16.81	99	0.8	2,006.71	69.05	11.15	11.2	4.85	4.1	11.05	6.27	1.78	7.14
21 - 30	107	58.13	2.25	25.46	577	6.7	4,584.00	101.69	19.73	19.86	8.08	17.6	16.45	7.56	1.03	9.12
31 - 40	105.1	45.7	4.06	34.98	442	2.8	6,118.65	55.57	7.09	7.09	3.81	20.3	19.33	4.3	0.83	15.82

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HYDRAULIC UNITS

External Causes Excluded, 2003 to 2007 Data

Table 6.1.2
(continued)

	UNIT YEARS (A)	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
41 - 50	141.5	40.12	1.57	45.86	531	4.8	4,851.00	79.56	6.92	7.11	4.34	20	14.12	2.71	1.14	9.48
51 - 60	251.6	30.86	2.34	55.96	972	7.9	6,057.61	71.21	5.31	5.34	3.78	33.2	13.2	3.07	0.75	9.29
61 - 70	579.1	24.73	1.27	64.5	2,047	9.1	3,480.00	39.15	2.39	2.51	1.99	62.9	10.86	2.52	0.63	8.56
71 - 80	790.9	16.97	2.31	75.35	2,173	7.2	5,542.83	29.18	1.2	1.22	1.06	60.9	7.7	2.11	0.62	6.15
81 - 90	738.8	7.14	5.58	85.21	2,039	7.1	3,082.91	30.41	1.11	1.18	1.11	57.5	7.79	2.17	0.6	6.09
91 - 100	695.1	1.92	6.45	94.36	1,400	4.1	2,259.18	25.42	0.62	0.77	0.76	27.1	3.9	1.7	0.45	2.69
ALL UNITS	**3,458.20**	**17.89**	**3.67**	**73.19**	**10,286**	**54.2**	**6,912.00**	**46.15**	**2.1**	**2.19**	**1.87**	**311.4**	**9**	**2.25**	**0.64**	**6.7**

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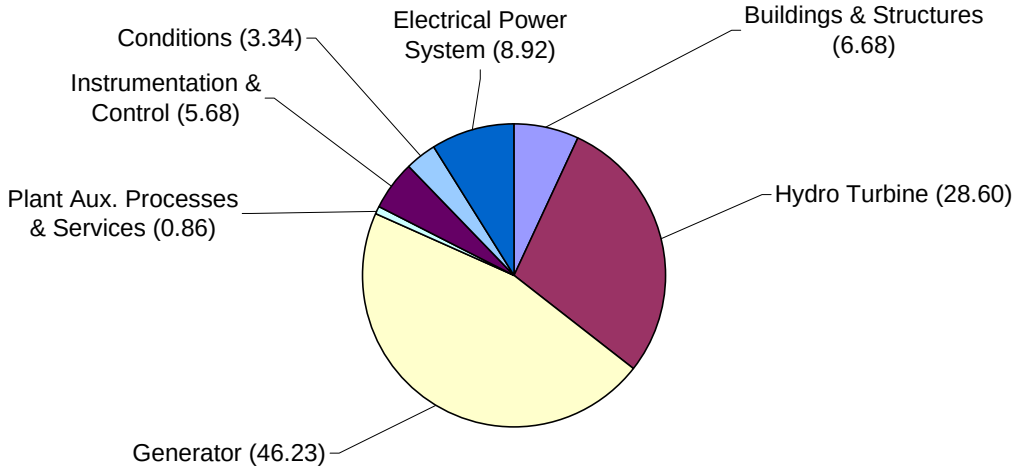
HYDRAULIC UNITS

Table 6.1.3

Major Component Outage Code Report, 2003 to 2007

Major component contribution to hydraulic unit ICbF based on 2003-07 data, (External Causes Included).



MAJOR COMPONENT	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT FOR (%)	CONTRIBUTION TO UNIT DAFOR (%)
BUILDINGS AND STRUCTURES	351	0.07	177	0.01	101	0	1,855	0.09	1,558	0.47	0.65	0.1	0.11
HYDRO TURBINE	2,650	0.67	521	0.02	57	0	1,704	0.19	2,200	1.78	2.66	0.9	0.95
GENERATOR	2,545	0.52	1,581	0.02	47	0.01	3,382	0.18	4,255	3.09	4.3	0.7	0.72
ELECTRICAL POWER SYSTEM	1,443	0.13	345	0.01	97	0	1,471	0.13	2,205	0.56	0.83	0.18	0.19
INSTRUMENTATION AND CONTROL	3,086	0.14	169	0	50	0	1,321	0.04	1,433	0.3	0.49	0.19	0.19
PLANT AUX. PROCESSES AND SERVICES	211	0.02	7	0	1	0	240	0.01	162	0.06	0.08	0.02	0.02
CONDITIONS	1,794	0.1	1,018	0.03	682	0.01	874	0.03	1,249	0.14	0.31	0.13	0.17
TOTAL (External Causes Included)	**12,080**	**1.65**	**3,818**	**0.09**	**1,035**	**0.03**	**10,847**	**0.67**	**13,062**	**6.16**	**9.3**	**2.21**	**2.35**
TOTAL (External Causes Excluded)	**10,286**	**1.56**	**2,800**	**0.06**	**353**	**0.02**	**9,973**	**0.64**	**11,813**	**6.02**	**9**	**2.1**	**2.19**

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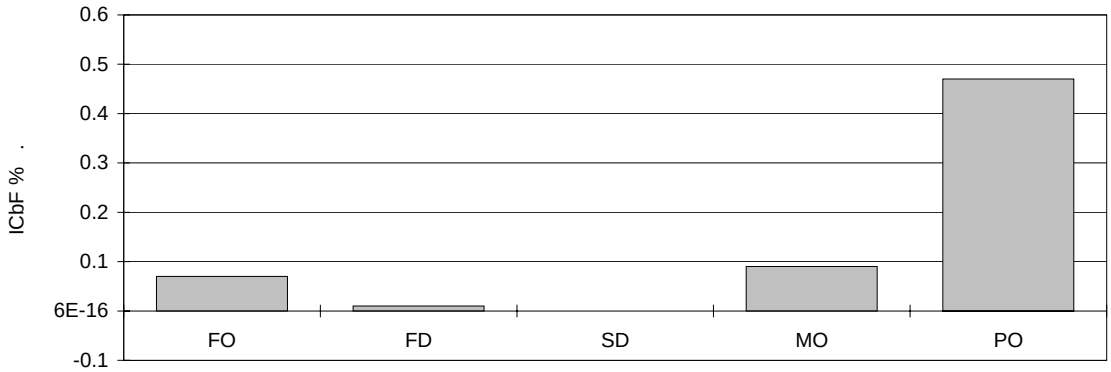
HYDRAULIC UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.1.4

Buildings and Structures



Buildings & Structures ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

Number of Units:	773
Number of Unit Years:	3458.2
Overall Operating Factor:	73.19

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
BUILDINGS AND STRUCTURES													
22100	**Powerhouse Substructure**	8	0	0	0	0	0	26	0	40	0.02	0.02	0
22110	**Draft Tubes (Concrete)**	1	0	0	0	2	0	21	0	14	0	0	0
22121	**Scroll Case (Concrete)**	5	0.01	0	0	0	0	10	0	6	0	0.01	0.01
26000	**Water And Earth Retaining Structures**	1	0	0	0	2	0	11	0	7	0	0	0
26100	**Main Dam And Associated Wingwalls - Concrete**	0	0	0	0	0	0	7	0	7	0	0	0
26200	**Main Dam And Associated Wingwalls - Earth And Rock Fill**	0	0	1	0	0	0	18	0	5	0.01	0.01	0
29200	**Channels & Tunnels**	0	0	2	0	1	0	6	0	20	0.01	0.01	0
29210	**Intake (Headrace) Channel**	24	0.02	23	0	1	0	95	0	31	0.01	0.03	0.03
29250	**Tailrace (Channel)**	28	0	4	0	5	0	557	0.01	90	0.03	0.04	0
29260	**Tunnels (Including Shafts And Pipelines)**	5	0	0	0	0	0	11	0.02	20	0.01	0.03	0
29270	**Dewatering Structure (Tunnel)**	1	0	0	0	0	0	2	0	1	0	0	0
29300	**Intake Structures Or Control Structures**	25	0.01	10	0	7	0	97	0.01	130	0.05	0.08	0.01
29320	**Intake Sectional Service Gates And Followers (Also Stop Logs)**	7	0	0	0	3	0	47	0.01	87	0.02	0.03	0
29330	**Trash Racks And Followers**	84	0.02	108	0	42	0	460	0.02	408	0.02	0.06	0.03
29400	**Sluiceway And Spillway (Concrete)**	1	0	0	0	0	0	10	0	4	0	0	0.01
29420	**Sluice Gates (Power Operated)**	7	0	0	0	10	0	8	0	5	0	0	0
29440	**Fishladders And Log Chutes**	0	0	0	0	0	0	4	0	10	0	0	0
29500	**Headworks**	12	0	0	0	1	0	49	0	284	0.06	0.06	0
29550	**Headgates**	100	0.01	15	0	23	0	335	0.01	236	0.17	0.19	0.01
29620	**Penstock**	22	0	14	0	3	0	44	0.01	79	0.03	0.04	0.01
29626	**Penstock Relief Valve**	14	0	0	0	1	0	9	0	9	0.01	0.01	0
29800	**Surge Tanks And Chambers**	6	0	0	0	0	0	27	0	65	0	0	0
29900	**Pump Storage Reservoirs**	0	0	0	0	0	0	1	0	0	0	0	0
BUILDINGS AND STRUCTURES TOTAL		**351**	**0.07**	**177**	**0.01**	**101**	**0**	**1,855**	**0.09**	**1,558**	**0.47**	**0.65**	**0.11**

Canadian Electricity Association
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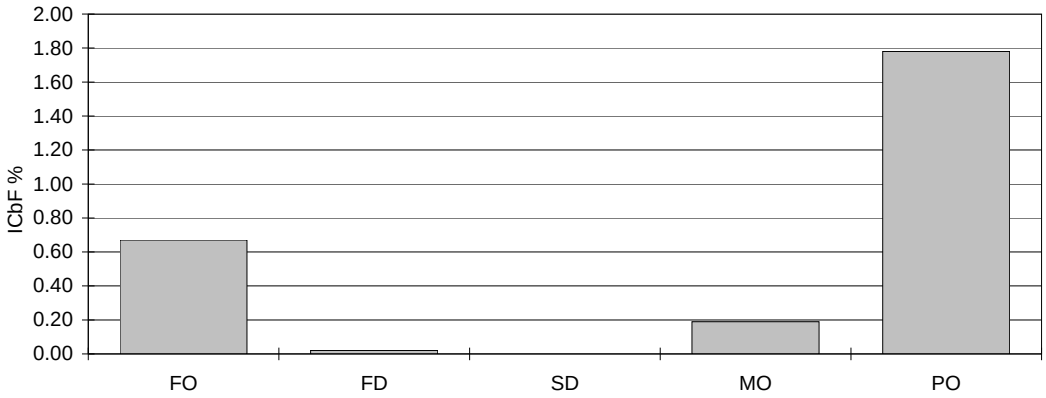
HYDRAULIC UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.1.4
Hydro Turbines



Hydro Turbine ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	773
NUMBER OF UNIT YEARS	3458.2
OVERALL OPERATING FACTOR	73.19

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
HYDRO TURBINE													
41100	**Turbines**	93	0.15	32	0.01	0	0	240	0.03	652	0.91	1.09	0.23
41105	**Turbine Aeration Equipment**	6	0	1	0	0	0	15	0	11	0	0	0
41110	**Runner**	71	0.07	19	0	45	0	152	0.09	393	0.44	0.6	0.1
41111	**Hub**	0	0	0	0	0	0	1	0	1	0	0	0
41112	**Blades**	4	0	0	0	0	0	2	0	20	0.01	0.01	0
41113	**Cone**	0	0	0	0	0	0	1	0	1	0	0	0
41120	**Head Cover**	10	0.04	69	0	0	0	11	0	7	0.01	0.05	0.05
41122	**Turbine Guide Bearing**	328	0.09	33	0	1	0	144	0	105	0.05	0.15	0.13
41123	**Turbine Guide Bearing Oil System**	90	0.01	1	0	0	0	45	0	28	0	0.01	0.01
41124	**Turbine Guide Bearing Cooling Equipment**	51	0	1	0	0	0	27	0	19	0	0.01	0
41125	**Head Cover Drainage**	60	0.01	4	0	0	0	29	0	34	0	0.01	0.02
41130	**Turbine Regulation**	40	0.02	1	0	3	0	28	0.01	60	0.01	0.04	0.02
41132	**Wicket Gate (Guidevanes)**	37	0.04	3	0	0	0	25	0	34	0.02	0.06	0.06
41133	**Wicket Linkage (Including Shear Pin)**	408	0.11	157	0	0	0	108	0.01	37	0.01	0.12	0.14
41139	**Nozzle Assembly**	5	0	3	0	0	0	10	0	25	0	0.01	0
41140	**Scroll Case**	8	0	0	0	0	0	12	0	5	0	0	0
41145	**Pit Liner**	1	0	0	0	0	0	4	0	3	0	0	0
41150	**Turbine Shaft**	21	0	2	0	0	0	7	0	4	0.01	0.01	0
41151	**Shaft Seal (Packing, Carbon Seal, Etc.)**	67	0.01	171	0.01	1	0	87	0	67	0.03	0.05	0.02
41160	**Inlet Valve**	154	0.01	0	0	0	0	102	0.01	105	0.04	0.05	0.01
41171	**Draft Tube Liner**	2	0	0	0	0	0	5	0	1	0	0	0
41180	**Greasing System**	1	0	0	0	0	0	34	0	18	0	0.01	0
41700	**Governor System**	326	0.03	10	0	4	0	156	0.01	185	0.06	0.1	0.04
41710	**Governor**	463	0.04	11	0	0	0	249	0.01	266	0.09	0.14	0.06
41711	**Governor Head**	5	0	0	0	0	0	18	0	5	0	0	0
41712	**Governor Gain**	1	0	0	0	0	0	20	0	0	0	0	0
41713	**Speed Detection**	53	0	2	0	0	0	29	0	23	0	0	0
41714	**Governor Feedback**	19	0	1	0	0	0	15	0	4	0	0	0
41715	**Governor Auxiliary Systems**	219	0.02	0	0	3	0	75	0	65	0.07	0.09	0.03
41720	**Governor Oil Pumps**	60	0.01	0	0	0	0	20	0	10	0	0.01	0.02
41740	**Governor Oil Piping**	6	0	0	0	0	0	5	0	7	0	0	0
41741	**Governor Oil Piping System - Components**	17	0	0	0	0	0	7	0	3	0	0	0
41742	**Governor Oil Piping System - Leakage**	16	0	0	0	0	0	15	0	1	0	0	0
41743	**Governor Oil Piping System - Filters**	8	0	0	0	0	0	6	0	1	0	0	0
HYDRO TURBINE TOTAL		**2,650**	**0.67**	**521**	**0.02**	**57**	**0**	**1,704**	**0.19**	**2,200**	**1.78**	**2.66**	**0.95**

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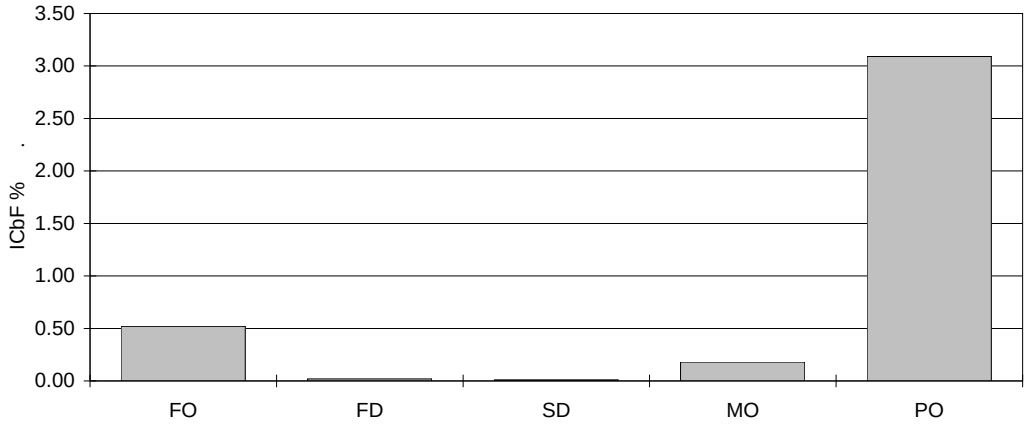
HYDRAULIC UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.1.4
Generators



Generator ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	773
NUMBER OF UNIT YEARS	3458.2
OVERALL OPERATING FACTOR	73.19

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
GENERATOR													
42100	**Generators**	284	0.1	5	0	18	0	555	0.05	2,554	2.43	2.58	0.13
42110	**Generator Rotor**	56	0.02	1	0	0	0	70	0.01	117	0.11	0.13	0.02
42111	**Braking/Jacking System**	187	0.01	0	0	0	0	132	0	93	0.02	0.03	0.01
42112	**Brake Pneumatic System**	23	0.01	0	0	0	0	16	0	8	0	0.01	0.01
42113	**Pole Windings And Connections**	14	0.03	18	0	0	0	19	0.01	14	0.01	0.05	0.04
42114	**Slip Rings And Commutator**	27	0.01	0	0	1	0	223	0.01	52	0.01	0.02	0.02
42115	**Brushes And Brush Rigging**	66	0	2	0	8	0	1,463	0.05	423	0.09	0.14	0
42120	**Generator Stator**	61	0.02	1,073	0	2	0	42	0	164	0.14	0.17	0.03
42121	**Generator Stator Terminals**	1	0	1	0	0	0	6	0	3	0	0	0
42123	**Generator Stator Winding**	39	0.04	228	0	17	0.01	67	0	44	0.13	0.19	0.06
42124	**Generator Stator Winding Wedges**	0	0	0	0	0	0	2	0	3	0	0	0
42125	**Core Iron**	4	0	0	0	0	0	0	0	1	0	0	0
42126	**Generator Stator Cooling System**	38	0	8	0	0	0	59	0.01	40	0.02	0.03	0
42170	**Thrust And Guide Bearings**	204	0.06	17	0	0	0	62	0.01	41	0.01	0.08	0.08
42171	**Thrust Bearing**	121	0.09	10	0	0	0	24	0	8	0.01	0.1	0.12
42172	**Thrust Bearing Oil System**	65	0	1	0	0	0	34	0	16	0.01	0.01	0
42174	**Thrust Bearing Oil Lift System**	21	0	0	0	0	0	12	0	2	0	0	0
42176	**Guide Bearing**	42	0.01	198	0	0	0	11	0	5	0	0.02	0.02
42177	**Guide Bearing Oil System**	18	0	0	0	0	0	18	0	11	0	0.01	0
42178	**Bearing Oil Cooling System**	49	0	1	0	0	0	34	0	3	0	0.01	0.01
42200	**Excitation**	683	0.06	9	0	1	0	287	0.02	293	0.1	0.18	0.09
42210	**Exciter Transformer**	25	0	0	0	0	0	31	0	34	0.01	0.02	0
42220	**Static Exciter(Thyristors, Diodes, Etc.)**	100	0	2	0.01	0	0	66	0	55	0.01	0.02	0.02
42230	**Field Breaker**	182	0.01	0	0	0	0	49	0	56	0.01	0.02	0.01
42240	**Rotating Exciters**	13	0.01	1	0	0	0	28	0	11	0	0.01	0.01
42260	**Automatic Voltage Regulators**	222	0.02	6	0	0	0	72	0	204	0.03	0.05	0.03
GENERATOR TOTAL		**2,545**	**0.52**	**1,581**	**0.02**	**47**	**0.01**	**3,382**	**0.18**	**4,255**	**3.09**	**4.3**	**0.72**

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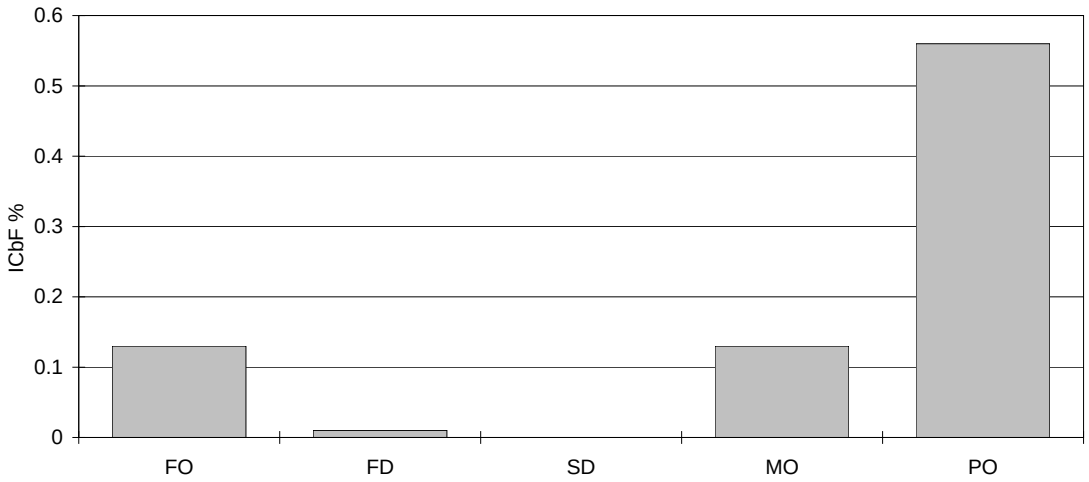
HYDRAULIC UNITS

Table 6.1.4

Detail Component Outage Code Report, 2003 to 2007

Elec. Power Sys.



Electrical Power Systems ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	773
NUMBER OF UNIT YEARS	3458.2
OVERALL OPERATING FACTOR	73.19

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
ELECTRICAL POWER SYSTEM													
51100	**Output System Generator Voltage Equipment**	58	0.01	10	0	4	0	82	0.01	68	0.03	0.05	0.01
51120	**Generator Power Transformers**	433	0.05	270	0.01	69	0	548	0.06	1,019	0.23	0.35	0.07
51130	**Switching Equipment - Generator Voltage**	18	0	0	0	0	0	21	0	38	0.02	0.02	0
51133	**Circuit Breakers - Generator Voltage**	492	0.05	5	0	0	0	381	0.03	529	0.15	0.22	0.06
51136	**Disconnect Switches - Generator Voltage**	103	0.01	1	0	4	0	138	0.01	256	0.05	0.07	0.02
51150	**Bus Duct, Bus, Cable**	141	0.01	29	0	7	0	100	0.01	184	0.07	0.09	0.01
51151	**Bus Duct Cooling System**	10	0	27	0	3	0	13	0	11	0	0	0
51170	**Generator Neutral Grounding Equipment**	5	0	0	0	0	0	4	0	4	0	0	0
52100	**Generator Voltage Supply System**	25	0	0	0	1	0	24	0	25	0	0.01	0
52120	**Station Service Transformer**	19	0	1	0	0	0	35	0	21	0	0	0
52130	**Unit Service Transformer**	9	0	0	0	2	0	9	0	10	0	0.01	0
53000	**Station Power Distribution**	84	0	2	0	7	0	88	0	32	0	0.01	0
55000	**Direct Current Power Supplies**	46	0	0	0	0	0	28	0	8	0	0	0
ELECTRICAL POWER SYSTEM TOTAL		**1,443**	**0.13**	**345**	**0.01**	**97**	**0**	**1,471**	**0.13**	**2,205**	**0.56**	**0.83**	**0.19**

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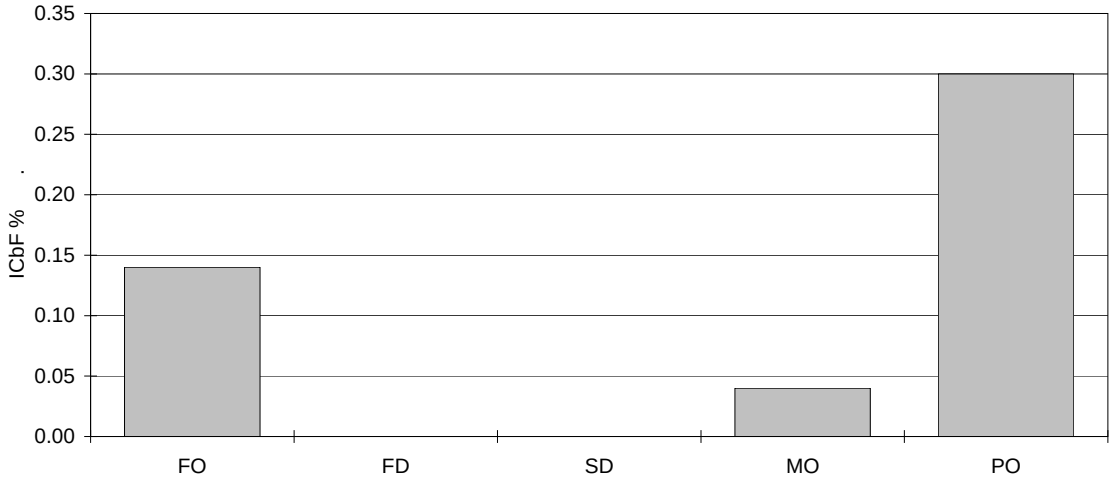
HYDRAULIC UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.1.4
Ins. And Controls



Instrumentation & Control ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	773
NUMBER OF UNIT YEARS	3458.2
OVERALL OPERATING FACTOR	73.19

		FORCED OUTAGES		FORCED OUTAGES		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
INSTRUMENTATION AND CONTROL													
64100	**Hydraulic Turbine And Auxiliaries - Instruments & Controls**	156	0.01	7	0	9	0	68	0	31	0.01	0.02	0.01
64112	**Turbine Guide Bearing - Instruments & Controls**	31	0.01	2	0	0	0	12	0	5	0	0.01	0.01
64170	**Governor - Instruments And Controls**	206	0.01	5	0	0	0	94	0	45	0	0.02	0.01
64171	**Governor Oil System - Instruments & Controls**	39	0	1	0	0	0	7	0	5	0	0	0
64200	**Generator And Auxiliaries - Instruments And Controls**	496	0.04	7	0	20	0	305	0.02	164	0.03	0.08	0.05
64210	**Supervisory Control & Data Acquisition - SCADA**	159	0.01	46	0	4	0	115	0	24	0.02	0.03	0.01
64211	**Generator Brakes - Instruments & Control**	39	0	0	0	0	0	30	0	3	0	0	0
64216	**Generator Thrust Bearing - Instruments & Controls**	25	0	2	0	0	0	20	0	5	0	0	0
64217	**Generator Guide Bearing - Instruments & Controls**	12	0	0	0	0	0	9	0	4	0	0	0
64220	**Excitation Instrumentation & Control**	137	0	0	0	0	0	67	0	45	0.01	0.01	0.01
64260	**Synchronous Condensor - Instrumentation & Control**	13	0	1	0	1	0	5	0	20	0.01	0.01	0
65100	**Main Power Output Systems - Instruments & Controls**	131	0	4	0	4	0	79	0	80	0.01	0.01	0
65200	**Station Service Main Transformation - Instruments & Controls**	9	0	1	0	0	0	3	0	10	0	0	0
65300	**Station Service Power Distribution - Instruments & Controls**	56	0	0	0	0	0	41	0	30	0	0.01	0
65500	**Direct Current Power Supplies - Instruments & Controls**	45	0	0	0	0	0	19	0	4	0	0	0
65900	**System Control**	488	0.02	6	0	0	0	253	0	727	0.17	0.19	0.02
66000	**Telecom and Communications**	974	0.03	81	0	4	0	131	0	218	0.05	0.08	0.04
67000	**Plant Auxiliary Processes And Services - Instruments & Controls**	70	0	6	0	8	0	63	0	13	0	0.01	0
INSTRUMENTATION AND CONTROL TOTAL		**3,086**	**0.14**	**169**	**0**	**50**	**0**	**1,321**	**0.04**	**1,433**	**0.3**	**0.49**	**0.19**

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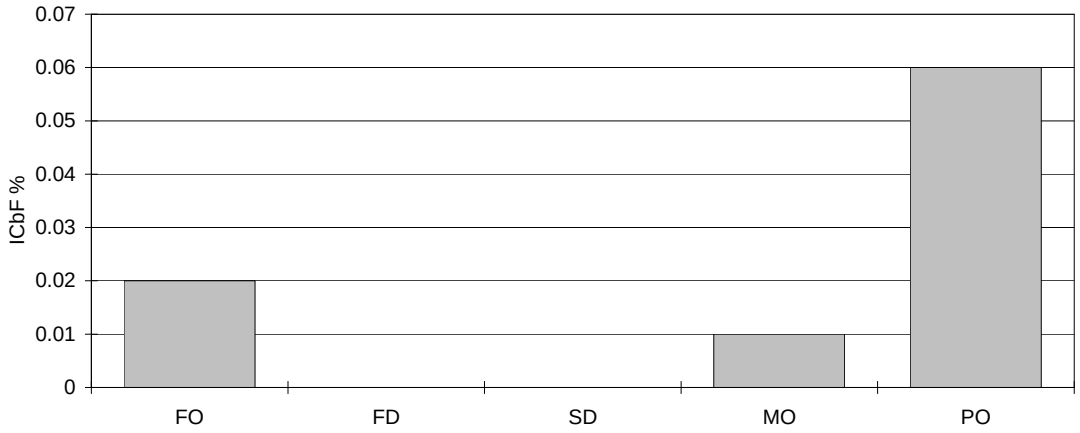
HYDRAULIC UNITS

Table 6.1.4

Detail Component Outage Code Report, 2003 to 2007

Aux. Processes



Plant Aux. Processes & Services ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	773
NUMBER OF UNIT YEARS	3458.2
OVERALL OPERATING FACTOR	73.19

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
PLANT AUX. PROCESSES AND SERVICES													
72300	**Cooling Water Systems**	145	0.01	6	0	1	0	138	0	96	0.05	0.06	0.01
72400	**Fire Protection Water System**	48	0.01	0	0	0	0	81	0	50	0.01	0.02	0.02
72600	**Turbine Dewatering & Rewatering Piping System**	1	0	0	0	0	0	7	0	6	0	0	0
75000	**Compressed Air To Brakes & Governor**	13	0	1	0	0	0	4	0	7	0	0	0
75140	**Water Depressing System**	3	0	0	0	0	0	9	0	2	0	0	0
75220	**Fixed Fire Protection CO2 & Halon System**	1	0	0	0	0	0	1	0	1	0	0	0
PLANT AUX. PROCESSES AND SERVICES TOTAL		**211**	**0.02**	**7**	**0**	**1**	**0**	**240**	**0.01**	**162**	**0.06**	**0.08**	**0.02**

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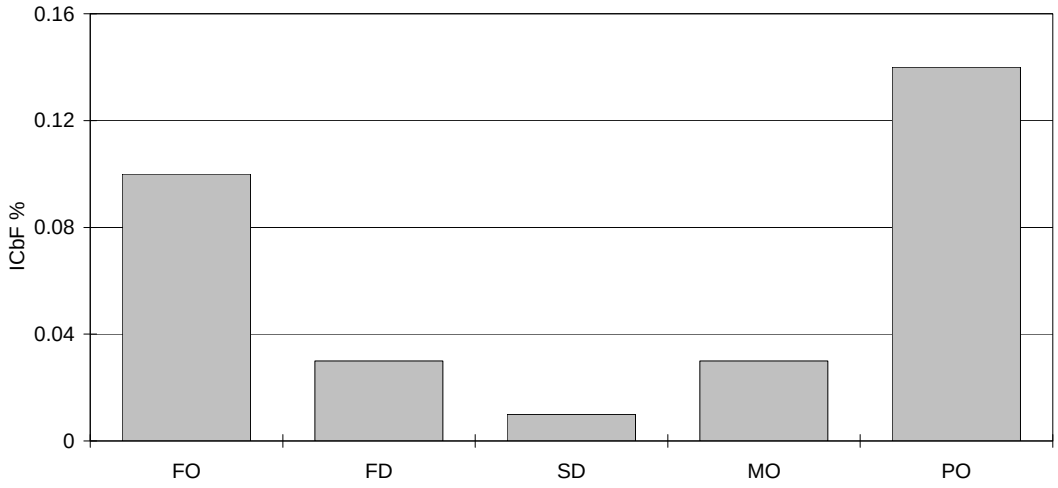
HYDRAULIC UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.1.4
Conditions



Conditions ICbF by event type for hydraulic units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	773
NUMBER OF UNIT YEARS	3458.2
OVERALL OPERATING FACTOR	73.19

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
CONDITIONS													
00500	**Regulatory Bodies**	21	0	324	0	49	0	304	0	243	0.01	0.02	0
05200	**Transmission Limitations**	723	0.02	468	0	69	0	292	0.02	456	0.09	0.13	0.03
05201	**Powerhouse Substation (non-generating unit equipment)**	19	0	0	0	0	0	6	0	32	0.01	0.01	0
05202	**Transmission Line (connected to powerhouse substation)**	68	0	0	0	0	0	3	0	16	0	0	0
05203	**Transmission Equipment (beyond transmission line)**	43	0	0	0	0	0	0	0	10	0	0	0
07010	**Site Environment, Storms, Floods**	310	0	1	0	0	0	36	0	123	0	0.01	0
07060	**Upstream Water Conditions**	38	0	107	0.02	522	0.01	28	0	9	0	0.03	0.02
07070	**Downstream Water Conditions**	11	0	3	0	40	0	11	0	53	0	0	0
7080	**Headpond Ice Cover**	137	0.06	30	0	0	0	41	0	7	0	0.07	0.09
8160	**Fire, General**	8	0	2	0	0	0	2	0	7	0	0	0
08940	**Labour Troubles**	4	0	0	0	0	0	0	0	0	0	0	0
99999	**Other**	412	0	83	0	2	0	151	0	293	0.03	0.04	0.01
CONDITIONS TOTAL		**1,794**	**0.1**	**1,018**	**0.03**	**682**	**0.01**	**874**	**0.03**	**1,249**	**0.14**	**0.31**	**0.17**

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6.2 Fossil Summary Statistics

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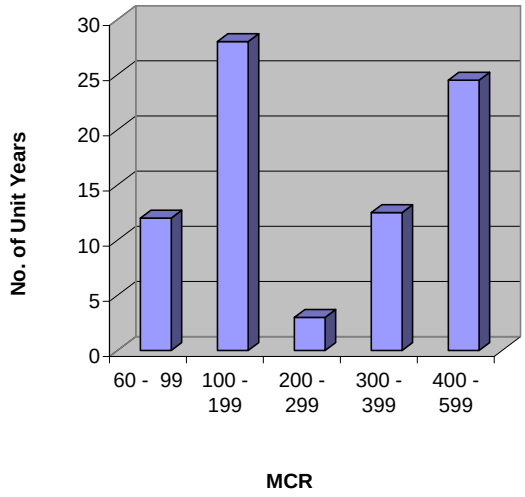
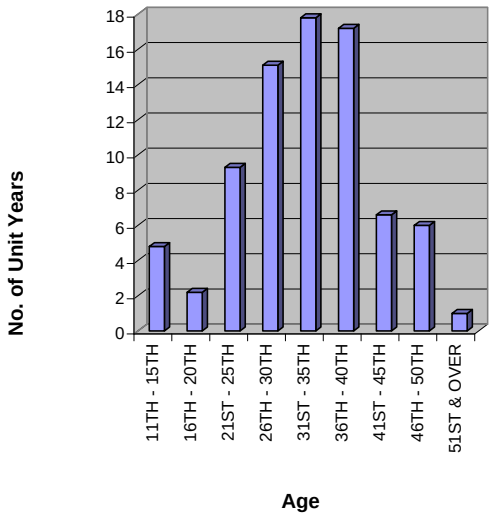
FOSSIL UNITS

External Causes Excluded, 2007 Data

Table 6.2.1





	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	12	49.08	40.75	62	0.3	576.25	49.07	6.63	10.11	9.16	1.5	12.51	10.84	2.57	4.71
100 - 199	28	18.03	64.71	227	1.3	1,868.38	51	6.8	8.49	7.72	5.2	18.7	10.27	1.77	10.77
200 - 299	3	8.56	75.92	39	0.1	92.28	14.8	2.81	3.48	3.35	0.5	16.08	15.37	1.53	11.79
300 - 399	12.5	10.71	76.65	107	0.5	734.18	41.66	5.03	7.42	7.07	1.9	14.81	10.73	0.45	8.13
400 - 599	24.5	13.01	68.71	232	1	404.25	39.35	5.84	9.81	8.85	5.3	21.77	10.23	3.95	10.08
CLASSIFICATION BY YEAR OF SERVICE															
11TH - 15TH	4.8	0.06	90.62	27	0.1	103.01	24.86	1.74	2.81	2.8	0.5	10.55	5.79	0.23	7.48
16TH - 20TH	2.2	0.24	95.77	12	0	56.5	20.05	1.27	1.72	1.71	0.1	4.58	5.14	0.15	2.61
21ST - 25TH	9.3	4	80.67	126	0.6	312.01	41.99	7.45	8.61	8.34	1.5	16.51	13.33	0.69	8.14
26TH - 30TH	15.1	7.46	73.43	126	0.5	734.18	35.74	4.44	6.89	6.47	3.2	21.18	9.67	2.94	12.76
31ST - 35TH	17.8	27.24	57.78	150	0.6	404.25	35.8	5.62	9.76	8.34	3.2	18.11	11.55	3.07	8.48
36TH - 40TH	17.2	21.17	60.25	171	1.2	1,868.38	59.1	10.03	13.6	12.02	3.6	21.24	13.53	2.03	9.82
41ST - 45TH	6.6	55.2	32.49	13	0	89.5	11.83	0.81	0.83	0.8	0.8	12.85	5.12	2.57	9.48
46TH - 50TH	6	34.51	49.54	33	0.2	576.25	61.27	7.21	11.24	10.22	1.2	19.67	9.42	4.55	7.55
51ST & OVER	1	0	89.6	9	0	207.91	47.02	5.12	10.53	9.8	0.2	15.99	8.93	1.07	4.5
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	8	84.28	2.88	4	0.2	1,868.38	530.28	51.27	51.48	6.75	1	12.88	4.35	0.9	8.92
11 - 20	6	55.73	16.95	48	0.5	576.25	97.57	34.46	35.54	16.57	1.7	28.11	15.74	4.56	13.85
21 - 30	2	47.38	27.07	1	0	12.73	12.73	0.27	0.27	0.26	0.5	26.53	0	0.79	24.69
31 - 40	2	37.29	34.12	3	0	29.36	11.31	0.56	2.14	2.05	0.6	29.13	2.93	0.71	27.69
41 - 50	3	35.8	46.68	14	0	89.5	22.59	2.51	3.98	3.57	0.6	18.35	7.86	3.59	12.73
51 - 60	6	23.75	53.28	38	0.2	878.76	53.04	6.71	10.02	8.27	1.5	24.94	9.07	4.01	15.12
61 - 70	9	10.92	65.62	110	0.6	860.06	46.53	9	14.51	13.2	2.5	27.88	14.22	4.76	12.21
71 - 80	10	3.91	75.95	104	0.6	472.41	51.72	7.48	12.67	12.11	2.6	26.26	10.4	6.27	7.73
81 - 90	12	0.22	86.44	154	0.5	734.18	25.93	4.21	6.7	6.68	1.9	15.79	14.17	0.46	9.08
91 - 100	22	0.19	94.37	191	0.6	144.08	26.74	2.73	3.95	3.95	1.5	6.8	8.67	0.17	2.62
ALL UNITS	**80**	**19.65**	**64.63**	**667**	**3.3**	**1,868.38**	**43.15**	**5.98**	**8.66**	**7.84**	**14.4**	**18**	**10.62**	**2.34**	**9.27**

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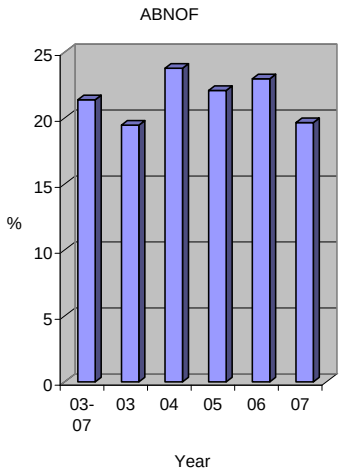
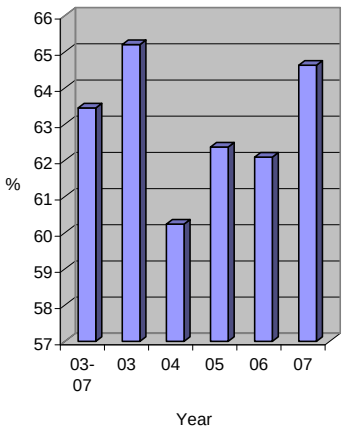
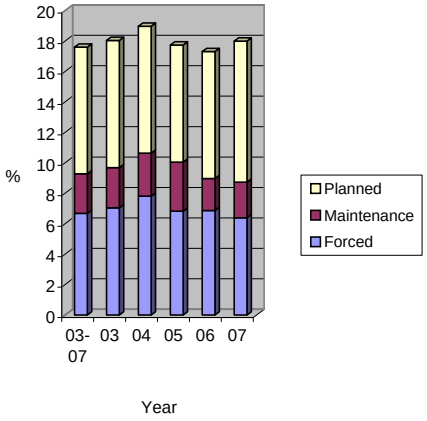
FOSSIL UNITS

External Causes Excluded, 2003 to 2007 Data

Table 6.2.2







	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	57	45.46	40.49	250	2.4	3,688.95	83.91	9.4	14.88	12.54	9.6	16.83	9.09	4.56	5.3
100 - 199	153.1	25.89	59.93	1,007	5	3,552.98	43.28	5.14	6.59	5.68	23.5	15.35	9.64	1.6	9.33
200 - 299	12	2.74	78.93	143	0.5	890.78	28.63	4.7	5.96	5.84	2.3	19.57	13.09	1.1	13.33
300 - 399	61.1	4.66	84.21	476	2.3	734.18	42.49	4.3	6.2	6.07	8	13.09	8.57	0.37	6.98
400 - 599	112	14.09	66.98	1,146	6.7	2,978.43	50.87	8.15	13.51	11.67	26.1	23.3	10.81	4.33	8.66
CLASSIFICATION BY YEAR OF SERVICE															
6TH - 10TH	4.8	0.18	90.36	32	0.1	232.58	31.05	2.53	3.06	3.06	0.5	9.98	6.64	0.7	6.42
11TH - 15TH	23.5	0.13	91.34	161	0.5	215.01	24.91	2.09	3.02	3.21	2.2	9.53	6.79	0.52	6.07
16TH - 20TH	21.7	0.39	88.16	166	0.7	890.78	39.37	3.76	4.47	4.51	2.7	12.25	7.7	0.58	7.43
21ST - 25TH	50.2	5.69	80.66	446	2	591.4	38.3	4.6	6.12	5.84	7.6	15.18	9.81	1.13	8.63
26TH - 30TH	93.3	23.33	61.11	744	3.7	1,276.50	43.91	6.14	9.98	8.31	17	18.24	10.07	3.25	8.3
31ST - 35TH	89.8	19.42	63.61	812	4.3	2,978.43	46.43	7.01	11.32	9.76	18.2	20.31	11.11	2.81	9.37
36TH - 40TH	59.6	42.94	42.42	398	2.7	3,552.98	58.34	9.49	12.73	9.95	9.9	16.62	13.05	1.84	8.35
41ST - 45TH	34.7	39.29	43.23	149	1.7	3,688.95	98.88	10.08	14.3	11.44	6.9	19.96	7.27	3.47	9.16
46TH - 50TH	15.6	19.84	60.46	88	0.8	1,737.25	82.97	8.13	14.54	13.27	3.9	24.86	8.71	9.7	4.64
51ST - 55TH	1	0.18	58.86	17	0.3	852.83	147.65	32.75	33.53	33.46	0.4	41.88	22.09	2.59	9.73
56TH & OVER	1	0	89.6	9	0	207.91	47.02	5.12	10.53	9.8	0.2	15.99	8.93	1.07	4.5
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	41	84.51	4.77	65	1.1	3,688.95	154.47	36.94	39	16.27	4.5	10.97	13.8	1.23	6.7
11 - 20	33	65.91	16.06	127	0.6	1,868.38	41.46	10.18	13.72	5.25	6.3	18.97	10.37	3.63	12.58
21 - 30	10	56.94	25.87	16	0.8	3,552.98	432.62	23.38	23.65	12.92	1.9	18.65	4.25	0.19	9.1
31 - 40	12	51.33	33.14	17	0.2	1,630.08	98.98	4.61	8.45	4.32	2	16.96	3.27	3.27	10.66
41 - 50	10	25.65	46.65	26	0.4	1,737.25	137.32	8.03	17.71	12.84	3.4	33.69	5.14	23.2	0.46
51 - 60	32	24.31	54.85	203	1.2	1,435.16	50.55	6.25	8.94	7.55	7.2	22.59	9.97	2.01	15.18
61 - 70	55	8.73	66.92	582	4	2,978.43	60.23	9.8	14.82	13.17	15.8	28.64	10.4	4.96	12.12
71 - 80	27	2.73	73.35	364	2.6	1,270.65	61.62	11.44	20.71	19.82	8.7	32.37	12.47	6.38	8.06
81 - 90	61	0.35	87.04	709	2.6	860.06	32.45	4.71	6.52	6.55	8.9	14.58	12.41	0.55	7.76
91 - 100	114.1	0.11	92.02	913	3.3	451.75	31.71	3.05	4.64	4.71	10.9	9.53	8.35	0.34	4.63
ALL UNITS	**395.2**	**21.38**	**63.45**	**3,022**	**16.8**	**3,688.95**	**48.7**	**6.28**	**9.4**	**8.17**	**69.5**	**17.6**	**9.85**	**2.6**	**8.32**

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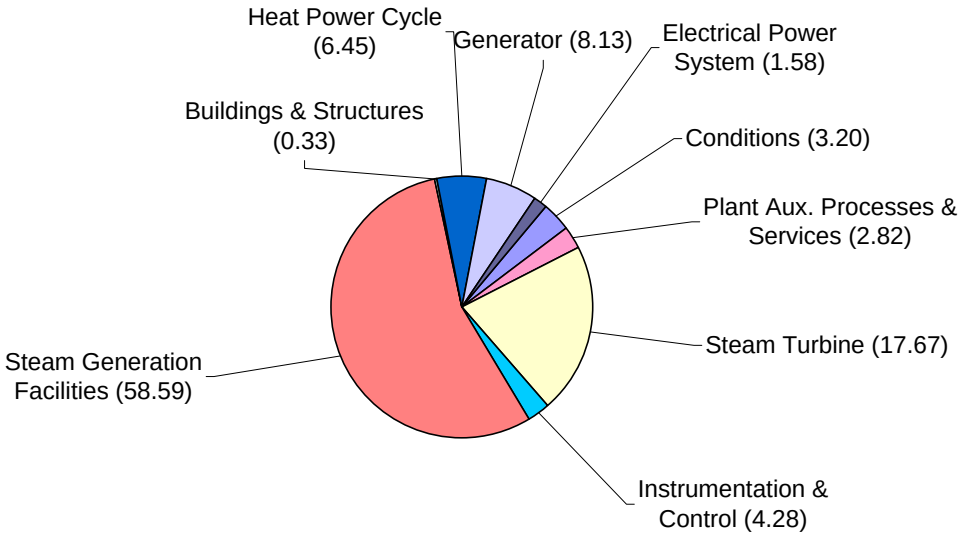
FOSSIL UNITS

Table 6.2.3

Major Component Outage Code Report, 2003 to 2007

Major component contribution to fossil unit ICbF based on 2002-06 data.



UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
BUILDINGS AND STRUCTURES	6	0	1	0	3	0	21	0.04	9	0.03	0.08	0.01	0.01
STEAM GENERATION FACILITIES	1,250	1.91	22,052	1.4	1,833	0.17	581	1.09	250	5.38	10.07	3.18	5.32
STEAM TURBINE	423	0.77	926	0.17	1,274	0.05	129	0.49	102	2.15	3.83	1.12	1.37
GENERATOR	173	0.62	259	0.02	103	0.01	81	0.23	17	0.31	1.2	0.91	0.94
HEAT POWER CYCLE	355	0.22	3,044	0.34	253	0.04	274	0.43	10	0.06	1.09	0.32	0.81
ELECTRICAL POWER SYSTEM	173	0.2	267	0.02	38	0	44	0.03	19	0.04	0.29	0.3	0.32
INSTRUMENTATION AND CONTROL	576	0.22	1,494	0.08	359	0.01	49	0.03	15	0.17	0.52	0.33	0.44
PLANT AUX. PROCESSES AND SERVICES	66	0.08	704	0.04	334	0.01	64	0.12	30	0.28	0.53	0.11	0.18
CONDITIONS	125	0.16	9,979	0.37	247	0.02	25	0.03	9	0.07	0.64	0.23	0.77
TOTAL (External Causes Included)	**3,147**	**4.2**	**38,726**	**2.45**	**4,444**	**0.31**	**1,268**	**2.49**	**461**	**8.1**	**18.25**	**6.51**	**10.16**
TOTAL (External Causes Excluded)	**3,022**	**4.04**	**28,747**	**2.08**	**4,197**	**0.29**	**1,243**	**2.46**	**452**	**8.03**	**17.6**	**6.28**	**9.4**

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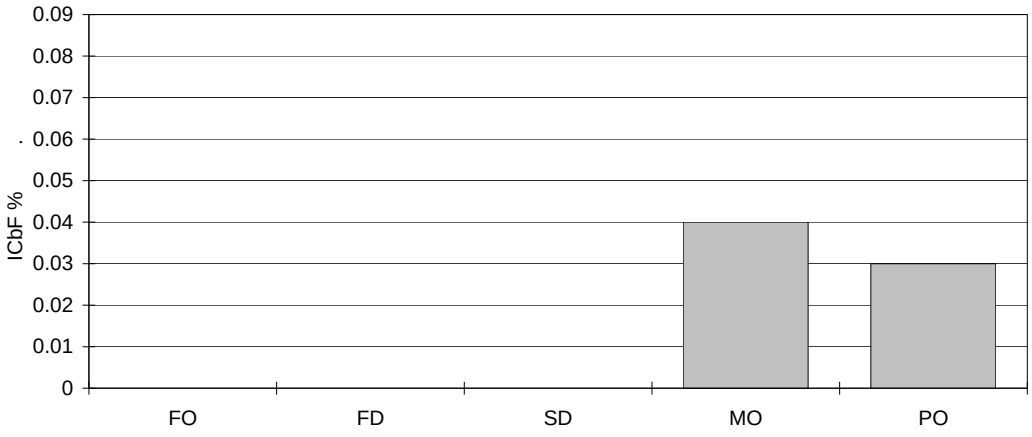
FOSSIL UNITS

Table 6.2.4

Detail Component Outage Code Report, 2003 to 2007

Buildings and Structures



Building & Structures ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
BUILDINGS AND STRUCTURES													
22000	**Powerhouse**	1	0	0	0	0	0	2	0.01	0	0	0.01	0
23290	**Chimney**	5	0	1	0	3	0	19	0.03	9	0.03	0.07	0
BUILDINGS AND STRUCTURES TOTAL		**6**	**0**	**1**	**0**	**3**	**0**	**21**	**0.04**	**9**	**0.03**	**0.08**	**0.01**

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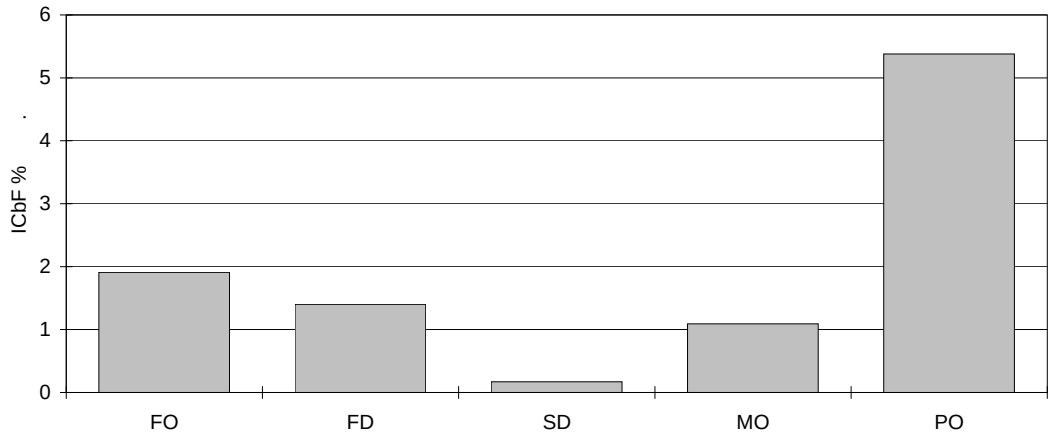
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Steam Generators



Steam Generation Facilities ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM GENERATION FACILITIES													
31000	**Steam Generator**	136	0.19	1,684	0.18	341	0.03	75	0.26	230	5.01	5.66	0.84
31120	**Primary Air Fans - Pulverized Fuel**	21	0.01	920	0.06	29	0	8	0.02	0	0	0.09	0.1
31130	**Primary Air Fan Drives - Pulverized Fuel**	2	0	42	0	0	0	0	0	0	0	0	0.01
31150	**Air Heaters**	33	0.05	383	0.05	9	0	82	0.12	0	0	0.23	0.15
31170	**Primary Air Duct - Pulverized Fuel**	6	0	26	0	4	0	2	0	0	0	0	0
31210	**Coal Feeders (Gravimetric Or Volumetric)**	6	0	2,524	0.06	108	0	1	0	0	0	0.06	0.09
31220	**Pulverized Fuel Burner Piping And Valves**	4	0	812	0.04	32	0.01	7	0	0	0	0.05	0.06
31230	**Oil Burner Piping And Valves**	1	0	1	0	1	0	1	0	0	0	0	0
31240	**Gas Burner Piping And Valves**	4	0	16	0	0	0	3	0.01	5	0.1	0.1	0
31250	**Pulverizers**	13	0	5,475	0.36	840	0.09	13	0.01	1	0	0.47	0.53
31262	**Pulverizer Motors**	0	0	64	0.01	3	0	0	0	0	0	0.01	0.01
31270	**Burners And Windboxes**	7	0	42	0	7	0	5	0.01	0	0	0.02	0.01
31280	**Igniters**	6	0	111	0	2	0	13	0.01	0	0	0.02	0.01
31300	**Sootblower Systems**	4	0	229	0.01	5	0	3	0	2	0.02	0.04	0.02
31510	**Steam Drum - Scrubbers,Separators, Etc.**	8	0	7	0	0	0	0	0	1	0.03	0.03	0
31530	**Steam Generating Tubes (Between Steam Drum And Mud Drum)**	20	0.04	13	0.01	0	0	13	0.02	0	0	0.07	0.08
31540	**Waterwalls**	351	0.66	169	0.01	0	0	63	0.14	1	0	0.81	0.96
31550	**Circulating Pumps**	13	0	76	0.01	11	0	6	0.01	0	0	0.03	0.02
31560	**Circulating Pumps Drives**	5	0	459	0.01	2	0	7	0.02	0	0	0.04	0.03
31570	**Safety Valves**	18	0.03	277	0.02	114	0.01	12	0.01	0	0	0.06	0.07
31580	**Water Gauges**	2	0	0	0	0	0	1	0	0	0	0	0
31701	**Superheater**	195	0.36	305	0.01	26	0	12	0.02	1	0.01	0.41	0.55
31702	**Reheater**	76	0.22	68	0.01	0	0	10	0.02	1	0.01	0.25	0.32
31703	**Economizer**	52	0.08	17	0	0	0	7	0.02	0	0	0.1	0.12
31810	**Attemperation**	12	0.01	68	0	5	0	6	0.01	1	0.02	0.04	0.01

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FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4

Steam Generators
(Continued)

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
31820	**Burner Tilt**	0	0	7	0	0	0	0	0	0	0	0	0
31832	**Flue Gas-Recirculation Fans**	4	0.01	180	0.02	4	0	6	0.02	0	0	0.05	0.04
31834	**Flue Gas Recirculation Motors**	0	0	9	0	0	0	1	0	0	0	0.01	0
32100	**Forced Draft Ducts**	2	0	21	0	1	0	3	0	0	0	0	0
32310	**Forced Draft Fans**	39	0.02	246	0.09	16	0.01	21	0.02	0	0	0.14	0.17
32320	**Forced Draft Fan Variable Speed Coupling Drives**	0	0	1	0	0	0	0	0	0	0	0	0
32330	**Forced Draft Fan Motors**	1	0	65	0.02	1	0	0	0	0	0	0.02	0.02
32400	**Induced Draft Flues**	1	0	11	0	0	0	6	0.01	1	0	0.01	0
32510	**Induced Draft Fans**	65	0.07	931	0.05	16	0	33	0.05	0	0	0.18	0.18
32520	**Induced Draft Fan Variable Speed Coupling Drives**	5	0.01	0	0	1	0	3	0	0	0	0.01	0.01
32530	**Induced Draft Fan Motors**	3	0	130	0	4	0	1	0	0	0	0.01	0.01
33100	**Main Steam Piping**	14	0.02	2	0	1	0	11	0.02	1	0.03	0.06	0.02
33200	**Hot Reheat Piping**	3	0.01	11	0	0	0	1	0	0	0	0.01	0.01
33300	**Cold Reheat Piping**	1	0	0	0	0	0	1	0	0	0	0	0
34100	**Furnace And Water Gauge Television Auxiliary Sys**	1	0	1	0	0	0	0	0	0	0	0	0
34200	**Boiler Blowdown System**	5	0	74	0	0	0	2	0	0	0	0.01	0.01
34400	**Boiler Drains System**	5	0.01	11	0	0	0	4	0	0	0	0.01	0.01
35110	**Furnace Ash Removal System**	45	0.04	771	0.04	11	0	14	0.01	1	0	0.1	0.12
35120	**Pulverizer Pyrites Removal System**	1	0	334	0	6	0	0	0	0	0	0	0.01
35130	**Fly Ash Removal System - Dry Transportation**	2	0	137	0.01	9	0	37	0.03	0	0	0.05	0.02
35140	**Fly Ash Removal System - Wet Transportation**	4	0	20	0	9	0	2	0	0	0	0	0
35210	**Precipitators-Electrostatic**	24	0.03	3,702	0.24	69	0	77	0.15	1	0.02	0.44	0.49
35220	**Precipitators-Mechanical**	1	0	13	0	0	0	1	0	1	0.03	0.04	0
35230	**Precipitators-Baghouse**	0	0	3	0	0	0	0	0	0	0	0	0
36100	**Coal Receiving Systems**	5	0	120	0	36	0	1	0	0	0	0.01	0.01
36200	**Coal Storage Systems**	3	0	988	0.04	32	0	0	0	0	0	0.04	0.05
36300	**Coal Handling Systems**	1	0	361	0.01	3	0	0	0	0	0	0.01	0.02
36370	**Coal Stacker/Reclaimer Machine**	1	0	10	0	0	0	0	0	0	0	0	0
36400	**Coal Processing Systems**	1	0	18	0	2	0	0	0	0	0	0	0
37100	**Fuel Oil Receiving Systems**	1	0	1	0	0	0	0	0	0	0	0	0
37300	**Fuel Oil Transfer Systems**	0	0	0	0	52	0	0	0	2	0.01	0.01	0
37400	**Fuel Oil Forwarding Systems**	2	0	2	0	0	0	0	0	0	0	0	0
37500	**Fuel Oil Boosting Systems**	4	0	8	0	0	0	1	0	0	0	0	0
37600	**Fuel Oil Heating Systems**	0	0	2	0	0	0	0	0	0	0	0	0
38000	**Sulphur Oxides Removal System**	11	0	37	0	20	0	5	0.04	0	0	0.04	0.01
38300	**In-Furnace Bed Limestone Injection System**	0	0	3	0	1	0	0	0	0	0	0	0
38400	**Fluid Bed Limestone Injection System**	0	0	34	0	0	0	0	0	0	0	0	0
STEAM GENERATION FACILITIES TOTAL		**1,250**	**1.91**	**22,052**	**1.4**	**1,833**	**0.17**	**581**	**1.09**	**250**	**5.38**	**10.07**	**5.32**

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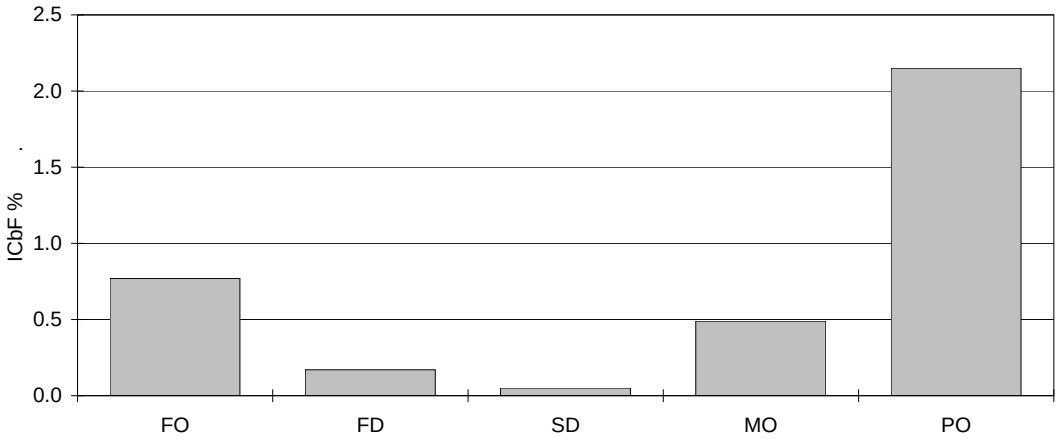
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Steam Turbine



Steam Turbine ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM TURBINE													
41100	**Turbine**	165	0.53	608	0.06	220	0.02	55	0.34	94	1.99	2.96	0.85
41110	**Cylinders**	5	0.03	13	0.05	1	0	0	0	0	0	0.08	0.11
41120	**Rotors**	8	0	22	0.05	12	0.03	2	0	0	0	0.08	0.07
41121	**Shaft Coupling Mechanism**	2	0	0	0	0	0	9	0.03	1	0.01	0.04	0
41130	**Blades**	1	0	0	0	0	0	2	0	1	0.02	0.03	0
41140	**Crossover Piping**	4	0	2	0	0	0	0	0	1	0.03	0.03	0.01
41150	**Turning Gear**	3	0	0	0	0	0	0	0	0	0	0	0
41157	**Turning Gear Motor**	1	0	0	0	0	0	1	0	0	0	0	0
41160	**Valve Gear**	55	0.06	86	0.02	59	0	27	0.08	3	0.13	0.4	0.11
41170	**Bearings And Pedestals**	25	0.02	50	0	0	0	2	0	0	0	0.02	0.03
41200	**Lubricating Oil System**	34	0.02	7	0	0	0	6	0.01	0	0	0.03	0.03
41500	**Gland Seal System-Steam**	8	0.02	4	0	1	0	8	0.01	1	0	0.03	0.03
41540	**Gland Seal System-Water**	1	0	0	0	0	0	0	0	0	0	0	0
41600	**Turbovisory**	39	0.05	27	0	6	0	5	0	0	0	0.05	0.07
41700	**Governing System**	72	0.04	107	0	975	0	12	0.01	1	0	0.06	0.06
STEAM TURBINE TOTAL		**423**	**0.77**	**926**	**0.17**	**1,274**	**0.05**	**129**	**0.49**	**102**	**2.15**	**3.83**	**1.37**

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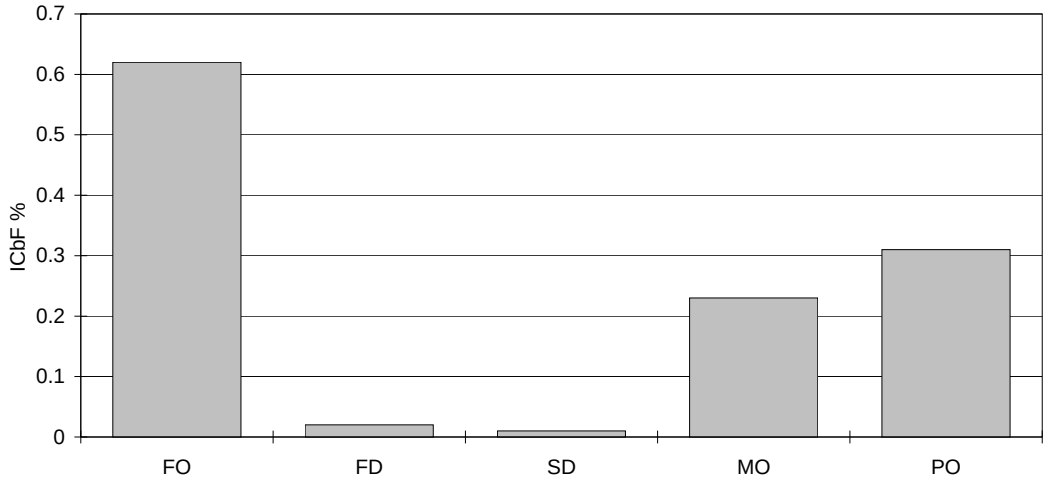
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Generators



Generator ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
GENERATOR													
42100	**Generator**	24	0.05	14	0	18	0	4	0	11	0.15	0.2	0.07
42110	**Generator Rotor**	11	0.17	1	0	7	0	2	0.02	3	0.1	0.28	0.24
42111	**Generator Bearings**	9	0.11	41	0	0	0	4	0.03	0	0	0.14	0.17
42112	**Generator Hydrogen Seals**	11	0.09	3	0	0	0	4	0.02	2	0.04	0.15	0.13
42114	**Generator Collector And Brushes**	3	0	10	0	2	0	16	0.02	0	0	0.02	0
42120	**Generator Stator**	4	0.02	13	0	1	0	0	0	0	0	0.02	0.02
42200	**Excitation Systems Equipment**	70	0.05	36	0	36	0	33	0.09	1	0.03	0.17	0.07
42300	**Hydrogen Gas Cooling System**	24	0.04	116	0.01	37	0	7	0.02	0	0	0.08	0.08
42400	**Generator Liquid Cooling System**	13	0.1	23	0	2	0	7	0.02	0	0	0.12	0.15
42500	**Seal Oil System**	4	0	2	0	0	0	4	0.01	0	0	0.01	0
GENERATOR TOTAL		**173**	**0.62**	**259**	**0.02**	**103**	**0.01**	**81**	**0.23**	**17**	**0.31**	**1.2**	**0.94**

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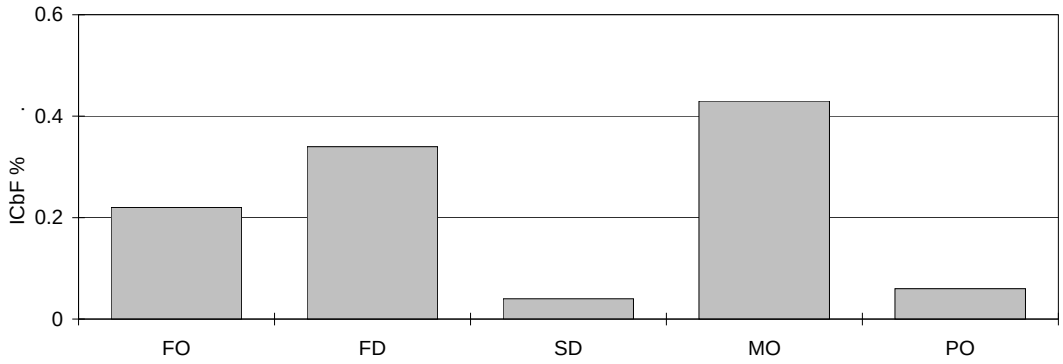
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Heat Power Cycle



Heat Power Cycle ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED OUTAGES		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
HEAT POWER CYCLE													
43090	**Boiler Feedwater Piping And Supports**	26	0.02	26	0	0	0	13	0.03	0	0	0.05	0.04
43100	**High Pressure Feedwater Heaters And Aux.**	44	0.04	433	0.07	12	0	25	0.04	2	0.02	0.17	0.15
43200	**Boiler Feed Pumps And Auxiliaries**	71	0.03	766	0.11	49	0.01	39	0.07	0	0	0.21	0.2
43260	**Boiler Feed Pump Variable Speed Coupling Drives**	6	0	39	0.01	2	0	2	0	0	0	0.02	0.02
43300	**Boiler Feed Pump Turbines & Auxiliaries**	17	0.01	183	0.03	10	0	10	0.01	0	0	0.05	0.05
43400	**Boiler Feed Pump Motors And Auxiliaries**	12	0.01	75	0.03	6	0.01	3	0	1	0	0.05	0.05
44090	**Condensate Piping And Supports**	4	0	64	0	1	0	4	0	0	0	0.01	0.01
44110	**Condensor**	21	0.01	333	0.02	14	0	28	0.04	7	0.04	0.11	0.05
44120	**Condensor Tubes**	46	0.04	631	0.03	106	0.01	104	0.11	0	0	0.19	0.1
44200	**Condensate Extraction Pumps And Auxiliaries**	14	0.01	215	0.02	26	0	7	0	0	0	0.04	0.05
44300	**Condensate Extraction Pump Motors And Aux.**	1	0	24	0	1	0	0	0	0	0	0	0
44400	**Low Pressure Feedwater Heaters And Aux.**	7	0	51	0	13	0	1	0	0	0	0.01	0.01
44500	**Deaerator, Storage Tank, And Auxiliaries**	31	0.02	35	0	2	0	16	0.03	0	0	0.05	0.03
45000	**Air Extraction System**	18	0.01	29	0	0	0	1	0	0	0	0.01	0.01
45090	**Air Extraction System And Piping Support**	2	0	4	0	0	0	0	0	0	0	0	0
45100	**Air Extraction System Vacuum Pumps And Aux.**	8	0	20	0	1	0	0	0	0	0	0	0.01
45200	**Air Extraction System Vacuum Pump, Motors And Auxiliaries**	4	0	1	0	0	0	0	0	0	0	0	0
45300	**Steam Air Ejectors**	6	0	5	0	0	0	3	0.04	0	0	0.04	0
46100	**Turbine Bypass System**	1	0	0	0	0	0	0	0	0	0	0	0
47000	**Condensate Make-up System**	5	0	7	0	0	0	3	0.03	0	0	0.03	0
48000	**Feed Cycle Auxiliary Systems**	2	0	1	0	0	0	1	0	0	0	0	0
48100	**Extraction Steam System**	3	0.01	19	0	1	0	4	0.01	0	0	0.02	0.01
48200	**Feedwater Heater Drains System**	5	0	31	0	1	0	5	0	0	0	0.01	0.01
48400	**Feedwater Heater Relief Valve, Vent**	0	0	52	0	8	0	1	0	0	0	0	0.01
48500	**Turbine And Piping Drains**	1	0	0	0	0	0	4	0.01	0	0	0.01	0
HEAT POWER CYCLE TOTAL		**355**	**0.22**	**3,044**	**0.34**	**253**	**0.04**	**274**	**0.43**	**10**	**0.06**	**1.09**	**0.81**

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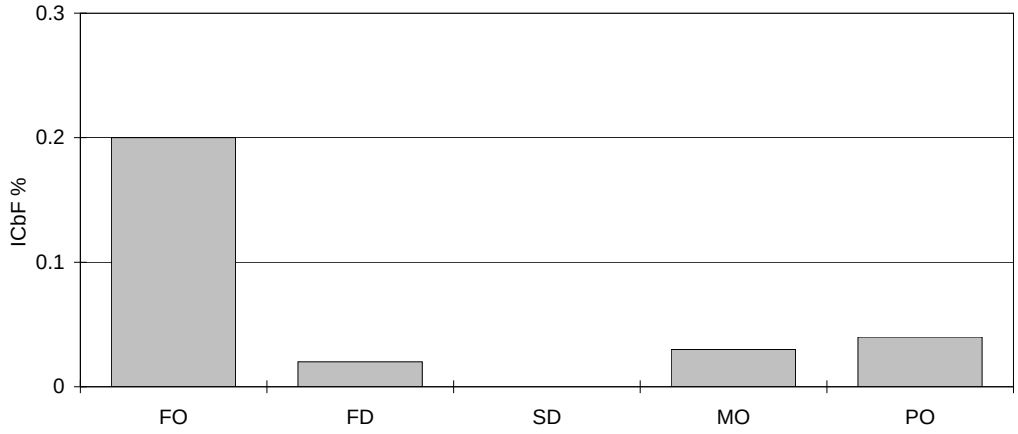
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Electrical Power Sys.



Electric Power Systems ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
ELECTRICAL POWER SYSTEM													
51100	**Output System Generator Voltage Equipment**	13	0	4	0	15	0	1	0	1	0	0	0
51120	**Generator Power Transformers**	47	0.11	99	0.01	8	0	12	0.01	10	0	0.13	0.17
51130	**Switching Equipment-Generator Voltage**	2	0	0	0	0	0	2	0	0	0	0	0
51133	**Circuit Breakers-Generator Voltage**	6	0	3	0	0	0	4	0	3	0	0.01	0
51136	**Disconnect Switches-Generator Voltage**	4	0	1	0	1	0	0	0	1	0	0	0
51150	**Bus Duct, Bus, Cable**	1	0	4	0	0	0	4	0.01	2	0.01	0.02	0
51151	**Bus Duct Cooling System**	0	0	8	0	0	0	1	0	0	0	0	0
51170	**Generator Neutral Grounding Equipment**	6	0	4	0	0	0	0	0	0	0	0	0.01
52100	**Generator Voltage Supply System**	8	0	4	0	1	0	1	0	1	0.01	0.01	0
52120	**Station Service Transformer**	11	0.01	7	0	10	0	0	0	0	0	0.01	0.01
52130	**Unit Service Transformer**	10	0.01	21	0	1	0	7	0	0	0	0.01	0.02
52140	**Exciter XFMR**	10	0.01	2	0	0	0	1	0	0	0	0.01	0.01
53200	**Station Service Power Distribution**	45	0.02	105	0	2	0	4	0	1	0.01	0.04	0.04
55000	**Direct Current Power Supplies**	10	0.03	5	0	0	0	7	0.01	0	0	0.04	0.05
ELECTRICAL POWER SYSTEM TOTAL		**173**	**0.2**	**267**	**0.02**	**38**	**0**	**44**	**0.03**	**19**	**0.04**	**0.29**	**0.32**

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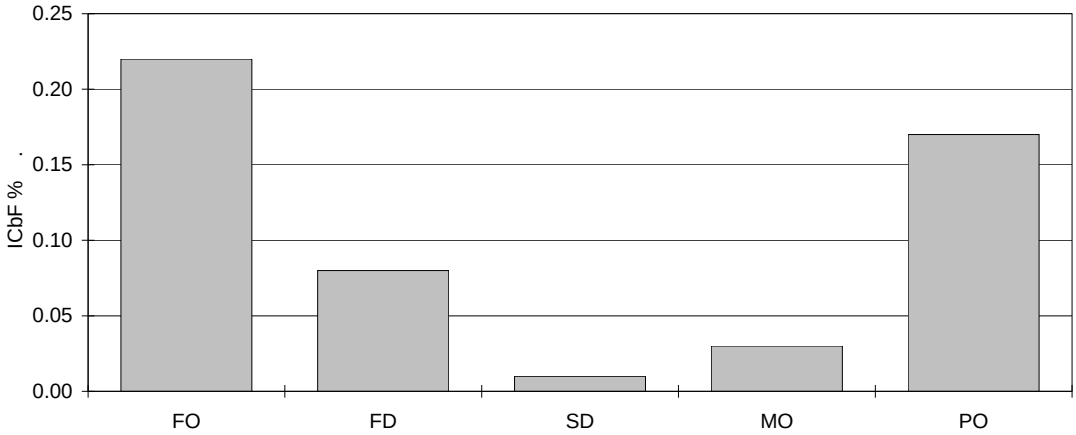
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Ins. And Control



Instrumentation & Control ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
INSTRUMENTATION AND CONTROL													
63100	**Steam Generator Controls**	127	0.03	890	0.05	282	0	13	0.01	2	0.09	0.17	0.11
63200	**Equipment Controls-Furnace Draft**	32	0.01	57	0.01	4	0	0	0	0	0	0.01	0.02
63300	**Primary Steam Instrumentation & Control**	5	0	13	0	7	0	0	0	0	0	0	0
63400	**Auxiliary Systems -Instrumentation & Control**	5	0	8	0	1	0	0	0	0	0	0	0
63500	**Waste Removal Systems - Instrumentation & Control**	0	0	8	0	0	0	0	0	0	0	0	0
63600	**Fuel Coal Management - Instrumentation & Control**	26	0	133	0	1	0	1	0	0	0	0.01	0.01
63700	**Fuel Oil Management - Instrumentation & Control**	1	0	5	0	0	0	0	0	0	0	0	0
63800	**Sulphur Oxide Removal System - Instrumentation & Control**	0	0	1	0	1	0	0	0	0	0	0	0
63900	**Ignition Fuel,Fuel Gas, & Miscellaneous Fuel Management-Instrumentation & Control**	19	0	27	0	0	0	0	0	4	0.08	0.08	0
64100	**Steam Turbine And Auxiliaries - Instrumentation And Control**	67	0.02	42	0	15	0	16	0	0	0	0.03	0.03
64200	**Generator And Auxiliaries - Instrumentation And Controls**	50	0.02	62	0	8	0	5	0.01	1	0	0.04	0.04
64300	**Boiler Feedwater System - Instrumentation And Controls**	90	0.01	115	0.01	5	0	2	0	0	0	0.02	0.03
64400	**Condensate System - Instrumentation And Controls**	8	0	19	0	1	0	1	0	0	0	0.01	0.01
64500	**Condensate Air Extraction System - Instrumentation And Controls**	6	0	1	0	0	0	0	0	0	0	0	0
64700	**Condensate Make-up system - Instrumentation And Controls**	0	0	5	0	0	0	0	0	0	0	0	0

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FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4

Ins. And Control
(Continued)

64800	**Feedwater Heating Anciliary Systems - Instrumentation & Controls**	4	0	24	0	2	0	0	0	0	0	0	0.01
65100	**Main Power Output Systems - Control And Protection**	20	0.01	15	0	3	0	6	0	4	0	0.02	0.02
65200	**Station Service Main Transformation - Control And Protection**	9	0	3	0	0	0	0	0	0	0	0	0.01
65300	**Alternating Current Power Distribution - Control And Protection**	21	0	12	0	0	0	1	0	1	0	0	0
65500	**Direct Current Power Distribution - Control & Protection**	19	0.01	4	0	0	0	0	0	0	0	0.01	0.01
65900	**System Control Facilities**	1	0	2	0	3	0	1	0	0	0	0	0
67000	**Plant Auxiliary Processes And Services - Instrumentation & Controls**	2	0	22	0	4	0	1	0	0	0	0	0
69000	**Computers**	64	0.09	26	0	22	0.01	2	0	3	0	0.1	0.14
INSTRUMENTATION AND CONTROL TOTAL		576	0.22	1,494	0.08	359	0.01	49	0.03	15	0.17	0.52	0.44

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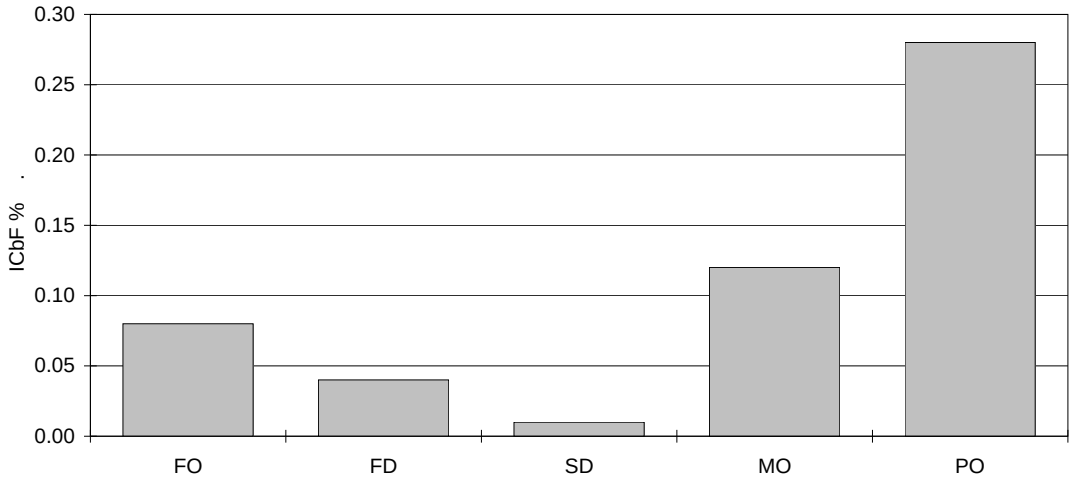
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Auxiliary Processes



Plant Aux. Processes & Services ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS	
NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED DERATINGS		FORCED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
PLANT AUX. PROCESSES AND SERVICES													
71000	**Circulating Water Systems**	8	0	84	0.01	10	0	26	0.05	11	0.12	0.18	0.02
71110	**Travelling Water Screens**	11	0	15	0	2	0	2	0.01	0	0	0.01	0
71120	**Circulating Water Pumps**	12	0.02	53	0	7	0	1	0	0	0	0.02	0.03
71127	**Circulating Water Pump Motors**	1	0	23	0.01	1	0	0	0	0	0	0.01	0.02
71140	**Circulating Water Main Butterfly Valves And Operators**	3	0	18	0	1	0	2	0	0	0	0.01	0.01
71190	**Circulating Water Piping And Supports**	0	0	9	0	2	0	7	0.02	7	0.02	0.05	0
71500	**Circulating Water Screenwash System**	0	0	3	0	0	0	0	0	0	0	0	0
71700	**Circulating Water Cooling Towers**	0	0	192	0.01	1	0	1	0	0	0	0.01	0.01
71800	**Circulating Water Cooling Ponds**	0	0	201	0	0	0	0	0	0	0	0	0.01
72000	**Service Water Systems**	1	0	19	0	1	0	4	0.01	0	0	0.01	0
72100	**Service Water Low Pressure Open System**	2	0	3	0	0	0	2	0	0	0	0	0
72800	**Ash Transport Water Systems**	1	0.02	12	0	0	0	1	0	0	0	0.03	0.04
73000	**Heating, Ventilating, And Air Conditioning Systems**	0	0	1	0	0	0	0	0	0	0	0	0
73100	**Auxiliary Steam And Condensate Systems**	3	0	2	0	1	0	1	0	0	0	0	0
73200	**Powerhouse Heating & Ventilating Systems**	2	0	27	0	308	0.01	1	0	0	0	0.01	0
74000	**Water Treatment Plant**	13	0.02	23	0	0	0	7	0	5	0.07	0.1	0.03
75000	**Compressed Air Systems**	1	0	0	0	0	0	4	0	0	0	0	0
75110	**Service Air System**	2	0	5	0	0	0	1	0	0	0	0	0
75120	**Instrument Air System**	3	0	9	0	0	0	3	0	0	0	0	0
76000	**Miscellaneous Services**	1	0	1	0	0	0	1	0.02	7	0.06	0.08	0
78000	**Fire Protection Systems**	2	0	4	0	0	0	0	0	0	0	0	0
PLANT AUX. PROCESSES AND SERVICES TOTAL		**66**	**0.08**	**704**	**0.04**	**334**	**0.01**	**64**	**0.12**	**30**	**0.28**	**0.53**	**0.18**

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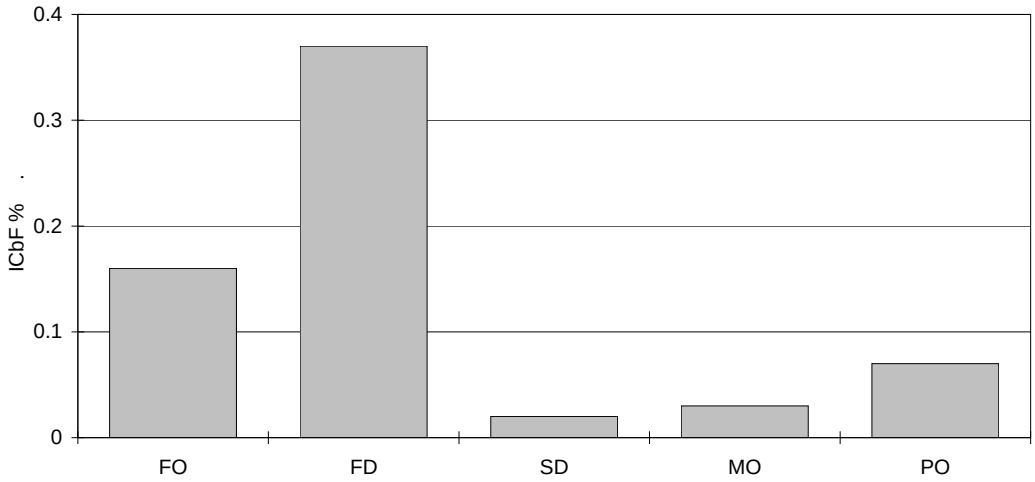
FOSSIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.4
Conditions



Conditions ICbF by event type for fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	86
NUMBER OF UNIT YEARS	395.2
OVERALL OPERATING FACTOR	63.45

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE DERATINGS		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
CONDITIONS													
00500	**Regulatory Bodies**	0	0	0	0	1	0	0	0	0	0	0	0
01410	**Poor Quality Fuel, Heat Content**	9	0	3,438	0.15	131	0.01	3	0	0	0	0.16	0.22
01420	**Problems - Primary Fuel for Units with Secondary Fuel Op.**	3	0	217	0.01	5	0	0	0	0	0	0.01	0.01
04200	**Synchronous Condenser Operation**	0	0	0	0	0	0	0	0	1	0	0	0
05200	**Transmission Limitations**	54	0.03	18	0	74	0.01	12	0.01	3	0	0.05	0.05
05202	**Transmission Line (connected to powerhouse substation)**	3	0	3	0	0	0	0	0	0	0	0	0
07010	**Site Environment, Storms, Floods**	9	0.03	407	0.02	12	0	2	0	0	0	0.05	0.07
07110	**Nitrous Oxides - Environmental Restrictions**	0	0	5	0	6	0	0	0	0	0	0	0
07120	**Sulphur Dioxide - Environmental Restriction**	1	0	596	0.06	2	0	2	0	0	0	0.06	0.09
07130	**Particulates - Environmental Restriction**	6	0.01	4,856	0.09	5	0	0	0	0	0	0.09	0.14
07210	**Cooling Water Discharge -Thermal Effects**	8	0.02	366	0.04	2	0	1	0	0	0	0.06	0.08
07220	**Liquid And Chemical Effluents**	0	0	0	0	0	0	0	0	1	0	0	0
07230	**Solid Waste Effluents**	0	0	3	0	0	0	0	0	0	0	0	0
08160	**Fire, General**	8	0.01	23	0	0	0	0	0	0	0	0.02	0.02
08910	**Staff Shortage**	1	0.01	0	0	0	0	0	0	0	0	0.01	0.02
08940	**Labour Troubles**	1	0	0	0	1	0	0	0	0	0	0	0
99999	**Other**	22	0.04	47	0	8	0	5	0.02	4	0.06	0.12	0.06
CONDITIONS TOTAL		**125**	**0.16**	**9,979**	**0.37**	**247**	**0.02**	**25**	**0.03**	**9**	**0.07**	**0.64**	**0.77**

Canadian Electricity Association
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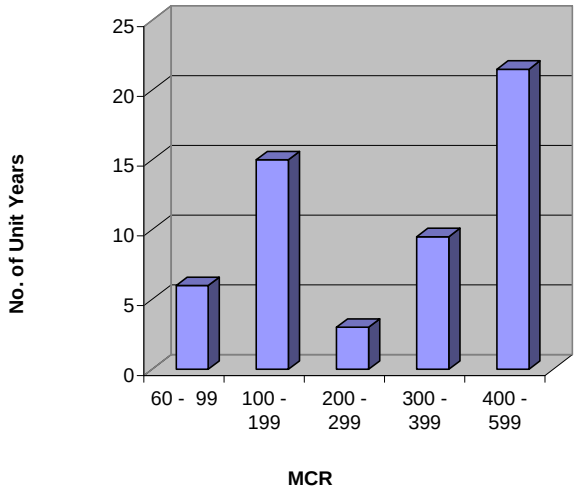
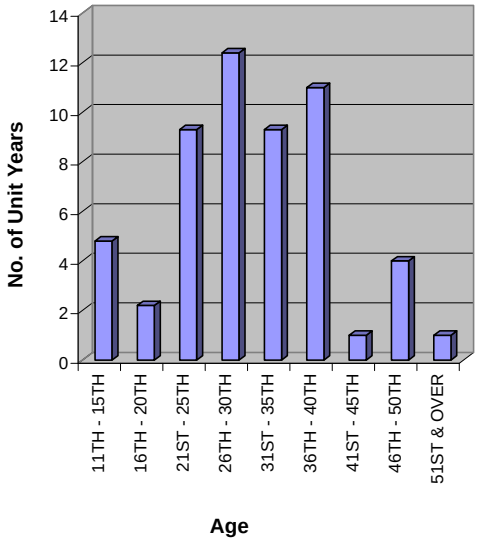
FOSSIL - COAL UNITS

Table 6.2.5

External Causes Excluded, 2007 Data





	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	6	29.26	57.28	53	0.3	576.25	54.35	8.73	13.44	12.21	1	16.6	13.39	0.44	7.54
100 - 199	15	2.79	83.37	176	0.8	860.06	40.95	6.17	6.95	6.8	2.2	14.8	11.67	0.79	7.56
200 - 299	3	8.56	75.92	39	0.1	92.28	14.8	2.81	3.48	3.35	0.5	16.08	15.37	1.53	11.79
300 - 399	9.5	0.23	89.22	102	0.5	734.18	43.3	5.6	8.08	8.06	1.3	13.22	11.64	0.38	4.88
400 - 599	21.5	5.1	76.27	217	1	404.25	40.33	5.75	9.79	9.28	4.8	22.53	10.2	4.19	9.78
CLASSIFICATION BY YEAR OF SERVICE															
11TH - 15TH	4.8	0.06	90.62	27	0.1	103.01	24.86	1.74	2.81	2.8	0.5	10.55	5.79	0.23	7.48
16TH - 20TH	2.2	0.24	95.77	12	0	56.5	20.05	1.27	1.72	1.71	0.1	4.58	5.14	0.15	2.61
21ST - 25TH	9.3	4	80.67	126	0.6	312.01	41.99	7.45	8.61	8.34	1.5	16.51	13.33	0.69	8.14
26TH - 30TH	12.4	5.06	78.09	116	0.5	734.18	36.93	4.79	7.39	7.06	2.4	19.19	10.18	2.63	10.3
31ST - 35TH	9.3	1.48	82.72	122	0.6	404.25	39.97	6.78	11.93	11.67	2	21.43	13.59	4.11	5.68
36TH - 40TH	11	6.85	74.97	138	0.7	860.06	43.72	7.71	10.02	9.45	2.2	20.42	13.83	2.15	9.77
41ST - 45TH	1	29.71	61.51	8	0	5.38	2.38	0.35	0.41	0.41	0.1	10.36	11.38	8.56	0
46TH - 50TH	4	33.74	50.2	29	0.2	576.25	68.77	10.18	15.75	14.26	0.8	19.33	12.45	0.19	10.18
51ST & OVER	1	0	89.6	9	0	207.91	47.02	5.12	10.53	9.8	0.2	15.99	8.93	1.07	4.5
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	2	67.14	5.9	3	0	223.06	84.24	19.64	20.02	5.2	0.5	26.99	8.47	0.49	25.03
11 - 20	2	33.31	19.73	33	0.5	576.25	130.45	55.47	56.61	40.99	1	47.75	27.88	0.31	22.08
51 - 60	3	23.03	52.92	29	0.1	378.96	32.21	6.29	11.96	10.23	0.8	27.35	13.86	4.72	15.77
61 - 70	6	8.91	65.11	88	0.5	860.06	46.7	10.72	14.65	13.47	1.8	29.47	17.15	5.53	12.63
71 - 80	9	2.9	75.73	100	0.6	472.41	53.51	8.23	13.9	13.39	2.5	27.34	11.15	6.24	8.34
81 - 90	11	0.11	86.51	143	0.4	734.18	26.37	4.33	6.94	6.94	1.8	15.96	14.29	0.34	9.13
91 - 100	22	0.19	94.37	191	0.6	144.08	26.74	2.73	3.95	3.95	1.5	6.8	8.67	0.17	2.62
ALL UNITS	**55**	**6.45**	**78.36**	**587**	**2.7**	**860.06**	**40.6**	**5.94**	**8.6**	**8.2**	**9.8**	**17.81**	**11.44**	**2.05**	**8.19**

Canadian Electricity Association
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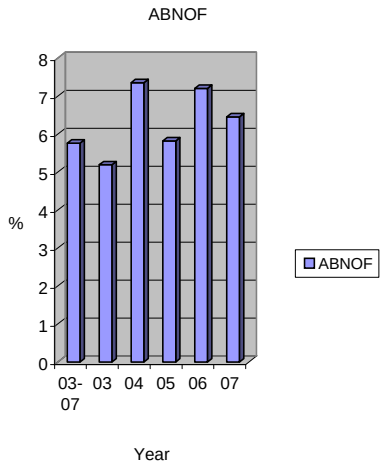
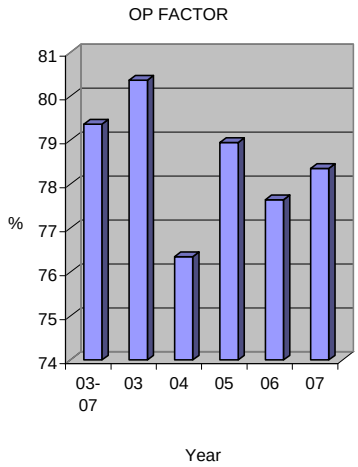
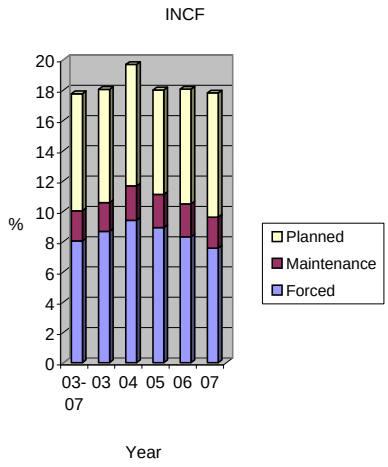
FOSSIL - COAL UNITS

Table 6.2.6

External Causes Excluded, 2003 to 2007 Data







	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	27	25.59	57.66	208	1.9	3,688.95	81.73	11.08	16.23	14.69	5.5	20.39	11.11	0.72	8.85
100 - 199	79	2.28	86.05	784	2.9	1,435.16	32.13	4.06	4.95	4.84	10	12.64	10.41	0.97	7.07
200 - 299	12	2.74	78.93	143	0.5	890.78	28.63	4.7	5.96	5.84	2.3	19.57	13.09	1.1	13.33
300 - 399	55.1	0.28	89.03	456	2.3	734.18	43.81	4.44	6.38	6.59	7.1	12.81	8.67	0.34	6.21
400 - 599	97	6.57	74.56	1,062	6.4	2,978.43	52.53	8.09	13.52	12.42	23.1	23.77	10.68	4.22	8.09
CLASSIFICATION BY YEAR OF SERVICE															
6TH - 10TH	4.8	0.18	90.36	32	0.1	232.58	31.05	2.53	3.06	3.06	0.5	9.98	6.64	0.7	6.42
11TH - 15TH	23.5	0.13	91.34	161	0.5	215.01	24.91	2.09	3.02	3.21	2.2	9.53	6.79	0.52	6.07
16TH - 20TH	21.7	0.39	88.16	166	0.7	890.78	39.37	3.76	4.47	4.51	2.7	12.25	7.7	0.58	7.43
21ST - 25TH	44.8	1.36	84.66	425	1.9	591.4	39.21	4.77	6.23	6.14	7	15.53	9.93	1.08	8.66
26TH - 30TH	60.6	6.01	78.65	617	3.3	1,276.50	47.34	6.54	10.7	9.99	11.6	19.08	10.41	2.71	7.13
31ST - 35TH	59.5	3.24	79.65	726	3.9	2,978.43	47.22	7.63	12.16	11.68	12.8	21.5	12.14	3.24	7.3
36TH - 40TH	25.2	8.87	74.83	300	1.5	880.58	43.78	7.37	10.36	9.23	4.9	19.36	13.31	2.75	7.59
41ST - 45TH	17.8	29.32	50.15	124	1.2	3,688.95	82.3	11.56	14.84	12.83	4	22.63	9.87	1.44	12.54
46TH - 50TH	10.2	17.72	70.62	76	0.5	576.25	53.66	6.05	12.99	12.26	1.8	17.46	9.96	0.51	6.61
51ST - 55TH	1	0.18	58.86	17	0.3	852.83	147.65	32.75	33.53	33.46	0.4	41.88	22.09	2.59	9.73
56TH & OVER	1	0	89.6	9	0	207.91	47.02	5.12	10.53	9.8	0.2	15.99	8.93	1.07	4.5
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	10	64.97	6.67	33	1.1	3,688.95	281.68	61.39	61.41	33.89	2.8	28.36	11.99	0.83	16.92
11 - 20	5	59.97	19.05	28	0	227.83	15.06	4.81	10.81	3.97	1.1	22.34	9.45	5.56	14.46
51 - 60	5	25.87	59.08	78	0.5	1,435.16	57.64	14.8	16.5	14.19	0.8	16.23	23.35	0.97	3.82
61 - 70	50	7.42	67.14	564	3.9	2,978.43	60.97	10.47	15.87	14.28	15.1	30.11	11.02	5.06	12.53
71 - 80	27	2.73	73.35	364	2.6	1,270.65	61.62	11.44	20.71	19.82	8.7	32.37	12.47	6.38	8.06
81 - 90	59	0.33	87.22	673	2.5	860.06	32.78	4.66	6.46	6.5	8.5	14.42	12.1	0.53	7.65
91 - 100	114.1	0.11	92.02	913	3.3	451.75	31.71	3.05	4.64	4.71	10.9	9.53	8.35	0.34	4.63
ALL UNITS	**270.1**	**5.76**	**79.37**	**2,653**	**13.9**	**3,688.95**	**46**	**6.1**	**9.14**	**8.64**	**48**	**17.75**	**10.27**	**1.99**	**7.72**

Canadian Electricity Association
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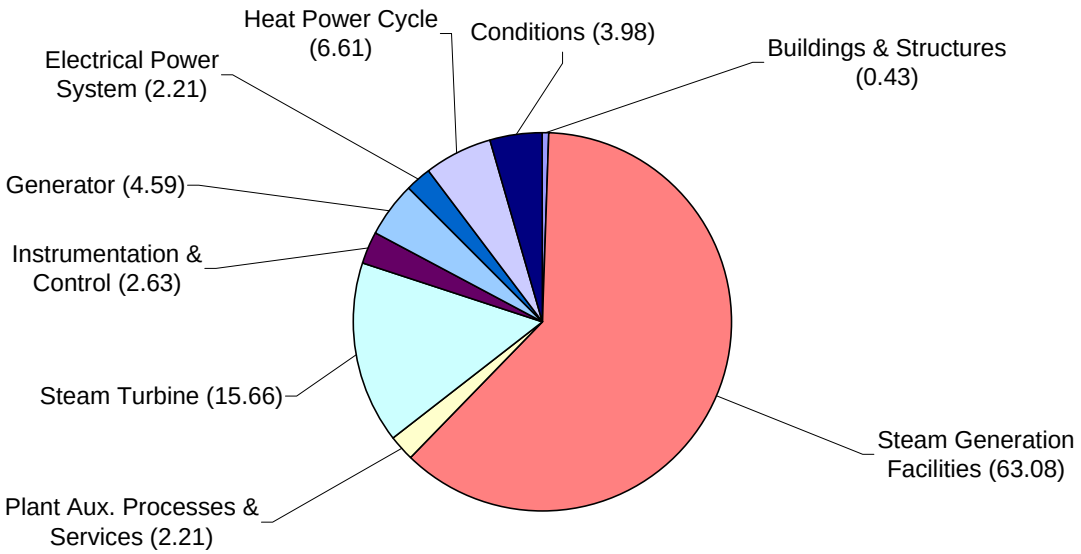
FOSSIL - COAL UNITS

Table 6.2.7

Major Component Outage Code Report, 2003 to 2007

Major component contribution to coal-fired fossil unit ICbF based on 2003-07 data.



UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

MAJOR COMPONENT	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT FOR (%)	CONTRIBUTION TO UNIT DAFOR (%)
BUILDINGS AND STRUCTURES	5	0.01	1	0	3	0	10	0.05	6	0.03	0.08	0.01	0.01
STEAM GENERATION FACILITIES	1,146	2.55	21,086	1.73	1,718	0.21	383	1.12	183	5.75	11.44	3.23	5.29
STEAM TURBINE	361	0.95	886	0.26	1,222	0.03	83	0.23	60	1.43	2.9	1.12	1.42
GENERATOR	137	0.48	252	0.03	78	0.01	25	0.06	9	0.27	0.85	0.56	0.6
HEAT POWER CYCLE	298	0.29	2,859	0.39	221	0.03	196	0.35	5	0.05	1.11	0.35	0.81
ELECTRICAL POWER SYSTEM	158	0.3	263	0.02	38	0	27	0.04	12	0.05	0.41	0.35	0.38
INSTRUMENTATION AND CONTROL	493	0.3	1,365	0.08	335	0.01	30	0.03	8	0.1	0.51	0.35	0.44
PLANT AUX. PROCESSES AND SERVICES	55	0.11	655	0.05	332	0.01	28	0.05	8	0.19	0.41	0.13	0.18
CONDITIONS	100	0.12	9,958	0.54	229	0.02	10	0.03	8	0.09	0.8	0.14	0.77
TOTAL (External Causes Included)	**2,753**	**5.11**	**37,325**	**3.11**	**4,176**	**0.32**	**792**	**1.95**	**299**	**7.56**	**18.51**	**6**	**9.9**
TOTAL (External Causes Excluded)	**2,653**	**4.99**	**27,367**	**2.56**	**3,947**	**0.3**	**782**	**1.92**	**291**	**7.47**	**17.75**	**6.1**	**9.14**

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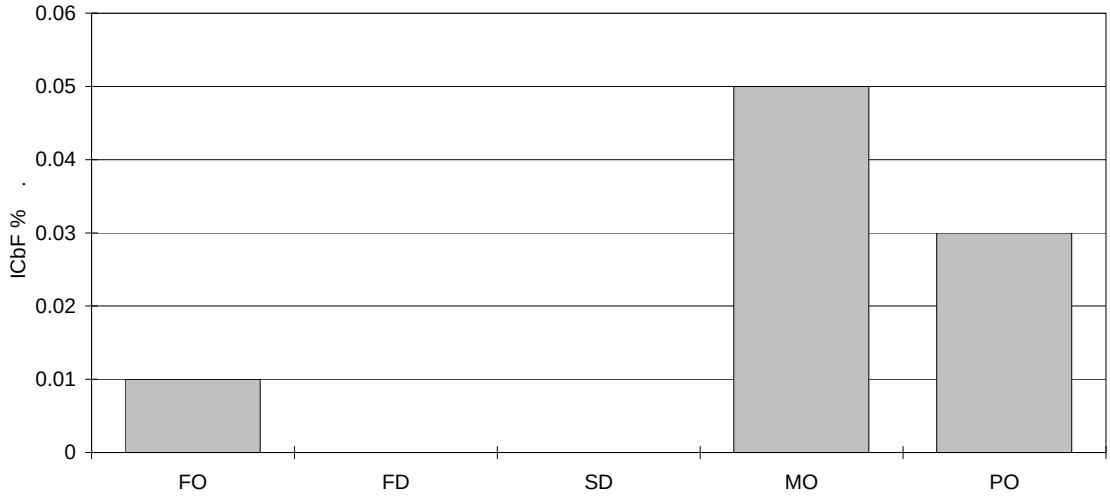
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Buildings and Structures



Building & Structures ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
BUILDINGS AND STRUCTURES													
22000	**Powerhouse**	1	0.01	0	0	0	0	2	0.01	0	0	0.01	0.01
23290	**Chimney**	4	0	1	0	3	0	8	0.04	6	0.03	0.07	0
BUILDINGS AND STRUCTURES TOTAL		**5**	**0.01**	**1**	**0**	**3**	**0**	**10**	**0.05**	**6**	**0.03**	**0.08**	**0.01**

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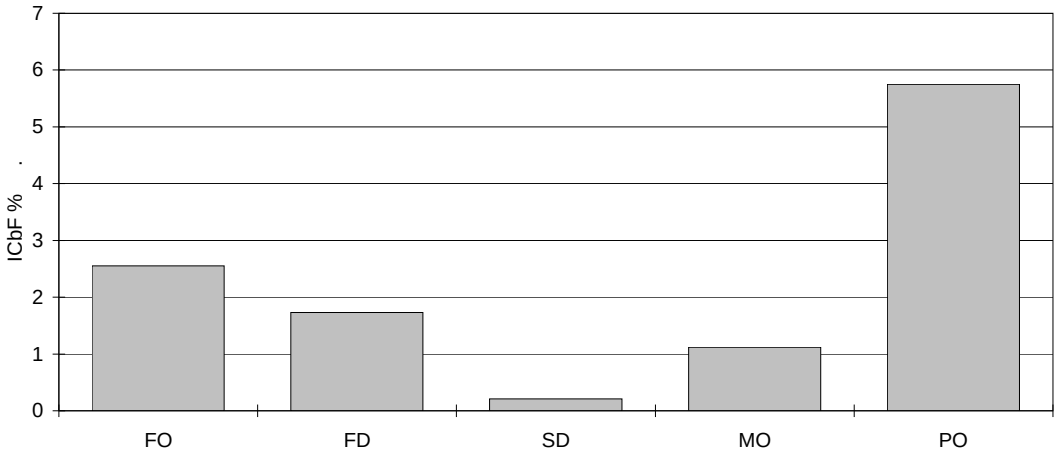
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Steam Generation



Steam Generation Facilities ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM GENERATION FACILITIES													
31000	**Steam Generator**	118	0.27	1,422	0.11	298	0.02	55	0.33	175	5.62	6.2	0.65
31120	**Primary Air Fans - Pulverized Fuel**	21	0.02	920	0.09	29	0	8	0.03	0	0	0.14	0.13
31130	**Primary Air Fan Drives - Pulverized Fuel**	2	0	42	0.01	0	0	0	0	0	0	0.01	0.01
31150	**Air Heaters**	31	0.08	308	0.05	9	0	40	0.12	0	0	0.24	0.14
31170	**Primary Air Duct - Pulverized Fuel**	6	0	26	0	4	0	2	0	0	0	0.01	0
31210	**Coal Feeders (Gravimetric Or Volumetric)**	6	0	2,524	0.09	108	0	1	0	0	0	0.09	0.1
31220	**Pulverized Fuel Burner Piping And Valves**	4	0	804	0.06	32	0.01	7	0	0	0	0.07	0.07
31230	**Oil Burner Piping And Valves**	1	0	1	0	1	0	0	0	0	0	0	0
31240	**Gas Burner Piping And Valves**	4	0	8	0	0	0	0	0	0	0	0	0
31250	**Pulverizers**	13	0	5,475	0.54	840	0.13	13	0.02	1	0	0.7	0.64
31262	**Pulverizer Motors**	0	0	64	0.01	3	0	0	0	0	0	0.01	0.01
31270	**Burners And Windboxes**	2	0	34	0	6	0	5	0.02	0	0	0.02	0
31280	**Igniters**	4	0	104	0	2	0	4	0.01	0	0	0.01	0
31300	**Sootblower Systems**	4	0	227	0.01	5	0	0	0	2	0.03	0.05	0.02
31510	**Steam Drum - Scrubbers,Separators, Etc.**	8	0	7	0	0	0	0	0	1	0.04	0.04	0
31530	**Steam Generating Tubes (Between Steam Drum And Mud Drum)**	14	0.03	12	0	0	0	1	0	0	0	0.04	0.04
31540	**Waterwalls**	341	0.94	141	0.01	0	0	26	0.06	0	0	1	1.11
31550	**Circulating Pumps**	13	0	65	0.01	11	0	5	0.01	0	0	0.03	0.02
31560	**Circulating Pumps Drives**	5	0.01	92	0.01	2	0	3	0.01	0	0	0.02	0.02
31570	**Safety Valves**	17	0.04	265	0.02	87	0	7	0.01	0	0	0.07	0.07
31580	**Water Gauges**	2	0	0	0	0	0	1	0	0	0	0	0
31701	**Superheater**	189	0.45	303	0.02	26	0	11	0.03	1	0.02	0.52	0.55
31702	**Reheater**	66	0.27	67	0.01	0	0	9	0.03	0	0	0.31	0.33
31703	**Economizer**	47	0.1	17	0	0	0	3	0.01	0	0	0.12	0.12
31810	**Attemperation**	9	0.01	59	0	4	0	2	0	1	0.04	0.05	0.01

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FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Steam Generation

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
31820	**Burner Tilt**	0	0	7	0	0	0	0	0	0	0	0	0
31832	**Flue Gas-Recirculation Fans**	4	0.01	180	0.03	4	0	6	0.03	0	0	0.07	0.05
31834	**Flue Gas Recirculation Motors**	0	0	9	0	0	0	1	0.01	0	0	0.01	0
32100	**Forced Draft Ducts**	2	0	20	0	1	0	1	0	0	0	0	0
32310	**Forced Draft Fans**	21	0.01	214	0.02	15	0.01	10	0.02	0	0	0.05	0.03
32330	**Forced Draft Fan Motors**	1	0	53	0.02	0	0	0	0	0	0	0.02	0.02
32400	**Induced Draft Flues**	1	0	5	0	0	0	4	0.01	1	0	0.01	0
32510	**Induced Draft Fans**	64	0.11	913	0.07	15	0	32	0.07	0	0	0.25	0.21
32520	**Induced Draft Fan Variable Speed Coupling Drives**	5	0.01	0	0	1	0	3	0	0	0	0.02	0.01
32530	**Induced Draft Fan Motors**	3	0	62	0	4	0	1	0	0	0	0.01	0.01
33100	**Main Steam Piping**	13	0.02	2	0	1	0	9	0.02	0	0	0.04	0.03
33200	**Hot Reheat Piping**	2	0.01	11	0	0	0	1	0	0	0	0.01	0.01
33300	**Cold Reheat Piping**	1	0	0	0	0	0	1	0	0	0	0	0
34200	**Boiler Blowdown System**	5	0	74	0.01	0	0	2	0.01	0	0	0.01	0.01
34400	**Boiler Drains System**	3	0	11	0	0	0	1	0	0	0	0	0
35110	**Furnace Ash Removal System**	45	0.06	771	0.06	11	0	13	0.02	1	0.01	0.15	0.14
35120	**Pulverizer Pyrites Removal System**	1	0	334	0.01	6	0	0	0	0	0	0.01	0.01
35130	**Fly Ash Removal System - Dry Transportation**	2	0	137	0.01	9	0	15	0.02	0	0	0.04	0.02
35140	**Fly Ash Removal System - Wet Transportation**	1	0	20	0	7	0	0	0	0	0	0	0
35210	**Precipitators-Electrostatic**	24	0.05	3,702	0.36	69	0.01	75	0.21	0	0	0.62	0.48
35220	**Precipitators-Mechanical**	1	0	13	0	0	0	1	0	0	0	0.01	0
35230	**Precipitators-Baghouse**	0	0	3	0	0	0	0	0	0	0	0	0
36100	**Coal Receiving Systems**	2	0	106	0.01	36	0	1	0	0	0	0.01	0.01
36200	**Coal Storage Systems**	3	0	988	0.05	32	0	0	0	0	0	0.06	0.06
36300	**Coal Handling Systems**	1	0	361	0.02	3	0	0	0	0	0	0.02	0.02
36370	**Coal Stacker/Reclaimer Machine**	1	0	10	0	0	0	0	0	0	0	0	0
36400	**Coal Processing Systems**	1	0	18	0	2	0	0	0	0	0	0	0
37100	**Fuel Oil Receiving Systems**	1	0	1	0	0	0	0	0	0	0	0	0
37300	**Fuel Oil Transfer Systems**	0	0	0	0	14	0	0	0	0	0	0	0
37400	**Fuel Oil Forwarding Systems**	2	0	1	0	0	0	0	0	0	0	0	0
38000	**Sulphur Oxides Removal System**	9	0.01	36	0	20	0	3	0.01	0	0	0.02	0.01
38300	**In-Furnace Bed Limestone Injection System**	0	0	3	0	1	0	0	0	0	0	0	0
38400	**Fluid Bed Limestone Injection System**	0	0	34	0	0	0	0	0	0	0	0	0
STEAM GENERATION FACILITIES TOTAL		**1,146**	**2.55**	**21,086**	**1.73**	**1,718**	**0.21**	**383**	**1.12**	**183**	**5.75**	**11.44**	**5.29**

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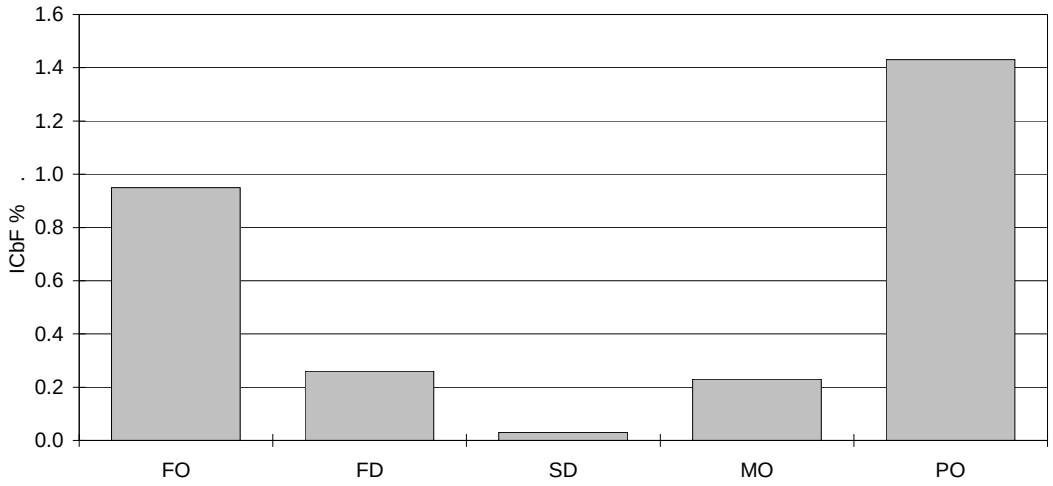
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Steam Turbine



Steam Turbine ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM TURBINE													
41100	**Turbine**	152	0.7	582	0.09	187	0.01	42	0.14	53	1.32	2.26	0.93
41110	**Cylinders**	5	0.04	13	0.07	1	0.01	0	0	0	0	0.12	0.13
41120	**Rotors**	7	0	20	0.07	0	0	1	0	0	0	0.07	0.08
41121	**Shaft Coupling Mechanism**	1	0	0	0	0	0	0	0	1	0.02	0.02	0
41130	**Blades**	1	0	0	0	0	0	0	0	0	0	0	0
41140	**Crossover Piping**	3	0	1	0	0	0	0	0	1	0.04	0.04	0.01
41150	**Turning Gear**	3	0	0	0	0	0	0	0	0	0	0	0
41157	**Turning Gear Motor**	1	0	0	0	0	0	0	0	0	0	0	0
41160	**Valve Gear**	47	0.07	85	0.02	58	0	22	0.08	3	0.05	0.23	0.11
41170	**Bearings And Pedestals**	22	0.02	48	0	0	0	2	0	0	0	0.03	0.03
41200	**Lubricating Oil System**	27	0.03	7	0	0	0	3	0	0	0	0.03	0.03
41500	**Gland Seal System-Steam**	7	0.03	3	0	1	0	3	0	1	0	0.03	0.04
41600	**Turbovisory**	28	0.01	23	0	4	0	3	0	0	0	0.01	0.01
41700	**Governing System**	57	0.05	104	0	971	0.01	7	0	1	0	0.06	0.06
STEAM TURBINE TOTAL		**361**	**0.95**	**886**	**0.26**	**1,222**	**0.03**	**83**	**0.23**	**60**	**1.43**	**2.9**	**1.42**

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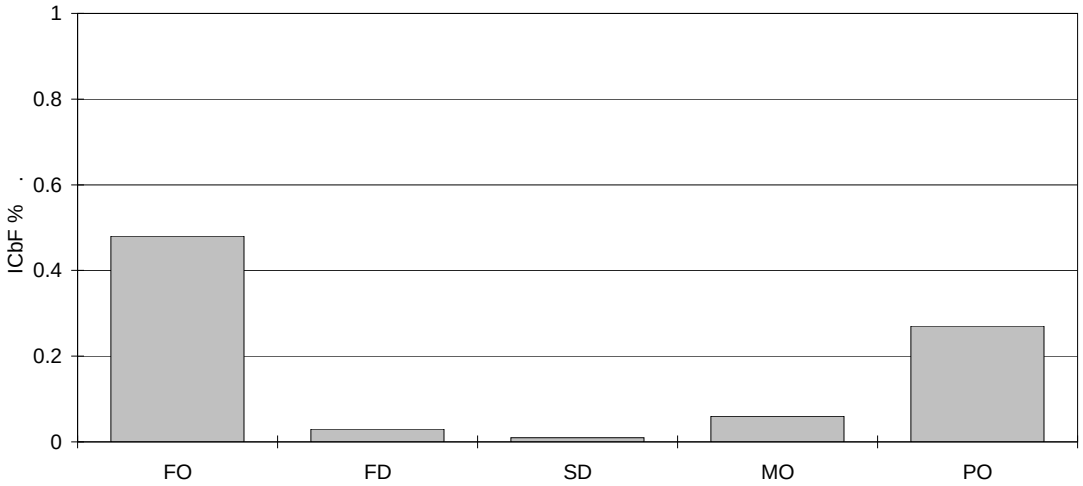
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Generators



Generator ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
GENERATOR													
42100	**Generator**	22	0.07	11	0	17	0	3	0	8	0.15	0.22	0.08
42110	**Generator Rotor**	1	0.02	1	0	2	0	0	0	1	0.12	0.14	0.02
42111	**Generator Bearings**	7	0.03	41	0	0	0	1	0	0	0	0.03	0.04
42112	**Generator Hydrogen Seals**	10	0.06	3	0	0	0	4	0.03	0	0	0.09	0.07
42114	**Generator Collector And Brushes**	3	0	10	0	2	0	1	0	0	0	0	0
42120	**Generator Stator**	4	0.02	12	0	1	0	0	0	0	0	0.02	0.03
42200	**Excitation Systems Equipment**	50	0.06	36	0.01	17	0	8	0	0	0	0.07	0.08
42300	**Hydrogen Gas Cooling System**	23	0.06	115	0.02	37	0	2	0.01	0	0	0.09	0.09
42400	**Generator Liquid Cooling System**	13	0.15	21	0	2	0	5	0.02	0	0	0.17	0.18
42500	**Seal Oil System**	4	0	2	0	0	0	1	0	0	0	0	0
GENERATOR TOTAL		**137**	**0.48**	**252**	**0.03**	**78**	**0.01**	**25**	**0.06**	**9**	**0.27**	**0.85**	**0.6**

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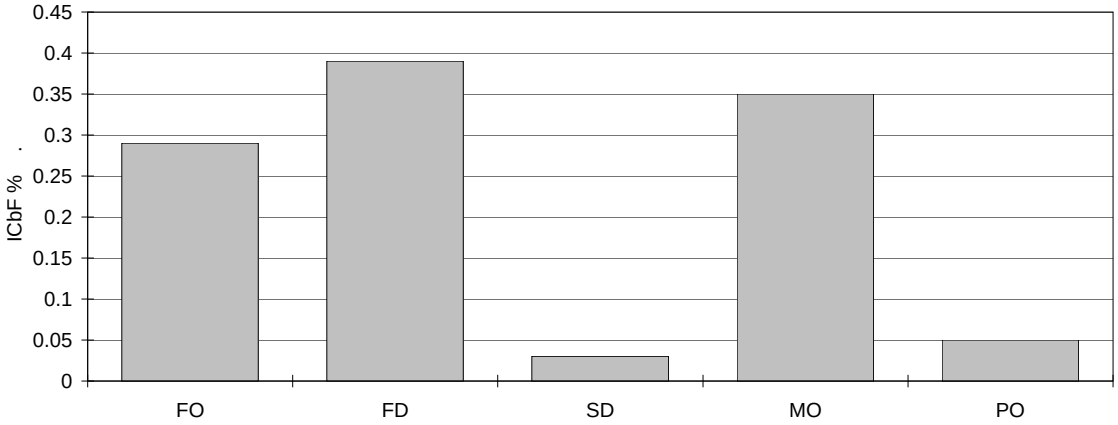
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Heat Power Cycle



Heat Power Cycle ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
HEAT POWER CYCLE													
43090	**Boiler Feedwater Piping And Supports**	21	0.03	22	0	0	0	8	0.02	0	0	0.05	0.03
43100	**High Pressure Feedwater Heaters & Auxiliaries**	36	0.05	403	0.09	9	0	21	0.05	2	0.04	0.23	0.17
43200	**Boiler Feed Pumps And Auxiliaries**	56	0.04	695	0.1	41	0.01	24	0.06	0	0	0.21	0.16
43260	**Boiler Feed Pump Variable Speed Coupling Drives**	6	0	29	0.01	0	0	2	0.01	0	0	0.01	0.01
43300	**Boiler Feed Pump Turbines & Auxiliaries**	17	0.01	181	0.04	9	0	10	0.02	0	0	0.07	0.06
43400	**Boiler Feed Pump Motors And Auxiliaries**	9	0	67	0.01	0	0	0	0	0	0	0.02	0.02
44090	**Condensate Piping And Supports**	3	0	61	0	1	0	1	0	0	0	0.01	0.01
44110	**Condensor**	19	0.02	323	0.03	12	0	17	0.03	3	0.01	0.09	0.06
44120	**Condensor Tubes**	44	0.06	601	0.04	97	0.01	84	0.11	0	0	0.22	0.11
44200	**Condensate Extraction Pumps & Auxiliaries**	13	0.02	213	0.03	26	0	4	0	0	0	0.06	0.06
44300	**Condensate Extraction Pump Motors & Auxiliaries**	1	0	23	0	1	0	0	0	0	0	0	0
44400	**Low Pressure Feedwater Heaters & Auxiliaries**	5	0.01	51	0.01	13	0	1	0	0	0	0.02	0.01
44500	**Deaerator, Storage Tank, And Auxiliaries**	25	0.03	35	0	2	0	13	0.03	0	0	0.06	0.04
45000	**Air Extraction System**	12	0.01	23	0	0	0	0	0	0	0	0.01	0.01
45090	**Air Extraction System And Piping Support**	1	0	4	0	0	0	0	0	0	0	0	0
45100	**Air Extraction System Vacuum Pumps & Auxiliaries**	8	0	20	0	1	0	0	0	0	0	0.01	0.01
45200	**Air Extraction System Vacuum Pump, Motors And Auxiliaries**	4	0	1	0	0	0	0	0	0	0	0	0
45300	**Steam Air Ejectors**	3	0	5	0	0	0	0	0	0	0	0	0
46100	**Turbine Bypass System**	1	0	0	0	0	0	0	0	0	0	0	0
47000	**Condensate Make-up System**	4	0	7	0	0	0	0	0	0	0	0	0
48000	**Feed Cycle Auxiliary Systems**	2	0	1	0	0	0	1	0	0	0	0	0
48100	**Extraction Steam System**	2	0.01	11	0	0	0	3	0.01	0	0	0.02	0.01
48200	**Feedwater Heater Drains System**	5	0.01	31	0	1	0	4	0	0	0	0.01	0.01
48400	**Feedwater Heater Relief Valve, Vent**	0	0	52	0.01	8	0	0	0	0	0	0.01	0.01
48500	**Turbine And Piping Drains**	1	0	0	0	0	0	3	0.01	0	0	0.01	0
HEAT POWER CYCLE TOTAL		**298**	**0.29**	**2,859**	**0.39**	**221**	**0.03**	**196**	**0.35**	**5**	**0.05**	**1.11**	**0.81**

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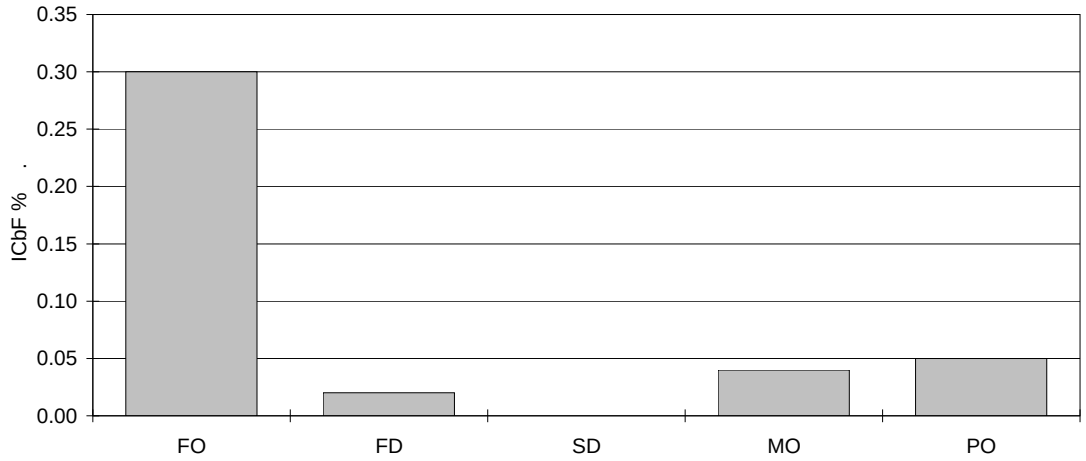
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Electrical Power Sys.



Electrical Power Systems ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
ELECTRICAL POWER SYSTEM													
51100	**Output System Generator Voltage Equipment**	12	0	4	0	15	0	0	0	1	0	0	0
51120	**Generator Power Transformers**	46	0.16	97	0.01	8	0	6	0.01	3	0	0.19	0.21
51130	**Switching Equipment-Generator Voltage**	2	0	0	0	0	0	0	0	0	0	0	0
51133	**Circuit Breakers-Generator Voltage**	5	0	3	0	0	0	3	0.01	3	0	0.01	0
51136	**Disconnect Switches-Generator Voltage**	3	0	1	0	1	0	0	0	1	0	0	0
51150	**Bus Duct, Bus, Cable**	1	0	4	0	0	0	3	0.01	2	0.02	0.03	0
51151	**Bus Duct Cooling System**	0	0	8	0	0	0	1	0	0	0	0	0
51170	**Generator Neutral Grounding Equipment**	5	0.01	4	0	0	0	0	0	0	0	0.01	0.01
52100	**Generator Voltage Supply System**	8	0	4	0	1	0	0	0	1	0.01	0.02	0.01
52120	**Station Service Transformer**	11	0.01	7	0	10	0	0	0	0	0	0.01	0.02
52130	**Unit Service Transformer**	9	0.02	21	0	1	0	4	0	0	0	0.02	0.02
52140	**Exciter XFMR**	9	0.01	2	0	0	0	1	0	0	0	0.01	0.01
53200	**Station Service Power Distribution**	37	0.03	104	0.01	2	0	4	0.01	1	0.02	0.06	0.04
55000	**Direct Current Power Supplies**	10	0.05	4	0	0	0	5	0.01	0	0	0.06	0.06
ELECTRICAL POWER SYSTEM TOTAL		**158**	**0.3**	**263**	**0.02**	**38**	**0**	**27**	**0.04**	**12**	**0.05**	**0.41**	**0.38**

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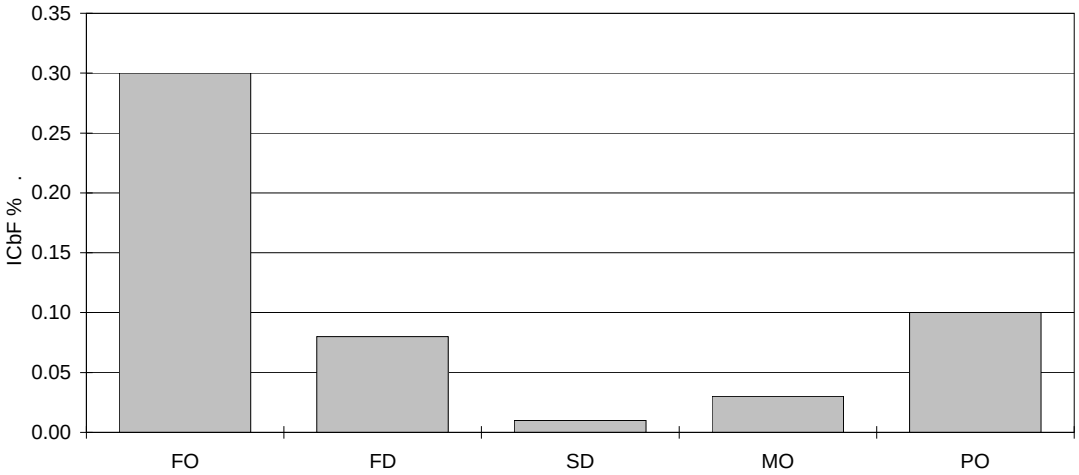
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Ins. And Control



Instrumentation & Control ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
INSTRUMENTATION AND CONTROL													
63100	**Steam Generator Controls**	111	0.04	819	0.05	281	0.01	11	0.01	1	0.1	0.2	0.1
63200	**Equipment Controls-Furnace Draft**	28	0.01	49	0	3	0	0	0	0	0	0.01	0.01
63300	**Primary Steam Instrumentation & Control**	3	0	13	0	6	0	0	0	0	0	0	0
63400	**Auxiliary Systems -Instrumentation And Control**	5	0	8	0	1	0	0	0	0	0	0	0
63500	**Waste Removal Systems - Instrumentation And Control**	0	0	8	0	0	0	0	0	0	0	0	0
63600	**Fuel Coal Management - Instrumentation And Control**	25	0	130	0	1	0	1	0	0	0	0.01	0.01
63800	**Sulphur Oxide Removal System - Instrumentation And Control**	0	0	1	0	1	0	0	0	0	0	0	0
63900	**Ignition Fuel,Fuel Gas, & Miscellaneous Fuel Management-Instrumentation &Control**	17	0	22	0	0	0	0	0	0	0	0	0.01
64100	**Steam Turbine And Auxiliaries - Instrumentation And Control**	56	0.03	37	0	15	0	12	0.01	0	0	0.04	0.04
64200	**Generator And Auxiliaries - Instrumentation And Controls**	37	0.03	61	0	8	0	1	0.01	1	0	0.04	0.04
64300	**Boiler Feedwater System - Instrumentation And Controls**	76	0.02	97	0.01	5	0	1	0	0	0	0.03	0.03
64400	**Condensate System - Instrumentation And Controls**	6	0	16	0	1	0	0	0	0	0	0	0
64500	**Condensate Air Extraction System - Instrumentation And Controls**	6	0	1	0	0	0	0	0	0	0	0	0.01
64700	**Condensate Make-up system - Instrumentation And Controls**	0	0	5	0	0	0	0	0	0	0	0	0
64800	**Feedwater Heating Anciliary Systems - Instrumentation And Controls**	3	0	24	0	2	0	0	0	0	0	0.01	0.01

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FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Ins. And Control

CODE	C A U S E	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
65100	**Main Power Output Systems - Control And Protection**	14	0.01	15	0	2	0	1	0	3	0	0.01	0.01
65200	**Station Service Main Transformation - Control And Protection**	8	0.01	3	0	0	0	0	0	0	0	0.01	0.01
65300	**Alternating Current Power Distribution - Control And Protection**	21	0	12	0	0	0	0	0	1	0	0	0
65500	**Direct Current Power Distribution - Control And Protection**	19	0.01	4	0	0	0	0	0	0	0	0.01	0.02
65900	**System Control Facilities**	1	0	2	0	3	0	1	0	0	0	0	0
67000	**Plant Auxiliary Processes And Services - Instrumentation And Controls**	2	0	22	0	4	0	0	0	0	0	0	0
69000	**Computers**	55	0.13	16	0	2	0	2	0	2	0	0.14	0.16
INSTRUMENTATION AND CONTROL TOTAL		**493**	**0.3**	**1,365**	**0.08**	**335**	**0.01**	**30**	**0.03**	**8**	**0.1**	**0.51**	**0.44**

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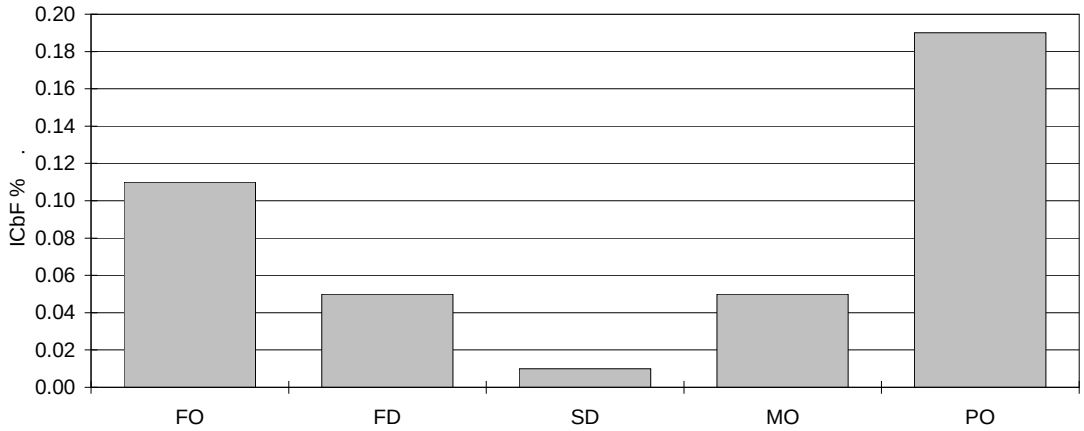
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Auxiliary Processes



Plant Aux. Processes & Services ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
PLANT AUX. PROCESSES AND SERVICES													
71000	**Circulating Water Systems**	7	0	82	0.01	10	0	9	0.02	1	0.02	0.05	0.02
71110	**Travelling Water Screens**	11	0	8	0	2	0	1	0	0	0	0	0
71120	**Circulating Water Pumps**	9	0.03	43	0	6	0	1	0	0	0	0.03	0.04
71127	**Circulating Water Pump Motors**	1	0	5	0	1	0	0	0	0	0	0	0
71140	**Circulating Water Main Butterfly Valves And Operators**	2	0	18	0	1	0	2	0	0	0	0.01	0.01
71190	**Circulating Water Piping And Supports**	0	0	9	0	2	0	2	0	0	0	0	0
71500	**Circulating Water Screenwash System**	0	0	3	0	0	0	0	0	0	0	0	0
71700	**Circulating Water Cooling Towers**	0	0	192	0.01	1	0	1	0	0	0	0.02	0.02
71800	**Circulating Water Cooling Ponds**	0	0	201	0.01	0	0	0	0	0	0	0.01	0.01
72000	**Service Water Systems**	1	0	19	0	1	0	2	0.01	0	0	0.01	0
72100	**Service Water Low Pressure Open System**	1	0	3	0	0	0	1	0	0	0	0	0
72800	**Ash Transport Water Systems**	1	0.04	12	0	0	0	1	0	0	0	0.04	0.04
73100	**Auxiliary Steam And Condensate Systems**	2	0	1	0	0	0	0	0	0	0	0	0
73200	**Powerhouse Heating & Ventilating Systems**	2	0	25	0	308	0.01	1	0	0	0	0.02	0
74000	**Water Treatment Plant**	11	0.03	20	0	0	0	2	0	5	0.11	0.14	0.04
75000	**Compressed Air Systems**	1	0	0	0	0	0	4	0	0	0	0	0
75110	**Service Air System**	0	0	0	0	0	0	1	0	0	0	0	0
75120	**Instrument Air System**	3	0	9	0	0	0	0	0	0	0	0	0
76000	**Miscellaneous Services**	1	0	1	0	0	0	0	0	2	0.07	0.07	0
78000	**Fire Protection Systems**	2	0	4	0	0	0	0	0	0	0	0	0
PLANT AUX. PROCESSES AND SERVICES TOTAL		**55**	**0.11**	**655**	**0.05**	**332**	**0.01**	**28**	**0.05**	**8**	**0.19**	**0.41**	**0.18**

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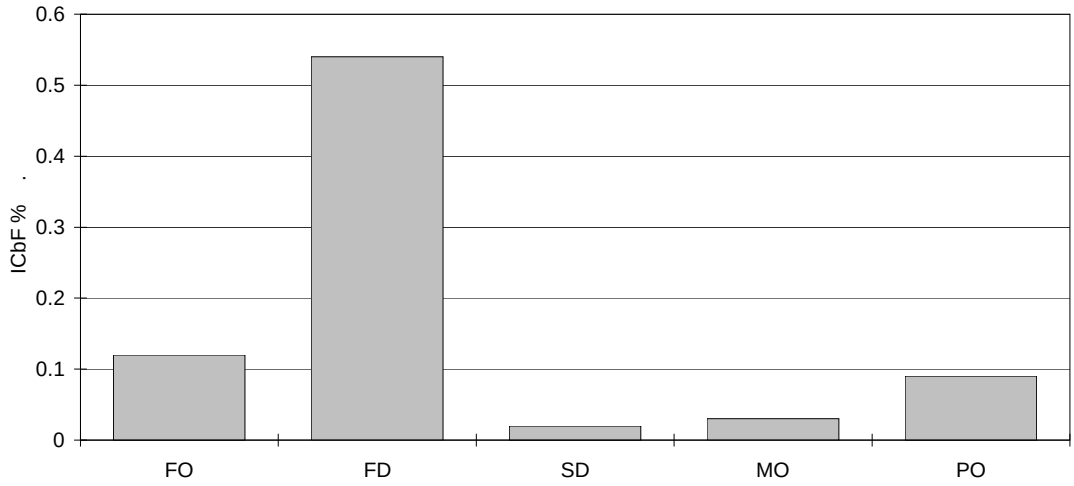
FOSSIL - COAL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.8
Conditions



Conditions ICbF by event type for coal-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	57
NUMBER OF UNIT YEARS	270.1
OVERALL OPERATING FACTOR	79.37

		FORCED OUTAGES		FORCED OUTAGES		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
CONDITIONS													
00500	**Regulatory Bodies**	0	0	0	0	1	0	0	0	0	0	0	0
01410	**Poor Quality Fuel, Heat Content**	9	0	3,437	0.23	131	0.01	2	0	0	0	0.24	0.27
1420	**Problems - Primary Fuel for Units with Secondary Fuel Op.**	3	0	217	0.01	5	0	0	0	0	0	0.01	0.01
4200	**Synchronous Condenser Operation**	0	0	0	0	0	0	0	0	1	0	0	0
5200	**Transmission Limitations**	43	0.04	16	0	65	0.01	6	0.01	3	0	0.06	0.05
5202	**Transmission Line (connected to powerhouse substation)**	3	0	3	0	0	0	0	0	0	0	0	0
7010	**Site Environment, Storms, Floods**	2	0	390	0.02	3	0	0	0	0	0	0.02	0.02
7110	**Nitrous Oxides - Environmental Restrictions**	0	0	5	0	6	0	0	0	0	0	0	0
7120	**Sulphur Dioxide - Environmental Restriction**	1	0	595	0.09	2	0	0	0	0	0	0.09	0.11
7130	**Particulates - Environmental Restriction**	5	0.01	4,856	0.13	5	0	0	0	0	0	0.14	0.16
7210	**Cooling Water Discharge - Thermal Effects**	8	0.03	366	0.06	2	0	1	0	0	0	0.09	0.1
7220	**Liquid And Chemical Effluents**	0	0	0	0	0	0	0	0	1	0.01	0.01	0
7230	**Solid Waste Effluents**	0	0	3	0	0	0	0	0	0	0	0	0
8160	**Fire, General**	5	0.01	23	0	0	0	0	0	0	0	0.02	0.02
8940	**Labour Troubles**	1	0	0	0	1	0	0	0	0	0	0	0
99999	**Other**	20	0.02	47	0	8	0	1	0.02	3	0.09	0.12	0.02
CONDITIONS TOTAL		**100**	**0.12**	**9,958**	**0.54**	**229**	**0.02**	**10**	**0.03**	**8**	**0.09**	**0.8**	**0.77**

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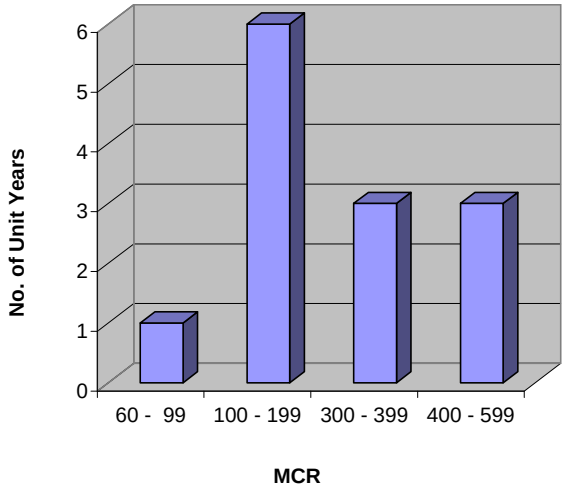
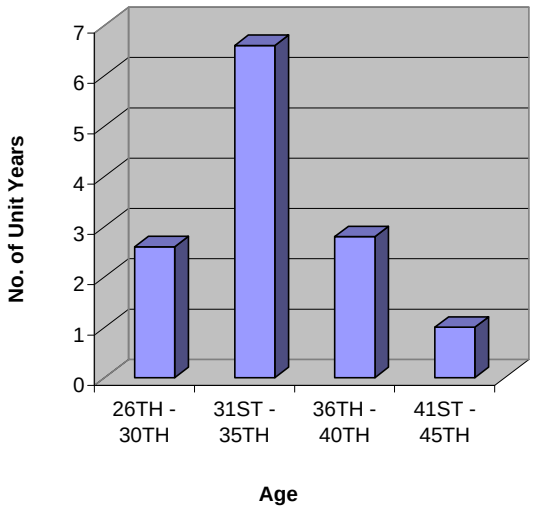
FOSSIL - OIL UNITS

External Causes Excluded, 2007 Data

Table 6.2.9





	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	1	41.31	48.81	5	0	89.5	26.96	3.06	3.06	2.88	0.1	9.88	8.19	1.62	6.72
100 - 199	6	12.75	63.29	48	0.3	878.76	51.81	6.96	12.34	11.01	1.7	27.79	10.27	3.39	15.84
300 - 399	3	44.01	36.71	5	0	29.36	8.13	0.42	2.05	1.9	0.6	19.88	3.63	0.67	18.46
400 - 599	3	69.58	14.56	15	0	80.3	25.21	8.99	10.43	4.42	0.5	16.31	11.44	2.22	12.19
CLASSIFICATION BY YEAR OF SERVICE															
26TH - 30TH	2.6	18.84	51.39	10	0	80.61	22.02	1.83	3.12	2.7	0.8	30.58	5.92	4.39	24.42
31ST - 35TH	6.6	53.66	31.95	27	0.1	80.3	18.31	2.61	3.71	2.63	1	14.85	6.66	1.96	11.57
36TH - 40TH	2.8	5.2	67.48	31	0.3	878.76	70.69	11.73	21.28	21.14	1	34.85	13.82	1.63	16.73
41ST - 45TH	1	41.31	48.81	5	0	89.5	26.96	3.06	3.06	2.88	0.1	9.88	8.19	1.62	6.72
CLASSIFICATION BY OPERATING FACTOR															
11 - 20	3	69.58	14.56	15	0	80.3	25.21	8.99	10.43	4.42	0.5	16.31	11.44	2.22	12.19
31 - 40	2	37.29	34.12	3	0	29.36	11.31	0.56	2.14	2.05	0.6	29.13	2.93	0.71	27.69
41 - 50	3	35.8	46.68	14	0	89.5	22.59	2.51	3.98	3.57	0.6	18.35	7.86	3.59	12.73
51 - 60	2	21.79	55.23	8	0.1	878.76	135.16	10.05	10.98	8.64	0.5	23.66	5.43	3.02	13.78
61 - 70	2	11.41	67.14	22	0.1	441.95	45.84	7.9	20.62	18.62	0.6	30.85	12.66	1.95	13.74
81 - 90	1	1.44	85.68	11	0	76.96	20.23	2.88	3.93	3.88	0.1	13.95	12.84	1.82	8.52
ALL UNITS	**13**	**35.27**	**44.8**	**73**	**0.3**	**878.76**	**41.65**	**5.63**	**9.59**	**7.4**	**2.9**	**21.94**	**8.93**	**2.35**	**14.9**

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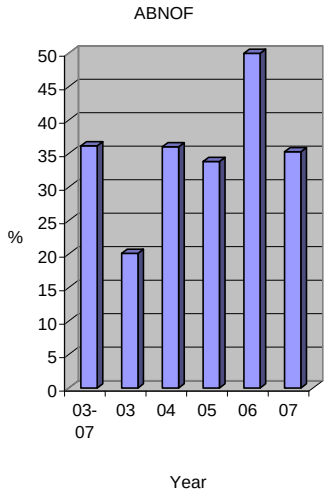
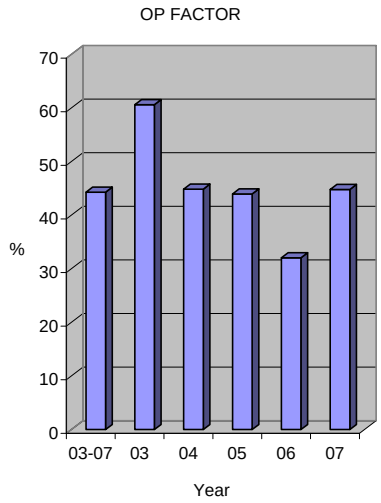
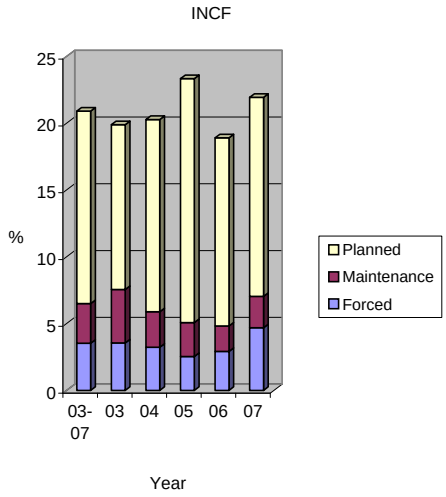
FOSSIL - OIL

External Causes Excluded, 2003 to 2007 Data

Table 6.2.10







	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	5	36.48	51.59	10	0	100.53	31.42	1.37	1.37	1.29	0.6	11.93	3.49	1.36	9.85
100 - 199	27	19.38	58.5	163	0.8	878.76	43.24	4.85	7.74	6.49	6.5	24.12	8.86	2.64	16.5
300 - 399	6	44.94	39.98	20	0	141.53	12.46	1.17	2.5	2.33	0.9	15.65	6.67	0.62	13.98
400 - 599	15	62.72	18.02	84	0.3	561.98	29.92	9.59	13.47	5.27	3	20.25	14.42	5.03	12.33
CLASSIFICATION BY YEAR OF SERVICE															
21ST - 25TH	3.1	20.39	61.07	17	0	126.66	24.01	2.38	5.58	4.71	0.7	20.84	8.38	2.67	14.38
26TH - 30TH	23.3	45.36	35.89	113	0.4	561.98	28.18	4.17	6.19	3.65	4.6	19.61	8.25	4.64	12.55
31ST - 35TH	17.6	34.1	44.89	75	0.4	569.03	43.05	4.47	6.44	4.86	3.9	22.18	6.72	1.64	17.27
36TH - 40TH	7.7	19.45	61.22	67	0.4	878.76	47.29	7.09	11.69	10.78	1.7	22.46	13.08	1.35	13.31
41ST - 45TH	1.3	36.17	45.66	5	0	89.5	26.96	2.55	2.55	2.4	0.2	18.18	6.79	1.25	15.73
CLASSIFICATION BY OPERATING FACTOR															
11 - 20	15	62.72	18.02	84	0.3	561.98	29.92	9.59	13.47	5.27	3	20.25	14.42	5.03	12.33
21 - 30	2	58.02	29.43	7	0	141.53	29.34	3.83	5.23	4.44	0.3	13.03	8.49	0.03	11.35
31 - 40	2	50.2	35.79	7	0	10.58	4.49	0.5	1.71	1.52	0.3	14.44	6.98	0.29	13.54
51 - 60	27	24.02	54.06	125	0.7	878.76	46.12	4.31	7.22	6.08	6.4	23.77	7.26	2.2	17.28
61 - 70	5	21.75	64.74	18	0.1	383.36	37.18	2.3	2.88	2.35	0.7	13.89	4.01	3.94	8.05
81 - 90	2	0.83	81.69	36	0.1	126.78	26.14	6.17	8.08	8.01	0.4	19.25	22.03	1.07	11.04
ALL UNITS	**53**	**36.15**	**44.29**	**277**	**1.2**	**878.76**	**36.55**	**4.69**	**7.27**	**5.27**	**11.1**	**20.91**	**8.69**	**2.97**	**14.41**

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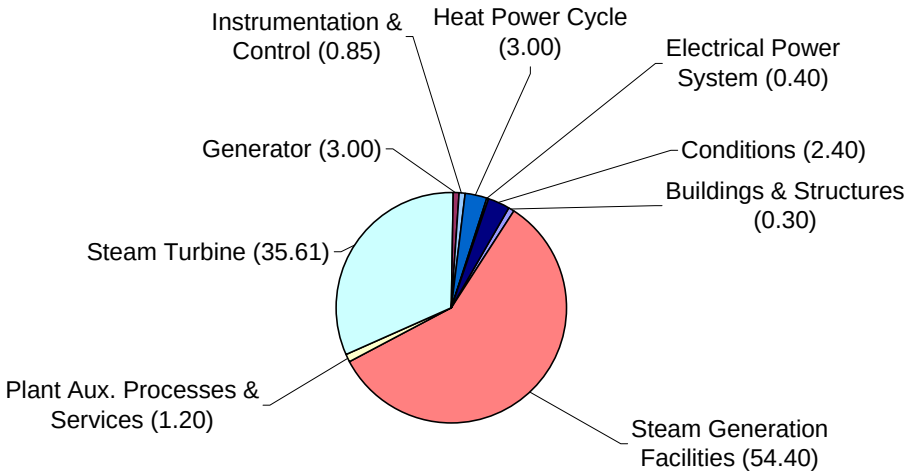
FOSSIL - OIL

Table 6.2.11

Major Component Outage Code Report, 2003 to 2007

Major component contribution to oil-fired fossil unit ICbF based on 2003-07 data.



UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

MAJOR COMPONENT	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT FOR (%)	CONTRIBUTION TO UNIT DAFOR (%)
BUILDINGS AND STRUCTURES	1	0	0	0	0	0	11	0.05	3	0.11	0.16	0	0
STEAM GENERATION FACILITIES	93	0.9	735	0.83	70	0.03	167	1.45	43	8.23	11.44	2.73	4.3
STEAM TURBINE	52	0.49	36	0	35	0.01	29	0.39	36	5.36	6.26	0.99	0.99
GENERATOR	18	0.17	6	0	25	0	4	0.03	1	0	0.2	0.32	0.32
HEAT POWER CYCLE	46	0.12	110	0.09	20	0.03	41	0.37	0	0	0.61	0.24	0.41
ELECTRICAL POWER SYSTEM	10	0.02	4	0	0	0	9	0.03	7	0	0.04	0.03	0.03
INSTRUMENTATION AND CONTROL	47	0.07	77	0.03	23	0.04	3	0	1	0.01	0.15	0.13	0.19
PLANT AUX. PROCESSES AND SERVICES	10	0.01	43	0.08	2	0	9	0.1	1	0.04	0.23	0.02	0.19
CONDITIONS	19	0.51	21	0.04	18	0.01	11	0.05	0	0	0.61	0.98	1.05
TOTAL (External Causes Included)	**296**	**2.29**	**1,032**	**1.07**	**193**	**0.12**	**284**	**2.47**	**92**	**13.75**	**19.7**	**5.44**	**7.48**
TOTAL (External Causes Excluded)	**277**	**1.78**	**1,011**	**1.03**	**175**	**0.11**	**273**	**2.42**	**92**	**13.75**	**19.09**	**4.46**	**6.43**

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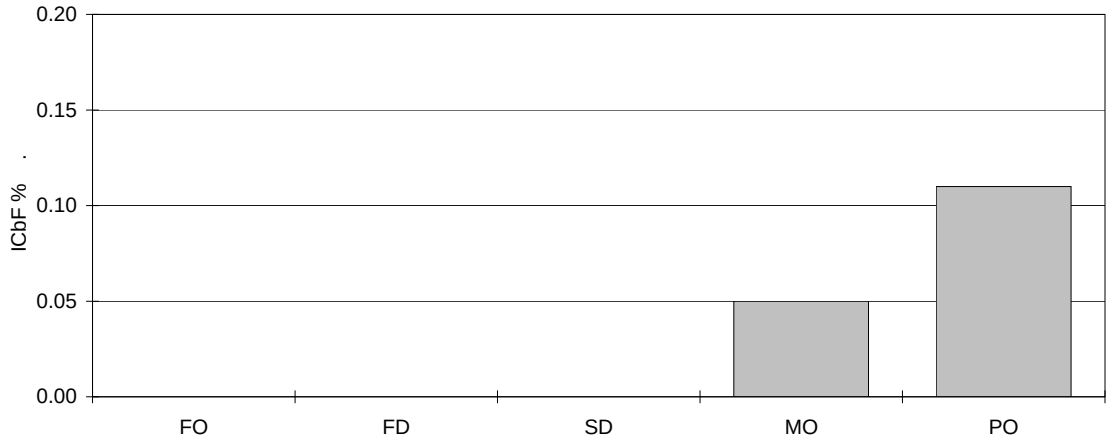
FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Buildings and Structures



Building & Structures ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
BUILDINGS AND STRUCTURES													
23290	**Chimney**	1	0	0	0	0	0	11	0.05	3	0.11	0.16	0
BUILDINGS AND STRUCTURES TOTAL		**1**	**0**	**0**	**0**	**0**	**0**	**11**	**0.05**	**3**	**0.11**	**0.16**	**0**

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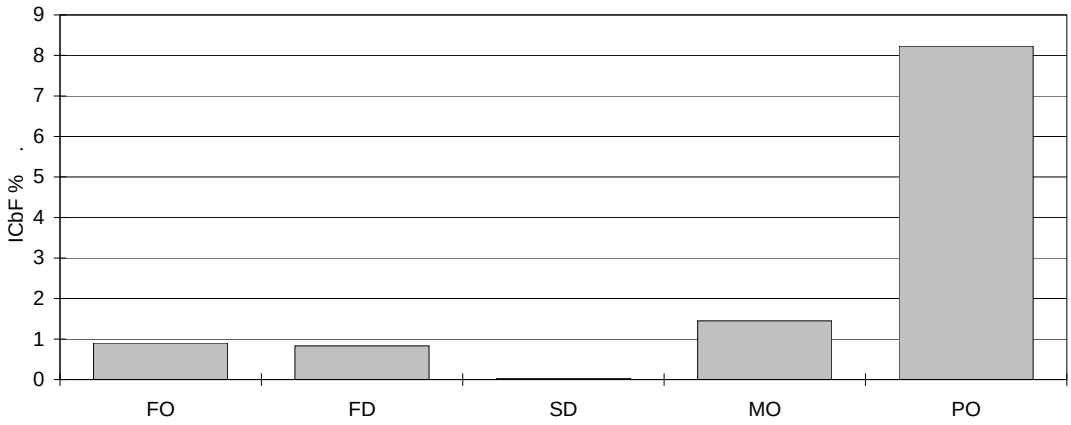
FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Steam Generation



Steam Generation Facilities ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM GENERATION FACILITIES													
31000	**Steam Generator**	12	0.04	47	0.11	1	0	10	0.11	37	7.77	8.02	0.58
31150	**Air Heaters**	2	0.01	75	0.14	0	0	42	0.28	0	0	0.43	0.29
31220	**Pulverized Fuel Burner Piping And Valves**	0	0	8	0	0	0	0	0	0	0	0	0
31230	**Oil Burner Piping And Valves**	0	0	0	0	0	0	1	0	0	0	0	0
31270	**Burners And Windboxes**	4	0.01	8	0	1	0	0	0	0	0	0.01	0.02
31280	**Igniters**	2	0.03	7	0.01	0	0	9	0.05	0	0	0.09	0.07
31300	**Sootblower Systems**	0	0	2	0	0	0	3	0.02	0	0	0.02	0
31530	**Steam Generating Tubes (Between Steam Drum And Mud Drum)**	6	0.1	1	0.08	0	0	11	0.13	0	0	0.31	0.34
31540	**Waterwalls**	10	0.18	27	0.01	0	0	27	0.36	1	0.03	0.58	0.35
31550	**Circulating Pumps**	0	0	11	0.03	0	0	0	0	0	0	0.03	0.06
31560	**Circulating Pumps Drives**	0	0	367	0.05	0	0	4	0.1	0	0	0.14	0.09
31570	**Safety Valves**	1	0.03	9	0.01	24	0.02	5	0.02	0	0	0.09	0.08
31701	**Superheater**	4	0.07	2	0	0	0	1	0	0	0	0.07	0.14
31702	**Reheater**	10	0.22	1	0	0	0	1	0.01	1	0.04	0.27	0.61
31703	**Economizer**	4	0.07	0	0	0	0	3	0.02	0	0	0.09	0.13
31810	**Attemperation**	3	0	9	0	1	0	4	0.05	0	0	0.06	0.01
32100	**Forced Draft Ducts**	0	0	1	0	0	0	2	0	0	0	0	0
32310	**Forced Draft Fans**	18	0.12	30	0.35	1	0	11	0.07	0	0	0.53	0.99
32320	**Forced Draft Fan Variable Speed Coupling Drives**	0	0	1	0	0	0	0	0	0	0	0	0
32330	**Forced Draft Fan Motors**	0	0	11	0.02	1	0	0	0	0	0	0.03	0.04
32400	**Induced Draft Flues**	0	0	6	0	0	0	2	0.01	0	0	0.01	0
32510	**Induced Draft Fans**	1	0	17	0.01	1	0	1	0.03	0	0	0.03	0.01
32530	**Induced Draft Fan Motors**	0	0	68	0.01	0	0	0	0	0	0	0.01	0.01
33100	**Main Steam Piping**	1	0.01	0	0	0	0	0	0	0	0	0.01	0.01

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FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12

Steam Generation
(Continued)

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
33200	**Hot Reheat Piping**	1	0.01	0	0	0	0	0	0	0	0	0.01	0.03
34100	**Furnace And Water Gauge Television Auxiliary Systems**	1	0	1	0	0	0	0	0	0	0	0	0
34400	**Boiler Drains System**	1	0	0	0	0	0	2	0.01	0	0	0.01	0.01
35110	**Furnace Ash Removal System**	0	0	0	0	0	0	1	0	0	0	0	0
35130	**Fly Ash Removal System - Dry Transportation**	0	0	0	0	0	0	22	0.13	0	0	0.13	0
35140	**Fly Ash Removal System - Wet Transportation**	3	0	0	0	2	0	2	0	0	0	0	0
35210	**Precipitators-Electrostatic**	0	0	0	0	0	0	2	0.03	1	0.12	0.15	0
35220	**Precipitators-Mechanical**	0	0	0	0	0	0	0	0	1	0.22	0.22	0
36100	**Coal Receiving Systems**	3	0	14	0	0	0	0	0	0	0	0	0
37300	**Fuel Oil Transfer Systems**	0	0	0	0	38	0	0	0	2	0.05	0.05	0
37400	**Fuel Oil Forwarding Systems**	0	0	1	0	0	0	0	0	0	0	0	0
37500	**Fuel Oil Boosting Systems**	4	0	8	0	0	0	1	0	0	0	0.01	0.01
37600	**Fuel Oil Heating Systems**	0	0	2	0	0	0	0	0	0	0	0	0
38000	**Sulphur Oxides Removal System**	2	0	1	0	0	0	0	0	0	0	0	0.01
STEAM GENERATION FACILITIES TOTAL		**93**	**0.9**	**735**	**0.83**	**70**	**0.03**	**167**	**1.45**	**43**	**8.23**	**11.44**	**4.3**

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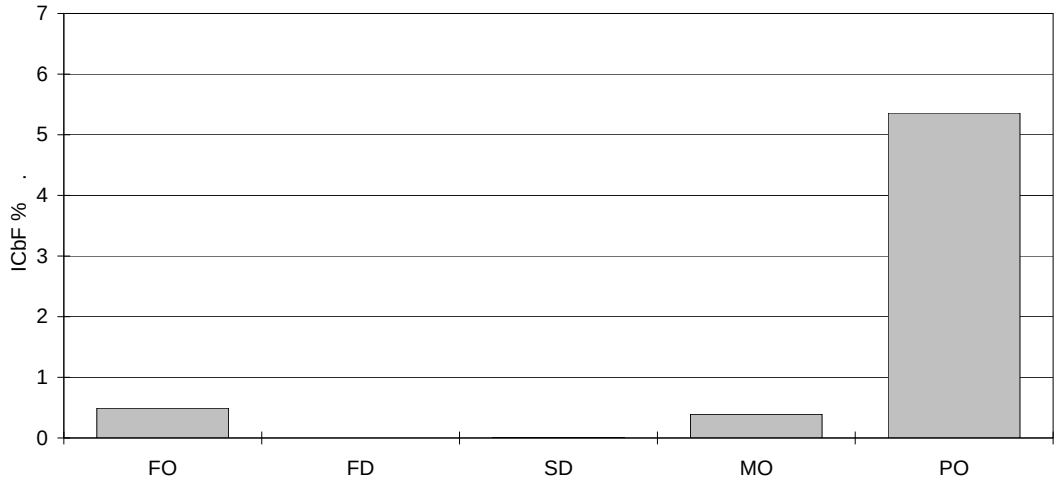
FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12

Steam Turbine



Steam Turbine ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM TURBINE													
41100	**Turbine**	13	0.36	26	0	28	0.01	6	0.05	35	5.21	5.64	0.75
41120	**Rotors**	0	0	0	0	0	0	1	0	0	0	0	0
41121	**Shaft Coupling Mechanism**	1	0.01	0	0	0	0	8	0.17	0	0	0.18	0.01
41130	**Blades**	0	0	0	0	0	0	1	0.01	1	0.14	0.15	0
41140	**Crossover Piping**	1	0.01	1	0	0	0	0	0	0	0	0.01	0.01
41157	**Turning Gear Motor**	0	0	0	0	0	0	1	0.01	0	0	0.01	0
41160	**Valve Gear**	6	0.04	1	0	1	0	4	0.1	0	0	0.14	0.08
41170	**Bearings And Pedestals**	1	0	0	0	0	0	0	0	0	0	0	0
41200	**Lubricating Oil System**	5	0.01	0	0	0	0	3	0.03	0	0	0.04	0.01
41500	**Gland Seal System-Steam**	1	0.01	1	0	0	0	3	0.02	0	0	0.02	0.01
41600	**Turbovisory**	9	0.02	4	0	2	0	1	0	0	0	0.02	0.04
41700	**Governing System**	15	0.04	3	0	4	0	1	0	0	0	0.04	0.07
STEAM TURBINE TOTAL		**52**	**0.49**	**36**	**0**	**35**	**0.01**	**29**	**0.39**	**36**	**5.36**	**6.26**	**0.99**

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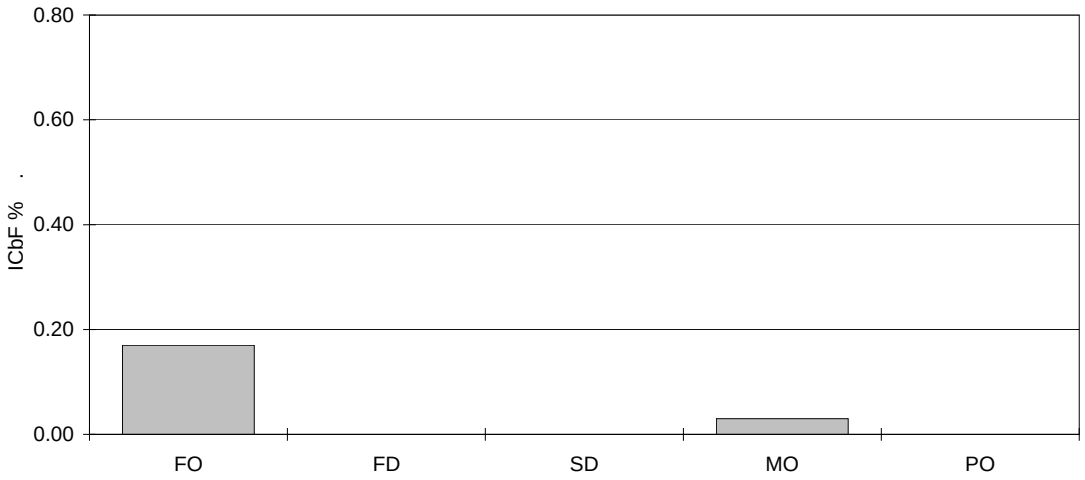
FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Generator



Generator ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
GENERATOR													
42100	**Generator**	0	0	2	0	1	0	0	0	0	0	0	0
42110	**Generator Rotor**	8	0.16	0	0	5	0	0	0	1	0	0.16	0.3
42114	**Generator Collector And Brushes**	0	0	0	0	0	0	1	0.02	0	0	0.02	0
42120	**Generator Stator**	0	0	1	0	0	0	0	0	0	0	0	0
42200	**Excitation Systems Equipment**	9	0.01	0	0	19	0	2	0.01	0	0	0.02	0.01
42300	**Hydrogen Gas Cooling System**	1	0	1	0	0	0	0	0	0	0	0.01	0.01
42400	**Generator Liquid Cooling System**	0	0	2	0	0	0	0	0	0	0	0	0
42500	**Seal Oil System**	0	0	0	0	0	0	1	0.01	0	0	0.01	0
GENERATOR TOTAL		**18**	**0.17**	**6**	**0**	**25**	**0**	**4**	**0.03**	**1**	**0**	**0.2**	**0.32**

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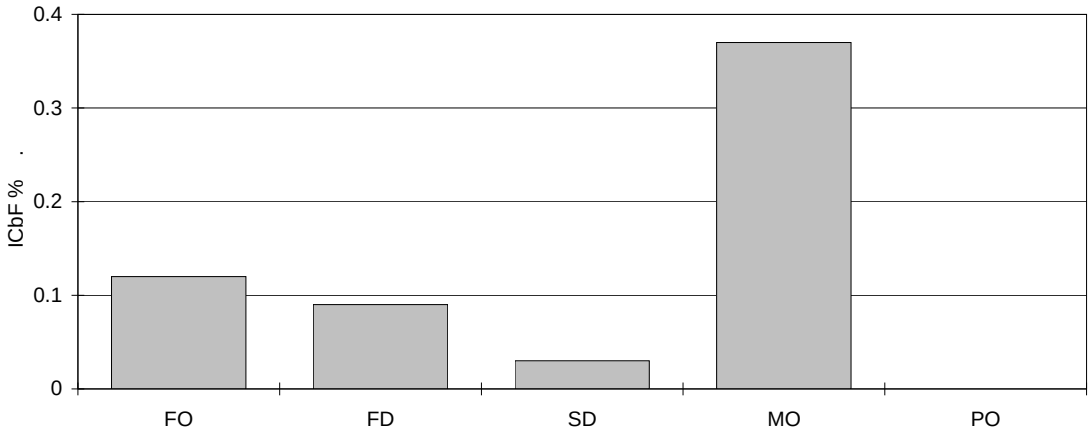
FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Heat Power Cycle



Heat Power Cycle ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
HEAT POWER CYCLE													
43090	**Boiler Feedwater Piping And Supports**	4	0.02	4	0	0	0	2	0.02	0	0	0.05	0.05
43100	**High Pressure Feedwater Heaters & Auxiliaries**	7	0.03	18	0.02	3	0.01	4	0.03	0	0	0.08	0.09
43200	**Boiler Feed Pumps And Auxiliaries**	12	0.04	36	0.04	3	0.01	9	0.06	0	0	0.14	0.15
43260	**Boiler Feed Pump Variable Speed Coupling Drives**	0	0	0	0	1	0	0	0	0	0	0	0
43300	**Boiler Feed Pump Turbines & Auxiliaries**	0	0	2	0	1	0	0	0	0	0	0	0
43400	**Boiler Feed Pump Motors And Auxiliaries**	2	0.02	2	0	0	0	3	0.02	0	0	0.05	0.05
44090	**Condensate Piping And Supports**	1	0	3	0	0	0	1	0.01	0	0	0.01	0
44110	**Condensor**	1	0	5	0	2	0	1	0.01	0	0	0.01	0
44120	**Condensor Tubes**	2	0	28	0.02	9	0.01	14	0.11	0	0	0.14	0.04
44200	**Condensate Extraction Pumps And Auxiliaries**	1	0	2	0	0	0	1	0.01	0	0	0.01	0
44300	**Condensate Extraction Pump Motors And Auxiliaries**	0	0	1	0	0	0	0	0	0	0	0	0
44400	**Low Pressure Feedwater Heaters & Auxiliaries**	2	0	0	0	0	0	0	0	0	0	0	0
44500	**Deaerator, Storage Tank, And Auxiliaries**	4	0.01	0	0	0	0	2	0.04	0	0	0.04	0.01
45000	**Air Extraction System**	5	0	1	0	0	0	0	0	0	0	0	0
45090	**Air Extraction System And Piping Support**	1	0	0	0	0	0	0	0	0	0	0	0
45300	**Steam Air Ejectors**	2	0	0	0	0	0	1	0.01	0	0	0.01	0
47000	**Condensate Make-up System**	1	0	0	0	0	0	2	0.04	0	0	0.04	0
48100	**Extraction Steam System**	1	0	8	0	1	0	0	0	0	0	0	0.01
48200	**Feedwater Heater Drains System**	0	0	0	0	0	0	1	0.01	0	0	0.01	0
HEAT POWER CYCLE TOTAL		46	0.12	110	0.09	20	0.03	41	0.37	0	0	0.61	0.41

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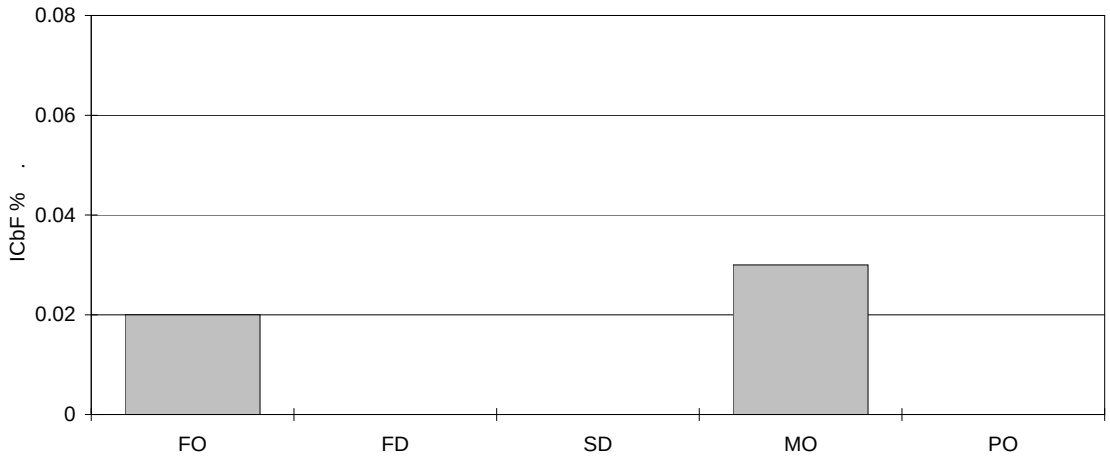
FOSSIL - OIL

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Electrical Power Sys.



Electrical Power System ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
ELECTRICAL POWER SYSTEM													
51120	**Generator Power Transformers**	1	0	2	0	0	0	5	0.01	7	0	0.01	0
51130	**Switching Equipment-Generator Voltage**	0	0	0	0	0	0	1	0	0	0	0	0
51170	**Generator Neutral Grounding Equipment**	1	0	0	0	0	0	0	0	0	0	0	0
52130	**Unit Service Transformer**	1	0	0	0	0	0	1	0	0	0	0	0
52140	**Exciter XFMR**	1	0.01	0	0	0	0	0	0	0	0	0.01	0.01
53200	**Station Service Power Distribution**	6	0.01	1	0	0	0	0	0	0	0	0.01	0.01
55000	**Direct Current Power Supplies**	0	0	1	0	0	0	2	0.01	0	0	0.01	0
ELECTRICAL POWER SYSTEM TOTAL		**10**	**0.02**	**4**	**0**	**0**	**0**	**9**	**0.03**	**7**	**0**	**0.04**	**0.03**

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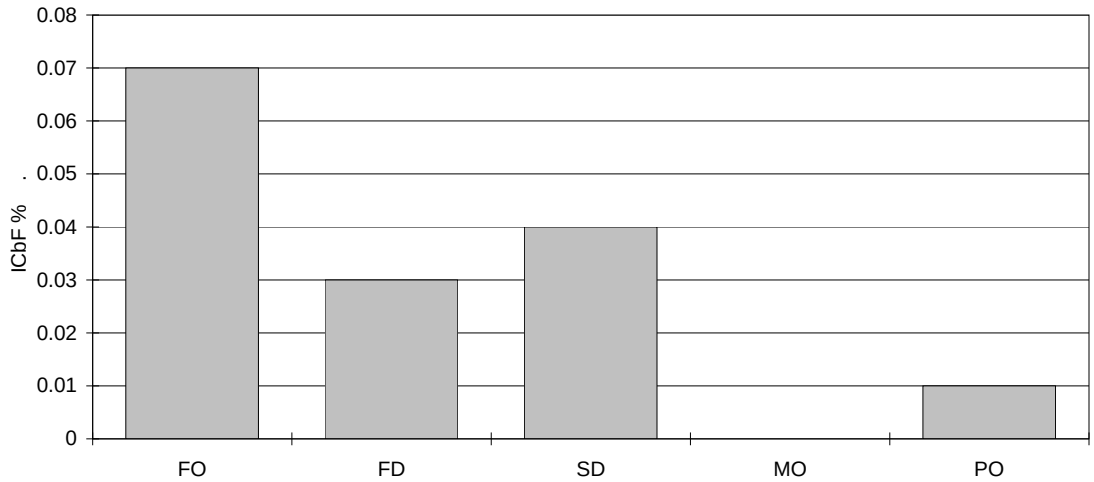
FOSSIL - OIL

Table 6.2.12

Detail Component Outage Code Report, 2003 to 2007

Ins. And Control



Instrumentation & Control ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

CODE	C A U S E	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
INSTRUMENTATION AND CONTROL													
63100	Steam Generator Controls	13	0.01	35	0.01	0	0	0	0	0	0	0.01	0.03
63200	Equipment Controls-Furnace Draft	2	0	7	0	1	0	0	0	0	0	0	0.01
63300	Primary Steam Instrumentation & Control	1	0	0	0	1	0	0	0	0	0	0	0
63600	Fuel Coal Management - Instrumentation And Control	1	0	3	0	0	0	0	0	0	0	0	0
63700	Fuel Oil Management - Instrumentation And Control	1	0	5	0.01	0	0	0	0	0	0	0.01	0.02
63900	Ignition Fuel,Fuel Gas, & Miscellaneous Fuel Management-Instrumentation & Control	0	0	1	0	0	0	0	0	0	0	0	0
64100	Steam Turbine And Auxiliaries - Instrumentation And Control	10	0.01	5	0	0	0	3	0	0	0	0.01	0.03
64200	Generator And Auxiliaries - Instrumentation And Controls	1	0	1	0	0	0	0	0	0	0	0	0
64300	Boiler Feedwater System - Instrumentation And Controls	6	0.01	9	0.01	0	0	0	0	0	0	0.01	0.03
64400	Condensate System - Instrumentation And Controls	2	0.01	1	0	0	0	0	0	0	0	0.01	0.01
64800	Feedwater Heating Anciliary Systems - Instrumentation And Controls	1	0	0	0	0	0	0	0	0	0	0	0
65100	Main Power Output Systems - Control And Protection	1	0.01	0	0	1	0	0	0	0	0	0.01	0.01
69000	Computers	8	0.02	10	0.01	20	0.04	0	0	1	0.01	0.07	0.05
INSTRUMENTATION AND CONTROL TOTAL		47	0.07	77	0.03	23	0.04	3	0	1	0.01	0.15	0.19

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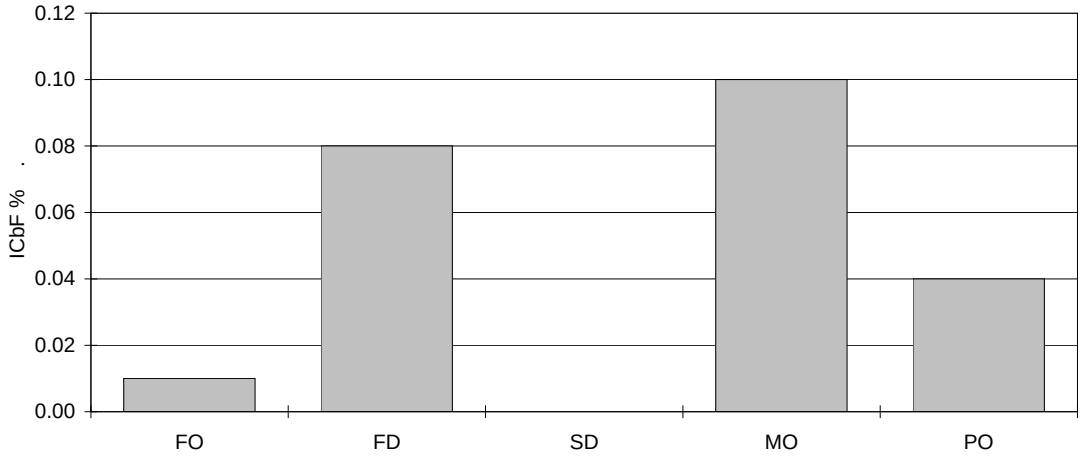
FOSSIL - OIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Auxiliary Processes



Plant Aux. Processes & Services ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
PLANT AUX. PROCESSES AND SERVICES													
71000	**Circulating Water Systems**	1	0	1	0	0	0	3	0.05	1	0.04	0.09	0
71110	**Travelling Water Screens**	0	0	4	0	0	0	1	0.03	0	0	0.04	0
71120	**Circulating Water Pumps**	2	0	10	0.01	1	0	0	0	0	0	0.01	0.03
71127	**Circulating Water Pump Motors**	0	0	18	0.07	0	0	0	0	0	0	0.07	0.13
71140	**Circulating Water Main Butterfly Valves And Operators**	1	0	0	0	0	0	0	0	0	0	0	0.01
72100	**Service Water Low Pressure Open System**	1	0.01	0	0	0	0	1	0	0	0	0.01	0.01
73000	**Heating, Ventilating, And Air Conditioning Systems**	0	0	1	0	0	0	0	0	0	0	0	0
73100	**Auxiliary Steam And Condensate Systems**	1	0	1	0	1	0	0	0	0	0	0	0
73200	**Powerhouse Heating & Ventilating Systems**	0	0	2	0	0	0	0	0	0	0	0	0
74000	**Water Treatment Plant**	2	0	1	0	0	0	1	0	0	0	0	0
75110	**Service Air System**	2	0	5	0	0	0	0	0	0	0	0	0
75120	**Instrument Air System**	0	0	0	0	0	0	3	0	0	0	0	0
PLANT AUX. PROCESSES AND SERVICES TOTAL		**10**	**0.01**	**43**	**0.08**	**2**	**0**	**9**	**0.1**	**1**	**0.04**	**0.23**	**0.19**

Canadian Electricity Association
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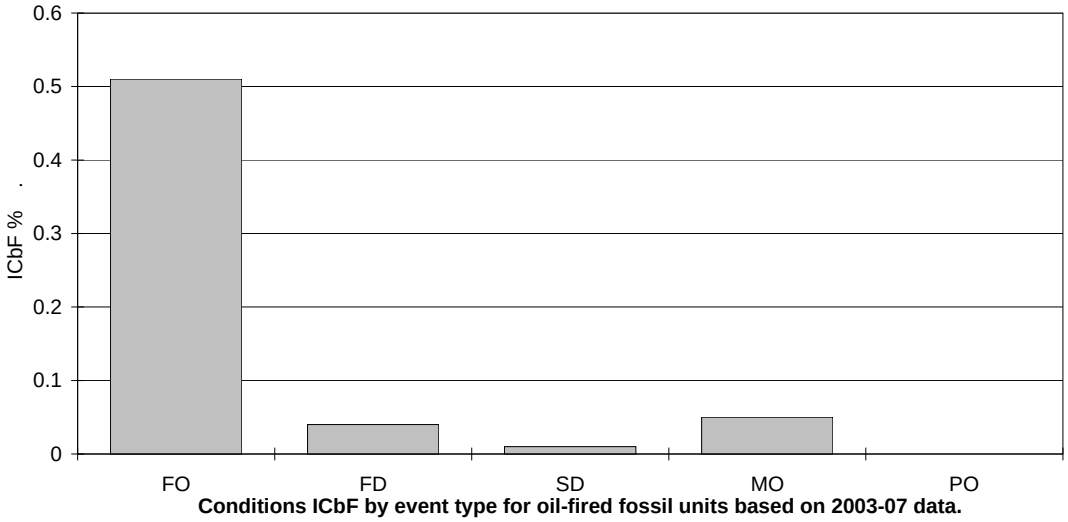
FOSSIL - OIL UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.12
Conditions



Conditions ICbF by event type for oil-fired fossil units based on 2003-07 data.

UNIT STATISTICS

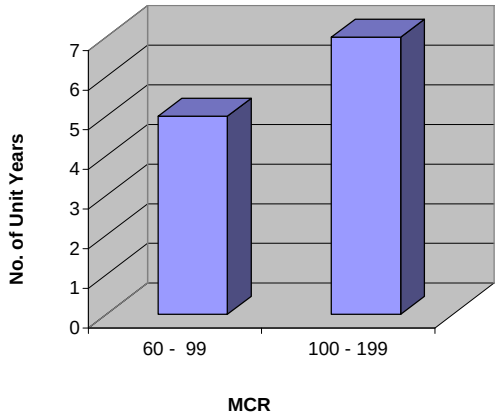
NUMBER OF UNITS	13
NUMBER OF UNIT YEARS	53
OVERALL OPERATING FACTOR	44.29

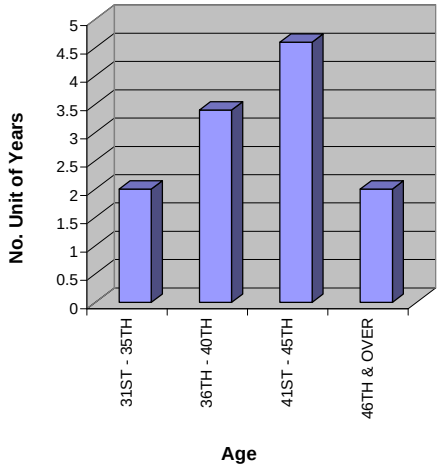
		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
CONDITIONS													
01410	**Poor Quality Fuel, Heat Content**	0	0	1	0	0	0	1	0	0	0	0	0
05200	**Transmission Limitations**	9	0.01	2	0	9	0.01	5	0.01	0	0	0.03	0.03
07010	**Site Environment, Storms, Floods**	5	0.2	17	0.04	9	0	2	0.02	0	0	0.26	0.45
07120	**Sulphur Dioxide - Environmental Restriction**	0	0	1	0	0	0	2	0.01	0	0	0.01	0
07130	**Particulates - Environmental Restriction**	1	0	0	0	0	0	0	0	0	0	0	0
08160	**Fire, General**	2	0.02	0	0	0	0	0	0	0	0	0.02	0.05
80910	**Staff Shortage**	1	0.07	0	0	0	0	0	0	0	0	0.07	0.14
99999	**Other**	1	0.2	0	0	0	0	1	0.01	0	0	0.21	0.38
CONDITIONS TOTAL		**19**	**0.51**	**21**	**0.04**	**18**	**0.01**	**11**	**0.05**	**0**	**0**	**0.61**	**1.05**

FOSSIL UNITS - Natural Gas

Table 6.2.13

External Causes Excluded, 2007 Data





	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	5	74.41	19.29	4	0	15.4	6.89	0.33	0.81	0.79	0.4	8.14	3.11	5.31	0.92
100 - 199	7	55.22	25.92	3	0.2	1,868.38	627.19	10.58	10.91	5.46	1.3	19.25	0.55	2.49	13.3
CLASSIFICATION BY YEAR OF SERVICE															
31ST - 35TH	2	59.4	27.44	1	0	0.45	0.45	0.01	1.21	1.07	0.3	13.49	1.82	1.92	11.24
36TH - 40TH	3.4	80.82	6.51	2	0.2	1,868.38	940.56	49.34	49.34	11.84	0.4	12.7	0	2	4.33
41ST - 45TH	4.6	63.73	22.66	0	0	0	0	0	0	0	0.6	14.04	0	1.48	12.13
46TH & OVER	2	36.03	48.23	4	0	15.4	6.89	0.33	0.81	0.79	0.4	20.35	3.11	13.28	2.29
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	6	89.99	1.87	1	0.2	1,868.38	1,868.38	65.55	65.65	6.31	0.5	8.17	0	1.04	3.55
11 - 20	1	59.03	18.53	0	0	0	0	0	0.27	0.07	0.2	24.19	0	20.08	2.35
21 - 30	2	47.38	27.07	1	0	12.73	12.73	0.27	0.27	0.26	0.5	26.53	0	0.79	24.69
51 - 60	1	29.84	50.47	1	0	0.45	0.45	0.01	1.16	1.16	0.2	20.28	1.98	3.83	15.86
61 - 70	1	21.98	65.64	0	0	0	0	0	0	0	0.1	12.37	0	5.78	6.59
71 - 80	1	13.04	77.93	4	0	15.4	6.89	0.4	0.93	0.92	0.2	16.51	3.85	6.48	2.24
ALL UNITS	12	63.22	23.16	7	0.2	1,868.38	272.73	7.27	7.65	4.73	1.8	14.62	1.44	3.67	8.14

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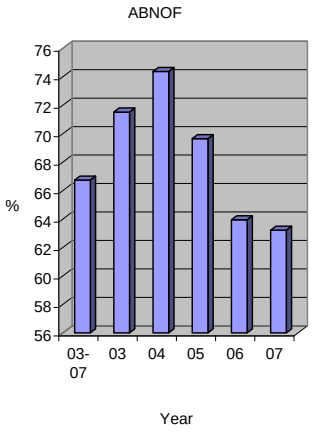
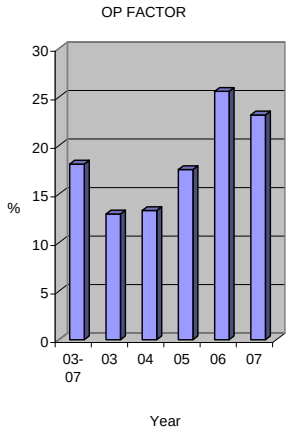
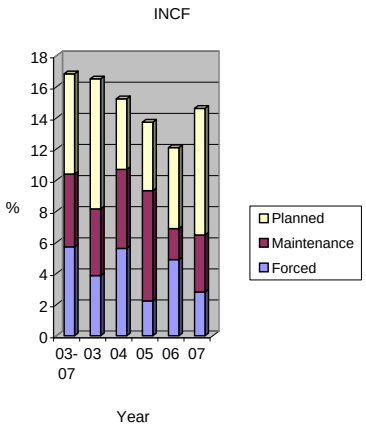
FOSSIL UNITS - Natural Gas

Table 6.2.14

External Causes Excluded, 2003 to 2007 Data







	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
60 - 99	25	68.7	19.73	32	0.4	1,737.25	114.49	7.81	17.02	11.09	3.5	13.97	5.67	9.34	0.56
100 - 199	47	69.3	16.86	60	1.3	3,552.98	189.18	14.04	16.83	7.83	7	14.88	4.54	2.07	9
CLASSIFICATION BY YEAR OF SERVICE															
21ST - 25TH	2.2	72.36	27.57	4	0	5.76	2.73	0.2	0.28	0.27	0	0.09	6.53	0.01	0
26TH - 30TH	9.4	80.51	10.48	14	0	129.86	19.87	3.13	6.77	3.83	0.9	9.42	9.15	3.33	5.34
31ST - 35TH	12.8	74.47	14.77	11	0	117.5	17.43	1.14	10.02	1.92	1.6	12.24	3.7	2.43	8.16
36TH - 40TH	26.7	81.92	6.37	31	0.8	3,552.98	223.1	31.72	33.79	12.22	3.3	12.33	10	1.12	7.63
41ST - 45TH	15.6	50.9	35.16	20	0.5	1,872.91	219.68	8.37	14.57	9.3	2.7	17.07	3.09	5.95	4.77
46TH & OVER	5.3	23.91	40.97	12	0.4	1,737.25	268.63	14.41	19.22	15.11	2.1	39.07	4.58	27.4	0.86
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	31	90.81	4.15	32	0.1	325	23.28	6.19	12.51	4.99	1.7	5.37	14.74	1.36	3.4
11 - 20	13	71.87	12.64	15	0.3	1,868.38	155.4	13.93	15.69	6.73	2.1	16.19	4.26	1.29	12.15
21 - 30	8	56.67	24.99	9	0.8	3,552.98	746.28	27.71	27.73	14.12	1.6	20.05	3	0.23	8.54
31 - 40	10	51.56	32.61	10	0.2	1,630.08	165.12	5.46	9.81	4.62	1.7	17.46	2.45	3.87	10.08
41 - 50	10	25.65	46.65	26	0.4	1,737.25	137.32	8.03	17.71	12.84	3.4	33.69	5.14	23.2	0.46
ALL UNITS	72	69.1	17.86	92	1.7	3,552.98	163.2	11.76	16.9	8.83	10.5	14.57	4.98	4.6	6.07

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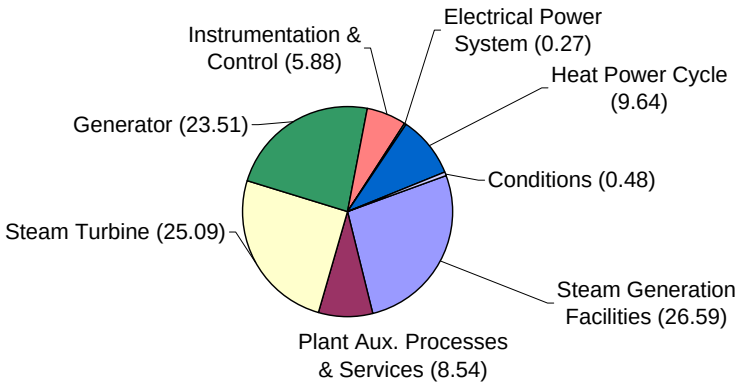
FOSSIL - NATURAL GAS

Table 6.2.15

Major Component Outage Code Report, 2003 to 2007

Major component contribution to gas-fired fossil unit ICbF based on 2003-07 data.



UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
STEAM GENERATION FACILITIES	11	0.35	231	0.65	45	0.12	31	0.67	24	2.11	3.89	1.72	4.78
STEAM TURBINE	10	0.32	4	0	17	0.19	17	1.59	6	1.57	3.67	1.59	1.55
GENERATOR	18	1.61	1	0	0	0	52	1.06	7	0.77	3.44	7.93	7.73
HEAT POWER CYCLE	11	0.01	75	0.35	12	0.07	37	0.78	5	0.2	1.41	0.06	1.72
ELECTRICAL POWER SYSTEM	5	0.01	0	0	0	0	8	0.03	0	0	0.04	0.06	0.06
INSTRUMENTATION AND CONTROL	36	0.08	52	0.13	1	0	16	0.06	6	0.59	0.86	0.39	1.02
PLANT AUX. PROCESSES AND SERVICES	1	0	6	0	0	0	27	0.41	21	0.84	1.25	0	0.02
CONDITIONS	6	0.02	0	0	0	0	4	0.03	1	0.03	0.07	0.08	0.08
TOTAL (External Causes Included)	**98**	**2.4**	**369**	**1.13**	**75**	**0.38**	**192**	**4.63**	**70**	**6.1**	**14.63**	**11.83**	**16.97**
TOTAL (External Causes Excluded)	**92**	**2.38**	**369**	**1.13**	**75**	**0.38**	**188**	**4.6**	**69**	**6.07**	**14.56**	**11.76**	**16.9**

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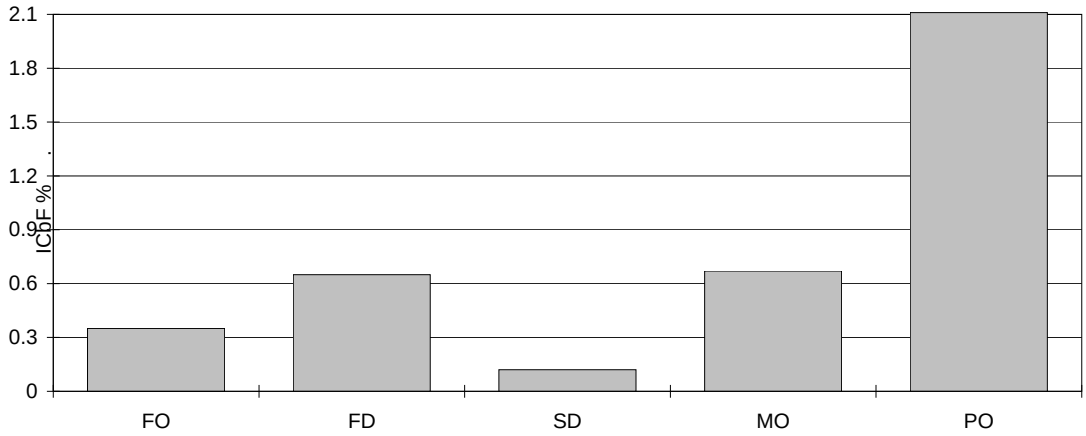
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Steam Generation Fac.



Steam Generation Facilities ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM GENERATION FACILITIES													
31000	**Steam Generator**	6	0	215	0.52	42	0.12	10	0.08	18	1.4	2.13	2.51
31240	**Gas Burner Piping And Valves**	0	0	8	0	0	0	3	0.03	5	0.55	0.59	0
31270	**Burners And Windboxes**	1	0	0	0	0	0	0	0	0	0	0	0
31530	**Steam Generating Tubes (Between Steam Drum And Mud Drum)**	0	0	0	0	0	0	1	0	0	0	0	0
31540	**Waterwalls**	0	0	1	0	0	0	10	0.28	0	0	0.29	0.01
31550	**Circulating Pumps**	0	0	0	0	0	0	1	0.03	0	0	0.03	0
31570	**Safety Valves**	0	0	3	0	3	0	0	0	0	0	0	0.01
31701	**Superheater**	2	0.3	0	0	0	0	0	0	0	0	0.3	1.46
31703	**Economizer**	1	0.02	0	0	0	0	1	0.03	0	0	0.05	0.1
32310	**Forced Draft Fans**	0	0	2	0.12	0	0	0	0	0	0	0.12	0.59
32330	**Forced Draft Fan Motors**	0	0	1	0	0	0	0	0	0	0	0	0
32510	**Induced Draft Fans**	0	0	1	0	0	0	0	0	0	0	0	0
33100	**Main Steam Piping**	0	0	0	0	0	0	2	0.01	1	0.15	0.16	0
34400	**Boiler Drains System**	1	0.02	0	0	0	0	1	0.01	0	0	0.03	0.09
38000	**Sulphur Oxides Removal System**	0	0	0	0	0	0	2	0.18	0	0	0.18	0
STEAM GENERATION FACILITIES TOTAL		**11**	**0.35**	**231**	**0.65**	**45**	**0.12**	**31**	**0.67**	**24**	**2.11**	**3.89**	**4.78**

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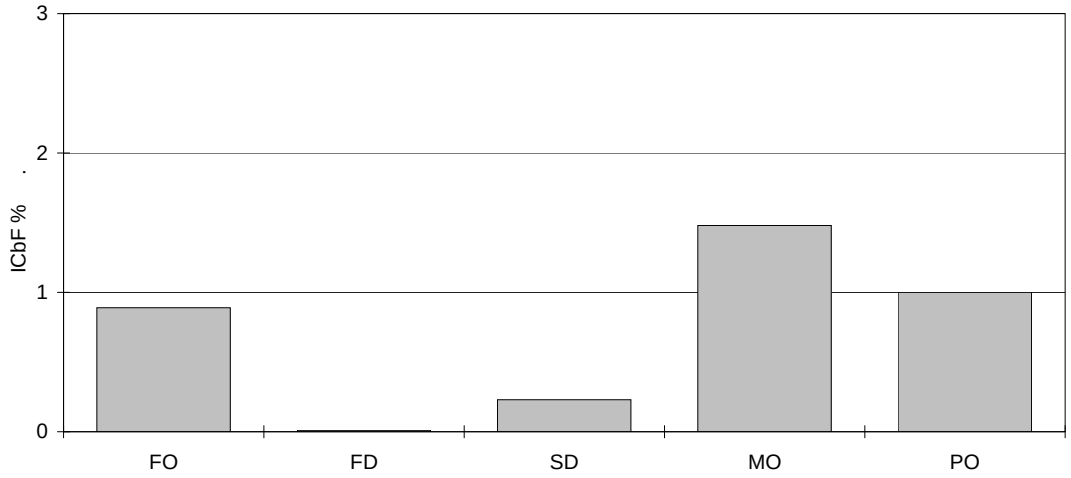
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Steam Turbine



Steam Turbine ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM TURBINE													
41100	**Turbine**	0	0	0	0	5	0.03	7	1.38	6	1.57	2.98	0
41120	**Rotors**	1	0.01	2	0	12	0.16	0	0	0	0	0.18	0.07
41121	**Shaft Coupling Mechanism**	0	0	0	0	0	0	1	0.01	0	0	0.01	0
41130	**Blades**	0	0	0	0	0	0	1	0	0	0	0	0
41160	**Valve Gear**	2	0.06	0	0	0	0	1	0.07	0	0	0.13	0.27
41170	**Bearings And Pedestals**	2	0	2	0	0	0	0	0	0	0	0	0.01
41200	**Lubricating Oil System**	2	0.02	0	0	0	0	0	0	0	0	0.02	0.11
41500	**Gland Seal System-Steam**	0	0	0	0	0	0	2	0.04	0	0	0.04	0
41540	**Gland Seal System-Water**	1	0	0	0	0	0	0	0	0	0	0	0
41600	**Turbovisory**	2	0.23	0	0	0	0	1	0.02	0	0	0.25	1.09
41700	**Governing System**	0	0	0	0	0	0	4	0.06	0	0	0.06	0
STEAM TURBINE TOTAL		**10**	**0.32**	**4**	**0**	**17**	**0.19**	**17**	**1.59**	**6**	**1.57**	**3.67**	**1.55**

Canadian Electricity Association
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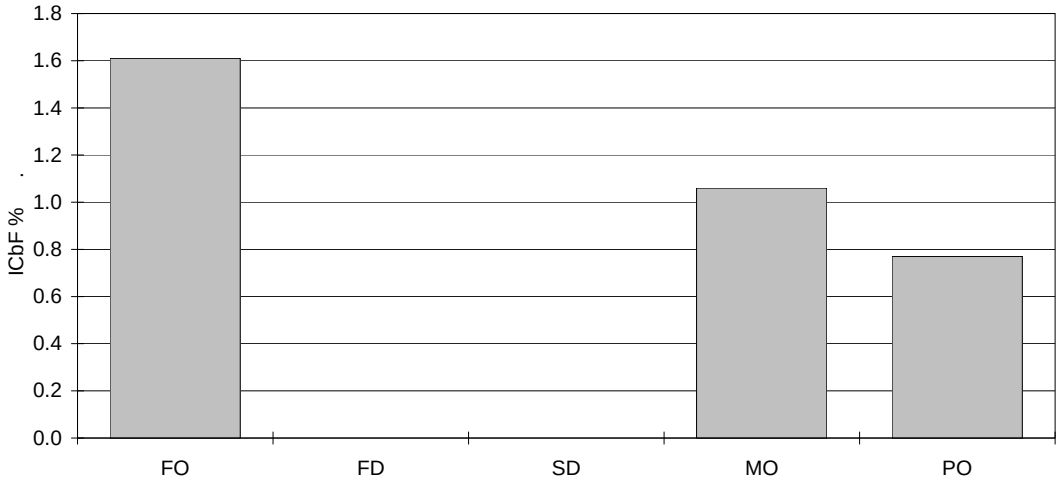
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Generator



Generator ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
GENERATOR													
42100	**Generator**	2	0	1	0	0	0	1	0.01	3	0.32	0.33	0.01
42110	**Generator Rotor**	2	0.76	0	0	0	0	2	0.09	1	0.09	0.94	3.64
42111	**Generator Bearings**	2	0.53	0	0	0	0	3	0.15	0	0	0.68	2.57
42112	**Generator Hydrogen Seals**	1	0.3	0	0	0	0	0	0	2	0.21	0.5	1.43
42114	**Generator Collector And Brushes**	0	0	0	0	0	0	14	0.12	0	0	0.12	0
42200	**Excitation Systems Equipment**	11	0.02	0	0	0	0	23	0.52	1	0.15	0.69	0.09
42300	**Hydrogen Gas Cooling System**	0	0	0	0	0	0	5	0.09	0	0	0.09	0
42400	**Generator Liquid Cooling System**	0	0	0	0	0	0	2	0.05	0	0	0.05	0
42500	**Seal Oil System**	0	0	0	0	0	0	2	0.04	0	0	0.04	0
GENERATOR TOTAL		**18**	**1.61**	**1**	**0**	**0**	**0**	**52**	**1.06**	**7**	**0.77**	**3.44**	**7.73**

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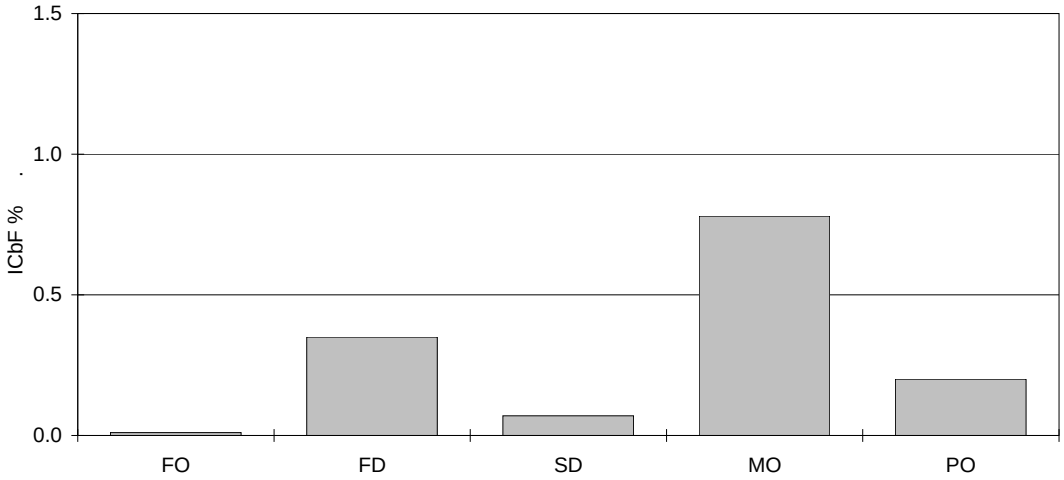
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Heat Power Cycle



Heat Power Cycle ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
HEAT POWER CYCLE													
43090	**Boiler Feedwater Piping And Supports**	1	0	0	0	0	0	3	0.05	0	0	0.05	0.01
43100	**High Pressure Feedwater Heaters And Auxiliaries**	1	0	12	0.01	0	0	0	0	0	0	0.01	0.06
43200	**Boiler Feed Pumps And Auxiliaries**	3	0	35	0.19	5	0	6	0.09	0	0	0.29	0.92
43260	**Boiler Feed Pump Variable Speed Coupling Drives**	0	0	10	0.03	1	0	0	0	0	0	0.04	0.16
43400	**Boiler Feed Pump Motors And Auxiliaries**	1	0	6	0.1	6	0.07	0	0	1	0.02	0.19	0.46
44090	**Condensate Piping And Supports**	0	0	0	0	0	0	2	0.01	0	0	0.01	0
44110	**Condensor**	1	0	5	0.01	0	0	10	0.13	4	0.18	0.32	0.06
44120	**Condensor Tubes**	0	0	2	0	0	0	6	0.11	0	0	0.12	0.01
44200	**Condensate Extraction Pumps And Auxiliaries**	0	0	0	0	0	0	2	0	0	0	0	0
44500	**Deaerator, Storage Tank, And Auxiliaries**	2	0	0	0	0	0	1	0.03	0	0	0.03	0.01
45000	**Air Extraction System**	1	0	5	0	0	0	1	0	0	0	0.01	0.02
45300	**Steam Air Ejectors**	1	0	0	0	0	0	2	0.19	0	0	0.19	0
47000	**Condensate Make-up System**	0	0	0	0	0	0	1	0.11	0	0	0.11	0
48100	**Extraction Steam System**	0	0	0	0	0	0	1	0.03	0	0	0.03	0
48400	**Feedwater Heater Relief Valve, Vent**	0	0	0	0	0	0	1	0	0	0	0	0
48500	**Turbine And Piping Drains**	0	0	0	0	0	0	1	0.01	0	0	0.01	0
HEAT POWER CYCLE TOTAL		**11**	**0.01**	**75**	**0.35**	**12**	**0.07**	**37**	**0.78**	**5**	**0.2**	**1.41**	**1.72**

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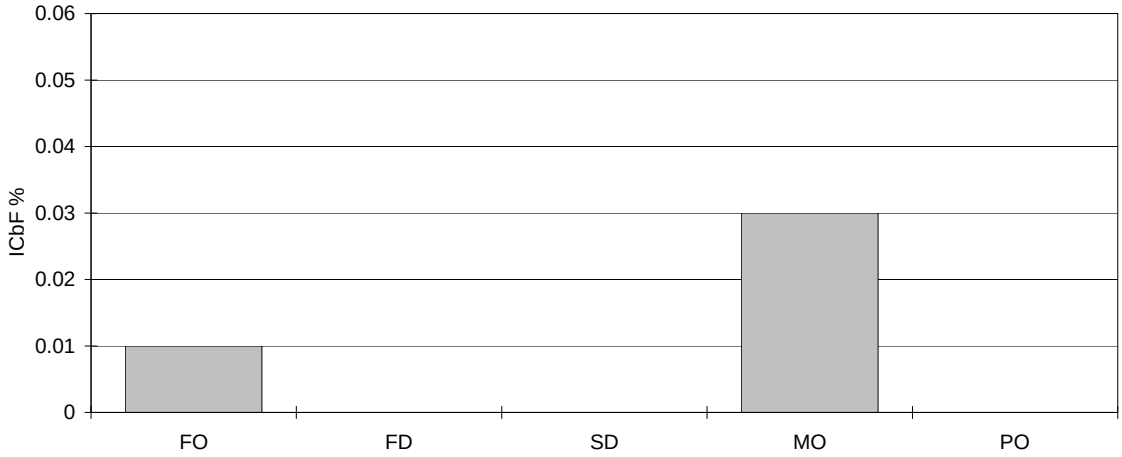
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Electrical Power Sys.



Electrical Power System ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
ELECTRICAL POWER SYSTEM													
51100	**Output System Generator Voltage Equipment**	1	0	0	0	0	0	1	0	0	0	0	0
51120	**Generator Power Transformers**	0	0	0	0	0	0	1	0.01	0	0	0.01	0
51130	**Switching Equipment-Generator Voltage**	0	0	0	0	0	0	1	0	0	0	0	0
51133	**Circuit Breakers-Generator Voltage**	1	0	0	0	0	0	1	0	0	0	0	0.01
51136	**Disconnect Switches-Generator Voltage**	1	0.01	0	0	0	0	0	0	0	0	0.01	0.03
51150	**Bus Duct, Bus, Cable**	0	0	0	0	0	0	1	0	0	0	0	0
52100	**Generator Voltage Supply System**	0	0	0	0	0	0	1	0	0	0	0	0
52130	**Unit Service Transformer**	0	0	0	0	0	0	2	0.01	0	0	0.01	0
53200	**Station Service Power Distribution**	2	0	0	0	0	0	0	0	0	0	0	0.02
ELECTRICAL POWER SYSTEM TOTAL		**5**	**0.01**	**0**	**0**	**0**	**0**	**8**	**0.03**	**0**	**0**	**0.04**	**0.06**

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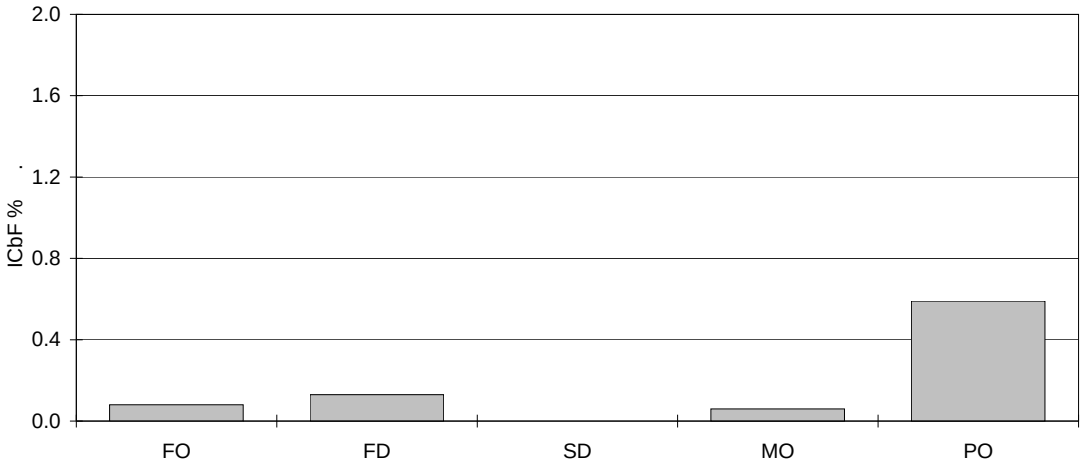
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Ins. And Control



Instrumentation & Control ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
INSTRUMENTATION AND CONTROL													
63100	**Steam Generator Controls**	3	0	36	0.09	1	0	2	0	1	0.12	0.21	0.42
63200	**Equipment Controls-Furnace Draft**	2	0	1	0.02	0	0	0	0	0	0	0.02	0.12
63300	**Primary Steam Instrumentation & Control**	1	0	0	0	0	0	0	0	0	0	0	0
63900	**Ignition Fuel,Fuel Gas, & Miscellaneous Fuel Management-Instrumentation &Control**	2	0	4	0	0	0	0	0	4	0.44	0.44	0
64100	**Steam Turbine And Auxiliaries - Instrumentation And Control**	1	0	0	0	0	0	1	0	0	0	0	0
64200	**Generator And Auxiliaries - Instrumentation And Controls**	12	0.02	0	0	0	0	4	0.03	0	0	0.05	0.1
64300	**Boiler Feedwater System - Instrumentation And Controls**	8	0	9	0.01	0	0	1	0	0	0	0.02	0.09
64400	**Condensate System - Instrumentation And Controls**	0	0	2	0.01	0	0	1	0.01	0	0	0.02	0.04
65100	**Main Power Output Systems - Control And Protection**	5	0.05	0	0	0	0	5	0	1	0.03	0.08	0.24
65200	**Station Service Main Transformation - Control And Protection**	1	0	0	0	0	0	0	0	0	0	0	0
65300	**Alternating Current Power Distribution - Control And Protection**	0	0	0	0	0	0	1	0	0	0	0	0
67000	**Plant Auxiliary Processes And Services - Instrumentation And Controls**	0	0	0	0	0	0	1	0	0	0	0	0
69000	**Computers**	1	0	0	0	0	0	0	0	0	0	0	0.01
INSTRUMENTATION AND CONTROL TOTAL		**36**	**0.08**	**52**	**0.13**	**1**	**0**	**16**	**0.06**	**6**	**0.59**	**0.86**	**1.02**

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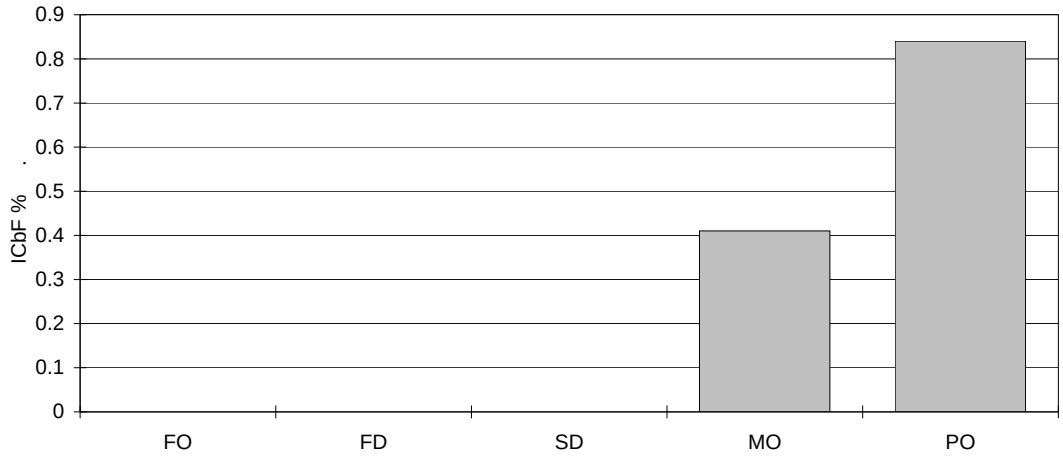
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Auxiliary Processes



Plant Aux. Processes & Services ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS	
NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
PLANT AUX. PROCESSES AND SERVICES													
71000	**Circulating Water Systems**	0	0	1	0	0	0	14	0.14	9	0.61	0.76	0.01
71110	**Travelling Water Screens**	0	0	3	0	0	0	0	0	0	0	0	0
71120	**Circulating Water Pumps**	1	0	0	0	0	0	0	0	0	0	0	0
71190	**Circulating Water Piping And Supports**	0	0	0	0	0	0	5	0.13	7	0.13	0.26	0
72000	**Service Water Systems**	0	0	0	0	0	0	2	0.01	0	0	0.01	0
73100	**Auxiliary Steam And Condensate Systems**	0	0	0	0	0	0	1	0	0	0	0	0
74000	**Water Treatment Plant**	0	0	2	0	0	0	4	0.03	0	0	0.03	0.01
76000	**Miscellaneous Services**	0	0	0	0	0	0	1	0.09	5	0.1	0.19	0
PLANT AUX. PROCESSES AND SERVICES TOTAL		**1**	**0**	**6**	**0**	**0**	**0**	**27**	**0.41**	**21**	**0.84**	**1.25**	**0.02**

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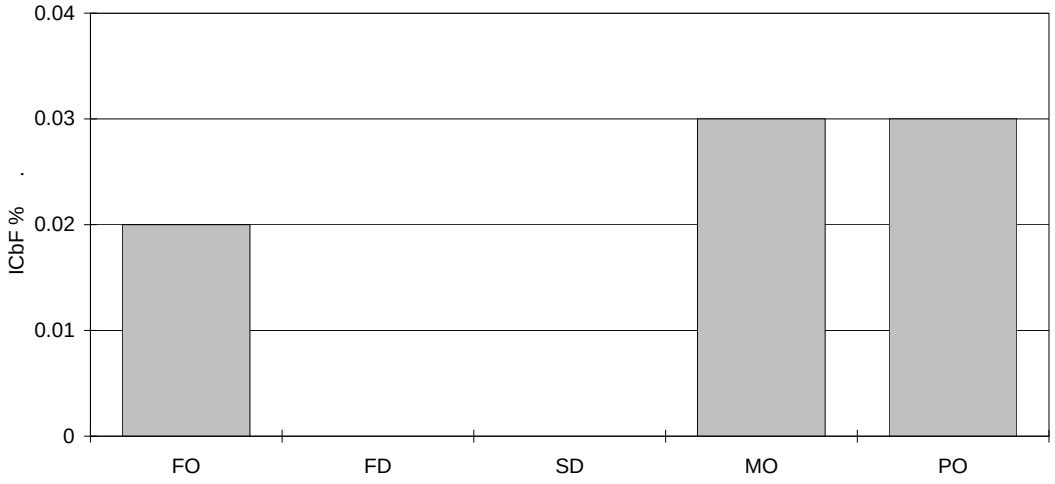
FOSSIL - NATURAL GAS

Detail Component Outage Code Report, 2003 to 2007

Table 6.2.16
Conditions



Conditions ICbF by event type for gas-fired fossil units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	16
NUMBER OF UNIT YEARS	72
OVERALL OPERATING FACTOR	17.86

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
CONDITIONS													
05200	**Transmission Limitations**	2	0.01	0	0	0	0	1	0	0	0	0.02	0.06
07010	**Site Environment, Storms, Floods**	2	0	0	0	0	0	0	0	0	0	0	0
08160	**Fire, General**	1	0	0	0	0	0	0	0	0	0	0	0.01
99999	**Other**	1	0	0	0	0	0	3	0.03	1	0.03	0.05	0
CONDITIONS TOTAL		**6**	**0.02**	**0**	**0**	**0**	**0**	**4**	**0.03**	**1**	**0.03**	**0.07**	**0.08**

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6.3 Combustion Turbine Summary Statistics

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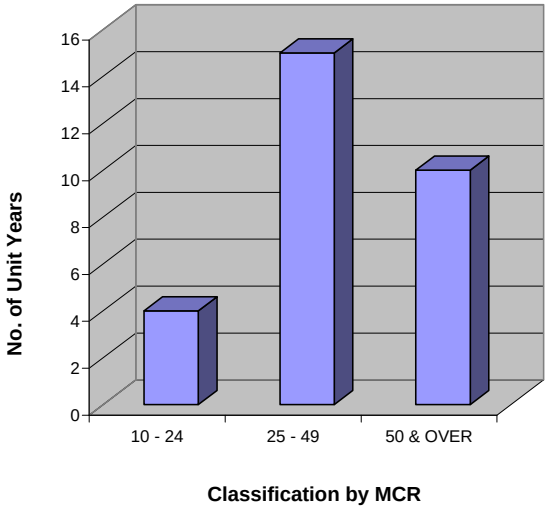
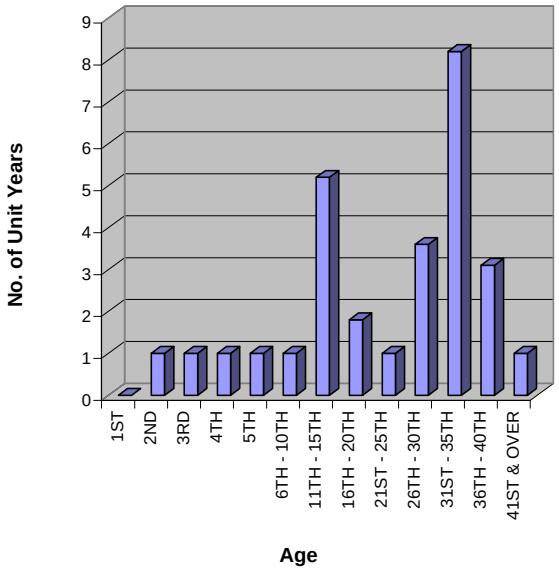
COMBUSTION TURBINE UNITS

Table 6.3.1

External Causes Excluded, 2007 Data





	UNIT YEARS (A)	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	UFOP (%)	DAUFOP (%)	SR	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)																
10 - 24	4	96.56	2.77	0.19	1	0	1.33	1.33	1.96	1.17	1.17	0.9714	3.25	0	0.46	2.79
25 - 49	15	81.09	22.78	12.27	87	0.2	1,036.46	22.16	10.68	4.38	4.45	0.9882	6.67	21.74	0.58	4.6
50 & OVER	10	93.63	10.98	1.34	43	0.1	603.96	23.97	46.8	5.74	6.06	0.9726	10.87	82.27	0.77	3.09
CLASSIFICATION BY YEAR OF SERVICE																
1ST	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2ND	1	63.86	0	34.85	16	0	28.36	3.99	2.03	1.4	1.4	1	1.3	34.17	0.05	0.53
3RD	1	67.19	0	31.64	12	0	29.8	4.5	1.94	1.32	1.32	1	1.18	12.82	0.04	0.51
4TH	1	96.25	0	2.85	6	0	43.75	9.64	19.05	9.08	9.32	0.9355	0.92	71.32	0.23	0
5TH	1	82.91	0	1.32	7	0.1	603.96	89.64	84.27	7.15	7.15	1	15.77	149.6	0	8.73
6TH - 10TH	1	0.21	0	96.71	7	0	28.01	9.11	0.75	0.75	1.1	1	3.44	7.24	0.11	2.25
11TH - 15TH	5.2	95.38	10.66	0.08	2	0	31.28	26.6	58.76	3.17	3.17	0.9615	4.54	0	1.32	3.1
16TH - 20TH	1.8	98.41	0	0.4	3	0	11	7.61	26.2	6.31	6.31	1	1.19	0	0.06	0.99
21ST - 25TH	1	93.44	92.89	2.84	2	0	43	24.53	16.47	3.41	3.41	1	3.72	0	0.1	3.06
26TH - 30TH	3.6	96.96	48.48	0.6	35	0	36.63	5.65	50.66	4.64	5.96	0.9783	18.45	545.5	0.13	1.68
31ST - 35TH	8.2	86.25	14.8	2.88	37	0.2	1,036.46	47.77	46.03	6.04	6.04	0.9589	10.87	42.27	1.02	7.39
36TH - 40TH	3.1	99.07	5.28	0.34	3	0	0.58	0.45	1.43	1.2	1.2	1	0.59	189.1	0.58	0
41ST & OVER	1	88.78	0	0.04	1	0	1.33	1.33	26.44	4.39	4.39	0.9333	11.17	0	0	11.16
CLASSIFICATION BY OPERATING FACTOR																
0 - 10	26	92.59	17.79	1.35	96	0.3	1,036.46	28.94	47.47	5.44	5.55	0.9707	8.3	79.77	0.69	4.15
31 - 40	2	65.6	0	33.17	28	0	29.8	4.21	1.99	1.36	1.36	1	1.23	24.13	0.04	0.52
91 - 100	1	0.21	0	96.71	7	0	28.01	9.11	0.75	0.75	1.1	1	3.44	7.24	0.11	2.25
ALL UNITS	**29**	**87.55**	**15.95**	**6.83**	**131**	**0.3**	**1,036.46**	**22.6**	**14.57**	**4.95**	**5.09**	**0.9844**	**7.64**	**25.74**	**0.63**	**3.83**

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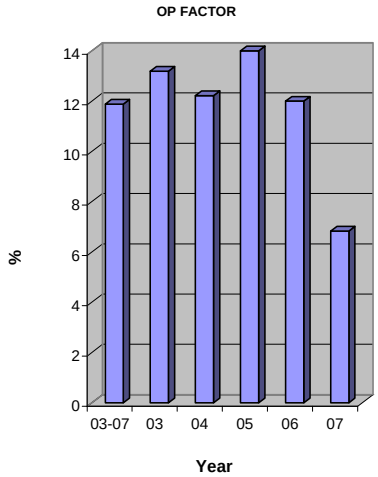
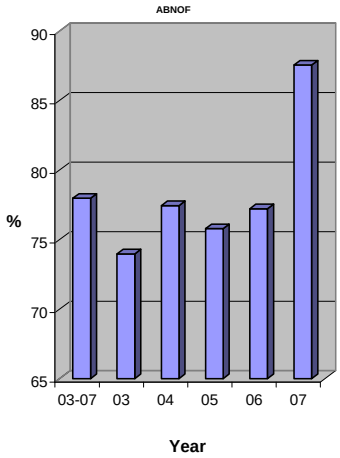
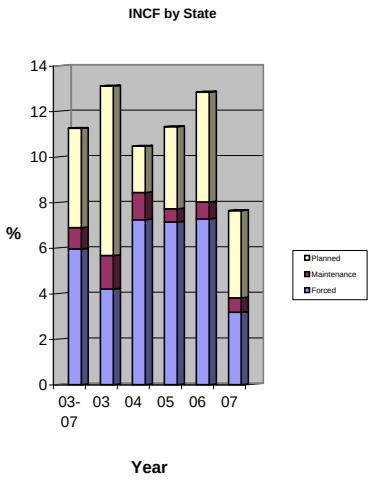
COMBUSTION TURBINE UNITS

Table 6.3.2

External Causes Excluded, 2003 to 2007 Data







	UNIT YEARS (A)	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	UFOP (%)	DAUFOP (%)	SR	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)																
1 - 9	3	26.13	0	0.34	3	2.2	8,040.00	6,446.58	99.54	1.42	1.42	1	73.52	0	0	0
10 - 24	26	89.26	4.18	0.56	39	2.4	4,150.36	540.49	94.3	1.33	1.33	0.984	10.18	123.7	0.39	0.55
25 - 49	72.6	83.82	18.42	8.81	365	1.6	4,008.00	39.2	20.35	5.71	5.78	0.987	7.61	26.9	1.71	3.41
50 & OVER	79	70.85	16.6	18.87	231	2.5	5,694.33	96.41	14.56	6.95	6.99	0.968	12.57	5.16	0.42	6.64
CLASSIFICATION BY YEAR OF SERVICE																
0	2.6	69.8	0	17.44	46	0.2	1,318.45	34.5	28.72	8.48	8.48	0.997	12.77	44.47	2.83	2.91
1ST	4	84.72	0	12.77	29	0	25.55	2.3	1.47	1.07	1.24	0.999	2.79	39.09	0.8	1.51
2ND	4	80.08	0	13.96	38	0.2	621.46	38.04	22.84	5.84	5.96	0.995	10.83	37.67	0.63	1.21
3RD	3	86.38	0	11.12	19	0	29.91	8.59	5.32	2.66	2.66	0.995	2.71	12.05	1.14	0.74
4TH	2	94.73	0	2.66	14	0	43.75	6.87	17.11	9.48	9.63	0.918	2.62	75.21	0.12	1.95
5TH	1	82.91	0	1.32	7	0.1	603.96	89.64	84.27	7.15	7.15	1	15.77	149.6	0	8.73
6TH - 10TH	13.5	70.21	4.25	23.77	48	0.2	137.91	27.56	4.49	3.43	3.8	0.959	6.14	6.54	0.91	3.99
11TH - 15TH	22.7	93.96	8.98	1.04	32	0.2	355.95	42.06	39.52	5.94	5.94	0.964	5.01	25.52	0.89	3.44
16TH - 20TH	5.8	93.03	44.81	4.85	16	0.1	159	34.18	18.2	5.26	5.26	1	2.37	14.26	0.5	0.55
21ST - 25TH	15.9	60.82	24.5	18.7	50	1.8	5,694.33	307.02	37.12	14.03	14.04	0.964	21.42	10.44	0.46	8.98
26TH - 30TH	55.8	70.09	27.23	20.99	217	1.2	4,008.00	49.6	9.5	4.96	5	0.978	11.69	7.86	1.45	5.27
31ST - 35TH	23.9	86.09	9.96	4.51	84	0.4	1,036.46	41.08	26.73	6.99	6.99	0.965	9.61	20.37	0.72	7.03
36TH - 40TH	19.6	87	4.73	0.23	31	2.4	4,150.36	669.21	98.17	0.5	0.5	0.983	12.78	453.2	0.52	0.15
41ST - 45TH	2.1	93.76	0	0.09	4	0	143.81	36.47	89.64	2.33	2.33	0.947	6.15	0	0	5.35
46TH - 50TH	4.8	53.8	0	0.54	3	2.2	8,040.00	6,446.58	98.82	1.17	1.17	1	45.66	0	0	0
51ST & OVER	0.1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLASSIFICATION BY OPERATING FACTOR																
0 - 10	140.1	89.9	12.55	1.72	435	6.8	8,040.00	136.96	73.84	3.7	3.7	0.974	9.28	57.28	1.13	2.38
11 - 20	8	57.29	13.88	19.39	26	0.7	2,339.25	234.74	30.98	17.98	17.98	0.857	23.32	9.02	0.25	14.37
21 - 30	17.6	57.58	5.72	24.18	142	1.2	5,694.33	77.01	22.7	8.55	8.56	0.998	18.37	19.29	0.33	10.82
81 - 90	8	2.64	64.78	84.14	9	0	10.01	3.2	0.05	0.05	0.05	0.974	13.21	1.19	0	13.17
91 - 100	7	0.18	38.55	93.1	26	0	107.95	13.53	0.61	0.64	0.9	0.986	16.64	3.83	0.1	6.05
ALL UNITS	**180.7**	**77.97**	**15.27**	**11.88**	**638**	**8.8**	**8,040.00**	**120.69**	**29.05**	**7.76**	**7.78**	**0.981**	**11.25**	**12.44**	**0.93**	**4.36**

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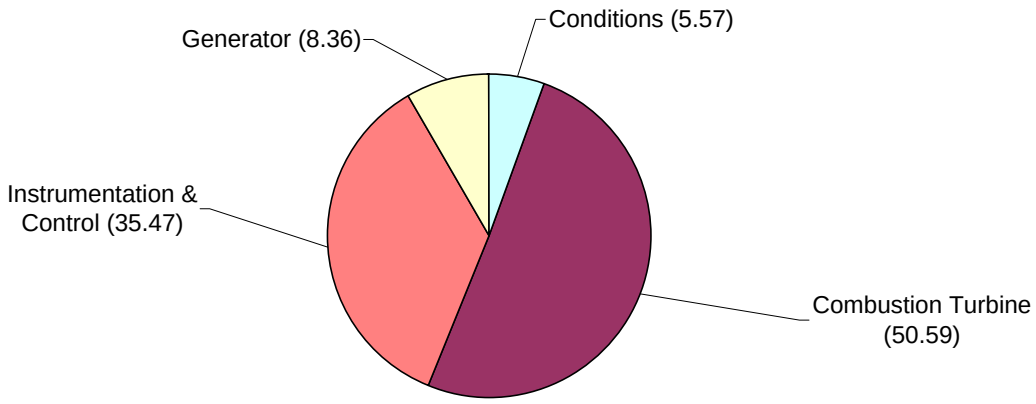
COMBUSTION TURBINE UNITS

Table 6.3.3

Major Component Outage Code Report, 2003 to 2007

Major component contribution to combustion turbine unit ICbF based on 2003-07 data, (External Causes Included).



UNIT STATISTICS

NUMBER OF UNITS	45
NUMBER OF UNIT YEARS	180.7
OVERALL OPERATING FACTOR	11.88

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	UFOP (%)
COMBUSTION TURBINE	358	1.96	170	0.77	32	0.39	268	0.69	240	1.87	5.99	13.14	3.79
GENERATOR	126	1.75	8	0.04	4	0	73	0.13	123	2.06	4.2	12.09	2.77
INSTRUMENTATION AND CONTROL	154	0.72	3	0	1	0	50	0.02	38	0.33	0.99	2.99	1.33
CONDITIONS	110	0.38	45	0.04	3	0	20	0.14	32	0.1	0.66	1.95	0.6
TOTAL (External Causes Included)	**748**	**4.8**	**226**	**0.85**	**40**	**0.39**	**411**	**0.98**	**433**	**4.36**	**11.84**	**30.17**	**8.38**
TOTAL (External Causes Excluded)	**638**	**4.42**	**181**	**0.81**	**37**	**0.39**	**391**	**0.84**	**401**	**4.26**	**11.25**	**29.05**	**7.76**

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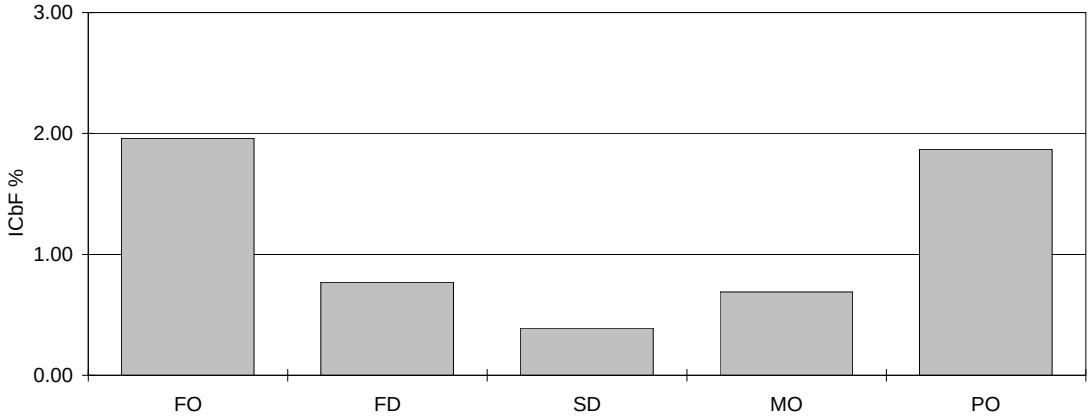
COMBUSTION TURBINE UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.3.4
Combustion Turbine



Combustion Turbine ICbF by event type for combustion turbine units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	45
NUMBER OF UNIT YEARS	180.7
OVERALL OPERATING FACTOR	11.88

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	UFOP (%)
COMBUSTION TURBINE													
49100	Combustion Turbine	92	1.09	81	0.14	26	0.38	52	0.28	90	1.13	3.01	2.14
49101	Combustion Turbine - Exhaust Emission	5	0	5	0.01	0	0	4	0	6	0.12	0.13	0
49210	Compressor	9	0	0	0	0	0	51	0.01	18	0.04	0.05	0.01
49211	Compressor Shaft And Bearings For Two-Shaft Machine	22	0	0	0	0	0	3	0.05	1	0.01	0.06	0
49220	Combustion System	2	0	1	0	2	0	0	0	3	0.05	0.05	0.01
49221	Combustion Chamber	5	0.05	4	0.09	1	0	5	0.01	4	0.03	0.18	0.1
49230	Turbine(High Pressure If More Than One)	2	0.08	0	0	1	0	1	0	1	0	0.09	0.16
49231	Low Pressure Turbine	6	0	0	0	0	0	1	0.07	2	0.02	0.09	0
49232	Interstage Gas Passages	1	0	0	0	0	0	1	0	1	0	0	0
49240	Turbine Load Shaft And Bearing	9	0.03	1	0.01	0	0	6	0.02	0	0	0.05	0.05
49241	Reduction Gear	3	0.01	0	0	0	0	0	0	11	0.05	0.06	0.01
49242	Main Coupling	1	0.02	0	0	0	0	1	0	1	0	0.02	0.04
49243	Clutch	10	0.38	14	0.02	0	0	6	0.01	4	0.02	0.44	0.76
49244	Braking System	5	0	0	0	0	0	3	0	1	0	0	0
49251	Inlet Air Ducts And Vanes	8	0.08	0	0	0	0	4	0	7	0.08	0.16	0.15
49252	Air Filters	0	0	0	0	0	0	5	0	1	0	0	0
49253	Intercoolers	1	0	0	0	0	0	3	0	1	0	0	0
49260	Turning Gear System	5	0.01	0	0	0	0	2	0	2	0	0.02	0.03
49270	Starting System	28	0.04	0	0	0	0	8	0	12	0.08	0.12	0.07
49280	Battery And Charger System	1	0	0	0	0	0	15	0.01	1	0	0.01	0
49291	Regenerators	2	0	0	0	0	0	0	0	0	0	0	0
49292	Exhaust Chamber Vanes	2	0	1	0	0	0	1	0	4	0	0.01	0
49293	Exhaust Stack And Silencer	3	0	2	0	0	0	8	0.04	15	0.08	0.12	0.01
49294	Exhaust Hood/Doors	4	0	0	0	0	0	5	0	1	0	0	0
49311	Internal Cooling And Seal Air System And Seals	7	0	4	0	0	0	1	0	2	0.01	0.01	0
49312	Heat Shields	0	0	0	0	0	0	1	0	1	0	0	0
49313	Supercharging Fan	1	0	0	0	0	0	0	0	0	0	0	0
49314	Fuel Supply System To Unit	38	0.03	45	0.02	0	0	20	0.01	10	0.02	0.09	0.06
49315	Unit Fuel Controls And Conditioning	25	0.01	10	0.47	1	0	9	0.04	7	0.11	0.67	0.01
49316	Ignition System	16	0.01	1	0	1	0.01	1	0	0	0	0.02	0.02
49317	Lubrication System	29	0.09	0	0	0	0	10	0.04	5	0.01	0.14	0.17
49318	Lubrication System - Power Turbine (If Separate)	1	0	0	0	0	0	0	0	0	0	0	0
49319	Cooling Water System	7	0.01	0	0	0	0	1	0	1	0	0.01	0.02
49321	External Cooling Air System	0	0	0	0	0	0	2	0.01	2	0	0.01	0
49322	Service Air Systems	2	0	0	0	0	0	29	0.06	0	0	0.06	0
49323	Building Heating	1	0	0	0	0	0	2	0	0	0	0	0
49324	Building Venting	0	0	1	0	0	0	2	0	0	0	0	0
49325	Building Fire Protection	5	0.01	0	0	0	0	5	0	25	0	0.02	0.02
COMBUSTION TURBINE TOTAL		**358**	**1.96**	**170**	**0.77**	**32**	**0.39**	**268**	**0.69**	**240**	**1.87**	**5.99**	**3.79**

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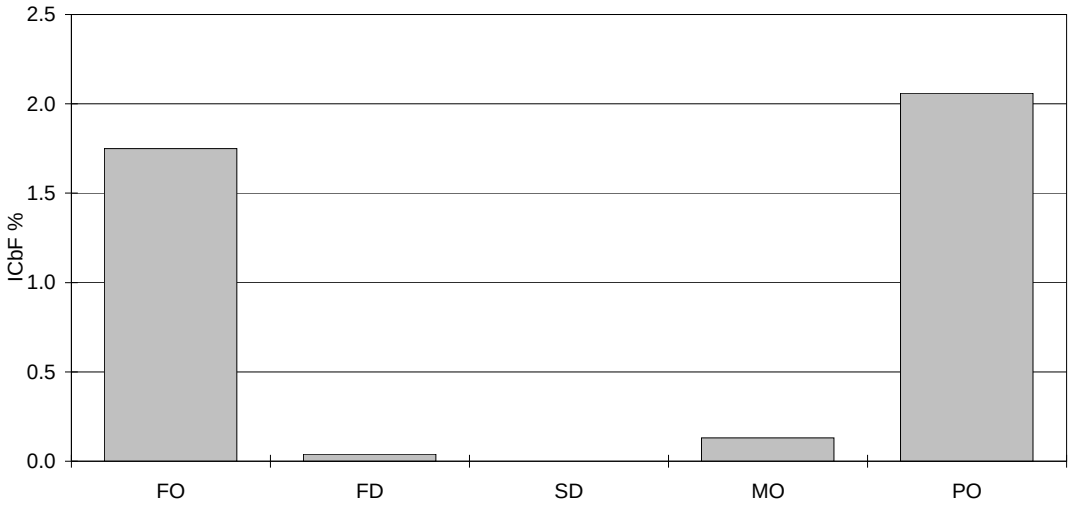
COMBUSTION TURBINE UNITS

Table 6.3.4

Detail Component Outage Code Report, 2003 to 2007

Generator



Generator ICbF by event type for combustion turbine units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	45
NUMBER OF UNIT YEARS	180.7
OVERALL OPERATING FACTOR	11.88

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	UFOP (%)
GENERATOR													
49800	**Generator**	22	0.07	0	0	2	0	19	0.02	80	1.58	1.86	0.14
49810	**Generator Rotor**	0	0	0	0	0	0	2	0	3	0.36	0.36	0
49811	**Generator Bearings**	21	0.02	7	0.04	0	0	1	0.05	2	0	0.11	0.04
49812	**Generator Lubrication System**	15	0.01	0	0	0	0	1	0	4	0.01	0.02	0.01
49813	**Generator Collector And Brushes**	1	0	0	0	0	0	17	0.01	1	0	0.01	0
49820	**Generator Stator**	4	0.46	0	0	0	0	2	0.02	1	0	0.48	0.91
49830	**Generator Heaters**	0	0	0	0	0	0	5	0	0	0	0	0
49840	**Excitation System**	19	0.06	0	0	2	0	2	0	6	0.03	0.08	0.11
49850	**Synchronous Condensor Equipment**	8	0	0	0	0	0	1	0	1	0	0.01	0
49860	**Generator Output System**	5	0.01	1	0	0	0	8	0.01	9	0.05	0.08	0.02
49870	**Automatic Synchronizing Equipment**	14	0.01	0	0	0	0	3	0	3	0	0.01	0.01
49880	**Voltage Control Equipment**	5	0	0	0	0	0	3	0	1	0.02	0.02	0
49890	**Electrical Distribution System**	12	1.12	0	0	0	0	9	0.01	12	0.01	1.14	2.2
GENERATOR TOTAL		**126**	**1.75**	**8**	**0.04**	**4**	**0**	**73**	**0.13**	**123**	**2.06**	**4.2**	**3.45**

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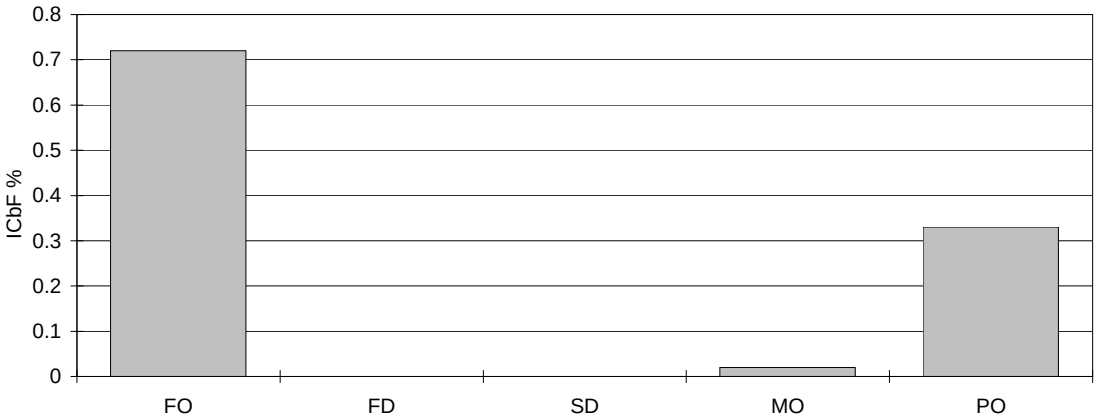
COMBUSTION TURBINE UNITS

Table 6.3.4

Detail Component Outage Code Report, 2003 to 2007

Ins. And Control



Instrumentation & Control ICbF by event type for combustion turbine units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	45
NUMBER OF UNIT YEARS	180.7
OVERALL OPERATING FACTOR	11.88

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
INSTRUMENTATION AND CONTROL													
49900	**Controls And Instrumentation-General**	59	0.12	1	0	0	0	31	0.01	21	0.29	0.43	0.24
49910	**Governing Systems**	6	0	0	0	0	0	0	0	1	0.03	0.03	0
49920	**Combustion Turbine Controls And Instrumentation**	41	0.03	0	0	0	0	6	0	3	0	0.04	0.06
49940	**Generator Controls And Instrumentation**	14	0.01	0	0	1	0	4	0	1	0	0.01	0.01
49945	**Supervisory Control & Data Acquisition - SCADA**	1	0	0	0	0	0	1	0	0	0	0	0
49950	**Fuel Management Controls And Instrumentation**	12	0	2	0	0	0	1	0	6	0	0.01	0.01
49970	**Main Power Output Systems - Protection And Control**	9	0.41	0	0	0	0	5	0	3	0	0.41	0.81
49980	**Auxiliaries Controls And Instrumentation**	9	0	0	0	0	0	2	0	3	0	0	0
49990	**Supervisory Control & Data Acquisition - SCADA**	3	0.14	0	0	0	0	0	0	0	0	0.14	0.28
INSTRUMENTATION AND CONTROL TOTAL		**154**	**0.72**	**3**	**0**	**1**	**0**	**50**	**0.02**	**38**	**0.33**	**0.99**	**1.33**

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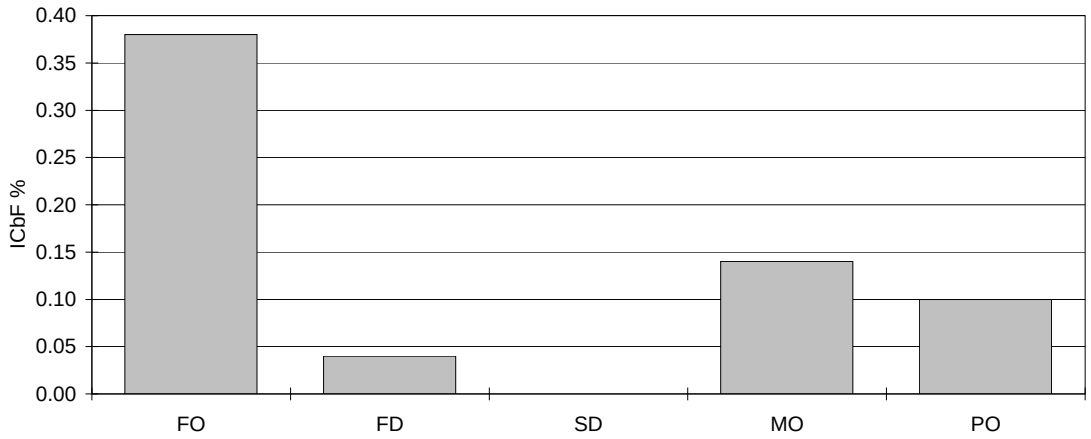
COMBUSTION TURBINE UNITS

Table 6.3.4

Detail Component Outage Code Report, 2003 to 2007

Conditions



Conditions ICbF by event type for combustion turbine units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	45
NUMBER OF UNIT YEARS	180.7
OVERALL OPERATING FACTOR	11.88

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
CONDITIONS													
01410	**Poor Quality Fuel, Heat Content**	5	0	2	0	0	0	1	0	0	0	0	0
01420	**Problems - Primary Fuel for Units with Secondary Fuel Op.**	1	0	0	0	0	0	0	0	0	0	0	0
05200	**Transmission Limitations**	20	0.01	1	0	0	0	5	0.01	14	0.06	0.08	0.02
05201	**Powerhouse substation (non-generating equipment)**	15	0.01	0	0	0	0	0	0	1	0	0.02	0.03
05203	**Transmission Equipment (beyond transmission line)**	0	0	0	0	0	0	0	0	2	0.01	0.01	0
07010	**Site Environment, Storms, Floods**	10	0	5	0	0	0	2	0	0	0	0	0.01
07110	**Nitrous Oxides**	5	0	9	0	1	0	0	0	0	0	0	0
07220	**Liquid And Chemical Effluents**	1	0	0	0	0	0	0	0	0	0	0	0
07510	**Noise, Noise Complaints**	0	0	0	0	0	0	0	0	1	0	0	0
08160	**Fire, General**	4	0	0	0	0	0	1	0	3	0	0	0
099999	**Other**	49	0.34	28	0.04	2	0	11	0.12	11	0.04	0.54	0.68
CONDITIONS TOTAL		**110**	**0.38**	**45**	**0.04**	**3**	**0**	**20**	**0.14**	**32**	**0.1**	**0.66**	**0.74**

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6.4 Nuclear Summary Statistics

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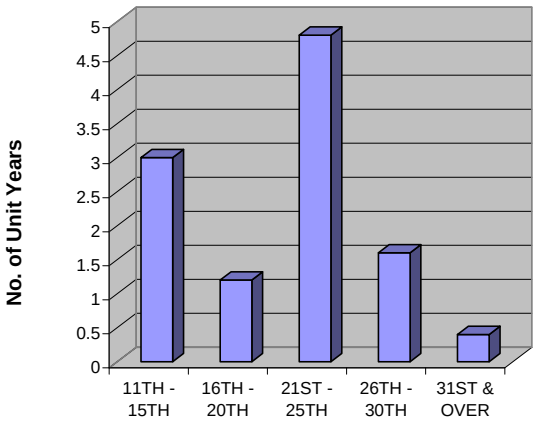
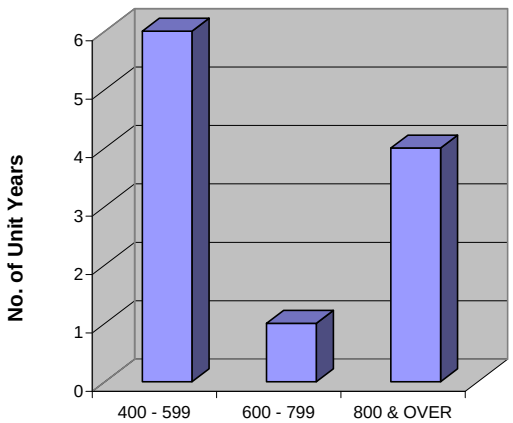
Nuclear Units

External Causes Excluded, 2007 Data

Table 6.4.1





	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	TOTAL EQ OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
400 - 599	6	0	67.26	20	1.6	1,282.85	702.14	28.43	32.03	33.51	2.2	36.64	3.47	0	6.02
600 - 799	1	0	85.56	4	0.1	246.58	161.57	7.94	8.51	7.88	0.2	23.51	3.51	0	7.06
800 & OVER	4	0	89.77	5	0	126.63	72.32	1.14	1.31	1.29	0.4	10.51	1.11	0	9.19
CLASSIFICATION BY YEAR OF SERVICE															
11TH - 15TH	3	0	91.82	5	0	126.63	72.32	1.48	1.7	1.67	0.3	8.48	1.45	0	6.81
16TH - 20TH	1.2	0	81.36	1	0.1	460.06	460.06	5.28	7.08	6.4	0.2	20.41	1.06	0	14.11
21ST - 25TH	4.8	0	80.98	17	0.5	671.78	251.88	11.09	14.74	16.47	1.2	24.57	2.81	0	8.92
26TH - 30TH	1.6	0	54.97	6	0.7	1,282.85	1,033.83	45.03	46.89	34.09	0.7	47.46	5.78	0	0
31ST & OVER	0.4	0	0	0	0.4	0	0	100	100	100	0.4	100	0	0	0
CLASSIFICATION BY OPERATING FACTOR															
31 - 40	1	0	39.35	2	0.6	1,282.85	2,656.62	60.65	61.09	46.87	0.6	61.09	5.08	0	0
41 - 50	1	0	47.1	4	0.5	1,180.33	1,158.42	52.9	55.39	36.22	0.6	56.28	6.37	0	0
61 - 70	1	0	64.35	5	0.2	591.91	291.43	20.54	27.91	23.15	0.4	42.2	6.22	0	19.02
71 - 80	1	0	75.21	2	0.1	373.53	336.74	9.27	13.74	12.57	0.3	29	0	0	17.1
81 - 90	4	0	84.28	10	0.2	671.78	205.08	6.49	7.51	6.97	0.8	19.14	2.37	0	9.86
91 - 100	3	0	95.03	6	0.1	460.06	153.7	3.56	5.32	5.13	0.2	6.75	1.4	0	1.46
ALL UNITS	**11**	**0**	**77.11**	**29**	**1.7**	**1,282.85**	**518.98**	**16.84**	**18.95**	**19.6**	**2.9**	**25.95**	**2.48**	**0**	**7.27**

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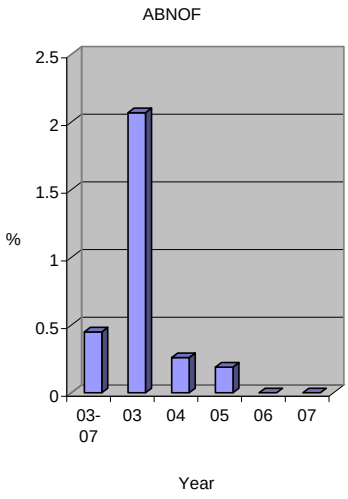
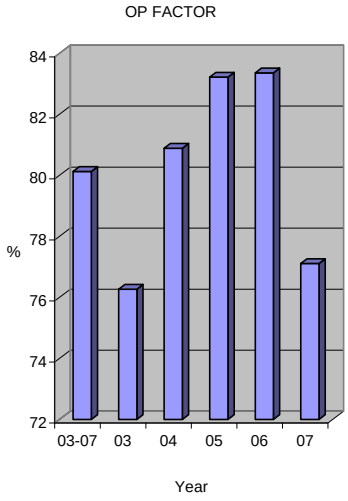
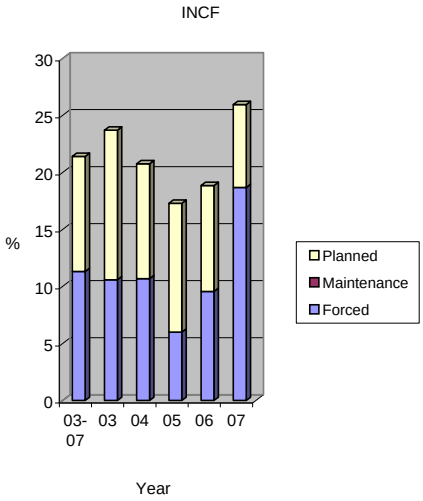
Nuclear Units

External Causes, 2002-2006 Data

Table 6.4.2







	UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)
CLASSIFICATION BY MCR (MW)															
400 - 599	26.4	0.34	72.93	91	4.2	2,018.48	402.24	17.82	20.29	20.4	7.7	29.25	3.53	0	10.92
600 - 799	6	1.83	83.36	11	0.2	559.06	161.24	3.89	4.17	4.11	1.1	17.91	1.8	0	11.44
800 & OVER	20	0.19	88.68	41	0.5	544.91	109.41	2.8	3.76	3.75	2.4	12.14	1.63	0	8.57
CLASSIFICATION BY YEAR OF SERVICE															
6TH - 10TH	3.4	0.7	86.8	7	0	284.6	52.45	1.38	2.66	2.64	0.5	13.81	1.34	0	11.29
11TH - 15TH	15.3	0.09	89.26	34	0.5	544.91	121.14	3.32	4.28	4.27	1.8	11.66	1.83	0	7.58
16TH - 20TH	13.6	1.19	76.03	37	1.3	2,018.48	318.2	11.51	12.98	12.82	3.3	24.32	2.71	0	12.89
21ST - 25TH	13.7	0.1	79.21	38	1.1	1,087.96	254.03	9.25	11.14	11.49	3.3	23.89	2.4	0	12.62
26TH - 30TH	0.7	0	77.56	5	0.1	311.48	185.75	15.8	22.52	18.94	0.2	28.73	7.08	0	7.9
31ST - 35TH	5.3	0.45	69.03	22	1.4	1,807.05	558.11	27.87	30.87	30.73	1.8	33.58	5.24	0	3.86
36TH & OVER	0.4	0	0	0	0.4	0	0	100	100	100	0.4	100	0	0	0
CLASSIFICATION BY OPERATING FACTOR															
61 - 70	6.4	0.37	65.39	27	1.9	1,807.05	627.82	31.58	34.78	34.64	2.4	37.46	5.49	0	4.06
71 - 80	15	0.31	73.55	48	1.8	2,018.48	326.35	13.94	16.06	16	4.3	28.4	2.99	0	14.22
81 - 90	31	0.54	86.37	68	1.2	1,233.05	150.7	4.18	5.26	5.29	4.6	14.73	1.87	0	9.32
ALL UNITS	**52.4**	**0.45**	**80.13**	**143**	**4.9**	**2,018.48**	**299.75**	**10.43**	**12.07**	**12.08**	**11.2**	**21.42**	**2.52**	**0**	**10.08**

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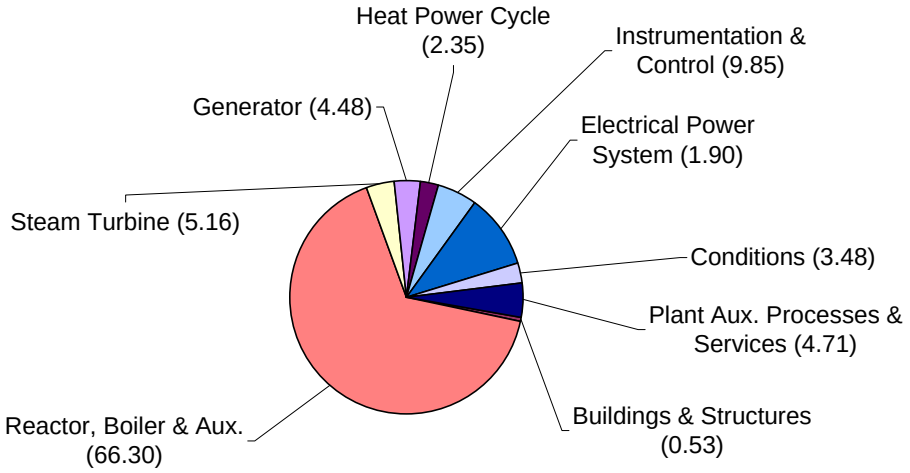
Nuclear Units

Table 6.4.3

Major Component Outage Code Report, 2003-2007

Major component contribution to nuclear unit ICbF based on 2003-07 data, (External Causes Included).



UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
BUILDINGS AND STRUCTURES	3	0.09	11	0.01	0	0	0	0	0	0	0.1	0.1	0.11
REACTOR, BOILER AND AUXILIARIES	58	3.7	234	0.41	144	0.59	0	0	51	9.71	14.62	4.32	4.88
STEAM TURBINE	13	0.27	189	0.18	12	0.01	0	0	4	0.36	0.83	0.3	0.5
GENERATOR	10	0.71	30	0.1	0	0	0	0	0	0	0.81	0.79	0.9
HEAT POWER CYCLE	8	0.33	320	0.19	3	0	0	0	0	0	0.52	0.37	0.58
ELECTRICAL POWER SYSTEM	11	2.16	38	0.04	0	0	0	0	1	0.02	2.22	2.71	2.76
INSTRUMENTATION AND CONTROL	25	0.68	1,189	0.37	13	0	0	0	2	0.23	1.28	0.75	1.17
PLANT AUX. PROCESSES AND SERVICES	15	0.89	153	0.16	3	0	0	0	0	0	1.04	0.98	1.16
CONDITIONS	4	0.02	852	0.61	2	0	0	0	0	0	0.63	0.03	0.7
TOTAL (External Causes Included)	**147**	**8.85**	**3,016**	**2.06**	**177**	**0.6**	**0**	**0**	**58**	**10.33**	**22.05**	**10.45**	**12.76**
TOTAL (External Causes Excluded)	**143**	**8.83**	**2,164**	**1.45**	**175**	**0.6**	**0**	**0**	**58**	**10.33**	**21.42**	**10.43**	**12.07**

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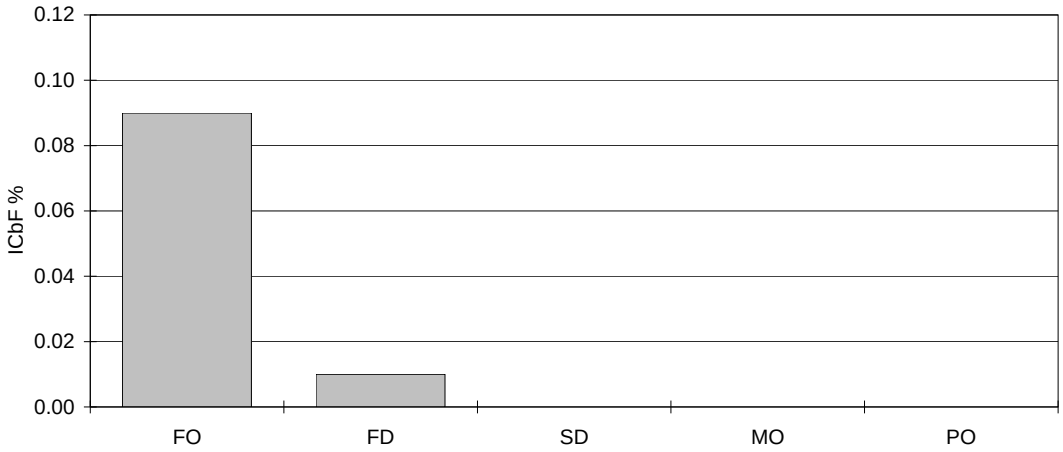
Nuclear Units

Detail Component Outage Code Report, 2003-2007

Table 6.4.4
Buildings and Structures



Building & Structures ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

CODE	CAUSE	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO DAFOR ICBF (%)	CONTRIBUTION TO DAFOR DAFOR (%)
BUILDINGS AND STRUCTURES													
21000	**Reactor Building And Fueling Facilities**	3	0.09	9	0.01	0	0	0	0	0	0	0.09	0.11
22000	**Powerhouse**	0	0	2	0	0	0	0	0	0	0	0	0
BUILDINGS AND STRUCTURES TOTAL		**3**	**0.09**	**11**	**0.01**	**0**	**0**	**0**	**0**	**0**	**0**	**0.1**	**0.11**

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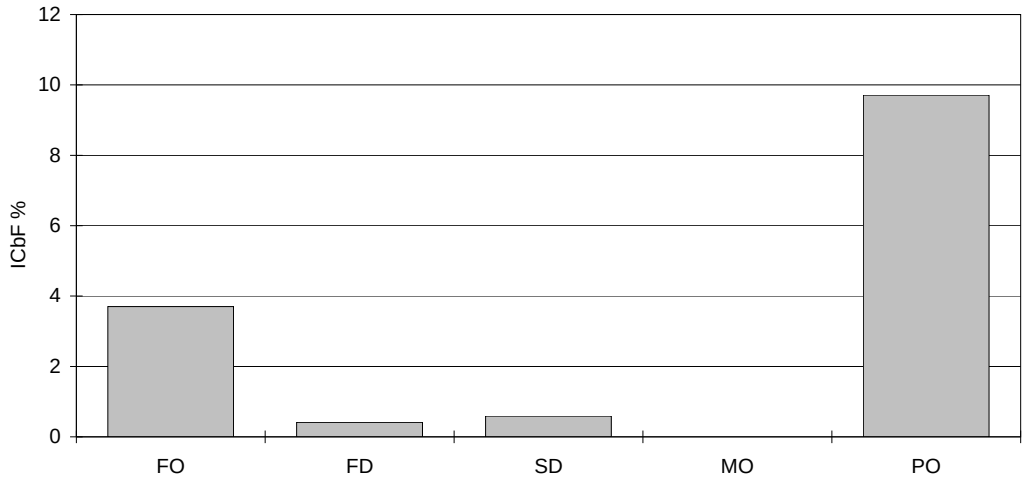
Nuclear Units

Detail Component Outage Code Report , 2003-2007

Table 6.4.4
Reactor, Boiler and Aux.



Reactor, Boiler & Aux. ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
REACTOR, BOILER AND AUXILIARIES													
31000	**Reactor**	0	0	0	0	0	0	0	0	4	0.72	0.72	0
31100	**Reactor Fuel Channel Assemblies**	4	0.72	2	0	34	0.1	0	0	17	4.6	5.43	1.1
31700	**Reactor Reactivity Control Units**	10	0.7	33	0.04	43	0.4	0	0	4	0.31	1.44	0.82
32100	**Main Moderator System**	2	0.06	10	0.1	0	0	0	0	3	0.23	0.39	0.18
33100	**Main Heat Transport Circuit**	12	1.05	26	0.04	8	0.02	0	0	6	1.4	2.51	1.22
33110	**Main Heat Transport Circuit Steam Generator**	1	0.17	1	0	8	0.02	0	0	3	0.65	0.85	0.19
33120	**Main Heat Transport Circuit Heat Transport Pumps**	1	0.06	6	0.01	0	0	0	0	0	0	0.07	0.07
33300	**Primary Heat Transport And Inventory Control Systems**	4	0.12	8	0.02	6	0.01	0	0	1	0.08	0.23	0.16
33400	**Primary Heat Transport Shut-Down Cooling Systems**	8	0.25	7	0.01	1	0	0	0	1	0.03	0.29	0.29
33500	**Primary Heat Transport Gas Control System**	0	0	1	0	0	0	0	0	0	0	0	0
33600	**Primary Heat Transport Overpressure Relief**	2	0.1	0	0	3	0	0	0	0	0	0.1	0.11
33800	**Primary Heat Transport Heavy Water Collection Systems**	1	0.09	0	0	0	0	0	0	0	0	0.09	0.1
34200	**Negative Pressure Containment System**	2	0.07	2	0	12	0.01	0	0	6	0.43	0.51	0.08
34300	**Emergency Cooling Systems**	3	0.08	6	0	0	0	0	0	0	0	0.08	0.09
35000	**Fuel Handling**	2	0.13	71	0.12	9	0.01	0	0	3	0.5	0.74	0.27
35200	**Fueling Machine**	4	0.09	24	0.03	0	0	0	0	1	0.3	0.41	0.13
35300	**Irradiated Fuel Transfer And Storage**	0	0	1	0	0	0	0	0	0	0	0	0
36000	**Boiler Steam And Water Systems**	1	0.01	20	0	17	0.01	0	0	2	0.48	0.5	0.01
36100	**Steam System**	0	0	1	0	3	0	0	0	0	0	0	0
36400	**Controlled Boiler Blow-Off System**	0	0	4	0	0	0	0	0	0	0	0	0
36700	**Steam Generator Emergency Cooling Circuit**	1	0	0	0	0	0	0	0	0	0	0	0
37000	**Fuel**	0	0	11	0.02	0	0	0	0	0	0	0.02	0.03
REACTOR, BOILER AND AUXILIARIES TOTAL		**58**	**3.7**	**234**	**0.41**	**144**	**0.59**	**0**	**0**	**51**	**9.71**	**14.62**	**4.88**

Canadian Electricity Association
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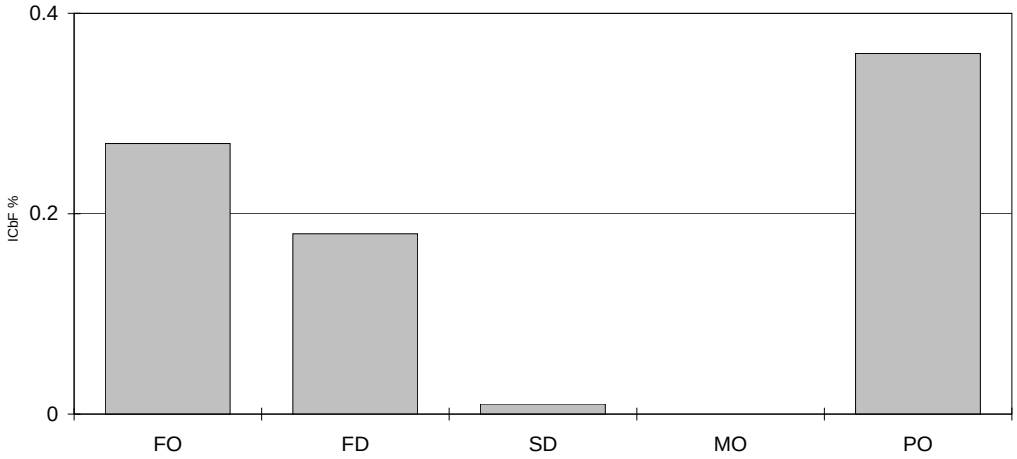
Nuclear Units

Detail Component Outage Code Report, 2003 to 2007

Table 6.4.4
Steam Turbine



Steam Turbine ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
STEAM TURBINE													
41100	**Turbine**	8	0.24	104	0.13	6	0	0	0	3	0.3	0.66	0.4
41700	**Governing System**	4	0.03	14	0.02	0	0	0	0	0	0	0.05	0.05
41810	**Moisture Separator**	1	0	10	0.01	0	0	0	0	0	0	0.01	0.01
41830	**Steam Reheater**	0	0	61	0.03	6	0.01	0	0	1	0.07	0.11	0.04
STEAM TURBINE TOTAL		**13**	**0.27**	**189**	**0.18**	**12**	**0.01**	**0**	**0**	**4**	**0.36**	**0.83**	**0.5**

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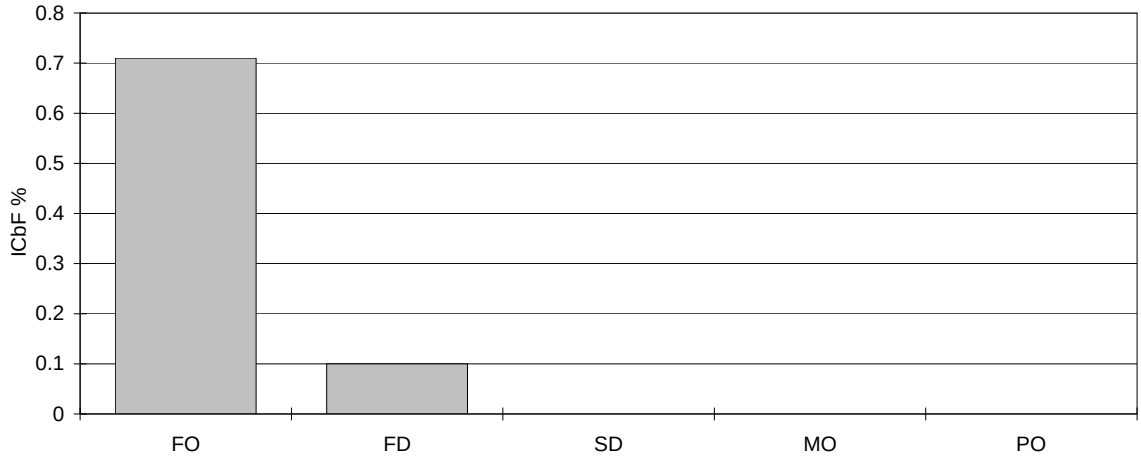
Nuclear Units

Detail Component Outage Code Report, 2003 to 2007

Table 6.4.4
Generator



Generator ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
GENERATOR													
42100	**Generator**	3	0.07	11	0.01	0	0	0	0	0	0	0.08	0.08
42200	**Excitation Systems Equipment**	3	0.04	10	0.01	0	0	0	0	0	0	0.05	0.06
42400	**Generator Liquid Cooling System**	2	0.48	7	0.07	0	0	0	0	0	0	0.54	0.6
42500	**Seal Oil System**	2	0.12	2	0.01	0	0	0	0	0	0	0.14	0.16
GENERATOR TOTAL		**10**	**0.71**	**30**	**0.1**	**0**	**0**	**0**	**0**	**0**	**0**	**0.81**	**0.9**

Canadian Electricity Association
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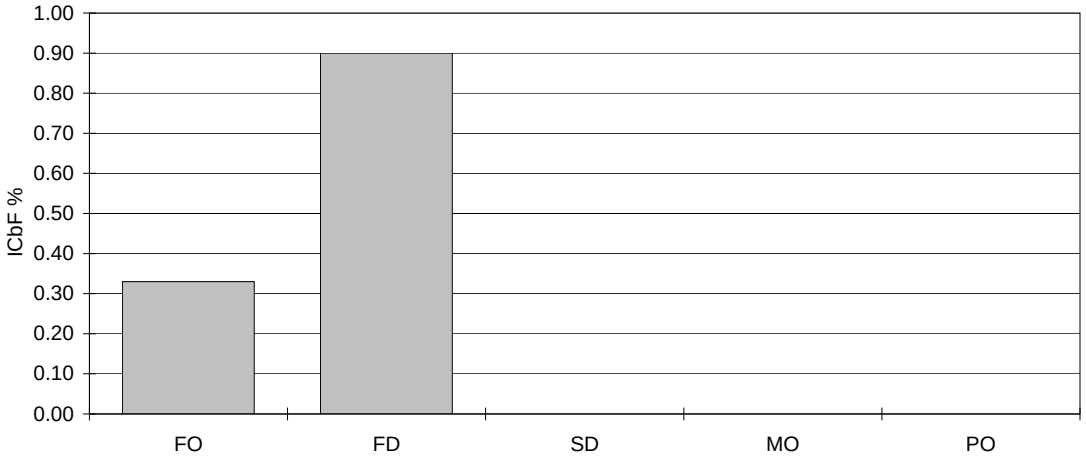
Nuclear Units

Detail Component Outage Code Report, 2003 to 2007

Table 6.4.4
Heat Power Cycle



Heat Power Cycle ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

		FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE DERATINGS		PLANNED OUTAGES		CONTRIBUTION TO UNIT	
CODE	C A U S E	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
HEAT POWER CYCLE													
43100	**High Pressure Feedwater Heaters And Auxiliaries**	2	0.02	2	0	0	0	0	0	0	0	0.02	0.03
43200	**Boiler Feed Pumps And Auxiliaries**	3	0.05	24	0.03	0	0	0	0	0	0	0.09	0.1
43500	**Auxiliary Boiler Feed Pump Motors And Auxiliaries**	0	0	1	0	0	0	0	0	0	0	0	0
44030	**Main Condensate Circuit**	0	0	171	0.07	2	0	0	0	0	0	0.07	0.08
44110	**Condensor**	0	0	83	0.05	1	0	0	0	0	0	0.05	0.05
44120	**Condensor Tubes**	0	0	20	0.02	0	0	0	0	0	0	0.02	0.02
44200	**Condensate Extraction Pumps And Auxiliaries**	0	0	1	0	0	0	0	0	0	0	0	0
47000	**Condensate Make-up System**	2	0.25	1	0.01	0	0	0	0	0	0	0.25	0.28
48100	**Extraction Steam System**	0	0	2	0	0	0	0	0	0	0	0	0
48200	**Feedwater Heater Drains System**	1	0.01	11	0.01	0	0	0	0	0	0	0.02	0.02
48500	**Turbine And Piping Drains**	0	0	4	0	0	0	0	0	0	0	0	0
HEAT POWER CYCLE TOTAL		**8**	**0.33**	**320**	**0.19**	**3**	**0**	**0**	**0**	**0**	**0**	**0.52**	**0.58**

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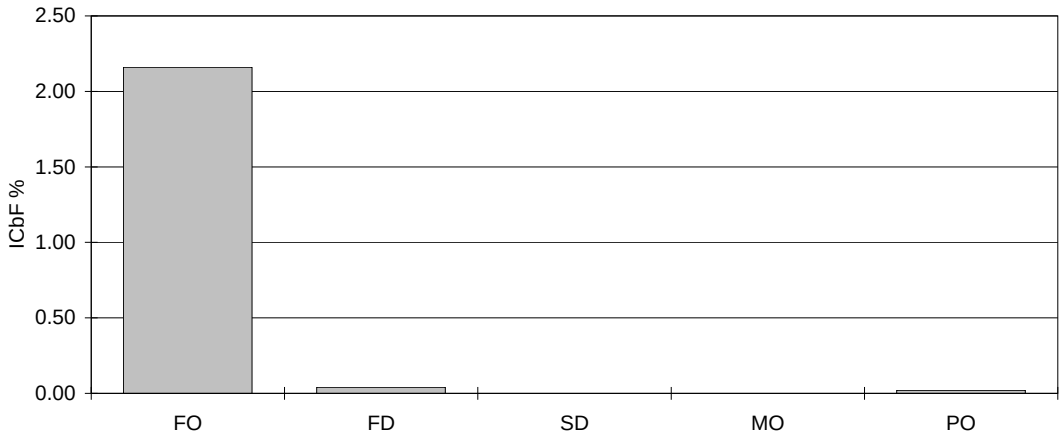
Nuclear Units

Detail Component Outage Code Report, 2003 to 2007

Table 6.4.4
Electrical Power System



Electrical Power Systems ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

CODE	C A U S E	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
ELECTRICAL POWER SYSTEM													
51100	**Output System Generator Voltage Equipment**	1	0.02	10	0.01	0	0	0	0	0	0	0.03	0.03
51120	**Generator Power Transformers**	2	0.09	6	0.01	0	0	0	0	0	0	0.1	0.11
51136	**Disconnect Switches-Generator Voltage**	0	0	4	0	0	0	0	0	0	0	0	0
53200	**Station Service Power Distribution**	8	2.06	18	0.02	0	0	0	0	1	0.02	2.1	2.59
ELECTRICAL POWER SYSTEM TOTAL		**11**	**2.16**	**38**	**0.04**	**0**	**0**	**0**	**0**	**1**	**0.02**	**2.22**	**2.76**

Canadian Electricity Association
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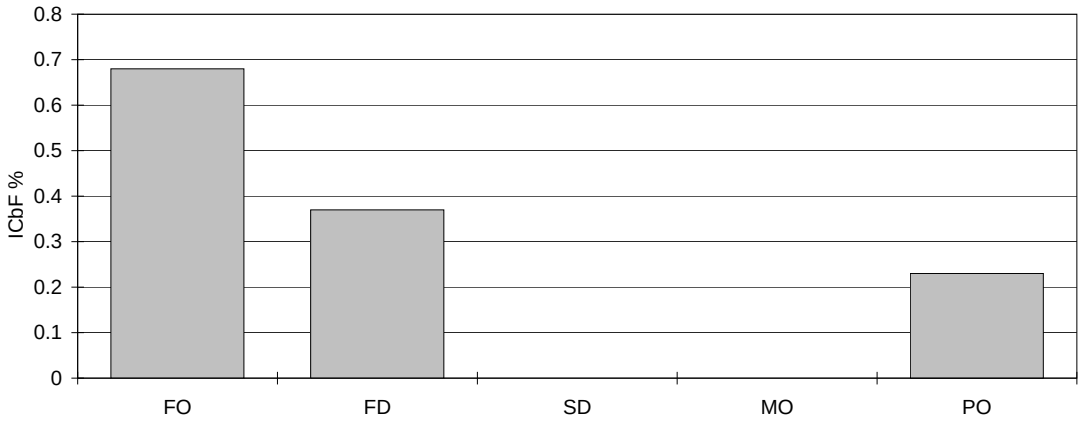
Nuclear Units

Detail Component Outage Code Report, 2003 to 2007

Table 6.4.4
Ins. And Control



Instrumentation & Control ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
INSTRUMENTATION AND CONTROL													
63100	**Reactor And Auxiliaries -Instrumentation And Control**	3	0.07	177	0.05	6	0	0	0	0	0	0.12	0.13
63300	**Heat Transport System - Instrumentation And Control**	1	0.06	0	0	0	0	0	0	0	0	0.06	0.06
63400	**Reactor Auxiliary System - Instrumentation And Control**	2	0.08	15	0.01	3	0	0	0	1	0.1	0.19	0.09
63500	**Fuel Handling Instrumentation & Control**	1	0.1	12	0.11	0	0	0	0	0	0	0.21	0.23
63600	**Boiler Steam And Water System - Instrumentation And Control**	0	0	2	0	0	0	0	0	0	0	0	0
63700	**Reactor Control Systems (Reactor Regulating Systems) Instrum. & Control**	5	0.11	900	0.15	4	0	0	0	0	0	0.27	0.29
64100	**Steam Turbine And Auxiliary - Instrumentation And Control**	0	0	1	0	0	0	0	0	0	0	0	0
64200	**Generator And Auxiliaries - Instrumentation And Control**	1	0	7	0	0	0	0	0	0	0	0	0
64300	**Boiler Feedwater Systems - Instrumentation And Controls**	2	0.03	38	0.03	0	0	0	0	0	0	0.06	0.06
64400	**Condensate System - Instrumentation And Control**	1	0.01	3	0	0	0	0	0	0	0	0.01	0.01
64700	**Condensate Make-up System - Instrumentation And Control**	1	0.06	3	0	0	0	0	0	0	0	0.07	0.08
65100	**Main Power Output Systems - Control And Protection**	2	0	8	0	0	0	0	0	0	0	0.01	0.01
65900	**System Control Facilities**	1	0.01	0	0	0	0	0	0	0	0	0.01	0.01
67000	**Plant Auxiliary Processes And Services- Instrumentation And Control**	1	0.03	2	0	0	0	0	0	0	0	0.04	0.04
68000	**Safety Systems Control**	3	0.1	5	0.01	0	0	0	0	1	0.13	0.24	0.12
69000	**Computers**	1	0.01	16	0.01	0	0	0	0	0	0	0.02	0.02
INSTRUMENTATION AND CONTROL TOTAL		**25**	**0.68**	**1,189**	**0.37**	**13**	**0**	**0**	**0**	**2**	**0.23**	**1.28**	**1.17**

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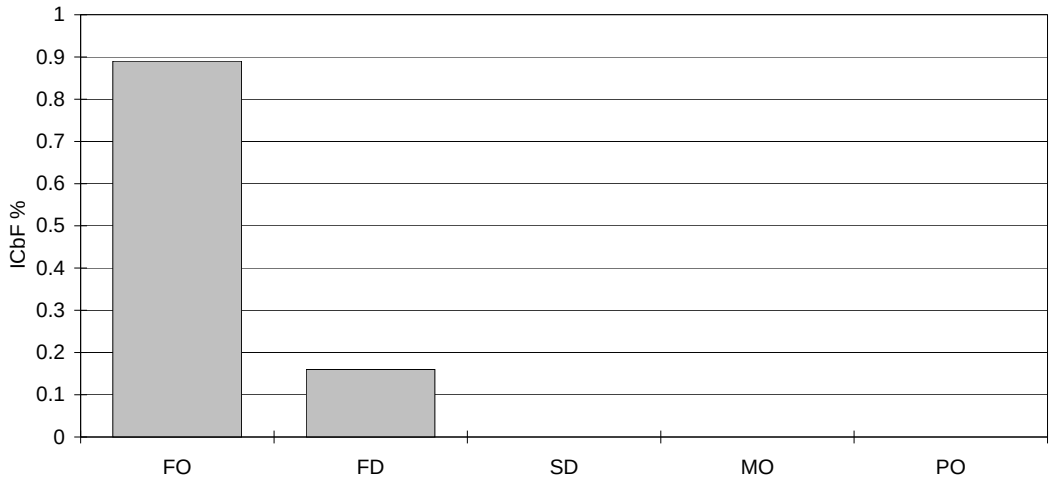
NUCLEAR UNITS

Detail Component Outage Code Report, 2003 to 2007

Table 6.4.4
Auxiliary Processes



Plant Aux. Processes & Services ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE NO. OCC.	MAINTENANCE ICBF (%)	PLANNED NO. OCC.	PLANNED ICBF (%)	CONTRIBUTION ICBF (%)	CONTRIBUTION DAFOR (%)
PLANT AUX. PROCESSES AND SERVICES													
71109	**Circulating Water Piping**	2	0.04	88	0.05	3	0	0	0	0	0	0.09	0.1
71110	**Circulating Water Travelling H2O Screens**	0	0	5	0	0	0	0	0	0	0	0	0
72100	**Service water Low Pressure Open System**	6	0.36	42	0.02	0	0	0	0	0	0	0.38	0.43
73200	**Powerhouse Heating & Ventilating System**	0	0	2	0	0	0	0	0	0	0	0	0
73700	**Containment Atmosphere System Heating, Ventilation And Cooling Systems**	2	0.12	8	0.01	0	0	0	0	0	0	0.13	0.14
74000	**Water Treatment Plant**	4	0.35	3	0.06	0	0	0	0	0	0	0.42	0.46
78000	**Fire Protection Systems**	1	0.01	5	0.01	0	0	0	0	0	0	0.02	0.02
PLANT AUX. PROCESSES AND SERVICES TOTAL		**15**	**0.89**	**153**	**0.16**	**3**	**0**	**0**	**0**	**0**	**0**	**1.04**	**1.16**

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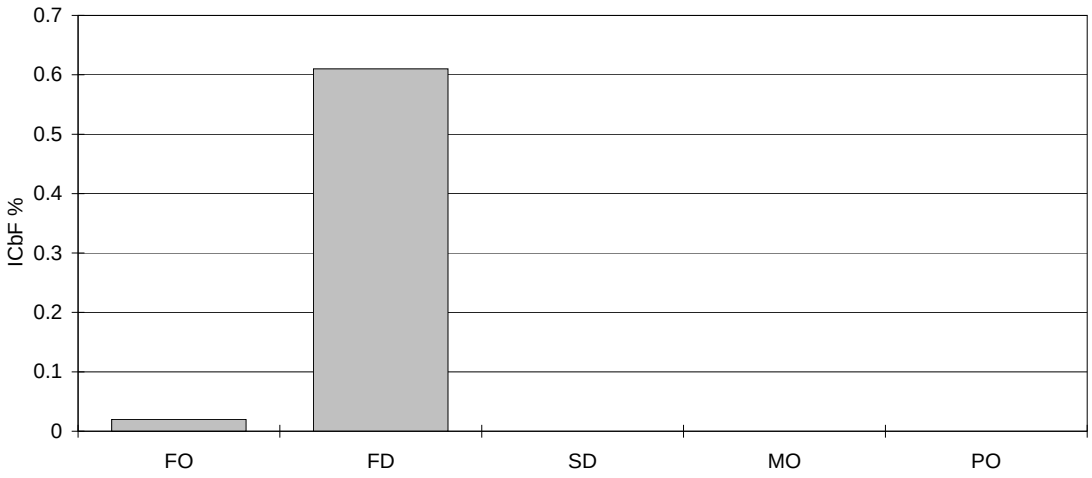
NUCLEAR UNITS

Table 6.4.4

Detail Component Outage Code Report, 2003 to 2007

Conditions



Conditions ICbF by event type for nuclear units based on 2003-07 data.

UNIT STATISTICS

NUMBER OF UNITS	12
NUMBER OF UNIT YEARS	52.4
OVERALL OPERATING FACTOR	80.13

CODE	CAUSE	FORCED OUTAGES NO. OCC.	FORCED OUTAGES ICBF (%)	FORCED DERATINGS NO. OCC.	FORCED DERATINGS ICBF (%)	SCHEDULED DERATINGS NO. OCC.	SCHEDULED DERATINGS ICBF (%)	MAINTENANCE OUTAGES NO. OCC.	MAINTENANCE OUTAGES ICBF (%)	PLANNED OUTAGES NO. OCC.	PLANNED OUTAGES ICBF (%)	CONTRIBUTION TO UNIT ICBF (%)	CONTRIBUTION TO UNIT DAFOR (%)
CONDITIONS													
00500	**Regulatory Bodies**	0	0	15	0.01	0	0	0	0	0	0	0.01	0.01
05200	**Transmission Limitations**	0	0	57	0.05	0	0	0	0	0	0	0.05	0.06
07010	**Site Environment, Storms, Floods**	0	0	45	0.02	0	0	0	0	0	0	0.02	0.03
07210	**Cooling Water Discharge Thermal Effects**	1	0.01	436	0.19	0	0	0	0	0	0	0.21	0.23
99999	**Other**	3	0.01	299	0.33	2	0	0	0	0	0	0.34	0.37
CONDITIONS TOTAL		**4**	**0.02**	**852**	**0.61**	**2**	**0**	**0**	**0**	**0**	**0**	**0.63**	**0.7**

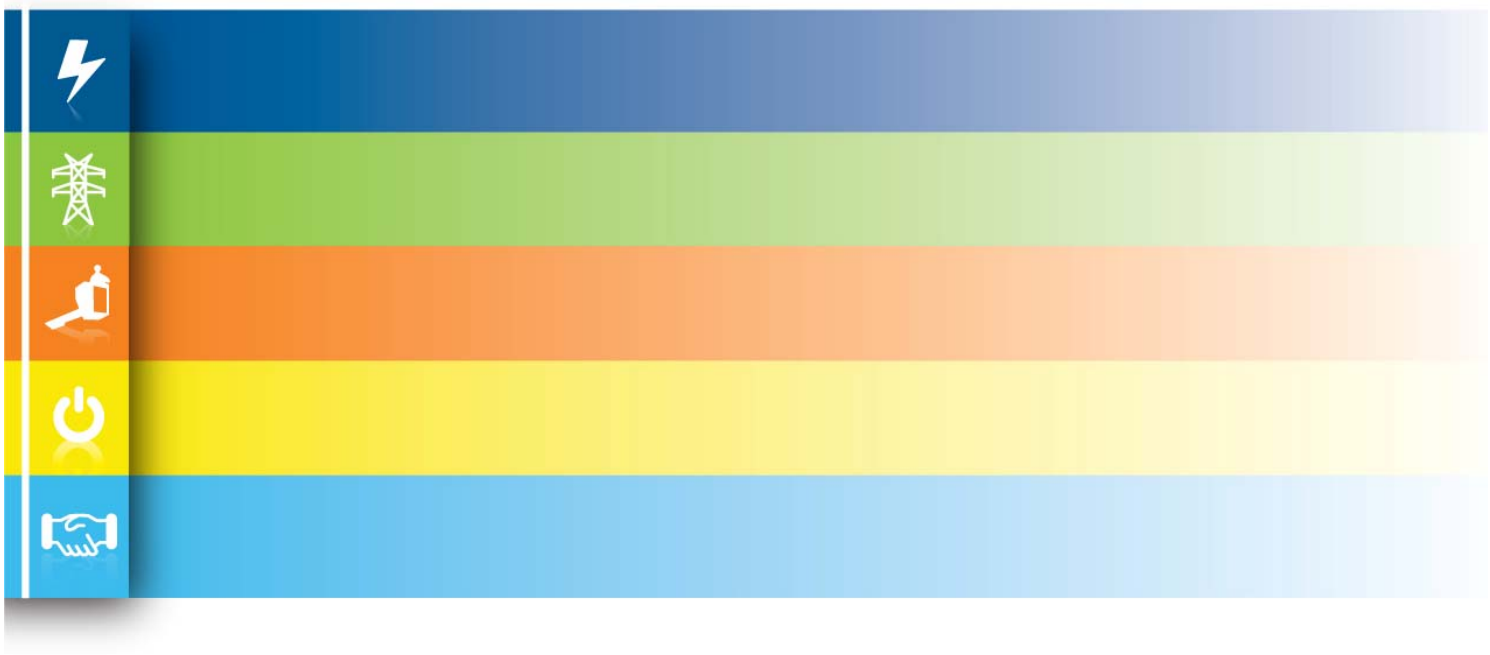
Canadian Electricity Association | Association canadienne de l'électricité

2008

GENERATION EQUIPMENT STATUS

ANNUAL REPORT

EQUIPMENT RELIABILITY INFORMATION SYSTEM



Acknowledgements

The Canadian Electricity Association gratefully acknowledges the support of the participant utilities whose data was used in the preparation of this report. We also wish to thank the Generation Consultative Committee on Outage Statistics (CCOS) and in particular its new chair Joe Renna (Ontario Power Generation) and its past Chair, Dr. Roy Billinton (University of Saskatchewan), for their support and guidance throughout the year.

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INTRODUCTION

The Canadian Electricity Association (CEA) was founded in 1891 and is the voice of the Canadian electricity industry, promoting electricity as the critical enabler of the economy and Canadians' expectations for an enhanced quality of life. A safe, secure, reliable, sustainable and competitively priced supply of electricity is essential to Canada's prosperity. This 2008 Generation Equipment Status Reports contains information that feeds directly into the "reliable" portion of CEA's Mission.

Scope:

This annual report on Generating Unit performance in Canada includes statistics for commercial generating units in Canada of the following specifications:

- Combustion Turbine units with a Maximum Continuous Rating (MCR) > 1 MW
- Fossil units with MCR > 60 MW
- Hydro units with MCR > 5 MW
- Nuclear units with MCR > 200 MW
- Fossil units including Coal, Oil and Natural Gas

Use of Information:

Information from this report can be used by utility companies to

- benchmark Generating Unit performance
- make decisions regarding new Generating Unit Construction
- make decisions regarding existing Unit upgrades
- focus resources for maintenance programs and system planning

The goal of using the information is to maximize Generating Unit performance within a company's financial and logistical constraints.

Contributors:

The publication of this report would not be possible without the data contribution of member utilities. These members include:

ATCO Power
BC Hydro
Churchill Falls (Labrador Corp)
EPCOR
FortisBC
Manitoba Hydro
New Brunswick Power
Newfoundland & Labrador Hydro
Nova Scotia Power
Ontario Power Generation
RioTinto Alcan
SaskPower
TransAlta Utilities Corporation

History:

In 1975, the CEA adopted a proposal to create a system for the centralized collection, processing and reporting of reliability and outage statistics for electrical generation, transmission and distribution equipment. To coordinate the development of this system, CEA constituted the Consultative Committee on Outage Statistics (CCOS). In 2007, after many distinguished years of service, Dr. Roy Billinton stepped down as the Chair of this committee and participated until last year. Through the work of Dr. Billinton and the CCOS committee, statistics have been generated for the electricity systems that have been adopted world-wide. The current chair of the Generation – CCOS program is Joe Renna of Ontario Power Generation. The mission and vision of CCOS are as follows:

Mission:

Provide a comprehensive database of component and system reliability and performance data which will assist member utilities in the optimal utilitization of corporate and financial resources.

Vision:

To be recognized as a world-class reliability database which meets the needs of its member utilities.

DATABASE OVERVIEW

CEA has been collecting performance data for Canadian generating units from participating utilities since 1978. This database of information is used to produce this annual report. There is a wealth of information stored in the database including:

- Performance data on over 1000 generating units
- Details of over 7000 equipment components
- Fuel types including hydro, fossil, combustion turbine, internal combustion and nuclear
- Details about individual generating units including manufacturers, Maximum Continuous Ratings (MCRs), ages
- Design information including speeds, ratings, temperatures, insulation types, pressures, capacities, diameters
- Component information for fans, pumps, condensers, boilers, generators, turbine reactors

Participating utilities monitor every change in state including:

- Normal operation
- derated states – including forced and scheduled
- outage states – including forced and scheduled
- available but not operating

More details about the states monitored can be found in section 4, Definition of Terms, Table of State and Time Codes.

The collection of this data follows a common set of definitions that has been accepted as the global industry standard for over 20 years. This data is reported to CEA annually and CEA follows a rigorous validation process for monitoring data quality to ensure that this report is of a high standard.

To date the database contains over 5,000,000 events.

The **Weighted Capability Factor**, by generating unit type, for 2008 and for the period of 2004-2008 Is as follow:

	Hydro	Fossil	Nuclear	Combustion
2008	93.37	78.49	72.99	86.70
2003-2008	91.53	80.88	74.40	88.67

INDIVIDUAL GENERATING UNIT PERFORMANCE

The tables in this section list the generating units of each type which experienced the lowest Incapability Factors (ICbF) and the highest Operating Factors in the 2008 calendar year.

Table 1 A – Hydro Units by ICbF with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated By	ICBF(%)
1	Ash River	1	BC Hydro Corporation	0.00
2	Revelstoke	2	BC Hydro Corporation	0.00
3	Kelsey	6	Manitoba Hydro	0.02
4	Kettle	8	Manitoba Hydro	0.03
5	Laurie River 1	2	Manitoba Hydro	0.04
6	Brilliant	3	Fortis BC (Aquila Networks)	0.05
7	Brilliant	4	Fortis BC (Aquila Networks)	0.05
8	Seven Sisters	3	Manitoba Hydro	0.06
9	Cameron	5	Ontario Power Generation	0.06
10	Ladore Falls	2	BC Hydro Corporation	0.09

Table 1 B – Hydro Units by Operating Factor with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated By	Op Fact (%)
1	Seven Sisters	6	Manitoba Hydro	99.90
2	Kelsey	6	Manitoba Hydro	99.89
3	Sir Adam Beck 1	2	Ontario Power Generation	99.88
4	Island Falls	1	SaskPower	99.88
5	Seven Sisters	3	Manitoba Hydro	99.86
6	Island Falls	5	SaskPower	99.86
7	Island Falls	3	SaskPower	99.86
8	Alexander	2	Ontario Power Generation	99.83
9	Coteau Creek	3	SaskPower	99.82
10	Alexander	3	Ontario Power Generation	99.82

Table 2 A – Fossil Units by ICbF with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated By	ICBF(%)
1	Coleson Cove	1	New Brunswick Power	1.46
2	Boundary Dam	5	SaskPower	3.72
3	Dalhousie	1	New Brunswick Power	4.60
4	Sheerness	2	ATCO Power	4.64
5	Lingan	3	Nova Scotia Power Inc.	6.34
6	Lingan	2	Nova Scotia Power Inc.	6.68
7	Battle River	3	ATCO Power	6.80
8	Sheerness	1	ATCO Power	7.73
9	Coleson Cove	2	New Brunswick Power	7.73
10	Queen Elizabeth	3	SaskPower	8.42

Table 2 B – Fossil Units by Operating Factor with Operating Time more than 4000 hrs

Ranking	Plant Name	Unit #	Operated By	Op Fact (%)
1	Battle River	3	ATCO Power	96.25
2	Boundary Dam	5	SaskPower	96.05
3	Dalhousie	1	New Brunswick Power	95.89
4	Sheerness	2	ATCO Power	95.85
5	Lingan	3	Nova Scotia Power Inc.	93.81
6	Lingan	2	Nova Scotia Power Inc.	93.51
7	Poplar River	2	SaskPower	93.02
8	Sheerness	1	ATCO Power	92.57
9	Boundary Dam	6	SaskPower	90.12
10	Dalhousie	2	New Brunswick Power	89.99

Table 3A – Combustion Turbine Units by ICbF with Operating Time more than 100 hrs

Ranking	Plant Name	Unit #	Operated By	ICBF (%)
1	Ste. Rose	1	New Brunswick Power	0.30
2	Millbank	2	New Brunswick Power	0.37
3	Success	3	SaskPower	0.55
4	Success	2	SaskPower	0.85
5	Prince Rupert	2	BC Hydro Corporation	0.96

Table 3B – Combustion Turbine Units by Operating Factor with Operating Time more than 100 hrs

Ranking	Plant Name	Unit #	Operated By	Op Fact (%)
1	Fort Nelson Gas	1	BC Hydro Corporation	96.03
2	Tufts Cove	5	Nova Scotia Power Inc.	36.97
3	Tufts Cove	4	Nova Scotia Power Inc.	28.90
4	Hardwoods	1	Newfoundland And Labrador Hydro	7.95
5	Landis	1	SaskPower	7.70

Table 4A – Nuclear Units by ICbF with Operating Time more than 100 hrs

Ranking	Plant Name	Unit #	Operated By	ICBF (%)
1	Darlington	2	Ontario Power Generation	1.18
2	Darlington	4	Ontario Power Generation	1.67
3	Pickering NGS-B	6	Ontario Power Generation	4.08
4	Pickering NGS-B	5	Ontario Power Generation	8.20
5	Pickering NGS-A	4	Ontario Power Generation	17.88

Table 4B – Nuclear Units by Operating Factor with Operating Time more than 100 hrs

Ranking	Plant Name	Unit #	Operated By	Op Fact (%)
1	Pickering NGS-B	6	Ontario Power Generation	91.68
2	Darlington	4	Ontario Power Generation	82.28
3	Darlington	2	Ontario Power Generation	80.78
4	Pickering NGS-A	4	Ontario Power Generation	74.36
5	Darlington	3	Ontario Power Generation	73.68

Definition of terms

Generating Unit: all equipment up to the high voltage terminals of the generator transformer and the station service transformers.

Maximum Continuous Rating (MCR): the gross maximum electrical output (in megawatts) which a generating unit has been designed for and/or shown by acceptance test to be capable of producing continuously.

The definitions of outages, deratings, states and times are reproduced here from the Instruction Manual on Generation Equipment Status.

4.1 Definition of Outages and Deratings

Forced Outage: the occurrence of a component failure or other condition which requires that the generating unit be removed from service immediately or up to and including the very next weekend.

There are 4 types of Forced Outages:
1. **Sudden Forced Outage**: the occurrence of a component failure or other condition which results in the unit being automatically or manually tripped.
2. **Immediately Deferrable Forced Outage:** the occurrence of a component failure or other condition which requires that the unit be removed from service within 10 minutes.
3. **Deferrable Forced Outage**: the occurrence of a component failure or other condition which requires that the unit be removed from service from 10 minutes up to and including the very next weekend.
4. **Starting-Failure Outage**: the unsuccessful attempt to bring a unit from a shutdown to synchronized or from synch-condensed or spin no load to generate with the electric system within a specified time interval. (The specified time interval may be different for individual units and should allow a reasonable time for the unit to pick up load.) This definition is most commonly associated with stand-by and peak units. *Note: repeated failures to start for the same cause without accomplishing corrective repairs are counted as one failure and the repeated attempts at starting are counted as a single attempt.*

Maintenance Outage: the removal of a generating unit from service to perform work on specific components which could have been postponed past the very next weekend. This is work done to prevent a potential forced outage and which could not be postponed from season to season.

Planned Outage: the removal of a generating unit from service for inspection and/or general overhaul of one or more major equipment groups. This work is usually scheduled well in advance (e.g. annual boiler overhaul, five-year turbine overhaul).

Forced Derating: a reduction (below MCR) of generating unit capacity in excess of 2% of its MCR resulting from a component failure or other condition which requires that the generating unit be derated at once or as soon as possible up to and including the very next weekend.

Scheduled Derating: a reduction (below MCR) of generating unit capacity in excess of 2% of its MCR resulting from a planned or maintenance outage of a piece of equipment.

4.2 Definition of States, (State Codes)

Operating State, (11): the generating unit is spinning and/or synchronized with the system and is capable of operating at MCR under normal operating procedures.

Operating under a Forced Derating, (12): the generating unit is spinning and/or synchronized with the system but not capable of carrying its MCR due to a forced derating being in effect.

Operating under a Scheduled Derating, (13): the generating unit is synchronized with the system but not capable of carrying its MCR due to a scheduled derating being in effect.

Available But Not Operating State, (14): the generating unit can carry its MCR but is not being operated to supply system load.

Available But Not Operating – Forced Derating State, (15): the generating unit can deliver only part of its MCR due to a forced derating but is not being operated to supply system load.

Available But Not Operating – Scheduled Derating State, (16): the generating unit can deliver only part of its MCR due to a scheduled derating but it is not being operated to supply system load.

Forced Outage State, (21): the generating unit has a forced outage which requires that it be removed from service.

Forced Extension of a Maintenance Outage State, (22): the generating unit has an outage resulting from a condition discovered during a maintenance outage which has forced the extension of the maintenance outage.

Forced Extension of a Planned Outage State, (23): the generating unit has an outage resulting from a condition discovered during a planned outage which has forced the extension of the planned outage.

Maintenance Outage State, (24): the generating unit has a maintenance outage which requires that it be removed from service.

Planned Outage State, (25): the generating unit has a planned outage which requires that it be removed from service.

Not in Commercial Service State, (30): the generating unit is decommissioned, mothballed, or on a prolonged outage to make modifications that will alter its performance beyond the original design and/or provide life extension through rehabilitation. The type codes associated with this state are:

1 - Decommissioned
2 - Mothballed
3 - Refurbishment
4 - Deferred

Operating as a Synchronous Condenser/Spin No-Load: The above state codes can also be used to identify the various modes of synchronous condenser or spin no-load (spinning reserve at 0 MW) operation as follows:

STATE OF THE TURBINE	STATE CODE OF THE UNIT
Spin No-Load De-Coupled (Hydro units only)	11, 12, 13
Synchronous Condenser Coupled	11, 12, 13
Unbolted or declutched but available	14, 15, 16
Unbolted or declutched but not available	21,22,23,24, 25

4.3 Definition of Times

O: the number of hours the generating unit was in the Operating State during the period.

O(FD): the number of hours the generating unit was operating under a Forced Derating during the period.

O (SD): the number of hours the generating unit was operating under a Scheduled Derating during the period.

ABNO: the number of hours the generating unit was in the Available But Not Operating State.

ABNO(FD): the number of hours the generating unit was in the Available But Not Operating - Forced Derating State.

ABNO (SD): the number of hours the generating unit was in the Available But Not Operating - Scheduled Derating State.

FO: the number of hours the generating unit was in a Forced Outage State.

FEMO: the number of hours the generating unit was in a Forced Extension of a Maintenance Outage State.

FEPO: the number of hours the generating unit was in a Forced Extension of a Planned Outage State.

MO: the number of hours the generating unit was in the Maintenance Outage State.

PO: the number of hours the generating unit was in the Planned Outage State.

Table of State and Time Codes
(Summary of Section 4.2 and 4.3)

States	State Codes	Duration (Hours)
Available States		
Operating	11	O
Operating under a Forced Derating	12	O(FD)
Operating under a Scheduled Derating	13	O(SD)
Available But Not Operating	14	ABNO
Available But Not Operating - Forced Derating	15	ABNO(FD)
Available But Not Operating - Scheduled Derating	16	ABNO(SD)
Not-Available States:		
Forced Outage	21	FO
Forced Extension of Maintenance Outage	22	FEMO
Forced Extension of Planned Outage	23	FEPO
Maintenance Outage	24	MO
Planned Outage	25	PO
No-in-Commercial Service	30	NICS

The Concept of Adjusted Time:

To take into account the derated levels of a generating unit, the operating time at these levels is transformed into an equivalent outage time. Thus, the time of X% of MCR, called O(FD) x, is converted to an equivalent outage time, called O(FD)adj according to the transformation.

$$O(FD)adj = \left[\frac{100 - X}{100}\right] \quad O(FD)x$$

For example, if a generating unit is derated to 80 percent of its MCR for 5 hours, that would be equivalent to a full outage of the generating unit for 1 hour. O(SD), ABNO(FD) and ABNO(SD) are treated in the same manner.

4.4 Definition of Headings Used on the Tables of Sections 5 and 6

4.4.1 Column Headings

UNIT YEARS (A): the number of Unit Hours divided by 8760. The number of Unit Hours is the sum of the durations of all states (i.e. O + O(FD) + O(SD) + ABNO + ABNO(FD) + ABNO(SD) + FO + FEMO + FEPO + MO + PO) of the generating units being considered.

ABNOF (%): the Available But Not Operating Factor. It is calculated by dividing ABNO + ABNO(FD) + ABNO(SD) by Unit Hours times 100.

OP FACTOR (%): Operating Factor. It is calculated by dividing the Total Operating Time by Unit Hours times 100. Total Operating Time means the sum of O + O(FD) + O(SD).

NO. OF FORCED OUTAGES: the number of occurrences of State Codes 21, 22 and 23.

TOTAL F.O.T. (A): Total Forced Outage Time expressed in years. It is FO + FEMO + FEPO divided by 8760.

MAXIMUM F.O.D. (H): the longest single residence in hours of one of the forced outage states 21, 22 and 23 in the study period.

TOTAL EQ. OUT. TIME (A): the Total Equivalent Outage Time expressed in years. It is the Total Forced Outage Time plus planned and maintenance outage times plus adjusted derated times (i.e. FO + FEMO + FEPO + MO + PO + O(FD) adj + O(SD) adj + ABNO(FD) adj + ABNO(SD) adj all divided by 8760). This equivalent time is used when calculating ICbF.

ICbF (%): the Incapability Factor. It is the ratio of Total Equivalent Outage Time, in hours, to number of Unit Hours times 100.

CbF (%) is the complement of the Incapability Factor. It is calculated by subtracting ICbF from 100. This index is not listed in the report tables.

WEIGHTED CAPABILITY FACTOR (%) is the Capability Factor of a unit weighted by its MCR

Weighted Capability Factor = 1- weighted ICbF

$$= 1 - \frac{\Sigma ICbF * MCR}{\Sigma MCR}$$

FAIL RATE: the Failure Rate. It is the rate at which a generating unit encounters a forced outage. It is computed by dividing the Number of Transitions from an Operating State (11, 12 and 13) to a Forced Outage (21) by the Total Operating Time times 8760.

MEAN F.O.D. (H): the mean duration of a forced outage. It is computed by dividing the Total Forced Outage Time by the Number of Forced Outages.

FOR (%): the Forced Outage Rate. It is the ratio of Total Forced Outage Time to Total Forced Outage Time plus Total Operating Time times 100.

$$FOR = \frac{FO + FEMO + FEPO}{FO+FEMO+FEPO+O+O(FD)+O(SD)} X100$$

Cautionary Note: The Forced Outage Rate obtained by the above equation is not equal to Lambda over Lambda + Mu (l/l+m) where Lambda (l) is the Fail Rate and Mu (m) is the reciprocal of Mean F.O.D.

DAFOR (%): the Derated Adjusted Forced Outage Rate. It is the ratio of Equivalent Forced Outage Time (i.e. FO + FEMO + FEPO + O(FD) adj + ABNO(FD) adj) to Equivalent Forced Outage Time plus Total Equivalent Operating Time (i.e. O + O(SD) + (O(FD) - 0(FD)adj)). This can be written as follows:

$$DAFOR = \frac{FO+FEMO+FEPO+O(FD)adj+ABNO(FD)adj}{FO+FEMO+FEPO+ABNO(FD)adj+O+O(FD)+O(SD)} X100$$

MOF (%): the Maintenance Outage Factor. It is computed by dividing the number of maintenance outage hours by the number of Unit Hours times 100.

POF (%): the Planned Outage Factor. It is computed by dividing the number of planned outage hours by the number of Unit Hours times 100.

SYN. CD. FACTOR (%): the Synchronous Condenser Factor. It is the total hours spent as a synchronous condenser divided by the number of Unit Hours times 100.

SR: the Starting Reliability. It gives the ratio of successful starts to start attempts.

$$\textbf{SR} = \frac{\text{Total Attempted Start} - \text{Total Start Failures}}{\text{Total Attempted Starts}}$$

Total Start
Failures= Total number of occurences of State 21 type 4

Total Attempted
Starts = Total Start Failures plus the number of transitions to states 11, 12 and 13 from any of the remaining states plus the number of transitions into a synchronous condenser mode from a not operating state.

UFOP (%): the Utilization Forced Outage Probability. It is the probability that a generating unit will not be available when required.

$$\text{UFOP} = \frac{f(FO + FEMO + FEPO)}{f(FO + FEMO + FEPO) + O + O(SD) + O(FD)}$$

Where f = Demand Factor

$$= \left[\frac{1}{R} + \frac{1}{T}\right] \Big/ \left[\frac{1}{D} + \frac{1}{r} + \frac{1}{T}\right]$$

Where r = Average Forced Outage Time (see above)
D = average in-service time per occasion of demand

$$= \frac{O + O(FD) + O(SD)}{SR \times \text{Total Attempted Starts}}$$

T = average reserve shutdown time between periods of need, exclusive of periods for maintenance or other planned unavailability.

$$D + T = \frac{O+O(FD)+O(SD)+ABNO+ABNO(FD) + ABNO(SD)}{\text{Total Attempted Starts}}$$

DAUFOP (%): the Derated Adjusted Utilization Forced Outage Probability. It is the probability that a generating Unit will not be available when required (derating included). It can be calculated as follows:

$$\text{DAUFOP} = \frac{f(FO + FEMO + FEPO) + O(FD)adj}{f(FO + FEMO + FEPO) + O + O(FD)\ O(SD)}$$

4.4.2 Row Headings

The row headings indicate the data for which the statistics in that row have been calculated.

YEARS 0 UNIT: all year zero data for a particular generating unit type over the specified time interval. For example, in the combined 1998-02 report, this row would have the 2002 data for the generating units commissioned in 2002 and the 2001 data for the generating units commissioned in 2001 and so on.

EXCL YR 0: all data for a particular generating unit type minus the year 0 data.

ALL UNITS: the data for all generating units of a particular type.

CLASSIFICATION BY MCR (MW): the data for all generating units whose MCR's fall within the indicated range.

CLASSIFICATION BY YEAR OF SERVICE: the data for all generating units in the indicated year or years of service. For example, a generating unit that was commissioned in 1994 would have its 1994 data grouped in the "0" row and its 1995 data in the "1st" row.

CLASSIFICATION BY OPERATING FACTOR: the data for all generating units with operating factors in the indicated ranges over the specified time interval.

4.5 Calculation of Cumulative Normalized Unit Years

Cumulative Normalized Unit Years is plotted on one of the graphs in Section 5-1 of this report. The information to produce the figure was taken from the Classification By Operating Factor sections of Tables 6.1.1, 6.2.1, 6.3.1 and 6.4.1. The calculation of the Cumulative Normalized Unit Years corresponding to the Operating Factor of 50% for combustion turbine units is given below to illustrate the method of calculation. Referring to Table 6.3.1, the sum of the unit years with operating factor equal to or less than 50% is 34 unit years. As the total for all units is 36.0 unit years, the percentage of unit years with operating factor equal to or less than 50% is (34/36) x 100 or 94.4% as is plotted on the graph.

5.0
All Unit Types
Summary Statistics

ALL CANADA Summary

Table 5.1

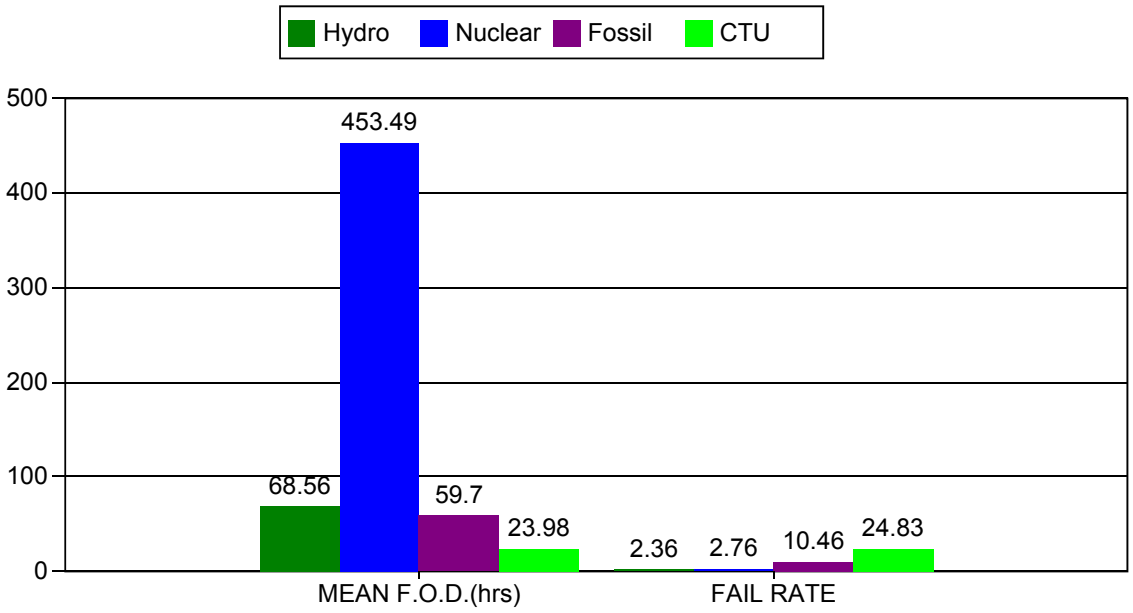
External Causes Excluded, 2008 Data

	Unit years (A)	ABNOF (%)	OP Time (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	Attempted Starts	Successful Starts	MOF (%)	POF (%)
Combustion Turbine Unit																	
Year 0 Units	0.0	0.00	0.0	0.00	0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0	0	0	0.00	0.00
Exc. Year 0	29.8	83.36	2.0	6.60	122	0.3	454.00	23.98	14.45	41.71	4.0	13.27	23.81	1436	1428	4.57	4.14
All Units	**29.8**	**83.36**	**2.0**	**6.60**	**122**	**0.3**	**454.00**	**23.98**	**14.45**	**41.71**	**4.0**	**13.27**	**23.81**	**1436**	**1428**	**4.57**	**4.14**
Fossil Generating Unit																	
Year 0 Units	0.0	0.00	0.0	0.00	0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0	0	0	0.00	0.00
Exc. Year 0	79.0	19.54	48.5	58.65	599	4.1	1344.02	59.70	7.26	11.01	17.0	20.55	9.49	1722	1720	2.15	10.25
All Units	**79.0**	**19.54**	**48.5**	**58.65**	**599**	**4.1**	**1344.02**	**59.70**	**7.26**	**11.01**	**17.0**	**20.55**	**9.49**	**1722**	**1720**	**2.15**	**10.25**
Hydro Generating Unit																	
Year 0 Units	0.1	5.81	0.1	62.05	0	0.0	0.00	0.00	0.00	0.00	0.0	32.14	0	55	55	0.00	32.14
Exc. Year 0	447.8	11.47	366.3	79.96	1124	8.8	8783.98	68.56	2.34	2.52	29.6	6.47	2.11	31679	31603	0.70	3.69
All Units	**447.9**	**11.47**	**366.4**	**79.95**	**1124**	**8.8**	**8783.98**	**68.56**	**2.34**	**2.52**	**29.7**	**6.48**	**2.11**	**31734**	**31658**	**0.70**	**3.70**
Nuclear Generating Unit																	
Year 0 Units	0.0	0.00	0.0	0.00	0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0	0	0	0.00	0.00
Exc. Year 0	10.4	0.02	8.0	66.22	25	1.3	5700.87	453.49	11.86	13.99	2.8	23.31	2.29	27	27	0.00	9.32
All Units	**10.4**	**0.02**	**8.0**	**66.22**	**25**	**1.3**	**5700.87**	**453.49**	**11.86**	**13.99**	**2.8**	**23.31**	**2.29**	**27**	**27**	**0.00**	**9.32**

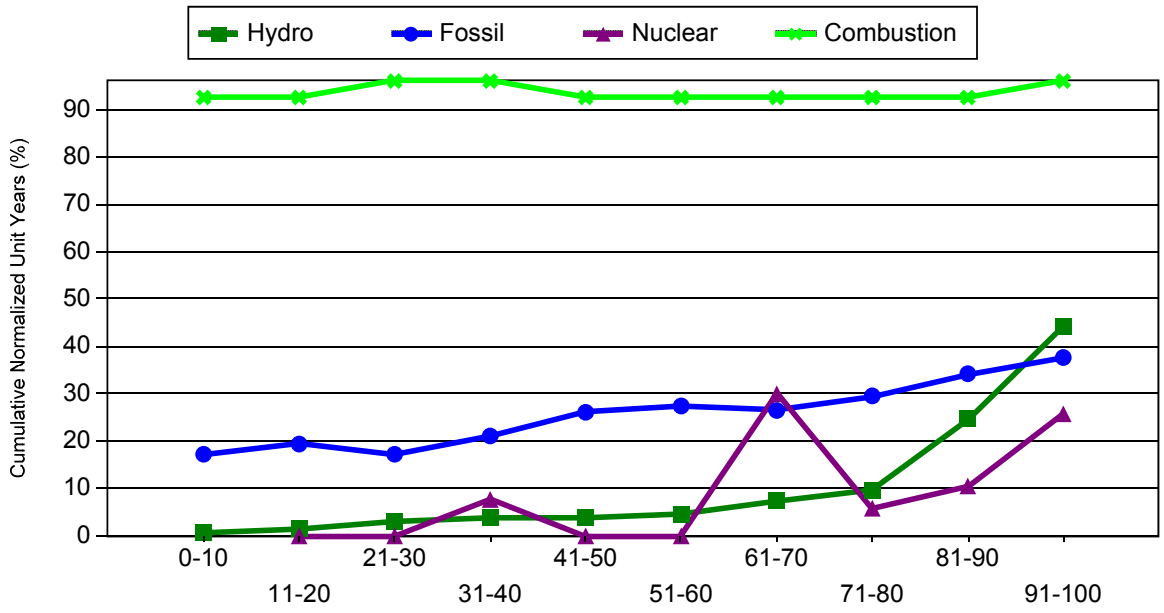
TOTAL NUMBER OF COMBUSTION GENERATING UNITS:	29.00
TOTAL NUMBER OF FOSSIL GENERATING UNITS:	78.00
TOTAL NUMBER OF HYDRO UNITS:	458.00
TOTAL NUMBER OF NUCLEAR GENERATING UNITS:	13.00

ALL CANADA Summary
External Causes Excluded, 2008 Data

Table 5.1



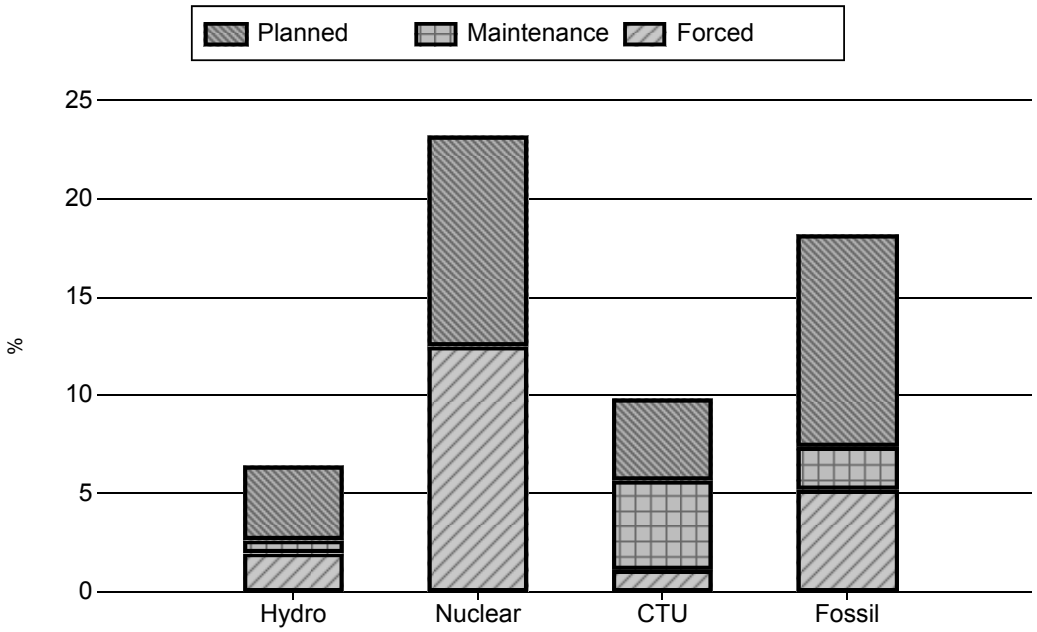
Comparison of Failure Rate & Mean Forced Outage Duration for different generating unit types based on 2008 data.



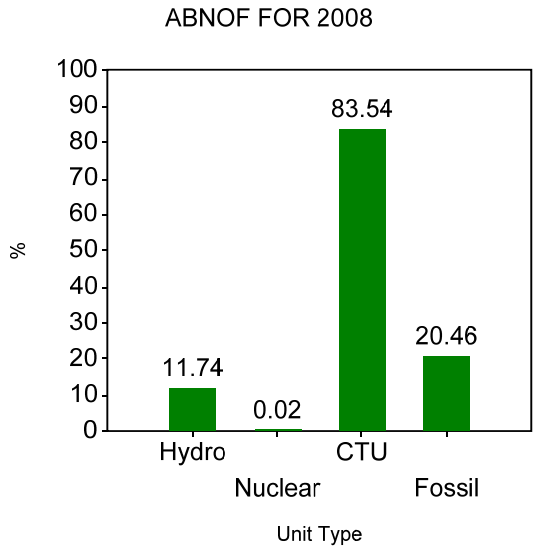
Cumulative Normalized Unit Years vs. Operating Factor for different generating unit types based on 2008 data.

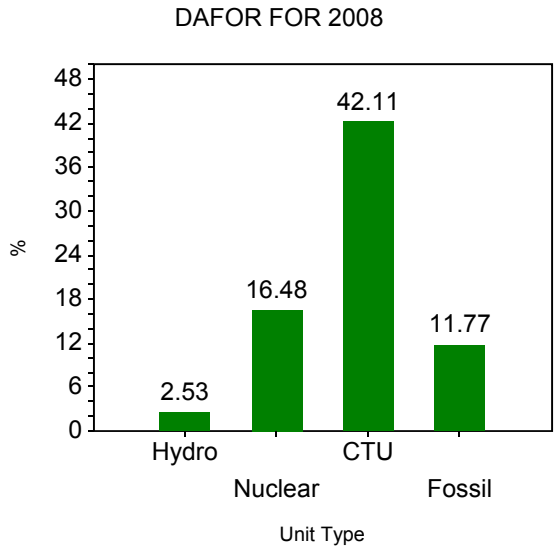
ALL CANADA Summary
External Causes Excluded, 2008 Data

Table 5.1



Comparison of ICbF for different generating unit types based on 2008 data.





ALL CANADA Summary

Table 5.2

External Causes Excluded, 2004 to 2008 Data

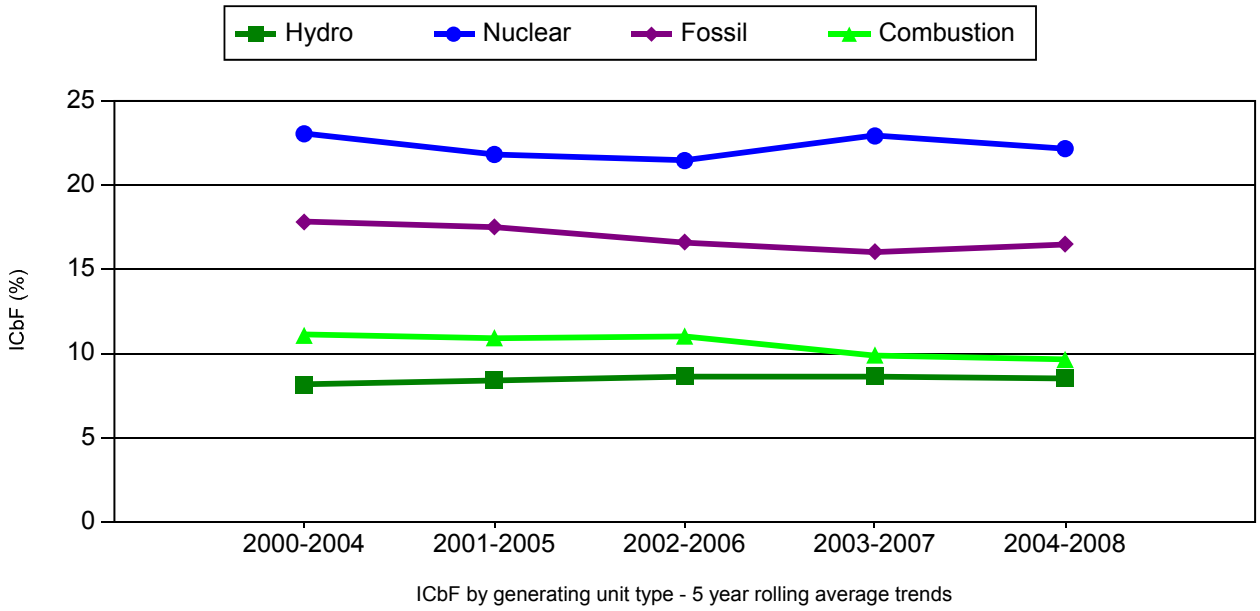
	Unit years (A)	ABNOF (%)	OP Time (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	Attempted Starts	Successful Starts	MOF (%)	POF (%)
Combustion Turbine Unit																	
Year 0 Units	2.6	40.34	1.4	53.71	49	0.0	107.95	6.64	2.61	3.39	0.1	5.69	18.06	674	673	0.47	3.34
Exc. Year 0	170.7	79.56	17.3	10.06	618	7.7	8783.98	109.15	29.94	35.35	19.5	11.32	13.86	7054	6916	1.45	3.70
All Units	**173.3**	**78.98**	**18.7**	**10.70**	**667**	**7.7**	**8783.98**	**101.61**	**28.51**	**33.79**	**19.6**	**11.24**	**14.17**	**7728**	**7589**	**1.44**	**3.69**
Fossil Generating Unit																	
Year 0 Units	0.0	0.00	0.0	0.00	0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0	0	0	0.00	0.00
Exc. Year 0	396.1	21.40	242.8	59.04	3198	18.9	3688.95	51.77	6.86	10.18	76.0	18.49	9.98	9268	9228	2.52	8.76
All Units	**396.1**	**21.40**	**242.8**	**59.04**	**3198**	**18.9**	**3688.95**	**51.77**	**6.86**	**10.18**	**76.0**	**18.49**	**9.98**	**9268**	**9228**	**2.52**	**8.76**
Hydro Generating Unit																	
Year 0 Units	29.9	3.83	25.9	86.57	114	1.7	5391.90	128.63	6.07	6.28	2.9	9.78	3.74	487	477	0.42	3.54
Exc. Year 0	3094.4	13.70	2393.7	75.02	9296	56.6	17064.00	53.30	2.30	2.42	267.3	8.38	2.38	238373	236252	0.67	5.82
All Units	**3124.3**	**13.60**	**2419.6**	**75.13**	**9410**	**58.2**	**17064.00**	**54.21**	**2.35**	**2.46**	**270.2**	**8.39**	**2.39**	**238861**	**236730**	**0.67**	**5.80**
Nuclear Generating Unit																	
Year 0 Units	0.0	0.00	0.0	0.00	0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0	0	0	0.00	0.00
Exc. Year 0	47.8	0.01	37.2	67.39	136	5.4	5700.87	347.55	10.80	12.47	11.8	21.45	2.36	133	132	0.00	9.40
All Units	**47.8**	**0.01**	**37.2**	**67.39**	**136**	**5.4**	**5700.87**	**347.55**	**10.80**	**12.47**	**11.8**	**21.45**	**2.36**	**133**	**132**	**0.00**	**9.40**

TOTAL NUMBER OF COMBUSTION GENERATING UNITS	45.00
TOTAL NUMBER OF FOSSIL GENERATING UNITS:	97.00
TOTAL NUMBER OF HYDRO UNITS:	793.00
TOTAL NUMBER OF NUCLEAR GENERATING UNITS:	14.00

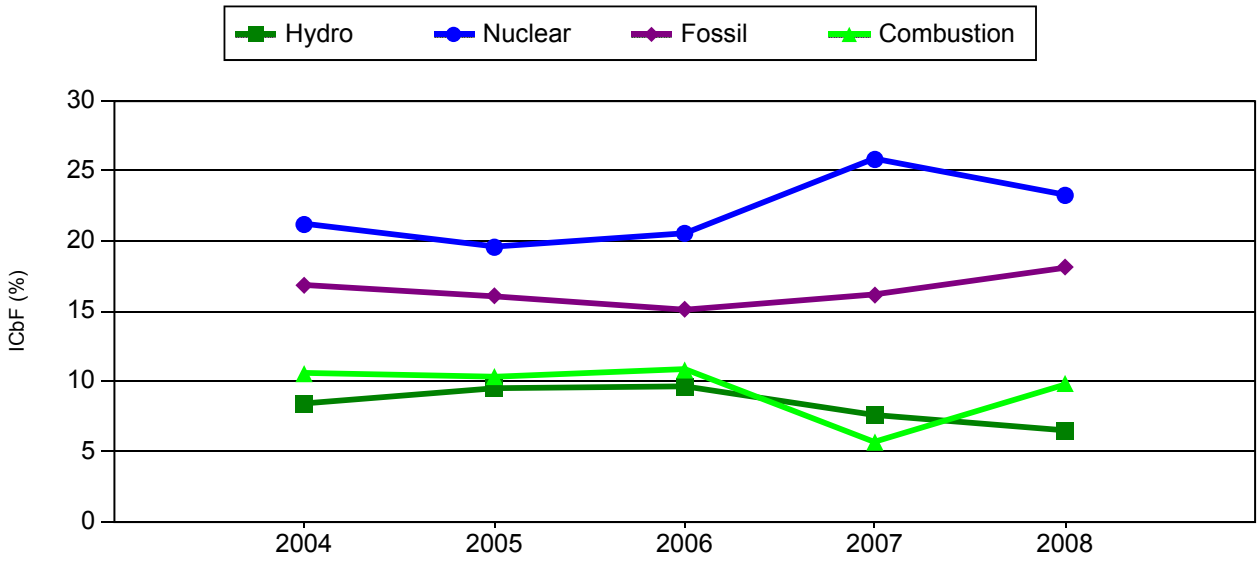
ALL CANADA Summary

External Causes Excluded, 2004 - 2008 Data

Table 5.2



ICbF by generating unit type - 5 year rolling average trends

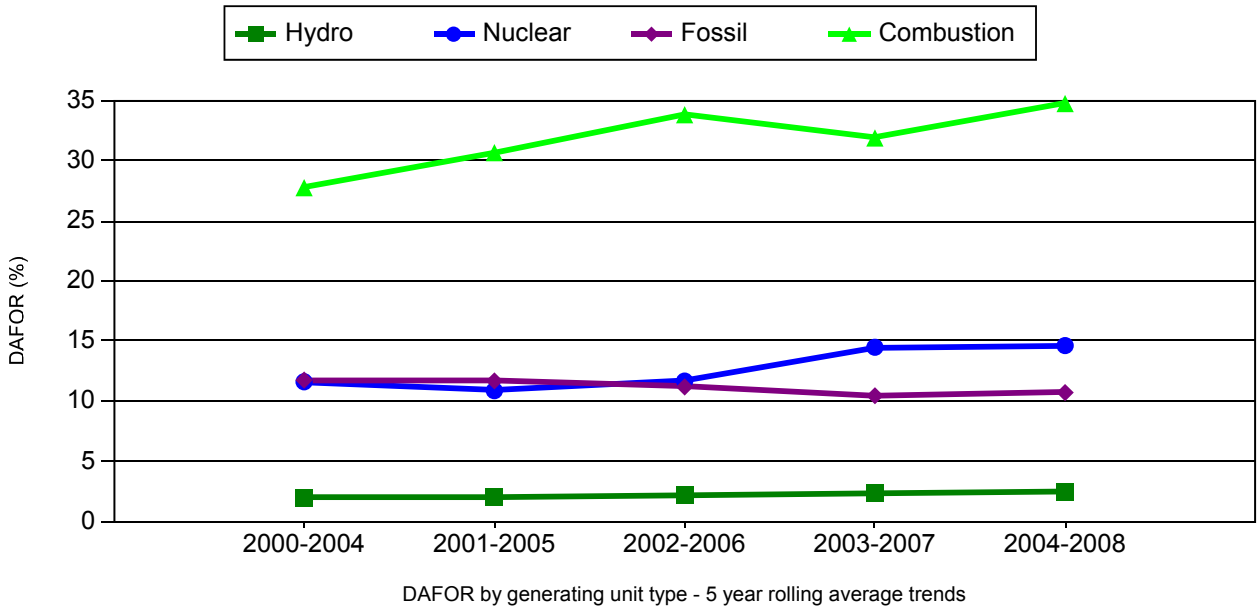


ICbF by generating unit type - 5 year rolling average trends

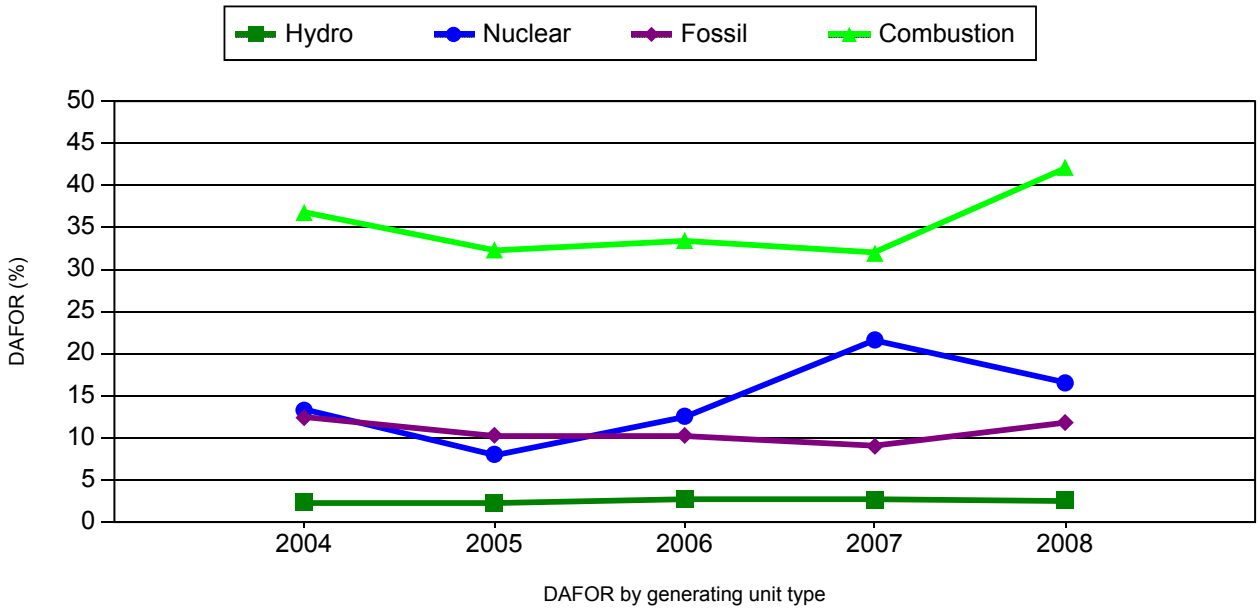
ALL CANADA Summary

Table 5.2

External Causes Excluded, 2004 - 2008 Data



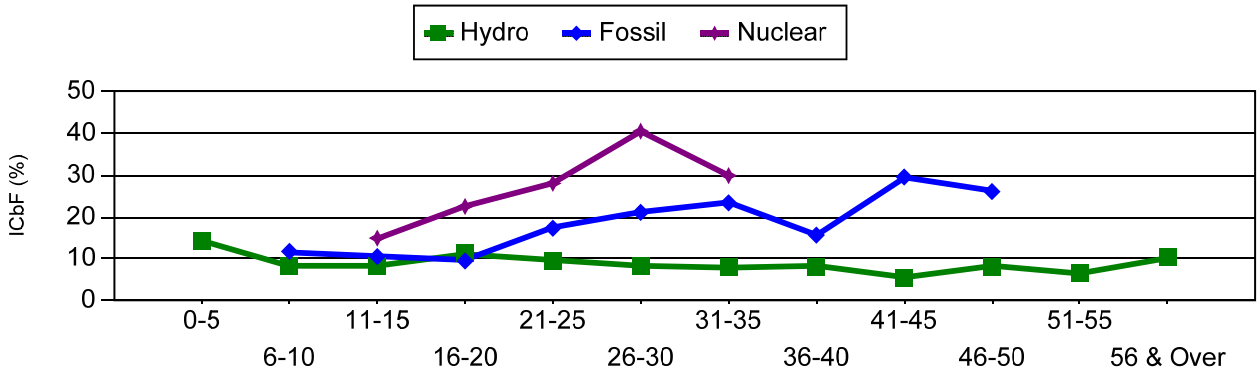
DAFOR by generating unit type - 5 year rolling average trends



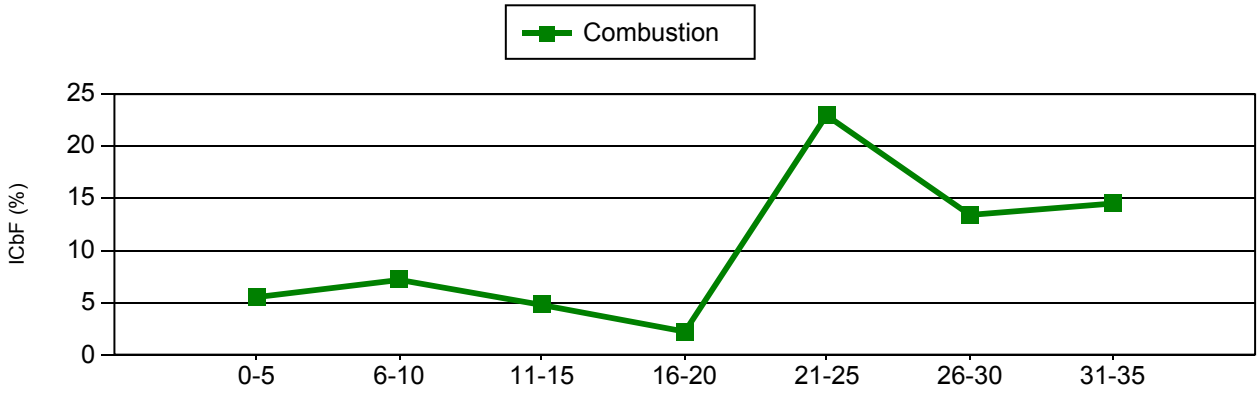
DAFOR by generating unit type

ALL CANADA Summary — Table 5.2

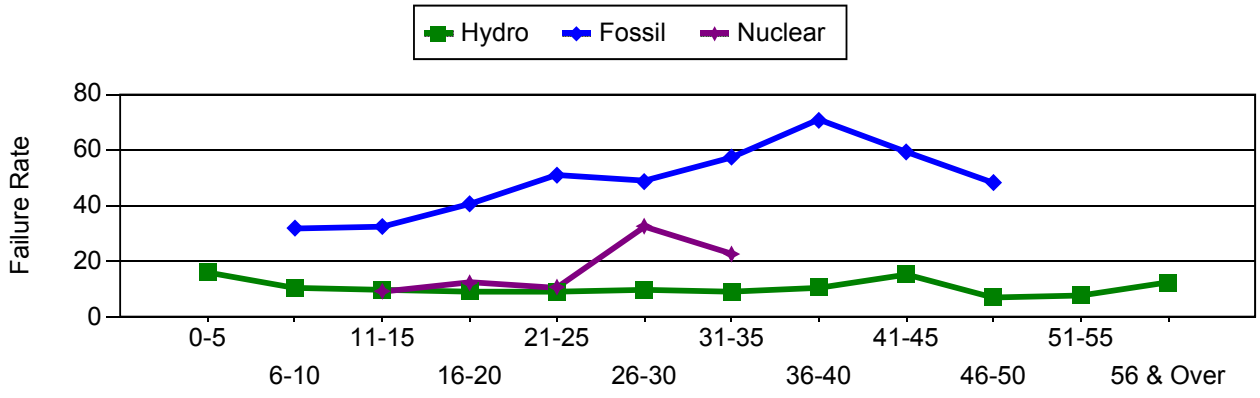
External Causes Excluded, 2004 - 2008 Data



The effect of age on ICbF for different generating unit types based on 2004-2008 data.



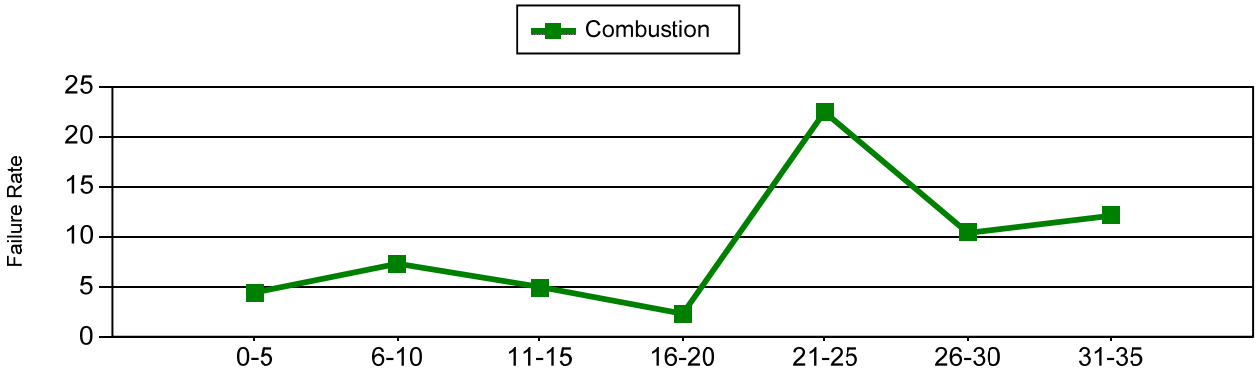
The effect of age on ICbF for different generating unit types based on 2004-2008 data.



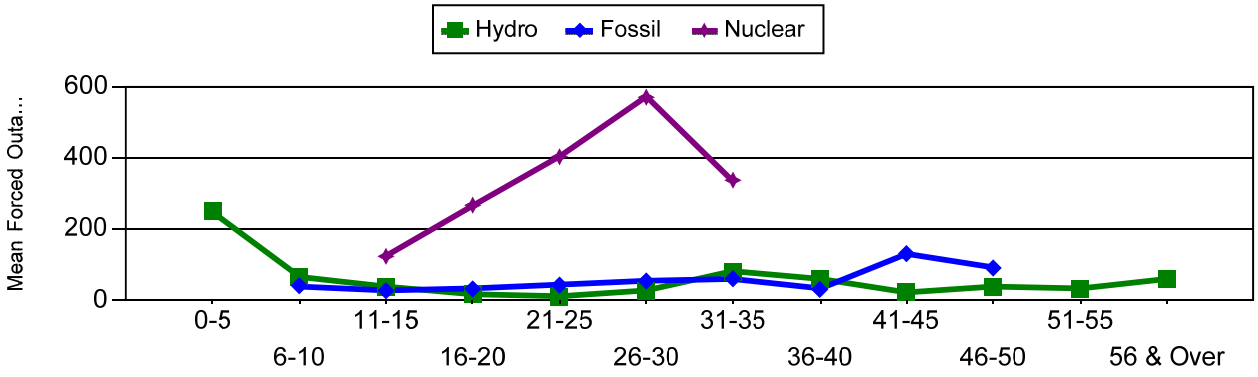
The effect of age on Failure Rate for different generating unit types based on 2004-2008 data.

ALL CANADA Summary — Table 5.2

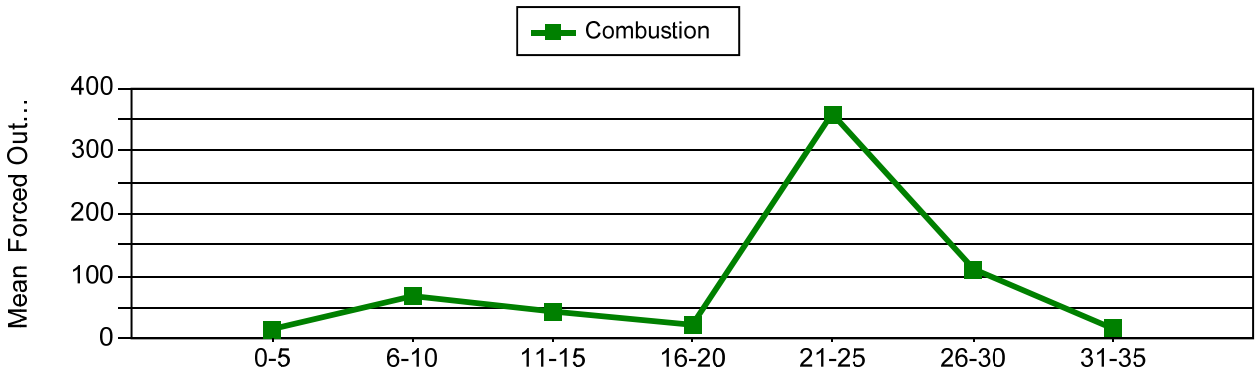
External Causes Excluded, 2004 - 2008 Data



The effect of age on Failure Rate for different generating unit types based on 2004-2008 data.



The effect of age on Mean Forced Outage Duration for different generating unit types based on 2004-2008 data.



The effect of age on Mean Forced Outage Duration for different generating unit types based on 2004-2008 data.

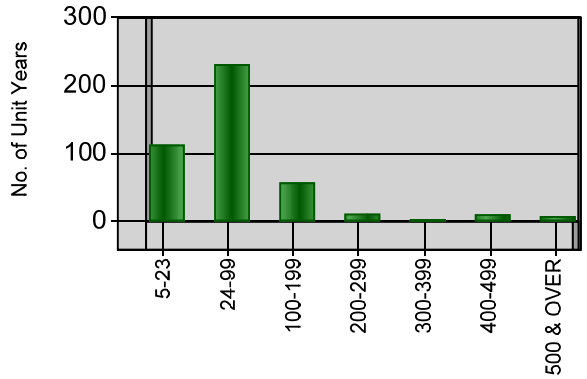
6.0 Generating Unit Statistics

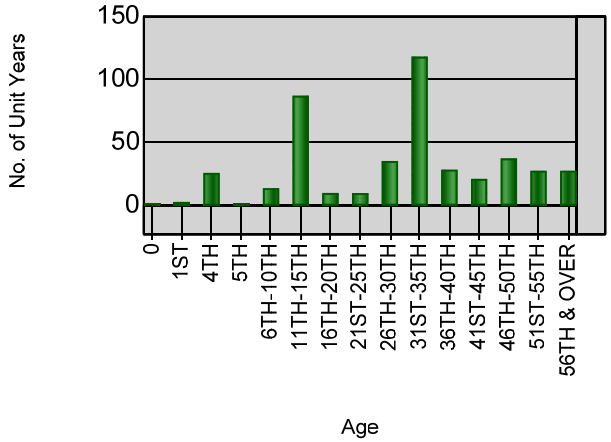
6.1 Hydro Summary Statistics

Hydro Units

External Causes Excluded, 2008 Data

Table 6.1.1



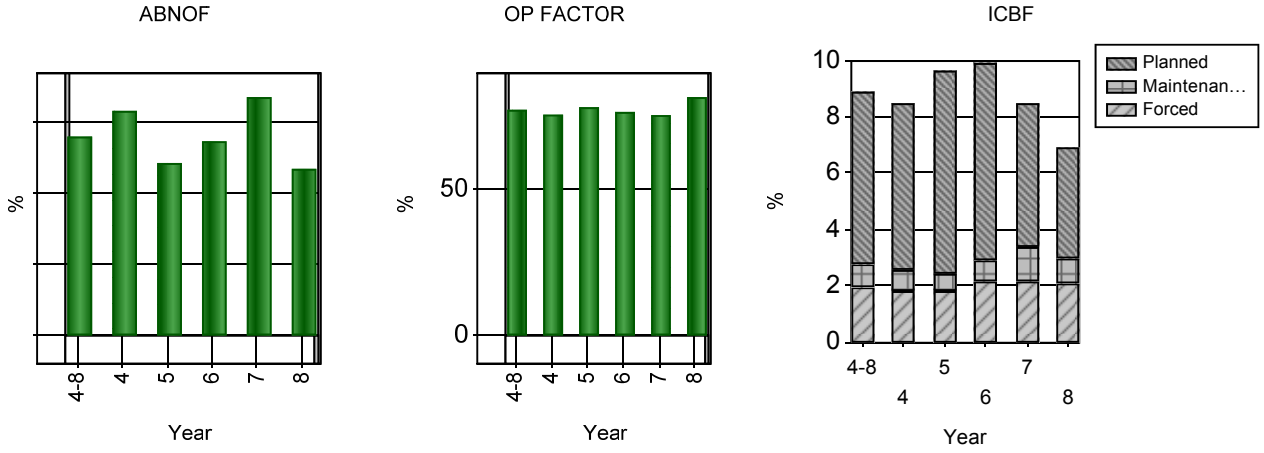


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
5-23	113.3	6.31	0.28	83.67	267	1.7	3390.77	54.60	1.63	1.73	1.73	5.5	4.59	2.06	0.57	2.52
24-99	231.7	12.74	6.35	79.60	582	3.5	5791.98	52.83	1.84	2.05	2.02	15.4	6.54	1.94	0.75	4.13
100-199	57.6	18.99	7.26	75.05	158	0.3	968.95	17.11	0.70	0.80	0.74	2.9	5.01	2.45	0.60	3.80
200-299	11.7	6.45	12.34	77.55	24	0.9	7314.50	333.47	9.17	9.39	9.37	1.9	16.13	2.10	0.90	7.21
300-399	2.0	9.95	0.00	77.09	8	0.0	294.87	45.08	2.60	2.60	2.59	0.3	12.96	4.53	2.26	8.65
400-499	10.7	17.80	11.90	74.35	18	0.2	1947.65	119.27	2.97	4.34	4.16	0.9	8.42	1.62	0.74	4.35
500 & OVER	8.0	9.09	0.00	76.58	33	0.6	1541.13	156.31	8.75	8.75	8.69	1.1	14.33	5.21	1.85	5.14
Classification By Year Of Service																
0	0.1	5.81	0.00	62.05	0	0.0	0.00	0.00	0.00	0.00	0	0.0	32.14	0.00	0.00	32.14
1ST	3.0	8.18	0.00	81.06	8	0.0	139.17	21.41	0.80	4.27	4.25	0.4	13.56	3.28	8.08	2.00
4TH	25.9	1.89	0.00	87.49	72	2.3	8783.98	280.74	9.13	9.16	9.13	2.6	10.02	2.54	0.31	0.83
5TH	1.9	1.00	9.47	92.29	10	0.0	212.70	26.51	1.62	1.62	1.62	0.1	4.63	3.82	0.84	2.26
6TH-10TH	13.8	6.81	0.00	91.39	17	0.1	146.57	26.28	0.40	0.67	0.45	0.3	2.04	1.03	0.13	1.30
11TH-15TH	87.2	7.59	0.44	81.21	212	0.8	3390.77	35.10	1.10	1.12	1	4.0	4.28	2.08	0.48	2.86
16TH-20TH	10.0	11.22	0.00	87.09	12	0.0	14.40	3.46	0.05	0.05	0.05	0.2	1.67	1.03	0.37	1.25
21ST-25TH	9.9	11.01	15.05	81.72	23	0.0	139.35	13.33	0.43	0.50	0.5	0.7	7.24	2.21	0.08	6.75
26TH-30TH	35.3	19.53	7.48	73.70	107	0.2	334.42	15.11	0.70	0.80	0.74	2.4	6.78	3.07	0.50	5.69
31ST-35TH	118.2	12.64	3.67	79.70	272	2.9	5791.98	93.70	2.98	3.20	3.1	8.8	7.40	1.97	0.93	3.84
36TH-40TH	28.5	17.38	7.33	73.95	66	1.1	7314.50	143.37	4.85	4.96	4.95	2.4	8.39	1.89	0.56	3.98
41ST-45TH	21.2	22.92	14.33	68.37	92	0.1	811.33	12.62	0.87	0.89	0.88	1.0	4.63	3.65	0.79	3.23
46TH-50TH	37.4	11.89	3.85	77.51	82	0.3	1147.90	32.07	1.01	1.07	1.06	3.6	9.65	1.36	0.91	7.90
51ST-55TH	27.6	8.50	4.39	86.90	56	0.2	528.53	33.54	0.88	0.90	0.89	1.0	3.58	1.15	0.85	1.93
56TH & OVER	27.7	9.33	17.68	79.59	95	0.7	2336.75	62.50	2.85	3.86	3.82	2.1	7.18	3.16	0.55	3.46
Classification By Operating Factor																
0-10	3.0	34.06	0.48	1.71	1	1.0	8783.98	8783.98	100.00	95.12	95.12	1.9	64.23	0.00	0.00	30.90
11-20	4.7	25.80	0.06	16.96	14	1.2	7314.50	719.68	52.72	46.05	45.27	1.3	16.06	8.16	0.22	1.37
21-30	11.5	59.74	2.89	26.20	46	0.1	501.08	28.23	4.41	4.41	4.38	1.0	8.14	7.79	0.42	6.51
31-40	15.1	43.19	4.97	35.97	53	1.1	5791.98	180.94	19.21	16.51	16.03	2.6	16.12	3.85	1.35	7.66
41-50	15.3	33.94	10.41	46.22	79	1.0	4064.23	114.49	13.67	12.28	11.95	2.6	16.07	5.70	0.54	9.06
51-60	19.6	26.10	2.55	55.72	83	1.1	3390.77	116.79	9.45	9.39	8.46	2.6	12.21	3.85	0.73	5.72
61-70	37.3	17.12	6.68	66.66	140	0.3	1405.85	21.69	1.46	1.93	1.86	4.8	12.43	3.67	1.90	9.21
71-80	42.4	13.02	6.83	76.43	109	1.1	1977.37	91.76	3.96	3.45	3.42	4.0	9.34	2.10	0.59	6.02
81-90	112.2	8.37	4.90	86.88	277	1.1	1327.68	35.90	1.51	1.21	1.20	4.8	4.28	2.05	0.80	2.40
91-100	186.7	1.45	4.14	96.10	322	0.6	506.15	17.35	0.54	0.51	0.51	4.1	2.18	1.45	0.42	1.27
All Units	**447.9**	**11.47**	**4.84**	**79.95**	**1124**	**8.8**	**8,783.98**	**68.56**	**2.34**	**2.52**	**2.49**	**29.7**	**6.48**	**2.11**	**0.70**	**3.70**

Hydro Units

External Causes Excluded, 2004 to 2008

Table 6.1.2



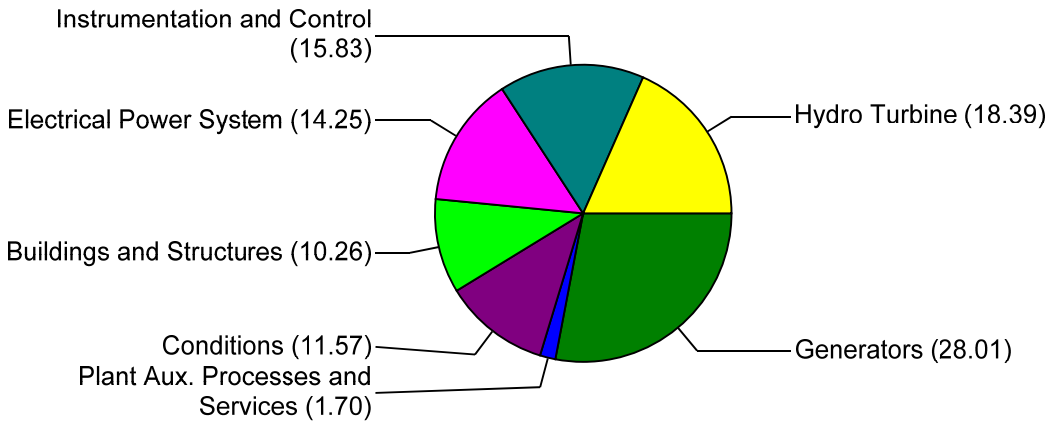
	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
5-23	741.9	11.42	0.61	74.27	2213	23.1	17064.00	91.35	3.78	3.85	3.82	66.5	8.43	2.63	0.88	4.56
24-99	1485.4	12.72	5.60	77.94	4166	16.8	5791.98	35.38	1.40	1.56	1.54	111.0	7.31	2.22	0.64	5.43
100-199	506.1	17.46	3.14	71.92	1473	4.0	2229.63	23.96	1.07	1.13	1.11	42.2	8.13	2.17	0.39	6.82
200-299	118.6	18.23	6.35	65.70	504	2.8	7314.50	49.02	3.48	3.66	3.62	18.9	15.86	2.78	0.98	12.39
300-399	75.9	24.88	0.00	63.32	515	0.5	371.33	8.78	1.06	1.06	1.06	8.8	11.60	3.24	0.44	10.48
400-499	60.1	16.75	8.98	71.09	130	0.6	1947.65	39.69	1.33	1.63	1.59	6.9	11.29	2.20	0.70	9.40
500 & OVER	39.7	12.90	0.00	77.53	91	0.8	1541.13	75.38	2.45	2.45	2.44	3.5	8.83	2.67	1.04	5.84
Classification By Year Of Service																
0	29.9	3.83	0.00	86.57	114	1.7	5391.90	128.63	6.07	6.28	4.23	2.9	9.78	3.74	0.42	3.54
1ST	37.8	3.43	0.34	79.86	134	3.3	8759.98	217.22	9.75	10.00	6.54	6.0	15.58	3.74	1.08	5.60
2ND	33.1	15.77	0.50	65.28	99	4.4	6206.98	385.74	16.71	16.73	15.78	6.1	18.48	3.27	0.78	4.56
3RD	29.4	7.30	0.39	74.54	105	4.0	8759.98	334.26	15.44	15.44	15.39	5.3	17.92	3.83	0.47	3.84
4TH	29.8	2.13	0.65	83.61	128	3.6	8783.98	246.76	12.47	12.50	9.24	4.0	13.44	4.18	0.29	1.14
5TH	37.4	10.03	0.48	77.04	159	1.6	7832.23	86.41	4.80	4.80	4.78	3.6	9.40	4.15	0.30	5.05
6TH-10TH	331.0	10.67	0.56	75.28	1007	9.2	17064.00	80.35	3.34	3.40	2.92	27.0	7.64	2.64	1.19	3.79
11TH-15TH	468.0	15.65	0.62	70.55	1408	6.7	5402.25	41.98	1.88	1.93	1.77	38.2	7.66	2.28	0.62	5.64
16TH-20TH	79.3	17.19	3.24	68.45	267	0.6	1197.08	21.17	1.14	1.14	1.11	9.0	10.93	2.31	0.43	9.72
21ST-25TH	142.6	21.44	3.89	68.75	543	0.6	394.21	9.92	0.62	0.65	0.64	13.6	9.52	2.19	0.41	8.67
26TH-30TH	1020.4	13.34	3.38	76.10	3202	9.2	2953.96	25.21	1.14	1.22	1.11	84.7	8.09	2.52	0.52	6.58
31ST-35TH	213.5	14.88	3.72	76.68	484	4.7	5791.98	85.83	2.79	2.93	2.52	17.1	7.97	1.80	0.86	4.79
36TH-40TH	129.1	22.93	10.46	68.61	331	2.5	7314.50	66.82	2.76	2.96	2.47	10.5	8.10	1.90	1.02	4.99
41ST-45TH	103.3	12.82	11.99	79.43	416	1.0	878.80	21.61	1.20	1.43	1.34	5.6	5.28	3.30	0.77	3.36
46TH-50TH	224.6	13.91	3.94	77.54	499	2.1	1848.21	36.06	1.16	1.23	1.21	18.2	8.07	1.33	0.61	6.49
51ST-55TH	103.2	7.38	4.75	84.61	192	0.7	1091.48	31.12	0.76	0.93	0.89	6.8	6.51	1.36	0.71	5.00
56TH & OVER	111.8	7.80	18.82	81.14	322	2.2	2336.75	60.15	2.33	3.26	3.2	11.3	9.92	2.55	0.62	6.59
Classification By Operating Factor																
0-10	12.9	15.51	0.00	2.42	7	6.6	17064.00	8217.12	95.45	95.45	95.45	10.6	82.07	0.00	0.00	31.31
11-20	14.2	29.11	2.00	15.17	95	0.2	242.01	17.38	4.24	4.28	4.20	1.8	6.50	11.76	1.11	4.70
21-30	117.3	51.82	2.48	25.56	548	7.3	8783.98	116.78	18.71	18.83	17.63	21.4	17.25	7.42	1.07	10.25
31-40	95.6	35.69	3.05	36.26	413	3.2	5402.25	68.73	7.86	7.95	7.79	20.3	19.39	4.32	0.88	15.37
41-50	87.2	36.23	5.49	46.59	365	1.2	1463.30	27.89	2.60	2.72	2.66	10.0	10.69	4.00	1.10	8.29
51-60	241.2	26.17	1.96	56.67	1054	8.2	7812.66	68.00	5.29	5.50	5.37	30.2	11.84	3.43	0.67	7.84
61-70	452.3	18.52	2.79	66.13	1574	10.1	7113.60	56.02	3.11	3.28	3.19	49.8	10.46	2.82	0.92	7.29
71-80	472.8	12.36	2.61	76.10	1643	8.6	6928.63	45.87	2.32	2.31	2.28	44.7	9.24	2.82	0.96	6.47
81-90	948.3	7.07	5.03	86.09	2359	9.2	5791.98	34.17	1.12	1.17	1.14	57.8	6.04	1.98	0.46	4.50
91-100	682.3	1.46	4.10	94.90	1352	3.7	1637.53	24.12	0.58	0.75	0.74	23.5	3.44	1.71	0.42	2.29
All Units	**3124.3**	**13.60**	**3.70**	**75.13**	**9410**	**58.2**	**17,064.00**	**54.21**	**2.35**	**2.46**	**2.44**	**270.2**	**8.39**	**2.39**	**0.67**	**5.80**

Hydro Units

Table 6.1.3

Major Component Outage Code Report, 2004 to 2008

Major Componenent Contribution to Hydro Unit ICbF based on 2004-2008 data.



UNIT STATISTICS

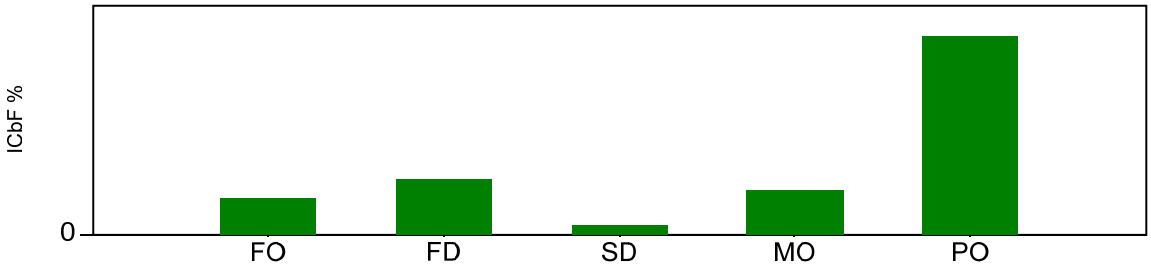
Number of Units:	793.00
Number of Unit Yars:	3248.04
Overall Operating Factor:	75.17

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Buildings and Structures	321	0.09	1220	0.14	115	0.02	1480	0.10	1213	0.53	0.83	0.10	0.11
Conditions	1515	0.11	887	0.06	659	0.05	922	0.06	1075	0.16	0.37	0.11	0.12
Electrical Power System	1224	0.17	344	0.04	45	0.02	1286	0.15	1786	0.54	0.90	0.22	0.24
Generators	2081	0.62	1841	0.17	57	0.04	2558	0.20	3083	2.65	3.61	0.75	0.77
Hydro Turbine	2103	0.80	475	0.10	52	0.01	1503	0.20	1864	1.77	2.88	1.03	1.04
Instrumentation and Control	2421	0.14	382	0.04	50	0.00	1182	0.03	1146	0.29	0.53	0.17	0.17
Plant Aux. Processes and Services	179	0.03	7	0.01	0	0.00	208	0.00	125	0.02	0.06	0.04	0.04
TOTAL (External Causes Included)	9844	1.96	5156	0.56	978	0.14	9139	0.74	10292	5.96	9.18	2.42	2.49
TOTAL (External Causes Excluded)	8473	1.95	4271	0.55	319	0.12	8231	0.77	9278	6.06	9.12	2.35	2.43

Hydro Units

Major Component Outage Code Report, 2004 to 2008

Table 6.1.4
Buildings and Structure



Buildings and Structures ICbF by event type forHydro units based on 2004-2008 data.

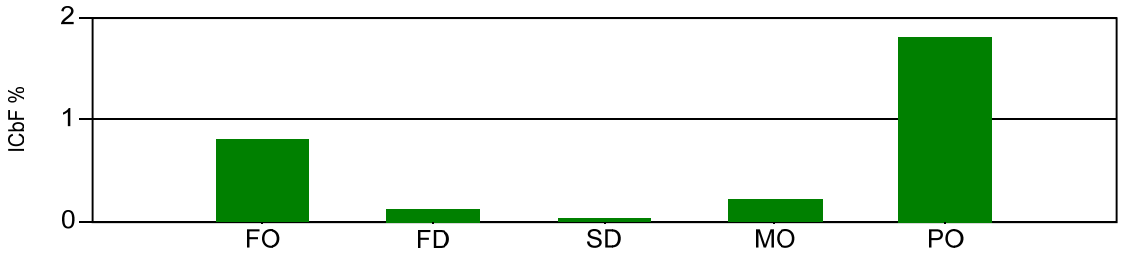
UNIT STATISTICS

Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Buildings and Structures													
22100	Powerhouse Substructure	9	0.00	0	0.00	0	0.00	25	0.00	41	0.02	0.02	0.00
22110	Draft Tubes (Concrete)	1	0.00	0	0.00	1	0.00	22	0.00	4	0.00	0.00	0.00
22121	Scroll Case (Concrete)	4	0.00	0	0.00	0	0.00	9	0.00	7	0.00	0.00	0.00
26000	Water And Earth Retaining Structures	1	0.00	0	0.00	1	0.00	9	0.00	9	0.00	0.00	0.00
26100	Main Dam And Associated Wingwalls - Concrete	0	0.00	0	0.00	1	0.00	3	0.00	7	0.01	0.01	0.00
26200	Main Dam And Associated Wingwalls - Earth And Rock Fill	0	0.00	0	0.00	0	0.00	16	0.00	5	0.01	0.01	0.00
29200	Channels & Tunnels	0	0.00	2	0.00	1	0.00	7	0.00	20	0.01	0.01	0.00
29210	Intake (Headrace) Channel	21	0.02	23	0.00	0	0.00	87	0.00	38	0.01	0.03	0.03
29250	Tailrace (Channel)	16	0.00	6	0.00	8	0.00	394	0.02	69	0.02	0.04	0.00
29260	Tunnels (Including Shafts And Pipelines)	4	0.00	0	0.00	0	0.00	12	0.02	16	0.02	0.04	0.00
29270	Dewatering Structure (Tunnel)	1	0.00	0	0.00	0	0.00	4	0.00	1	0.00	0.00	0.00
29300	Intake Structures Or Control Structures	60	0.01	13	0.01	7	0.00	73	0.01	119	0.06	0.08	0.01
29320	Intake Sectional Service Gates And Followers (Also Stop Logs)	7	0.00	0	0.00	1	0.00	38	0.00	60	0.01	0.02	0.00
29330	Trash Racks And Followers	60	0.03	112	0.03	55	0.01	406	0.02	264	0.03	0.09	0.03
29400	Sluiceway And Spillway (Concrete)	0	0.00	0	0.00	0	0.00	10	0.00	4	0.00	0.00	0.00
29420	Sluice Gates (Power Operated)	2	0.00	0	0.00	10	0.00	11	0.00	5	0.00	0.01	0.00
29440	Fishladders And Log Chutes	0	0.00	0	0.00	0	0.00	4	0.00	10	0.00	0.00	0.00
29500	Headworks	10	0.00	0	0.00	1	0.00	59	0.00	203	0.06	0.07	0.00
29550	Headgates	80	0.01	12	0.00	25	0.00	231	0.01	203	0.22	0.24	0.02
29620	Penstock	27	0.02	1052	0.10	3	0.01	38	0.02	91	0.04	0.15	0.02
29626	Penstock Relief Valve	12	0.00	0	0.00	1	0.00	6	0.00	8	0.01	0.01	0.00
29800	Surge Tanks And Chambers	6	0.00	0	0.00	0	0.00	15	0.00	29	0.00	0.00	0.00
29900	Pump Storage Reservoirs	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
Buildings and Structures Total		**321**	**0.09**	**1220**	**0.14**	**115**	**0.02**	**1480**	**0.10**	**1213**	**0.53**	**0.83**	**0.11**

Hydro Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.1.4
Hydro Turbines



Hydro Turbine ICbF by event type forHydro units based on 2004-2008 data.

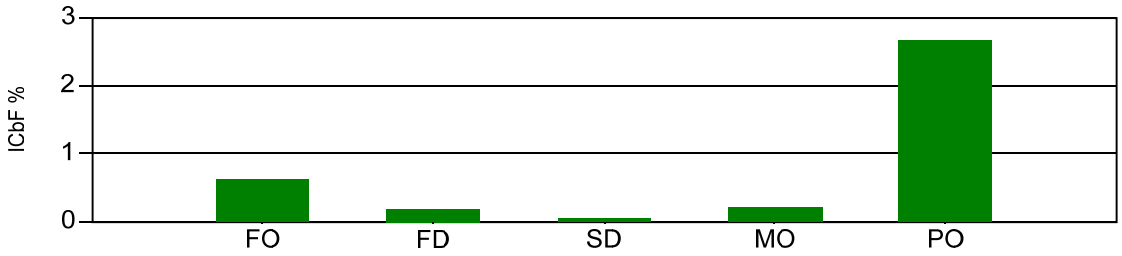
UNIT STATISTICS

Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Hydro Turbine													
41100	Turbines	81	0.21	32	0.02	0	0.00	220	0.03	605	0.95	1.20	0.27
41105	Turbine Aeration Equipment	6	0.00	1	0.00	0	0.00	12	0.00	11	0.00	0.00	0.00
41110	Runner	64	0.09	25	0.02	40	0.00	127	0.10	305	0.42	0.62	0.11
41111	Hub	1	0.02	0	0.00	0	0.00	1	0.00	2	0.02	0.04	0.03
41112	Blades	5	0.03	2	0.00	0	0.00	2	0.00	17	0.01	0.04	0.04
41113	Cone	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
41120	Head Cover	12	0.04	69	0.01	0	0.00	11	0.00	7	0.01	0.07	0.06
41122	Turbine Guide Bearing	243	0.10	28	0.01	1	0.00	121	0.01	92	0.03	0.15	0.13
41123	Turbine Guide Bearing Oil System	63	0.01	0	0.00	0	0.00	39	0.00	23	0.00	0.01	0.01
41124	Turbine Guide Bearing Cooling Equipment	41	0.00	0	0.00	0	0.00	18	0.00	16	0.00	0.01	0.00
41125	Head Cover Drainage	46	0.01	6	0.00	0	0.00	24	0.00	20	0.00	0.01	0.02
41130	Turbine Regulation	33	0.02	0	0.00	3	0.00	27	0.01	56	0.01	0.04	0.02
41132	Wicket Gate (Guidevanes)	31	0.05	3	0.00	0	0.00	24	0.00	28	0.01	0.06	0.06
41133	Wicket Linkage (Including Shear Pin)	315	0.10	112	0.00	0	0.00	87	0.01	26	0.01	0.12	0.13
41139	Nozzle Assembly	3	0.00	3	0.00	0	0.00	8	0.00	17	0.00	0.00	0.00
41140	Scroll Case	6	0.00	0	0.00	0	0.00	12	0.00	4	0.00	0.01	0.00
41145	Pit Liner	1	0.00	0	0.00	0	0.00	3	0.00	3	0.00	0.00	0.00
41150	Turbine Shaft	12	0.00	3	0.00	0	0.00	6	0.00	3	0.01	0.01	0.00
41151	Shaft Seal (Packing, Carbon Seal, Etc.)	51	0.01	170	0.04	1	0.01	84	0.01	54	0.03	0.08	0.01
41160	Inlet Valve	108	0.01	0	0.00	0	0.00	82	0.01	84	0.04	0.05	0.01
41171	Draft Tube Liner	2	0.00	0	0.00	0	0.00	3	0.00	8	0.00	0.00	0.00
41180	Greasing System	1	0.00	0	0.00	0	0.00	32	0.00	17	0.00	0.01	0.00
41700	Governor System	330	0.04	7	0.00	4	0.00	158	0.01	183	0.06	0.11	0.05
41710	Governor	329	0.02	9	0.00	0	0.00	232	0.01	198	0.09	0.12	0.03
41711	Governor Head	3	0.00	0	0.00	0	0.00	10	0.00	4	0.00	0.00	0.00
41712	Governor Gain	1	0.00	0	0.00	0	0.00	20	0.00	0	0.00	0.00	0.00
41713	Speed Detection	51	0.00	2	0.00	0	0.00	22	0.00	11	0.00	0.00	0.00
41714	Governor Feedback	17	0.00	1	0.00	0	0.00	4	0.00	3	0.00	0.00	0.01
41715	Governor Auxiliary Systems	140	0.02	1	0.00	3	0.00	65	0.00	47	0.07	0.10	0.03
41720	Governor Oil Pumps	58	0.02	1	0.00	0	0.00	20	0.00	7	0.00	0.02	0.02
41740	Governor Oil Piping	6	0.00	0	0.00	0	0.00	6	0.00	7	0.00	0.00	0.00
41741	Governor Oil Piping System - Components	16	0.00	0	0.00	0	0.00	6	0.00	5	0.00	0.00	0.00
41742	Governor Oil Piping System - Leakage	19	0.00	0	0.00	0	0.00	11	0.00	1	0.00	0.00	0.00
41743	Governor Oil Piping System - Filters	8	0.00	0	0.00	0	0.00	5	0.00	0	0.00	0.00	0.00
Hydro Turbine Total		**2103**	**0.80**	**475**	**0.10**	**52**	**0.01**	**1503**	**0.20**	**1864**	**1.77**	**2.88**	**1.04**

Hydro Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.1.4
Generators



Generators ICbF by event type forHydro units based on 2004-2008 data.

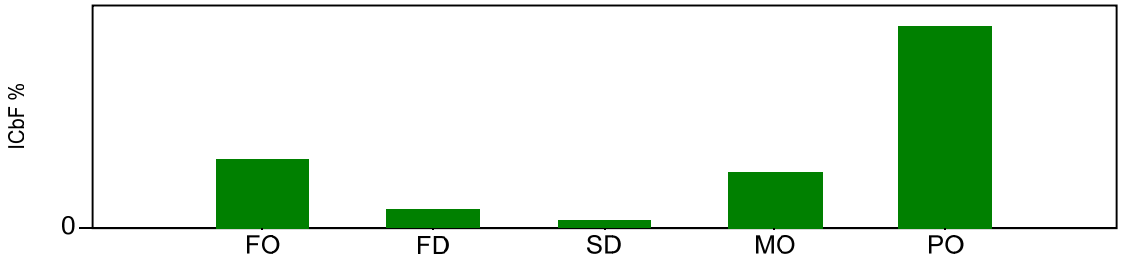
UNIT STATISTICS

Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Generators													
42100	Generators	270	0.12	6	0.00	20	0.00	483	0.05	1743	2.00	2.16	0.15
42110	Generator Rotor	50	0.02	1	0.00	0	0.00	60	0.01	90	0.10	0.12	0.02
42111	Braking/Jacking System	131	0.01	0	0.00	0	0.00	103	0.00	74	0.02	0.03	0.01
42112	Brake Pneumatic System	27	0.01	0	0.00	0	0.00	19	0.00	8	0.00	0.02	0.01
42113	Pole Windings And Connections	18	0.03	8	0.00	1	0.00	20	0.01	14	0.01	0.05	0.03
42114	Slip Rings And Commutator	20	0.01	0	0.00	1	0.00	131	0.01	52	0.01	0.02	0.01
42115	Brushes And Brush Rigging	63	0.00	1	0.00	8	0.00	936	0.06	267	0.09	0.15	0.00
42120	Generator Stator	56	0.03	1068	0.09	3	0.01	28	0.01	174	0.13	0.25	0.04
42121	Generator Stator Terminals	0	0.00	1	0.00	0	0.00	4	0.00	1	0.00	0.00	0.00
42123	Generator Stator Winding	37	0.10	488	0.05	16	0.03	61	0.02	33	0.13	0.27	0.12
42124	Generator Stator Winding Wedges	1	0.00	0	0.00	0	0.00	2	0.00	3	0.00	0.00	0.00
42125	Core Iron	4	0.00	0	0.00	0	0.00	0	0.00	2	0.00	0.00	0.00
42126	Generator Stator Cooling System	32	0.00	7	0.00	0	0.00	43	0.00	24	0.01	0.02	0.00
42170	Thrust And Guide Bearings	147	0.10	17	0.00	0	0.00	54	0.01	35	0.01	0.12	0.13
42171	Thrust Bearing	86	0.08	7	0.00	0	0.00	21	0.00	7	0.00	0.08	0.10
42172	Thrust Bearing Oil System	52	0.00	2	0.00	0	0.00	34	0.00	12	0.01	0.01	0.00
42174	Thrust Bearing Oil Lift System	20	0.00	0	0.00	0	0.00	13	0.00	2	0.00	0.00	0.00
42176	Guide Bearing	34	0.01	191	0.02	0	0.00	11	0.00	4	0.00	0.03	0.02
42177	Guide Bearing Oil System	14	0.00	0	0.00	0	0.00	13	0.00	9	0.00	0.01	0.00
42178	Bearing Oil Cooling System	42	0.01	2	0.00	0	0.00	35	0.00	2	0.00	0.01	0.01
42200	Excitation	527	0.06	28	0.00	8	0.00	260	0.02	230	0.07	0.16	0.08
42210	Exciter Transformer	24	0.00	0	0.00	0	0.00	29	0.00	24	0.01	0.02	0.00
42220	Static Exciter(Thyristors, Diodes, Etc.)	87	0.00	3	0.00	0	0.00	59	0.00	56	0.01	0.01	0.00
42230	Field Breaker	135	0.01	0	0.00	0	0.00	60	0.00	38	0.01	0.02	0.01
42240	Rotating Exciters	11	0.00	1	0.00	0	0.00	20	0.00	6	0.00	0.00	0.00
42260	Automatic Voltage Regulators	193	0.02	10	0.01	0	0.00	59	0.00	173	0.03	0.05	0.03
Generators Total		**2081**	**0.62**	**1841**	**0.17**	**57**	**0.04**	**2558**	**0.20**	**3083**	**2.65**	**3.61**	**0.77**

Hydro Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.1.4
Elec. Power Sys.



Electrical Power System ICbF by event type forHydro units based on 2004-2008 data.

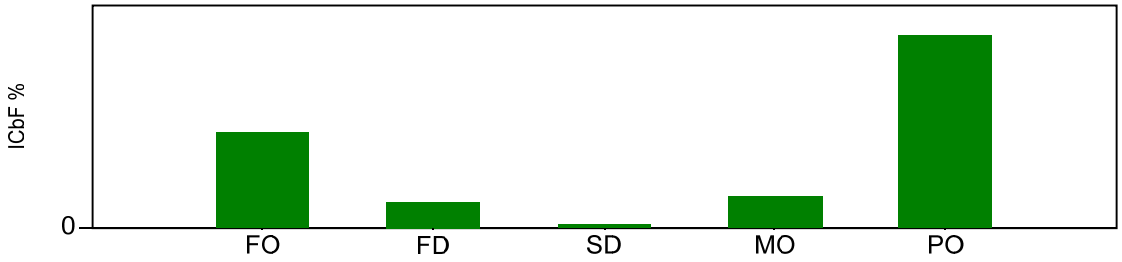
UNIT STATISTICS

Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Electrical Power System													
51100	Output System Generator Voltage	77	0.01	10	0.00	4	0.00	90	0.02	70	0.03	0.06	0.02
51120	Generator Power Transformers	360	0.06	275	0.04	14	0.01	391	0.08	784	0.21	0.37	0.08
51130	Switching Equipment - Generator Voltage	15	0.00	0	0.00	0	0.00	21	0.00	38	0.03	0.03	0.01
51133	Circuit Breakers - Generator Voltage	381	0.06	4	0.00	0	0.00	367	0.03	429	0.14	0.22	0.07
51136	Disconnect Switches - Generator Voltage	97	0.01	1	0.00	4	0.00	129	0.01	197	0.05	0.07	0.02
51150	Bus Duct, Bus, Cable	116	0.03	28	0.00	6	0.01	95	0.01	160	0.08	0.12	0.03
51151	Bus Duct Cooling System	8	0.00	25	0.00	1	0.00	11	0.00	4	0.00	0.00	0.00
51170	Generator Neutral Grounding Equipment	6	0.00	0	0.00	0	0.00	3	0.00	4	0.00	0.00	0.01
52100	Generator Voltage Supply System	29	0.00	0	0.00	1	0.00	22	0.00	28	0.00	0.01	0.00
52120	Station Service Transformer	14	0.00	0	0.00	4	0.00	48	0.00	13	0.00	0.00	0.00
52130	Unit Service Transformer	10	0.00	0	0.00	2	0.00	9	0.00	7	0.00	0.00	0.00
53000	Station Power Distribution	65	0.00	1	0.00	9	0.00	74	0.00	34	0.00	0.01	0.00
55000	Direct Current Power Supplies	46	0.00	0	0.00	0	0.00	26	0.00	18	0.00	0.01	0.00
Electrical Power System Total		**1224**	**0.17**	**344**	**0.04**	**45**	**0.02**	**1286**	**0.15**	**1786**	**0.54**	**0.90**	**0.24**

Hydro Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.1.4
Ins. And Controls



Instrumentation and Control ICbF by event type forHydro units based on 2004-2008 data.

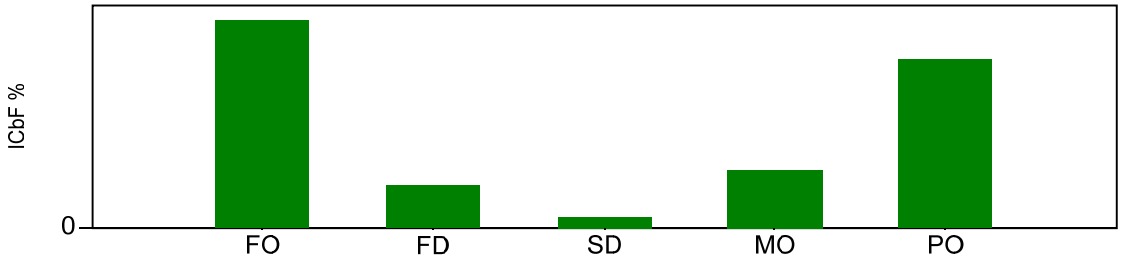
UNIT STATISTICS

Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Instrumentation and Control													
64100	Hydraulic Turbine And Auxiliaries - Instruments & Control	127	0.01	7	0.00	9	0.00	56	0.00	28	0.01	0.03	0.01
64112	Turbine Guide Bearing - Instruments	33	0.01	105	0.01	0	0.00	12	0.00	4	0.00	0.02	0.01
64170	Governor - Instruments And Controls	172	0.01	3	0.02	0	0.00	77	0.01	46	0.00	0.03	0.01
64171	Governor Oil System - Instruments And	43	0.00	0	0.00	0	0.00	6	0.00	4	0.00	0.00	0.00
64200	Generator And Auxiliaries -	437	0.04	132	0.01	20	0.00	281	0.02	189	0.05	0.12	0.06
64210	Supervisory Control & Data Acquisition -	156	0.01	36	0.00	4	0.00	121	0.00	18	0.01	0.03	0.01
64211	Generator Brakes - Instruments And	31	0.00	0	0.00	0	0.00	30	0.00	3	0.00	0.00	0.00
64216	Generator Thrust Bearing - Instruments	26	0.00	2	0.00	0	0.00	13	0.00	4	0.00	0.00	0.00
64217	Generator Guide Bearing - Instruments & Control	18	0.00	12	0.00	0	0.00	8	0.00	3	0.00	0.01	0.00
64220	Excitation Instrumentation & Control	118	0.01	0	0.00	0	0.00	68	0.00	36	0.00	0.01	0.01
64260	Synchronous Condensor - Instrumentation & Control	12	0.00	0	0.00	1	0.00	4	0.00	23	0.01	0.01	0.00
65100	Main Power Output Systems -	117	0.00	5	0.00	4	0.00	56	0.00	75	0.01	0.01	0.01
65200	Station Service Main Transformation - Instruments & Control	7	0.00	1	0.00	0	0.00	7	0.00	9	0.00	0.00	0.00
65300	Station Service Power Distribution - Instruments & Control	41	0.00	0	0.00	0	0.00	37	0.00	27	0.00	0.01	0.00
65500	Direct Current Power Supplies - Instruments & Control	38	0.00	0	0.00	0	0.00	10	0.00	4	0.00	0.00	0.00
65900	System Control	360	0.02	6	0.00	0	0.00	237	0.00	509	0.15	0.17	0.02
66000	Telecom and Communications	641	0.03	73	0.00	4	0.00	106	0.00	153	0.05	0.08	0.03
67000	Plant Auxiliary Processes And Services - Instruments & Control	44	0.00	0	0.00	8	0.00	53	0.00	11	0.00	0.00	0.00
Instrumentation and Control Total		**2421**	**0.14**	**382**	**0.04**	**50**	**0.00**	**1182**	**0.03**	**1146**	**0.29**	**0.53**	**0.17**

Hydro Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.1.4
Aux. Processes



Plant Aux. Processes and Services ICbF by event type forHydro units based on 2004-2008 data.

UNIT STATISTICS

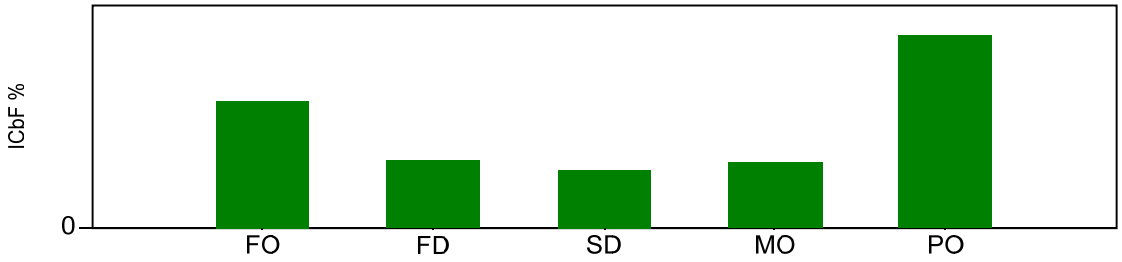
Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Plant Aux. Processes and Services													
72300	Cooling Water Systems	120	0.02	6	0.01	0	0.00	123	0.00	77	0.02	0.05	0.03
72400	Fire Protection Water System	40	0.01	0	0.00	0	0.00	65	0.00	35	0.00	0.01	0.01
72600	Turbine Dewatering & Rewatering Piping System	1	0.00	0	0.00	0	0.00	8	0.00	6	0.00	0.00	0.00
75000	Compressed Air To Brakes & Governor	16	0.00	1	0.00	0	0.00	3	0.00	7	0.00	0.00	0.00
75140	Water Depressing System	2	0.00	0	0.00	0	0.00	8	0.00	0	0.00	0.00	0.00
75220	Fixed Fire Protection CO2 & Halon System	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
Plant Aux. Processes and Services Total		**179**	**0.03**	**7**	**0.01**	**0**	**0.00**	**208**	**0.00**	**125**	**0.02**	**0.06**	**0.04**

Hydro Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.1.4
Conditions



Conditions ICbF by event type forHydro units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	793.00
Number of Unit Years:	3248.04
Overall Operating Factor:	75.17

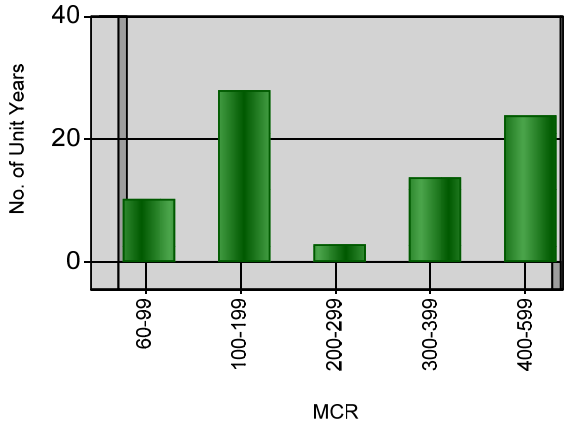
		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Conditions													
00500	Regulatory Bodies	16	0.00	359	0.01	54	0.01	309	0.01	246	0.02	0.03	0.00
05200	Transmission Limitations	563	0.02	259	0.01	39	0.01	325	0.03	321	0.08	0.13	0.02
05201	Powerhouse Substation (non-generating unit equipment)	15	0.00	1	0.00	0	0.00	10	0.00	33	0.02	0.02	0.00
05202	Transmission Line (connected to powerhouse substation)	80	0.00	0	0.00	0	0.00	4	0.00	17	0.00	0.00	0.00
05203	Transmission Equipment (beyond transmission line)	46	0.00	0	0.00	0	0.00	0	0.00	10	0.00	0.00	0.00
07010	Site Environment, Storms, Floods	254	0.00	4	0.00	0	0.00	29	0.00	100	0.00	0.01	0.00
07060	Upstream Water Conditions	40	0.02	107	0.02	508	0.03	18	0.01	3	0.01	0.05	0.01
07070	Downstream Water Conditions	5	0.00	9	0.00	55	0.00	17	0.00	45	0.00	0.01	0.00
07080	Headpond Ice Cover	120	0.06	30	0.01	0	0.00	38	0.00	5	0.00	0.07	0.08
08160	Fire, General	7	0.00	0	0.00	0	0.00	1	0.00	2	0.00	0.00	0.00
08940	Labour Troubles	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
99999	Other	367	0.01	118	0.01	3	0.00	171	0.01	293	0.03	0.05	0.01
Conditions Total		**1515**	**0.11**	**887**	**0.06**	**659**	**0.05**	**922**	**0.06**	**1075**	**0.16**	**0.37**	**0.12**

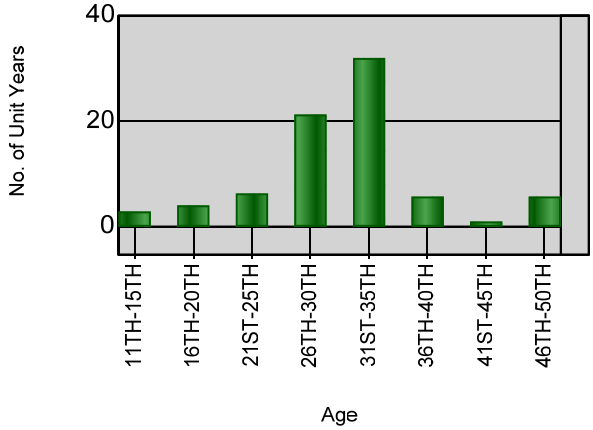
6.2 Fossil Summary Statistics

Fossil Units

External Causes Excluded, 2008 Data

Table 6.2.1



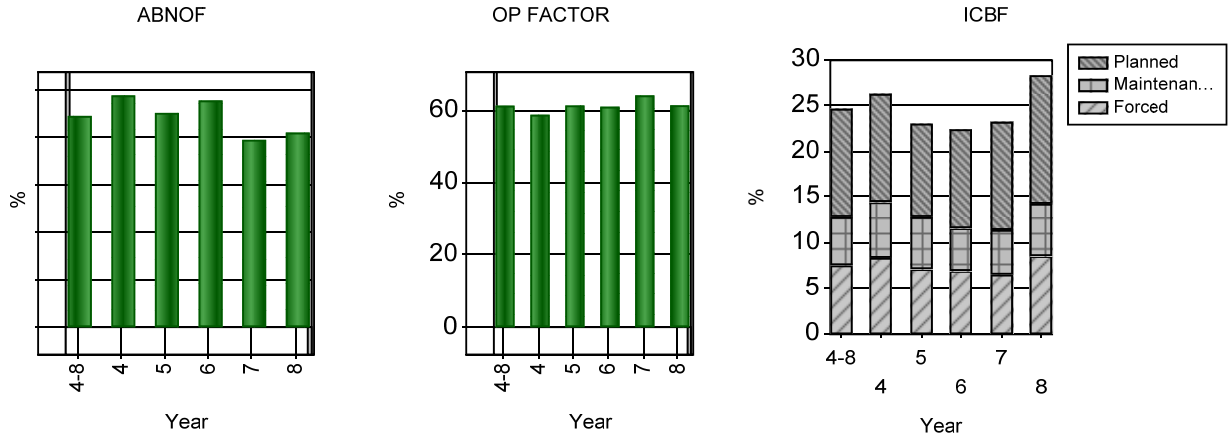


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	10.3	32.94	0.00	46.78	52	0.5	907.80	78.12	7.89	10.94	10.59	2.0	18.51	7.95	1.61	10.57
100-199	28.0	20.71	3.59	59.04	172	1.0	1344.02	51.77	5.59	7.08	6.85	5.7	20.02	8.75	1.75	13.51
200-299	2.9	10.35	0.00	73.31	24	0.1	274.33	34.40	3.93	4.87	4.75	0.4	14.70	6.76	2.50	7.44
300-399	13.8	16.60	0.00	61.70	101	0.6	342.98	48.00	4.64	9.18	8.97	2.4	15.26	8.53	0.36	6.54
400-599	23.9	15.42	0.00	59.63	250	2.0	883.55	68.47	10.94	17.05	16.79	6.5	26.02	11.89	3.90	9.06
Classification By Year Of Service																
11TH-15TH	2.9	0.02	0.00	85.25	21	0.1	263.00	52.19	4.49	5.27	5.1	0.4	12.52	7.14	0.68	6.62
16TH-20TH	4.0	0.15	0.00	90.29	24	0.1	152.32	47.48	3.33	4.46	4.35	0.4	9.05	5.82	0.19	4.54
21ST-25TH	6.3	4.39	0.00	64.15	80	0.6	620.07	66.74	10.31	13.76	13.63	1.7	24.35	11.69	0.83	11.28
26TH-30TH	21.3	17.80	2.30	64.53	181	0.7	763.50	34.11	4.56	7.63	7.29	3.8	17.38	10.66	1.34	10.25
31ST-35TH	32.0	26.98	1.55	47.24	227	2.0	1344.02	77.99	10.48	15.83	15.51	8.5	25.50	10.31	3.38	11.94
36TH-40TH	5.7	10.76	0.00	77.20	39	0.1	97.82	24.08	2.13	5.54	5.5	0.6	10.14	7.10	1.60	3.82
41ST-45TH	1.0	24.76	0.00	54.30	4	0.0	62.58	24.05	1.98	1.98	1.96	0.2	20.93	7.35	0.41	19.43
46TH-50TH	5.7	33.08	0.00	41.76	23	0.4	907.80	142.15	11.34	16.15	16.13	1.4	22.21	6.17	2.66	10.26
Classification By Operating Factor																
0-10	13.4	72.75	3.85	5.04	26	0.4	907.80	149.43	43.29	39.58	39.40	3.0	22.30	14.74	1.28	17.47
11-20	1.7	23.60	29.80	20.86	3	0.0	177.62	70.91	6.31	8.61	8.50	0.9	55.78	5.68	0.18	53.40
31-40	3.9	28.52	0.00	36.67	30	0.4	883.55	125.63	21.68	23.88	23.27	1.4	34.96	10.20	5.07	16.89
41-50	9.1	23.61	0.00	46.68	95	0.7	620.07	65.26	11.13	15.90	15.39	2.4	24.01	12.39	1.58	11.56
51-60	9.0	15.09	0.00	56.26	70	0.4	212.35	54.37	6.13	11.84	11.69	2.4	23.84	9.02	3.47	10.47
61-70	7.4	6.81	0.00	65.16	71	0.6	674.37	69.33	8.71	15.05	15.00	2.1	25.98	10.36	4.55	8.27
71-80	8.8	4.00	0.00	76.13	97	0.6	763.50	54.49	8.12	12.31	12.00	2.1	23.43	11.72	3.67	8.42
81-90	17.4	0.20	0.00	86.69	121	0.7	1344.02	47.37	3.80	6.58	6.34	2.1	11.63	6.70	0.96	4.15
91-100	8.3	0.00	0.00	94.55	86	0.2	128.72	22.64	2.72	4.42	4.33	0.6	6.75	10.69	0.33	2.04
All Units	**79.0**	**19.54**	**1.23**	**58.65**	**599**	**4.1**	**1,344.02**	**59.70**	**7.26**	**11.01**	**10.75**	**17.0**	**20.55**	**9.49**	**2.15**	**10.25**

Fossil Units

External Causes Excluded, 2004 to 2008 Data

Table 6.2.2

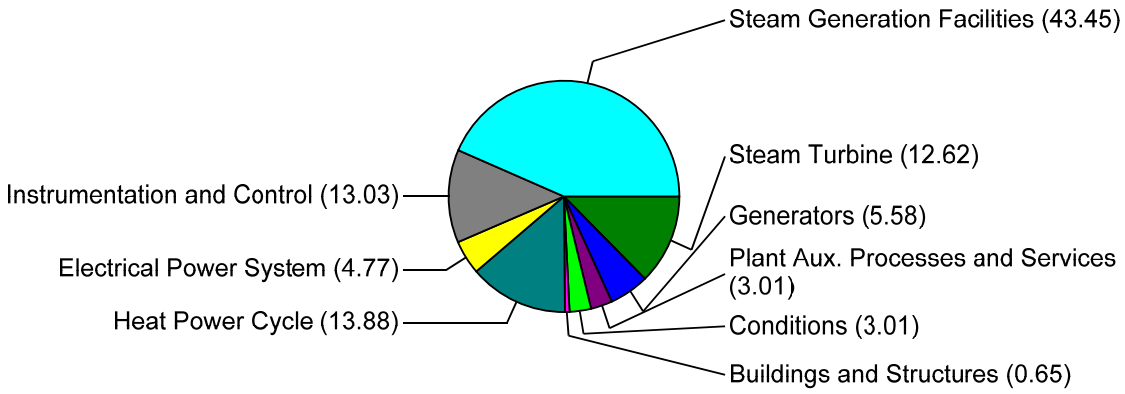


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	52.9	43.14	0.32	36.18	254	2.7	3688.95	91.56	10.41	15.42	14.62	10.2	18.29	9.22	4.14	6.75
100-199	154.3	25.23	4.36	57.60	1034	5.3	2894.31	45.32	5.38	6.83	6.41	25.4	16.09	9.41	1.51	10.02
200-299	15.9	9.11	0.00	67.43	262	1.0	890.78	34.66	7.85	10.73	10.03	3.4	19.80	14.92	2.85	8.20
300-399	60.7	8.32	0.00	74.29	485	2.4	1774.03	43.87	4.46	6.99	6.86	9.0	13.94	8.68	0.37	7.14
400-599	112.2	14.83	0.00	62.26	1163	7.4	2978.43	55.96	8.95	14.58	14.11	28.1	24.22	11.01	4.27	8.98
Classification By Year Of Service																
6TH-10TH	3.0	0.05	0.00	87.52	23	0.1	232.58	33.31	3.18	3.59	3.46	0.3	11.64	7.51	0.46	7.90
11TH-15TH	19.6	0.08	0.00	88.68	137	0.4	263.00	27.06	2.28	3.33	3.11	2.1	10.32	6.77	0.66	6.38
16TH-20TH	17.9	0.34	0.00	89.64	133	0.5	451.75	35.43	3.16	3.79	3.17	1.7	9.37	7.58	0.25	5.43
21ST-25TH	54.1	11.18	1.54	70.13	460	2.4	2894.31	45.74	5.49	6.92	5.92	9.2	16.39	9.20	1.04	9.72
26TH-30TH	196.9	28.40	2.72	52.73	1494	9.1	2978.43	53.48	7.56	11.85	10.38	38.8	19.19	10.20	2.72	8.99
31ST-35TH	50.3	21.17	0.97	54.43	450	2.9	1435.16	56.57	8.28	12.20	10.14	11.6	21.66	11.60	2.78	10.14
36TH-40TH	21.8	9.77	0.00	70.35	285	1.1	880.58	34.44	5.84	8.58	7.58	3.4	14.45	13.09	1.42	5.84
41ST-45TH	11.8	40.19	0.00	29.56	97	1.1	3688.95	97.14	20.59	26.17	19.42	3.5	28.20	15.05	3.23	13.62
46TH-50TH	20.7	25.26	0.80	48.41	119	1.2	1737.25	90.20	9.23	15.35	12.07	5.4	24.50	8.49	8.44	6.23
Classification By Operating Factor																
0-10	45.7	80.12	0.38	5.11	70	1.8	3688.95	219.06	34.22	35.77	30.81	6.1	12.96	9.07	1.15	7.71
11-20	27.9	68.93	4.79	12.91	101	0.4	595.98	30.56	8.82	11.94	9.34	5.1	18.26	10.47	2.84	13.60
21-30	9.8	48.28	19.41	26.79	94	0.8	1872.91	74.47	20.14	24.84	23.31	2.3	22.02	16.16	1.78	9.29
31-40	13.8	39.60	11.89	35.18	96	0.6	1630.08	56.19	9.55	13.43	11.22	3.2	21.88	9.44	3.80	11.79
41-50	40.6	26.32	3.00	46.37	210	1.5	1737.25	62.45	6.88	11.49	10.82	11.5	27.57	8.28	6.46	14.60
51-60	22.5	22.35	0.00	54.55	211	1.4	2894.31	56.86	9.74	12.14	11.05	5.2	22.61	11.36	2.91	12.00
61-70	50.0	6.77	0.00	66.29	522	4.0	2978.43	67.61	10.37	18.31	17.98	16.1	31.61	10.15	5.94	11.01
71-80	73.5	0.93	0.65	76.23	778	4.6	1162.73	51.53	6.20	9.87	9.76	14.3	17.59	9.61	1.72	6.20
81-90	62.3	0.01	0.00	85.59	735	2.6	1774.03	30.94	4.33	6.22	6.07	8.4	12.99	12.07	0.44	6.59
91-100	49.8	0.06	0.00	92.18	381	1.3	763.50	30.22	2.76	3.16	3.10	3.9	7.78	7.84	0.43	4.29
All Units	**396.1**	**21.40**	**1.72**	**59.04**	**3198**	**18.9**	**3,688.95**	**51.77**	**6.86**	**10.18**	**9.76**	**76.0**	**18.49**	**9.98**	**2.52**	**8.76**

Fossil Units — Table 6.2.3

Major Component Outage Code Report, 2004 to 2008

Major Componenent Contribution to Fossil Unit ICbF based on 2004-2008 data.



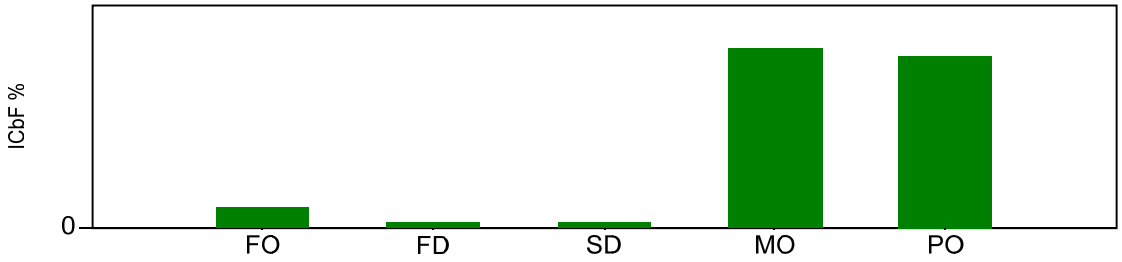
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Yars:	422.23
Overall Operating Factor:	62.26

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Buildings and Structures	3	0.00	0	0.00	2	0.00	19	0.04	9	0.04	0.08	0.01	0.01
Conditions	105	0.56	10303	3.57	239	0.54	27	0.40	8	0.44	4.00	0.25	0.80
Electrical Power System	160	0.24	269	0.09	36	0.02	40	0.05	26	0.10	0.45	0.33	0.35
Generators	157	0.61	283	0.12	102	0.03	76	0.24	26	0.43	1.33	0.87	0.90
Heat Power Cycle	339	0.65	2896	2.06	228	0.47	287	0.84	12	0.48	2.99	0.39	0.92
Instrumentation and Control	535	0.32	1624	0.72	421	0.11	56	0.10	11	0.10	1.11	0.38	0.49
Plant Aux. Processes and Services	61	0.16	656	0.43	325	0.25	53	0.16	23	0.47	1.23	0.14	0.22
Steam Generation Facilities	1208	4.07	21904	11.54	2116	2.86	499	2.80	245	7.47	22.02	3.51	5.73
Steam Turbine	384	0.91	911	0.82	1180	0.66	121	0.69	88	2.02	4.53	1.16	1.23
TOTAL (External Causes Included)	2952	7.52	38846	19.35	4649	4.94	1178	5.32	448	11.55	37.74	7.04	10.65
TOTAL (External Causes Excluded)	2855	7.31	28548	16.47	4411	4.67	1153	5.15	441	11.63	35.08	7.22	10.47

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Building and Structure



Buildings and Structures ICbF by event type forFossil units based on 2004-2008 data.

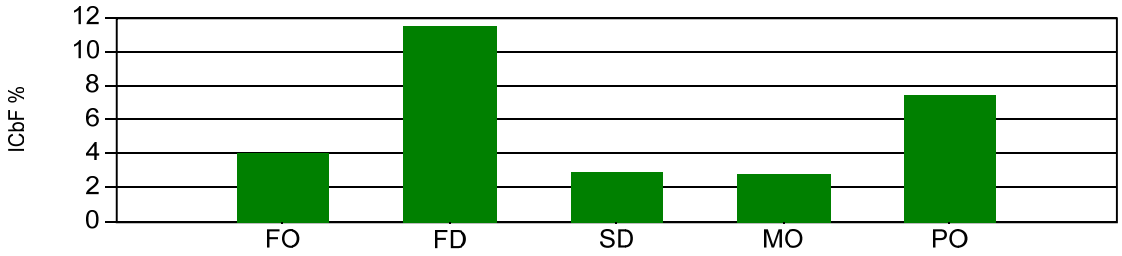
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Buildings and Structures													
22000	Powerhouse	1	0.00	0	0.00	0	0.00	2	0.01	0	0.00	0.01	0.01
23290	Chimney	2	0.00	0	0.00	2	0.00	17	0.03	9	0.04	0.07	0.00
Buildings and Structures Total		**3**	**0.00**	**0**	**0.00**	**2**	**0.00**	**19**	**0.04**	**9**	**0.04**	**0.08**	**0.01**

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Steam Generators



Steam Generation Facilities ICbF by event type forFossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Steam Generation Facilities													
31000	Steam Generator/HRSG	151	0.51	1590	1.27	437	0.53	83	0.55	225	5.74	7.68	0.69
31120	Primary Air Fans - Pulverized Fuel	16	0.10	1176	0.83	56	0.11	10	0.10	0	0.08	0.90	0.15
31130	Primary Air Fan Drives - Pulverized Fuel	1	0.01	48	0.03	0	0.01	0	0.01	0	0.01	0.03	0.01
31150	Air Heaters	36	0.10	312	0.29	8	0.03	68	0.15	0	0.03	0.47	0.15
31170	Primary Air Duct - Pulverized Fuel	7	0.01	27	0.01	4	0.00	1	0.00	0	0.00	0.02	0.01
31210	Coal Feeders (Gravimetric Or Volumetric)	5	0.08	2482	0.44	119	0.10	1	0.08	0	0.08	0.46	0.12
31220	Pulverized Fuel Burner Piping And Valves	6	0.06	747	0.26	33	0.07	8	0.06	0	0.05	0.28	0.07
31230	Oil Burner Piping And Valves	1	0.00	1	0.00	1	0.00	1	0.00	0	0.00	0.00	0.00
31240	Gas Burner Piping And Valves	4	0.00	17	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
31250	Pulverizers	13	0.44	5624	2.99	1034	1.06	5	0.44	0	0.44	3.61	0.52
31262	Pulverizer Motors	0	0.01	51	0.04	3	0.01	0	0.01	0	0.01	0.05	0.01
31270	Burners And Windboxes	16	0.01	71	0.04	6	0.01	3	0.01	0	0.00	0.06	0.01
31280	Igniters	12	0.01	147	0.04	0	0.01	2	0.01	0	0.01	0.04	0.02
31300	Sootblower Systems	2	0.01	177	0.10	5	0.01	2	0.02	2	0.03	0.12	0.02
31510	Steam Drum - Scrubbers,Separators, Etc.	6	0.00	6	0.00	0	0.00	0	0.00	1	0.03	0.03	0.00
31530	Steam Generating Tubes (Between Steam Drum and Mud Drum)	17	0.06	9	0.02	0	0.00	7	0.02	0	0.00	0.08	0.08
31540	Waterwalls	300	0.76	147	0.08	0	0.01	57	0.16	2	0.03	1.03	1.14
31550	Circulating Pumps	10	0.02	71	0.06	10	0.01	4	0.02	1	0.01	0.08	0.02
31560	Circulating Pumps Drives	3	0.01	203	0.10	2	0.01	3	0.01	0	0.01	0.11	0.01
31570	Safety Valves	17	0.06	242	0.17	105	0.06	14	0.03	0	0.02	0.26	0.07
31580	Water Gauges	2	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
31701	Superheater/High Pressure Section	166	0.45	249	0.08	54	0.07	13	0.04	2	0.07	0.65	0.67
31702	Reheater	71	0.25	67	0.04	1	0.01	9	0.03	1	0.01	0.31	0.36
31703	Economizer/Low Pressure Section	62	0.13	22	0.01	0	0.00	6	0.01	0	0.00	0.14	0.19
31810	Attemperation	8	0.01	53	0.01	3	0.00	4	0.01	1	0.03	0.05	0.02
31820	Burner Tilt	0	0.00	10	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
31832	Flue Gas-Recirculation Fans	4	0.03	144	0.11	5	0.02	6	0.04	0	0.02	0.14	0.04
31833	Recirculation Fans Variable Speed	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
31834	Flue Gas Recirculation Motors	0	0.00	11	0.01	0	0.00	1	0.01	0	0.00	0.02	0.00
32100	Forced Draft Ducts	2	0.00	6	0.01	3	0.01	3	0.00	0	0.00	0.01	0.00
32310	Forced Draft Fans	38	0.12	207	0.37	16	0.11	20	0.11	0	0.10	0.43	0.18
32320	Forced Draft Fan Variable Speed Coupling	7	0.01	18	0.00	0	0.00	1	0.00	0	0.00	0.01	0.01
32330	Forced Draft Fan Motors	0	0.02	57	0.06	2	0.02	0	0.02	0	0.02	0.06	0.02
32400	Induced Draft Flues	1	0.00	1	0.00	0	0.00	9	0.01	1	0.00	0.01	0.00
32510	Induced Draft Fans	52	0.10	1134	0.77	34	0.09	26	0.11	0	0.07	0.87	0.15
32520	Induced Draft Fan Variable Speed Coupling Drives	3	0.01	1	0.00	1	0.00	4	0.01	0	0.00	0.02	0.01
32530	Induced Draft Fan Motors	7	0.01	121	0.06	4	0.01	1	0.01	1	0.02	0.09	0.02
33100	Main Steam Piping	22	0.06	11	0.01	1	0.00	15	0.03	2	0.04	0.14	0.09
33200	Hot Reheat Piping	3	0.01	4	0.00	0	0.00	1	0.00	0	0.00	0.01	0.02
33300	Cold Reheat Piping	4	0.01	0	0.00	0	0.00	1	0.00	0	0.00	0.01	0.01

Fossil Units

Detail Component Outage Code Report, 2004 to 2008

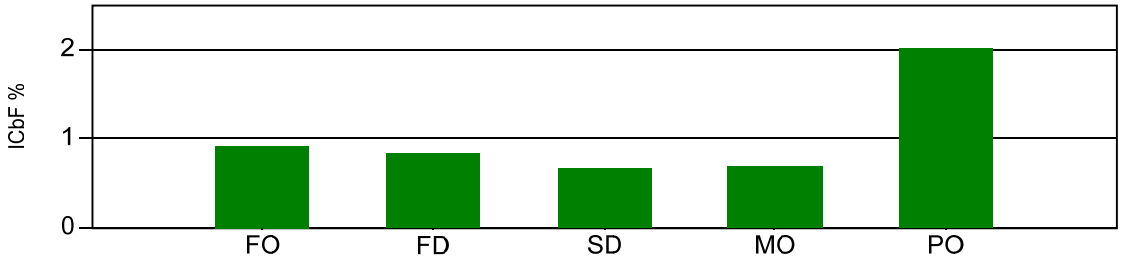
Table 6.2.4
Steam Generators

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Generation Facilities													
33600	High Pressure Steam Piping	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
34100	Furnace And Water Gauge Television	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
34200	Boiler Blowdown System	5	0.01	49	0.02	0	0.00	1	0.00	0	0.00	0.02	0.01
34400	Boiler Drains System	4	0.01	12	0.00	0	0.00	3	0.00	0	0.00	0.01	0.01
35110	Furnace Ash Removal System	44	0.12	816	0.31	20	0.09	12	0.10	1	0.09	0.37	0.17
35120	Pulverizer Pyrites Removal System	1	0.01	290	0.04	8	0.01	0	0.01	0	0.01	0.05	0.01
35130	Fly Ash Removal System - Dry Transportation	2	0.02	130	0.06	8	0.02	9	0.05	0	0.01	0.11	0.02
35140	Fly Ash Removal System - Wet	4	0.00	16	0.01	8	0.00	5	0.00	0	0.00	0.01	0.00
35210	Precipitators-Electrostatic	27	0.29	3644	2.35	41	0.25	66	0.39	1	0.26	2.58	0.43
35220	Precipitators-Mechanical	1	0.00	6	0.00	0	0.00	1	0.00	1	0.04	0.04	0.00
35230	Precipitators-Baghouse	0	0.00	16	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
36100	Coal Receiving Systems	1	0.00	68	0.02	8	0.01	1	0.00	0	0.00	0.02	0.00
36200	Coal Storage Systems	2	0.04	994	0.19	15	0.04	0	0.04	1	0.04	0.20	0.06
36300	Coal Handling Systems	23	0.08	466	0.17	32	0.06	2	0.05	0	0.05	0.22	0.12
36370	Coal Stacker/Reclaimer Machine	1	0.00	6	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
36400	Coal Processing Systems	0	0.00	18	0.01	2	0.00	0	0.00	0	0.00	0.01	0.00
37100	Fuel Oil Receiving Systems	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
37300	Fuel Oil Transfer Systems	0	0.00	0	0.00	6	0.00	0	0.00	2	0.01	0.01	0.00
37400	Fuel Oil Forwarding Systems	2	0.00	4	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
37500	Fuel Oil Boosting Systems	3	0.00	5	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
37600	Fuel Oil Heating Systems	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
38000	Sulphur Oxides Removal System	11	0.01	41	0.02	20	0.00	6	0.04	0	0.00	0.06	0.01
38300	IN-FURNACE BED LIMESTONE INJECTION SYS	0	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
38400	FLUID BED LIMESTONE INJECTION SYSTEM	0	0.00	53	0.02	0	0.00	0	0.00	0	0.00	0.02	0.00
Steam Generation Facilities Total		**1208**	**4.07**	**21904**	**11.54**	**2116**	**2.86**	**499**	**2.80**	**245**	**7.47**	**22.02**	**5.73**

Fossil Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Steam Turbine



Steam Turbine ICbF by event type forFossil units based on 2004-2008 data.

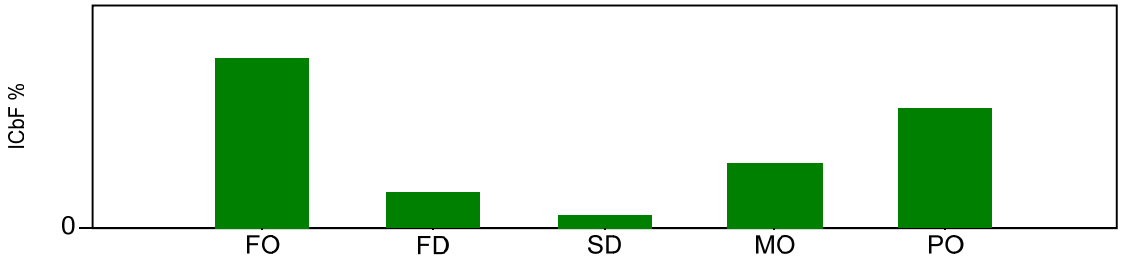
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Steam Turbine													
41100	Turbine	140	0.56	458	0.56	199	0.24	49	0.41	77	1.63	3.17	0.80
41110	Cylinders	4	0.03	8	0.01	0	0.00	0	0.00	0	0.00	0.03	0.04
41120	Rotors	9	0.03	19	0.03	4	0.18	2	0.02	0	0.02	0.19	0.01
41121	Shaft Coupling Mechanism	2	0.00	0	0.00	0	0.00	4	0.03	3	0.19	0.22	0.00
41130	Blades	0	0.00	4	0.00	0	0.00	2	0.00	1	0.02	0.03	0.00
41140	Crossover Piping	4	0.00	6	0.00	0	0.00	1	0.01	1	0.03	0.04	0.01
41150	Turning Gear	5	0.01	0	0.00	0	0.00	0	0.00	0	0.00	0.01	0.01
41157	Turning Gear Motor	2	0.00	0	0.00	0	0.00	2	0.00	0	0.00	0.00	0.00
41160	Valve Gear	48	0.06	71	0.04	53	0.01	26	0.10	3	0.05	0.23	0.09
41170	Bearings And Pedestals	29	0.02	53	0.02	1	0.00	3	0.01	1	0.03	0.07	0.03
41200	Lubricating Oil System	33	0.03	7	0.00	0	0.00	6	0.01	0	0.00	0.05	0.05
41500	Gland Seal System-Steam	10	0.02	3	0.00	1	0.00	8	0.02	1	0.00	0.04	0.04
41540	Gland Seal System-Water	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
41600	Turbovisory	37	0.05	25	0.01	6	0.00	3	0.00	0	0.00	0.06	0.08
41700	Governing System	60	0.10	256	0.15	916	0.23	15	0.08	1	0.05	0.39	0.07
Steam Turbine Total		**384**	**0.91**	**911**	**0.82**	**1180**	**0.66**	**121**	**0.69**	**88**	**2.02**	**4.53**	**1.23**

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Generators



Generators ICbF by event type forFossil units based on 2004-2008 data.

UNIT STATISTICS

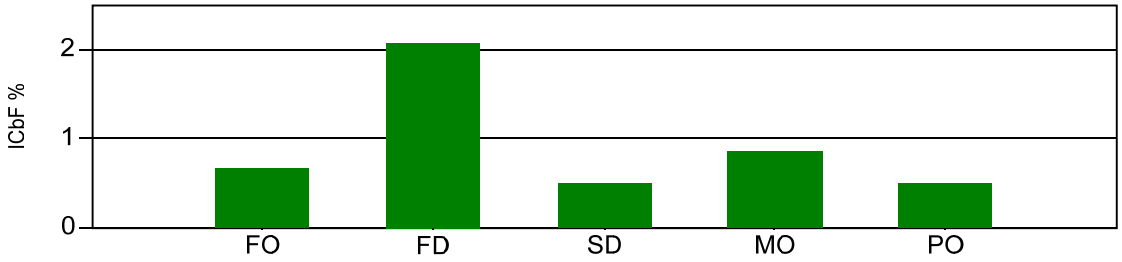
Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Generators													
42100	Generator	29	0.06	32	0.02	18	0.01	6	0.01	15	0.21	0.29	0.08
42110	Generator Rotor	9	0.08	53	0.02	15	0.00	2	0.02	6	0.16	0.27	0.11
42111	Generator Bearings	10	0.12	43	0.01	0	0.00	3	0.02	0	0.00	0.15	0.18
42112	Generator Hydrogen Seals	11	0.09	3	0.00	0	0.00	4	0.02	2	0.04	0.15	0.14
42114	Generator Collector And Brushes	3	0.00	8	0.00	2	0.00	19	0.04	3	0.00	0.04	0.00
42120	Generator Stator	3	0.02	8	0.00	1	0.00	0	0.00	0	0.00	0.02	0.03
42200	Excitation Systems Equipment	55	0.04	26	0.01	32	0.00	22	0.06	0	0.00	0.10	0.06
42300	Hydrogen Gas Cooling System	22	0.05	87	0.06	32	0.02	9	0.04	0	0.02	0.13	0.08
42400	Generator Liquid Cooling System	12	0.15	19	0.00	2	0.00	6	0.02	0	0.00	0.17	0.22
42500	Seal Oil System	3	0.00	4	0.00	0	0.00	5	0.01	0	0.00	0.01	0.00
Generators Total		**157**	**0.61**	**283**	**0.12**	**102**	**0.03**	**76**	**0.24**	**26**	**0.43**	**1.33**	**0.90**

Fossil Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Heat Power Cycle



Heat Power Cycle ICbF by event type forFossil units based on 2004-2008 data.

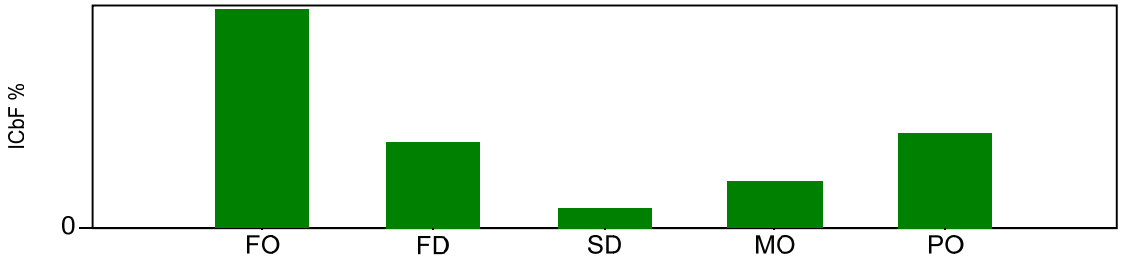
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Heat Power Cycle													
43090	Boiler Feedwater Piping And Supports	24	0.03	27	0.01	0	0.00	17	0.03	0	0.00	0.07	0.04
43100	High Pressure Feedwater Heaters And	44	0.06	362	0.29	11	0.03	26	0.06	3	0.05	0.40	0.09
43200	Boiler Feed Pumps And Auxiliaries	68	0.20	798	0.52	39	0.15	39	0.20	0	0.14	0.64	0.29
43260	Boiler Feed Pump Variable Speed Coupling	5	0.01	42	0.04	2	0.01	2	0.01	0	0.01	0.04	0.02
43300	Boiler Feed Pump Turbines & Auxiliaries	15	0.04	169	0.13	16	0.04	9	0.05	0	0.04	0.15	0.06
43400	Boiler Feed Pump Motors And Auxiliaries	10	0.05	76	0.14	6	0.09	2	0.05	1	0.05	0.20	0.06
44090	Condensate Piping And Supports	8	0.01	60	0.02	1	0.00	6	0.01	0	0.00	0.02	0.01
44110	Condensor	18	0.04	269	0.25	14	0.03	25	0.08	6	0.06	0.36	0.05
44120	Condensor Tubes	43	0.09	631	0.32	95	0.07	111	0.18	0	0.05	0.53	0.12
44200	Condensate Extraction Pumps And	15	0.05	226	0.17	26	0.04	8	0.05	0	0.04	0.20	0.07
44300	Condensate Extraction Pump Motors And	1	0.00	23	0.02	1	0.00	0	0.00	0	0.00	0.02	0.00
44400	Low Pressure Feedwater Heaters And	6	0.01	44	0.07	5	0.01	1	0.01	0	0.00	0.07	0.01
44500	Deaerator, Storage Tank, And Auxiliaries	29	0.03	39	0.01	2	0.00	18	0.04	2	0.04	0.11	0.04
45000	Air Extraction System	15	0.01	21	0.01	0	0.00	2	0.01	0	0.00	0.03	0.01
45090	Air Extraction System And Piping Support	1	0.00	4	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
45100	Air Extraction System Vacuum Pumps	11	0.00	20	0.01	1	0.00	0	0.00	0	0.00	0.02	0.01
45200	Air Extraction System Vacuum Pump, Motor and Auxiliaries	4	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
45300	Steam Air Ejectors	7	0.01	5	0.00	0	0.00	4	0.00	0	0.00	0.01	0.01
46100	Turbine Bypass System	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
47000	Condensate Make-up System	4	0.00	4	0.00	0	0.00	3	0.03	0	0.00	0.03	0.00
48000	Feed Cycle Auxiliary Systems	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
48100	Extraction Steam System	3	0.01	14	0.01	1	0.00	3	0.01	0	0.00	0.02	0.02
48200	Feedwater Heater Drains System	4	0.00	25	0.02	3	0.00	3	0.00	0	0.00	0.03	0.01
48400	Feedwater Heater Relief Valve, Vent	1	0.00	37	0.02	5	0.00	1	0.00	0	0.00	0.02	0.00
48500	Turbine And Piping Drains	1	0.00	0	0.00	0	0.00	7	0.02	0	0.00	0.02	0.00
Heat Power Cycle Total		**339**	**0.65**	**2896**	**2.06**	**228**	**0.47**	**287**	**0.84**	**12**	**0.48**	**2.99**	**0.92**

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Electrical Power Sys.



Electrical Power System ICbF by event type forFossil units based on 2004-2008 data.

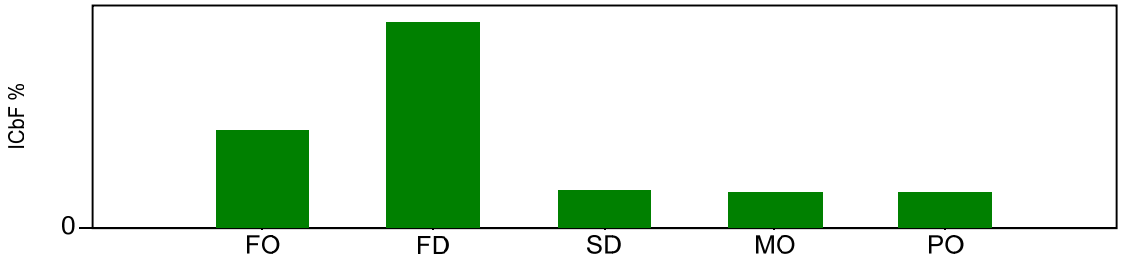
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Electrical Power System													
51100	Output System Generator Voltage Equipment	11	0.00	4	0.00	16	0.00	0	0.00	2	0.00	0.00	0.00
51120	Generator Power Transformers	41	0.12	90	0.04	6	0.01	10	0.01	10	0.02	0.18	0.18
51130	Switching Equipment-Generator Voltage	2	0.00	0	0.00	0	0.00	2	0.00	0	0.00	0.00	0.00
51133	Circuit Breakers-Generator Voltage	6	0.00	3	0.00	0	0.00	4	0.00	3	0.00	0.01	0.00
51136	Disconnect Switches-Generator Voltage	5	0.00	1	0.00	1	0.00	1	0.00	1	0.00	0.00	0.00
51150	Bus Duct, Bus, Cable	2	0.00	1	0.00	0	0.00	3	0.01	2	0.01	0.02	0.00
51151	Bus Duct Cooling System	0	0.00	4	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
51170	Generator Neutral Grounding Equipment	5	0.00	5	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
52100	Generator Voltage Supply System	7	0.01	4	0.00	1	0.00	0	0.00	1	0.01	0.02	0.01
52120	Station Service Transformer	9	0.01	10	0.01	8	0.00	0	0.00	1	0.00	0.02	0.01
52130	Unit Service Transformer	11	0.01	32	0.01	1	0.00	7	0.01	1	0.00	0.03	0.02
52140	Exciter XFMR	7	0.01	1	0.00	0	0.00	0	0.00	2	0.03	0.04	0.01
53200	Station Service Power Distribution	44	0.04	108	0.03	3	0.01	5	0.01	1	0.02	0.08	0.06
55000	Direct Current Power Supplies	10	0.04	6	0.00	0	0.00	7	0.01	2	0.01	0.05	0.05
Electrical Power System Total		**160**	**0.24**	**269**	**0.09**	**36**	**0.02**	**40**	**0.05**	**26**	**0.10**	**0.45**	**0.35**

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Ins. and Control



Instrumentation and Control ICbF by event type forFossil units based on 2004-2008 data.

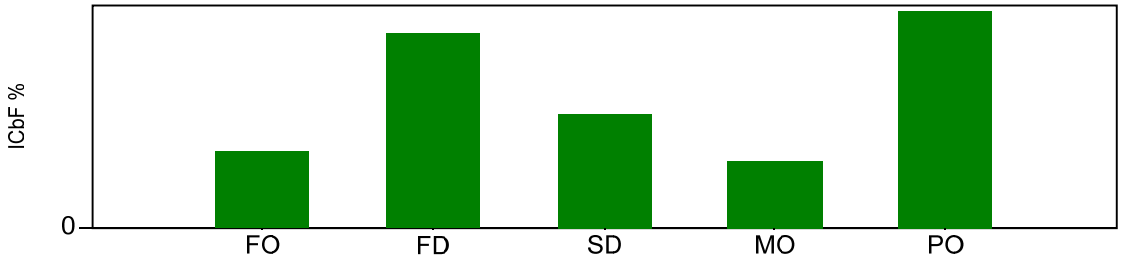
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Instrumentation and Control													
63100	Steam Generator Controls	127	0.07	1078	0.53	344	0.07	17	0.06	0	0.05	0.59	0.10
63200	Equipment Controls-Furnace Draft	21	0.01	41	0.02	2	0.00	0	0.00	0	0.00	0.02	0.01
63300	Primary Steam Instrumentation & Control	5	0.00	12	0.00	7	0.00	0	0.00	0	0.00	0.01	0.00
63400	Auxiliary Systems -Instrumentation and Control	6	0.01	8	0.01	3	0.00	2	0.00	0	0.00	0.02	0.02
63500	Waste Removal Systems - Instrumentation and Control	0	0.00	6	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
63600	Fuel Coal Management - Instrumentation and Control	19	0.01	124	0.02	1	0.00	1	0.00	0	0.00	0.03	0.01
63700	Fuel Oil Management - Instrumentation	2	0.00	4	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
63800	Sulphur Oxide Removal System - Instrumentation and Control	0	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
63900	Ignition Fuel,Fuel Gas, & Miscellaneous	20	0.00	19	0.00	0	0.00	0	0.00	1	0.00	0.01	0.01
64100	Steam Turbine And Auxiliaries -	61	0.02	45	0.02	13	0.00	15	0.01	0	0.00	0.04	0.03
64200	Generator And Auxiliaries - Instrumentation and Control	44	0.03	31	0.01	8	0.00	8	0.01	1	0.00	0.05	0.05
64300	Boiler Feedwater System -Instrumentation and Control	82	0.02	106	0.05	5	0.01	3	0.01	0	0.01	0.07	0.04
64400	Condensate System - Instrumentation and Control	9	0.01	22	0.01	1	0.00	0	0.00	0	0.00	0.02	0.01
64500	Condensate Air Extraction System - Instrumentation and Control	3	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64700	Condensate Make-up system - Instrumentation and Control	0	0.00	9	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64800	Feedwater Heating Anciliary Systems - Instrumentation and Control	4	0.01	24	0.02	0	0.00	0	0.00	0	0.00	0.02	0.01
65100	Main Power Output Systems - Control and Protection	21	0.02	13	0.00	2	0.00	3	0.00	3	0.00	0.02	0.02
65200	Station Service Main Transformation - Control and Protection	6	0.00	5	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
65300	Alternating Current Power Distribution - Control and Protection	15	0.00	14	0.00	1	0.00	1	0.00	1	0.00	0.01	0.01
65500	Direct Current Power Distribution - Control and Protection	19	0.01	3	0.00	0	0.00	0	0.00	0	0.00	0.01	0.02
65900	System Control Facilities	1	0.00	2	0.00	2	0.00	0	0.00	0	0.00	0.00	0.00
67000	Plant Auxiliary Processes And Services - Instrumentation and Control	3	0.00	23	0.01	4	0.01	1	0.00	0	0.00	0.02	0.00
69000	Computers	67	0.10	33	0.01	27	0.02	5	0.01	5	0.04	0.16	0.14
Instrumentation and Control Total		**535**	**0.32**	**1624**	**0.72**	**421**	**0.11**	**56**	**0.10**	**11**	**0.10**	**1.11**	**0.49**

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Auxiliary Processes



Plant Aux. Processes and Services ICbF by event type forFossil units based on 2004-2008 data.

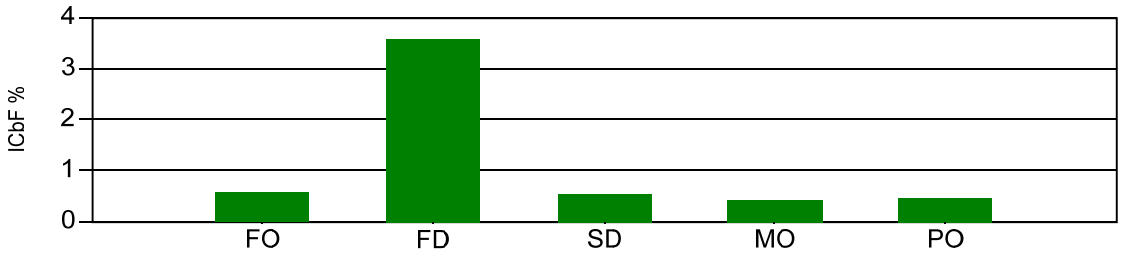
UNIT STATISTICS

Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Plant Aux. Processes and Services													
71000	Circulating Water Systems	7	0.01	80	0.04	13	0.01	26	0.05	13	0.22	0.30	0.01
71110	Travelling Water Screens	9	0.01	71	0.03	2	0.01	4	0.02	0	0.01	0.04	0.01
71120	Circulating Water Pumps	7	0.03	46	0.04	5	0.01	1	0.01	0	0.00	0.06	0.04
71127	Circulating Water Pump Motors	1	0.01	20	0.09	1	0.01	0	0.01	0	0.01	0.09	0.02
71140	Circulating Water Main Butterfly Valves and Operators	3	0.00	17	0.00	1	0.00	2	0.00	0	0.00	0.01	0.01
71190	Circulating Water Piping And Supports	0	0.00	17	0.00	2	0.00	5	0.01	1	0.00	0.01	0.00
71500	Circulating Water Screenwash System	0	0.00	4	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
71700	Circulating Water Cooling Towers	0	0.01	177	0.12	1	0.01	1	0.01	0	0.01	0.12	0.01
71800	Circulating Water Cooling Ponds	0	0.00	146	0.04	0	0.00	0	0.00	0	0.00	0.04	0.00
72000	Service Water Systems	3	0.03	17	0.00	1	0.00	3	0.01	2	0.05	0.09	0.04
72100	Service Water Low Pressure Open System	3	0.00	2	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
72800	Ash Transport Water Systems	1	0.03	12	0.04	0	0.01	0	0.01	0	0.01	0.06	0.05
73000	Heating, Ventilating, And Air	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
73100	Auxiliary Steam And Condensate Systems	6	0.00	10	0.00	1	0.00	1	0.00	0	0.00	0.00	0.00
73200	Powerhouse Heating & Ventilating Systems	2	0.01	4	0.01	296	0.19	1	0.01	0	0.01	0.20	0.00
74000	Water Treatment Plant	13	0.02	17	0.01	0	0.00	3	0.00	5	0.08	0.11	0.03
75000	Compressed Air Systems	1	0.00	0	0.00	0	0.00	2	0.00	0	0.00	0.00	0.00
75110	Service Air System	1	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
75120	Instrument Air System	3	0.00	8	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
76000	Miscellaneous Services	1	0.00	0	0.00	2	0.00	0	0.02	2	0.07	0.09	0.00
78000	Fire Protection Systems	0	0.00	7	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
Plant Aux. Processes and Services Total		**61**	**0.16**	**656**	**0.43**	**325**	**0.25**	**53**	**0.16**	**23**	**0.47**	**1.23**	**0.22**

Fossil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.4
Conditions



Conditions ICbF by event type forFossil units based on 2004-2008 data.

UNIT STATISTICS

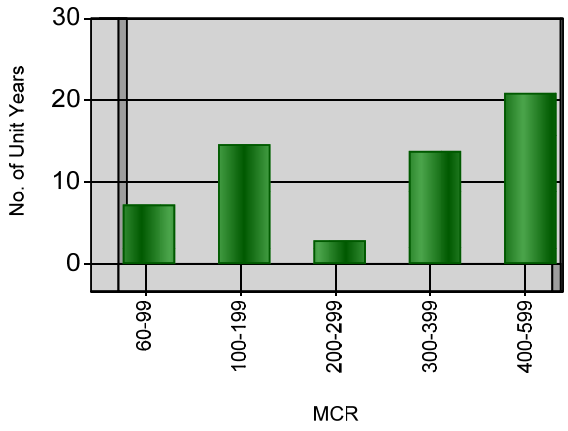
Number of Units:	97.00
Number of Unit Years:	422.23
Overall Operating Factor:	62.26

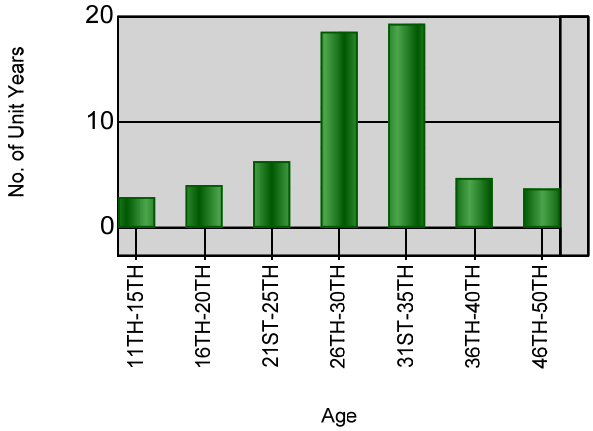
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Conditions													
00500	Regulatory Bodies	0	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
01410	Poor Quality Fuel, Heat Content	8	0.16	3608	1.69	129	0.28	3	0.16	0	0.16	1.82	0.22
01420	Problems - Primary Fuel for Units with Secondary Fuel Op.	1	0.05	206	0.32	4	0.05	0	0.04	0	0.04	0.32	0.07
04200	Synchronous Condenser Operation	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0.00	0.00
05200	Transmission Limitations	32	0.04	35	0.08	77	0.04	11	0.02	3	0.01	0.14	0.04
05201	Powerhouse Substation	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
05202	Transmission Line	4	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
07010	Site Environment, Storms, Floods	12	0.04	43	0.05	10	0.01	1	0.01	0	0.01	0.09	0.06
07110	Nitrous Oxides - Environmental Restriction	0	0.00	6	0.00	4	0.00	0	0.00	0	0.00	0.00	0.00
07120	Sulphur Dioxide - Environmental	3	0.02	660	0.09	2	0.02	2	0.02	0	0.02	0.09	0.03
07130	Particulates - Environmental Restriction	7	0.11	5402	1.16	4	0.10	0	0.10	0	0.10	1.16	0.16
07210	Cooling Water Discharge - Thermal Effects	9	0.05	261	0.15	0	0.03	1	0.03	0	0.03	0.17	0.08
07220	Liquid And Chemical Effluents	3	0.00	0	0.00	0	0.00	1	0.00	1	0.00	0.01	0.00
07230	Solid Waste Effluents	0	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
08160	Fire, General	6	0.03	23	0.01	0	0.00	0	0.00	0	0.00	0.04	0.05
08910	Staff Shortage	2	0.01	0	0.00	0	0.00	0	0.00	0	0.00	0.01	0.02
08940	Labour Troubles	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
99999	Other	16	0.05	52	0.02	7	0.01	8	0.02	3	0.07	0.15	0.07
Conditions Total		**105**	**0.56**	**10303**	**3.57**	**239**	**0.54**	**27**	**0.40**	**8**	**0.44**	**4.00**	**0.80**

Fossil - Coal Units

Table 6.2.5

External Causes Excluded, 2007 Data



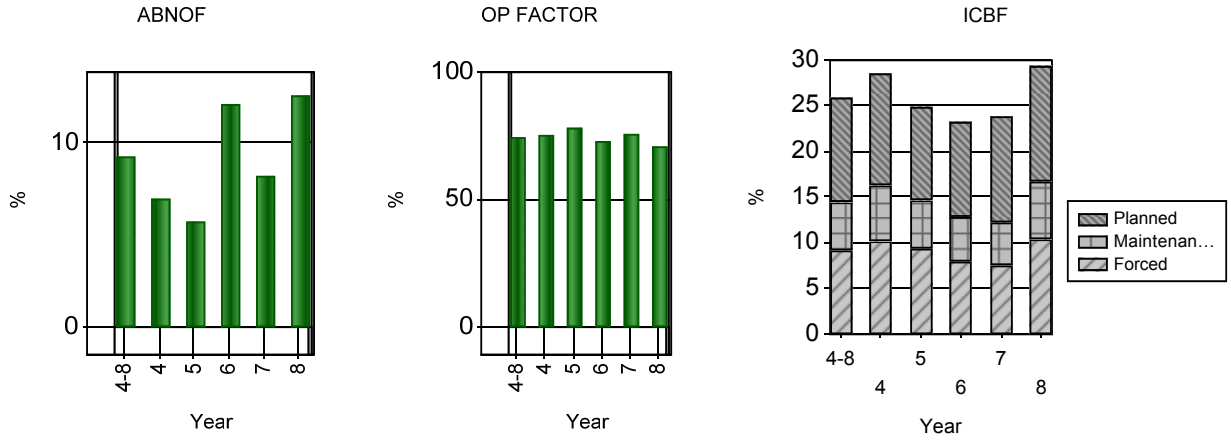


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	7.3	31.38	0.00	45.90	45	0.4	907.80	87.67	10.27	14.00	13.37	1.5	19.72	9.15	0.17	11.46
100-199	14.7	4.39	0.00	81.67	132	0.6	1344.02	40.00	4.54	6.37	6.20	2.0	13.15	9.40	0.84	6.54
200-299	2.9	10.35	0.00	73.31	24	0.1	274.33	34.40	3.93	4.87	4.75	0.4	14.70	6.76	2.50	7.44
300-399	13.8	16.60	0.00	61.70	101	0.6	342.98	48.00	4.64	9.18	8.97	2.4	15.26	8.53	0.36	6.54
400-599	20.9	7.01	0.00	66.74	243	1.9	883.55	69.97	11.02	17.21	16.99	6.0	27.50	11.94	4.14	8.59
Classification By Year Of Service																
11TH-15TH	2.9	0.02	0.00	85.25	21	0.1	263.00	52.19	4.49	5.27	5.1	0.4	12.52	7.14	0.68	6.62
16TH-20TH	4.0	0.15	0.00	90.29	24	0.1	152.32	47.48	3.33	4.46	4.35	0.4	9.05	5.82	0.19	4.54
21ST-25TH	6.3	4.39	0.00	64.15	80	0.6	620.07	66.74	10.31	13.76	13.63	1.7	24.35	11.69	0.83	11.28
26TH-30TH	18.6	18.22	0.00	66.73	166	0.7	763.50	34.89	4.70	7.97	7.6	2.8	14.68	10.66	1.40	6.99
31ST-35TH	19.3	10.70	0.00	62.50	196	1.6	1344.02	73.20	10.18	16.48	16.18	5.4	26.17	11.08	3.87	8.02
36TH-40TH	4.7	6.37	0.00	80.86	38	0.1	97.82	24.71	2.41	6.28	6.23	0.5	10.48	7.83	0.24	4.59
46TH-50TH	3.7	28.20	0.00	39.47	20	0.4	907.80	162.41	15.73	21.79	21.77	1.1	26.89	7.55	0.17	13.96
Classification By Operating Factor																
0-10	4.0	69.27	0.00	4.19	15	0.3	907.80	198.07	66.87	66.95	66.94	1.1	26.43	29.77	0.46	17.49
31-40	1.9	23.96	0.00	35.89	20	0.3	883.55	114.62	24.57	27.19	26.9	0.8	38.77	9.72	4.21	18.70
41-50	9.1	23.61	0.00	46.68	95	0.7	620.07	65.26	11.13	15.90	15.39	2.4	24.01	12.39	1.58	11.56
51-60	4.9	6.70	0.00	55.81	60	0.4	212.35	58.56	8.40	16.55	16.36	1.7	28.95	11.89	3.10	10.36
61-70	5.4	5.23	0.00	64.55	63	0.5	674.37	65.56	9.40	17.55	17.49	1.7	27.49	12.32	3.76	7.69
71-80	8.8	4.00	0.00	76.13	97	0.6	763.50	54.49	8.12	12.31	12	2.1	23.43	11.72	3.67	8.42
81-90	17.4	0.20	0.00	86.69	121	0.7	1344.02	47.37	3.80	6.58	6.34	2.1	11.63	6.70	0.96	4.15
91-100	7.3	0.00	0.00	94.37	74	0.2	128.72	24.01	2.82	4.70	4.6	0.5	7.05	10.45	0.08	2.31
All Units	**59.6**	**11.87**	**0.00**	**66.82**	**545**	**3.6**	**1,344.02**	**58.53**	**7.35**	**11.50**	**11.25**	**12.4**	**19.52**	**9.90**	**1.86**	**7.89**

Fossil - Coal Units

Table 6.2.6

External Causes Excluded, 2004 to 2008 Data



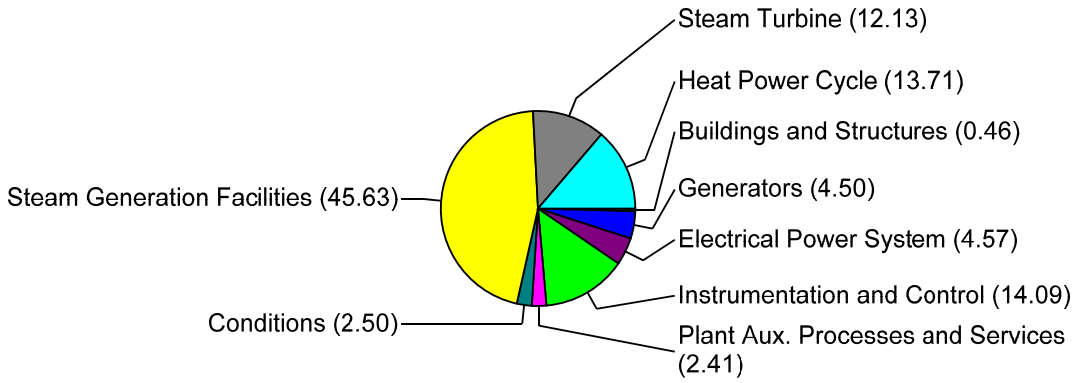
	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	25.9	26.73	0.62	45.01	217	2.2	3688.95	89.26	12.42	17.14	16.27	6.2	21.70	11.39	0.59	10.25
100-199	79.5	5.48	0.00	79.32	795	3.3	2894.31	36.35	4.62	5.64	5.49	10.5	12.73	10.20	0.95	6.73
200-299	15.9	9.11	0.00	67.43	262	1.0	890.78	34.66	7.85	10.73	10.03	3.4	19.80	14.92	2.85	8.20
300-399	60.7	8.32	0.00	74.29	485	2.4	1774.03	43.87	4.46	6.99	6.86	9.0	13.94	8.68	0.37	7.14
400-599	97.3	6.74	0.00	69.80	1103	7.2	2978.43	57.43	8.92	14.59	14.21	25.2	24.94	10.99	4.32	8.33
Classification By Year Of Service																
6TH-10TH	3.0	0.05	0.00	87.52	23	0.1	232.58	33.31	3.18	3.59	3.46	0.3	11.64	7.51	0.46	7.90
11TH-15TH	19.6	0.08	0.00	88.68	137	0.4	263.00	27.06	2.28	3.33	3.11	2.1	10.32	6.77	0.66	6.38
16TH-20TH	17.9	0.34	0.00	89.64	133	0.5	451.75	35.43	3.16	3.79	3.17	1.7	9.37	7.58	0.25	5.43
21ST-25TH	44.2	2.23	0.00	78.25	432	2.2	2894.31	44.88	5.51	6.94	5.91	7.8	16.88	9.47	1.12	9.46
26TH-30TH	122.8	11.19	0.00	68.36	1256	7.4	2978.43	51.90	7.51	12.14	10.64	26.5	20.76	10.54	3.13	7.72
31ST-35TH	33.6	7.28	0.00	67.83	414	2.5	1435.16	53.35	8.25	12.26	10.34	7.5	20.41	12.50	2.53	6.79
36TH-40TH	18.8	6.85	0.00	72.14	281	1.1	880.58	34.76	6.40	9.40	8.32	3.1	14.82	14.25	1.08	5.53
41ST-45TH	7.8	38.41	0.00	25.18	85	1.0	3688.95	104.59	28.07	32.68	24.94	2.6	31.66	19.83	1.90	15.39
46TH-50TH	11.7	24.79	1.35	48.54	101	0.9	907.80	73.92	9.97	15.87	10.82	2.7	20.41	11.21	0.14	9.74
Classification By Operating Factor																
0-10	10.0	55.58	1.60	4.21	37	1.4	3688.95	326.94	49.00	49.13	43.98	3.5	31.40	7.24	0.51	18.32
11-20	5.0	65.54	0.00	11.18	31	0.0	227.83	12.44	7.26	13.88	9.53	1.2	23.49	19.61	3.59	18.08
21-30	5.0	46.74	0.00	25.15	89	0.4	220.65	43.23	19.78	28.05	26.14	1.2	20.46	27.12	3.28	5.50
31-40	2.9	21.01	0.00	37.14	85	0.4	365.26	43.89	17.09	21.78	20.91	0.9	24.60	22.77	4.65	4.21
41-50	9.4	34.71	0.00	44.48	76	0.3	342.98	36.70	6.03	8.74	8.16	1.6	16.00	11.73	2.49	8.57
51-60	17.5	19.97	0.00	54.16	198	1.3	2894.31	58.99	11.88	14.85	13.53	4.5	25.23	13.26	2.89	12.71
61-70	45.1	5.61	0.00	66.27	502	3.9	2978.43	68.28	11.09	19.77	19.42	15.4	33.55	10.75	6.13	11.47
71-80	72.5	0.80	0.00	76.21	776	4.6	1162.73	51.58	6.26	9.96	9.86	14.1	17.67	9.70	1.74	6.15
81-90	59.4	0.01	0.00	85.55	687	2.5	1774.03	31.48	4.32	6.23	6.08	7.9	12.92	11.76	0.39	6.55
91-100	49.8	0.06	0.00	92.18	381	1.3	763.50	30.22	2.76	3.16	3.1	3.9	7.78	7.84	0.43	4.29
All Units	**279.3**	**8.83**	**0.06**	**70.90**	**2862**	**16.2**	**3,688.95**	**49.61**	**6.81**	**10.14**	**9.86**	**54.3**	**18.47**	**10.44**	**2.06**	**7.80**

Fossil - Coal Units

Table 6.2.7

Major Component Outage Code Report, 2004 to 2008

Major Componenent Contribution to Coal-Fired Fossil Unit ICbF based on 2004-2008 data.



UNIT STATISTICS

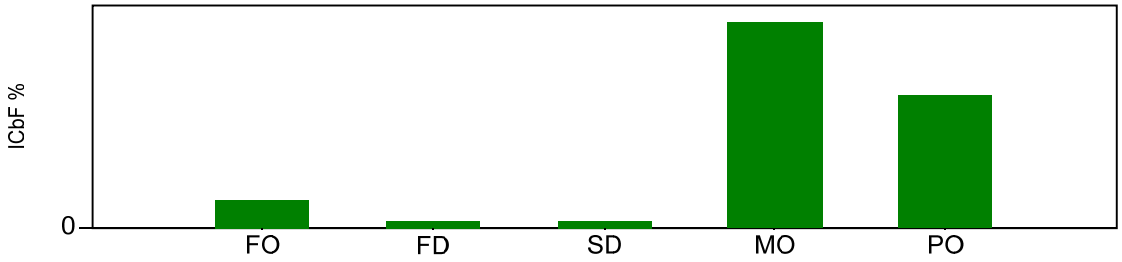
Number of Units:	67.00
Number of Unit Yars:	296.76
Overall Operating Factor:	75.33

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Buildings and Structures	3	0.00	0	0.00	2	0.00	9	0.05	6	0.03	0.08	0.01	0.01
Conditions	83	0.63	10282	4.95	223	0.71	8	0.53	5	0.60	5.37	0.16	0.77
Electrical Power System	142	0.30	265	0.13	36	0.02	22	0.05	12	0.07	0.52	0.33	0.36
Generators	128	0.55	276	0.17	77	0.05	32	0.12	11	0.29	1.06	0.62	0.68
Heat Power Cycle	300	0.76	2778	2.40	206	0.49	216	0.78	7	0.53	3.28	0.40	0.89
Instrumentation and Control	472	0.41	1554	0.87	401	0.13	46	0.13	10	0.14	1.33	0.41	0.48
Plant Aux. Processes and Services	53	0.19	619	0.47	322	0.32	29	0.09	9	0.35	1.19	0.16	0.26
Steam Generation Facilities	1111	5.00	21377	14.57	2018	3.40	375	3.19	181	7.84	25.94	3.68	5.86
Steam Turbine	326	1.07	873	1.09	1134	0.44	86	0.41	53	1.33	3.76	1.13	1.27
TOTAL (External Causes Included)	2618	8.91	38024	24.65	4419	5.56	823	5.35	294	11.18	42.53	6.90	10.58
TOTAL (External Causes Excluded)	2543	8.81	27750	20.79	4197	5.20	815	5.17	289	11.21	39.16	7.22	10.46

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Buildings and Structure



Buildings and Structures ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

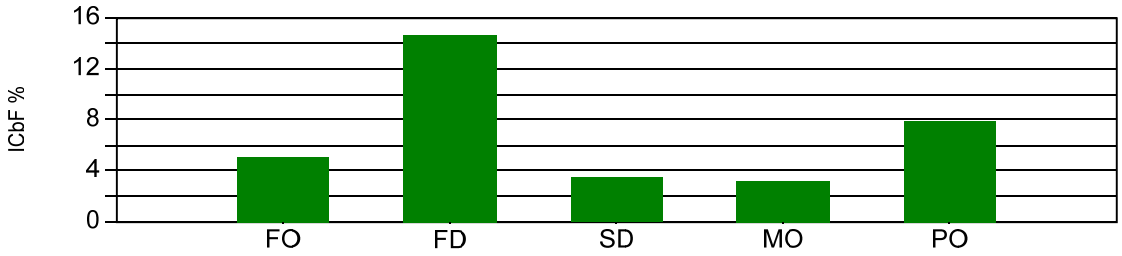
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Buildings and Structures													
22000	Powerhouse	1	0.00	0	0.00	0	0.00	2	0.01	0	0.00	0.01	0.01
23290	Chimney	2	0.00	0	0.00	2	0.00	7	0.04	6	0.03	0.07	0.00
Buildings and Structures Total		**3**	**0.00**	**0**	**0.00**	**2**	**0.00**	**9**	**0.05**	**6**	**0.03**	**0.08**	**0.01**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Steam Generation



Steam Generation Facilities ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Steam Generation Facilities													
31000	Steam Generator/HRSG	134	0.52	1358	0.96	375	0.33	66	0.54	169	5.78	7.54	0.62
31120	Primary Air Fans - Pulverized Fuel	16	0.14	1176	1.16	56	0.16	10	0.14	0	0.12	1.26	0.17
31130	Primary Air Fan Drives - Pulverized Fuel	1	0.01	48	0.04	0	0.01	0	0.01	0	0.01	0.04	0.01
31150	Air Heaters	34	0.11	261	0.20	8	0.02	37	0.13	0	0.02	0.40	0.14
31170	Primary Air Duct - Pulverized Fuel	7	0.01	27	0.01	4	0.01	1	0.00	0	0.00	0.02	0.01
31210	Coal Feeders (Gravimetric Or Volumetric)	5	0.11	2482	0.62	119	0.14	1	0.11	0	0.11	0.65	0.13
31220	Pulverized Fuel Burner Piping And Valves	5	0.08	740	0.37	33	0.09	8	0.08	0	0.08	0.39	0.09
31230	Oil Burner Piping And Valves	1	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
31240	Gas Burner Piping And Valves	4	0.00	9	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
31250	Pulverizers	13	0.62	5624	4.18	1034	1.48	5	0.62	0	0.61	5.06	0.60
31262	Pulverizer Motors	0	0.01	51	0.06	3	0.01	0	0.01	0	0.01	0.06	0.01
31270	Burners And Windboxes	9	0.01	65	0.05	5	0.01	3	0.01	0	0.00	0.07	0.01
31280	Igniters	12	0.02	142	0.05	0	0.01	2	0.01	0	0.01	0.05	0.02
31300	Sootblower Systems	2	0.02	175	0.13	5	0.02	0	0.02	2	0.05	0.16	0.02
31510	Steam Drum - Scrubbers,Separators, Etc.	6	0.00	6	0.00	0	0.00	0	0.00	1	0.04	0.04	0.00
31530	Steam Generating Tubes (Between Steam Drum and Mud Drum)	12	0.05	8	0.01	0	0.00	1	0.00	0	0.00	0.06	0.06
31540	Waterwalls	290	1.03	142	0.10	0	0.01	34	0.09	2	0.04	1.24	1.26
31550	Circulating Pumps	10	0.01	60	0.06	10	0.01	4	0.02	1	0.01	0.08	0.02
31560	Circulating Pumps Drives	3	0.01	156	0.08	2	0.01	3	0.01	0	0.01	0.09	0.01
31570	Safety Valves	15	0.04	235	0.18	84	0.05	10	0.03	0	0.02	0.25	0.04
31580	Water Gauges	2	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
31701	Superheater/High Pressure Section	157	0.53	247	0.11	54	0.10	12	0.06	1	0.05	0.75	0.64
31702	Reheater	62	0.31	66	0.06	0	0.01	8	0.04	0	0.01	0.39	0.38
31703	Economizer/Low Pressure Section	60	0.17	22	0.01	0	0.00	3	0.01	0	0.00	0.19	0.21
31810	Attemperation	8	0.01	47	0.02	2	0.00	2	0.01	1	0.04	0.06	0.02
31820	Burner Tilt	0	0.00	10	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
31832	Flue Gas-Recirculation Fans	4	0.04	144	0.16	5	0.03	6	0.05	0	0.03	0.19	0.05
31833	Recirculation Fans Variable Speed	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
31834	Flue Gas Recirculation Motors	0	0.00	11	0.02	0	0.00	1	0.01	0	0.00	0.03	0.00
32100	Forced Draft Ducts	2	0.00	3	0.00	3	0.01	1	0.00	0	0.00	0.01	0.00
32310	Forced Draft Fans	22	0.03	178	0.23	16	0.04	10	0.04	0	0.03	0.27	0.03
32320	Forced Draft Fan Variable Speed Coupling	7	0.01	18	0.01	0	0.00	1	0.00	0	0.00	0.02	0.02
32330	Forced Draft Fan Motors	0	0.02	47	0.06	1	0.02	0	0.02	0	0.02	0.06	0.02
32400	Induced Draft Flues	1	0.00	1	0.00	0	0.00	7	0.02	1	0.00	0.02	0.00
32510	Induced Draft Fans	49	0.14	1121	1.07	32	0.12	24	0.14	0	0.09	1.21	0.17
32520	Induced Draft Fan Variable Speed Coupling Drives	3	0.01	1	0.00	1	0.00	4	0.01	0	0.00	0.02	0.01
32530	Induced Draft Fan Motors	6	0.02	55	0.04	4	0.01	1	0.01	0	0.01	0.05	0.02
33100	Main Steam Piping	21	0.06	11	0.01	1	0.00	13	0.04	1	0.02	0.12	0.07
33200	Hot Reheat Piping	3	0.02	4	0.00	0	0.00	1	0.00	0	0.00	0.02	0.02

Fossil - Coal Units

Table 6.2.8

Detail Component Outage Code Report, 2004 to 2008

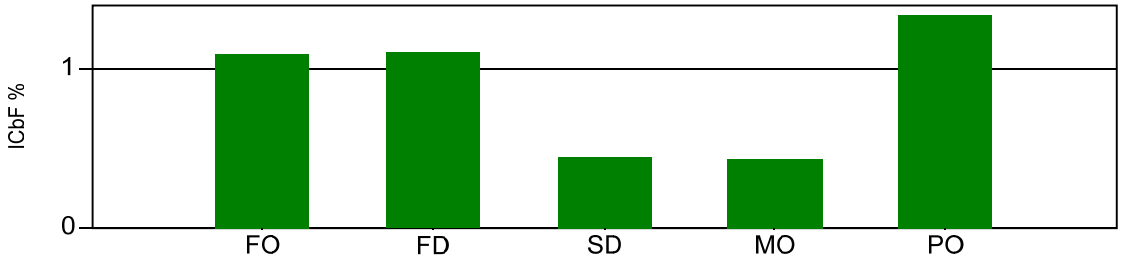
Steam Generation

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Generation Facilities													
33300	Cold Reheat Piping	4	0.01	0	0.00	0	0.00	1	0.00	0	0.00	0.01	0.01
34200	Boiler Blowdown System	5	0.01	49	0.02	0	0.00	1	0.01	0	0.00	0.03	0.01
34400	Boiler Drains System	2	0.00	12	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
35110	Furnace Ash Removal System	44	0.17	816	0.44	20	0.13	12	0.14	1	0.12	0.52	0.20
35120	Pulverizer Pyrites Removal System	1	0.01	290	0.06	8	0.01	0	0.01	0	0.01	0.06	0.01
35130	Fly Ash Removal System - Dry Transportation	2	0.02	130	0.09	8	0.02	6	0.05	0	0.02	0.13	0.03
35140	Fly Ash Removal System - Wet	1	0.00	16	0.01	3	0.00	1	0.00	0	0.00	0.01	0.00
35210	Precipitators-Electrostatic	27	0.41	3644	3.29	41	0.36	66	0.54	0	0.34	3.59	0.50
35220	Precipitators-Mechanical	1	0.00	6	0.00	0	0.00	1	0.00	0	0.00	0.01	0.00
35230	Precipitators-Baghouse	0	0.00	16	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
36100	Coal Receiving Systems	0	0.01	61	0.03	7	0.01	1	0.01	0	0.01	0.03	0.01
36200	Coal Storage Systems	2	0.06	994	0.27	15	0.06	0	0.06	1	0.06	0.28	0.07
36300	Coal Handling Systems	23	0.12	466	0.23	32	0.09	2	0.07	0	0.06	0.31	0.13
36370	Coal Stacker/Reclaimer Machine	1	0.00	6	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
36400	Coal Processing Systems	0	0.00	17	0.01	2	0.00	0	0.00	0	0.00	0.01	0.00
37100	Fuel Oil Receiving Systems	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
37300	Fuel Oil Transfer Systems	0	0.00	0	0.00	3	0.00	0	0.00	0	0.00	0.00	0.00
37400	Fuel Oil Forwarding Systems	2	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
37500	Fuel Oil Boosting Systems	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
38000	Sulphur Oxides Removal System	9	0.01	41	0.02	20	0.01	4	0.01	0	0.00	0.04	0.01
38300	IN-FURNACE BED LIMESTONE INJECTION SYS	0	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
38400	FLUID BED LIMESTONE INJECTION SYSTEM	0	0.00	53	0.03	0	0.00	0	0.00	0	0.00	0.03	0.00
Steam Generation Facilities Total		**1111**	**5.00**	**21377**	**14.57**	**2018**	**3.40**	**375**	**3.19**	**181**	**7.84**	**25.94**	**5.86**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Steam Turbine



Steam Turbine ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

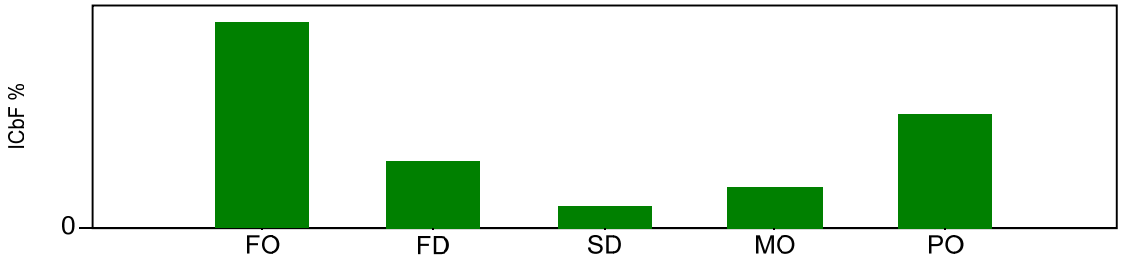
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Turbine													
41100	Turbine	125	0.72	431	0.77	165	0.10	39	0.21	45	1.09	2.63	0.87
41110	Cylinders	4	0.04	8	0.01	0	0.00	0	0.00	0	0.00	0.04	0.05
41120	Rotors	8	0.00	18	0.01	0	0.00	1	0.00	0	0.00	0.01	0.01
41121	Shaft Coupling Mechanism	1	0.00	0	0.00	0	0.00	0	0.00	1	0.01	0.02	0.00
41130	Blades	0	0.00	4	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
41140	Crossover Piping	3	0.00	5	0.00	0	0.00	1	0.01	1	0.04	0.06	0.01
41150	Turning Gear	3	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
41157	Turning Gear Motor	2	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
41160	Valve Gear	43	0.08	70	0.06	51	0.02	19	0.08	3	0.07	0.25	0.10
41170	Bearings And Pedestals	26	0.03	51	0.02	1	0.00	3	0.01	1	0.04	0.10	0.04
41200	Lubricating Oil System	28	0.04	7	0.00	0	0.00	2	0.00	0	0.00	0.05	0.05
41500	Gland Seal System-Steam	10	0.03	3	0.00	1	0.00	5	0.01	1	0.00	0.05	0.04
41540	Gland Seal System-Water	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
41600	Turbovisory	26	0.01	21	0.01	4	0.00	3	0.00	0	0.00	0.03	0.02
41700	Governing System	47	0.12	254	0.21	912	0.32	12	0.09	1	0.08	0.52	0.08
Steam Turbine Total		**326**	**1.07**	**873**	**1.09**	**1134**	**0.44**	**86**	**0.41**	**53**	**1.33**	**3.76**	**1.27**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Generators



Generators ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

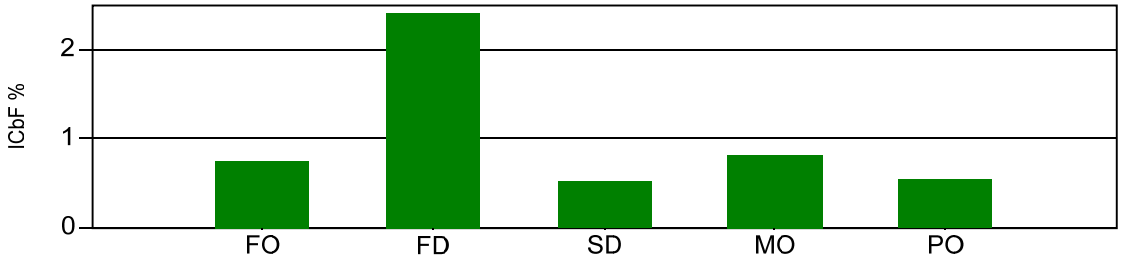
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Generators													
42100	Generator	25	0.07	29	0.03	17	0.01	5	0.01	8	0.14	0.25	0.09
42110	Generator Rotor	1	0.02	53	0.03	10	0.01	0	0.01	3	0.13	0.18	0.03
42111	Generator Bearings	8	0.04	43	0.01	0	0.00	1	0.00	0	0.00	0.04	0.05
42112	Generator Hydrogen Seals	10	0.06	3	0.00	0	0.00	4	0.03	0	0.00	0.09	0.07
42114	Generator Collector And Brushes	3	0.00	8	0.00	2	0.00	2	0.00	0	0.00	0.00	0.00
42120	Generator Stator	3	0.03	7	0.00	1	0.00	0	0.00	0	0.00	0.03	0.03
42200	Excitation Systems Equipment	42	0.05	25	0.01	13	0.00	9	0.01	0	0.00	0.06	0.06
42300	Hydrogen Gas Cooling System	22	0.07	86	0.09	32	0.03	5	0.04	0	0.02	0.17	0.09
42400	Generator Liquid Cooling System	11	0.21	18	0.00	2	0.00	4	0.02	0	0.00	0.23	0.26
42500	Seal Oil System	3	0.00	4	0.00	0	0.00	2	0.00	0	0.00	0.01	0.00
Generators Total		**128**	**0.55**	**276**	**0.17**	**77**	**0.05**	**32**	**0.12**	**11**	**0.29**	**1.06**	**0.68**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Heat Power Cycle



Heat Power Cycle ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

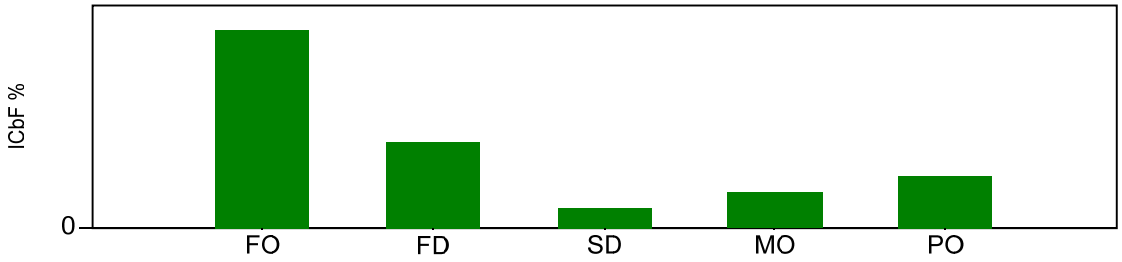
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Heat Power Cycle													
43090	Boiler Feedwater Piping And Supports	20	0.03	23	0.02	0	0.00	13	0.02	0	0.00	0.07	0.04
43100	High Pressure Feedwater Heaters And	37	0.08	353	0.37	10	0.04	22	0.08	2	0.07	0.51	0.10
43200	Boiler Feed Pumps And Auxiliaries	57	0.19	742	0.50	36	0.16	28	0.20	0	0.15	0.62	0.23
43260	Boiler Feed Pump Variable Speed Coupling	5	0.01	33	0.02	0	0.01	2	0.01	0	0.01	0.03	0.01
43300	Boiler Feed Pump Turbines & Auxiliaries	15	0.06	166	0.17	15	0.06	9	0.06	0	0.05	0.21	0.07
43400	Boiler Feed Pump Motors And Auxiliaries	7	0.03	68	0.09	0	0.02	0	0.02	0	0.02	0.09	0.03
44090	Condensate Piping And Supports	8	0.01	59	0.02	1	0.00	3	0.00	0	0.00	0.03	0.01
44110	Condensor	16	0.05	268	0.35	12	0.04	19	0.07	3	0.05	0.42	0.06
44120	Condensor Tubes	42	0.12	612	0.38	89	0.09	87	0.18	0	0.06	0.59	0.14
44200	Condensate Extraction Pumps And	14	0.07	224	0.24	26	0.06	6	0.06	0	0.05	0.27	0.08
44300	Condensate Extraction Pump Motors And	1	0.00	22	0.02	1	0.00	0	0.00	0	0.00	0.02	0.00
44400	Low Pressure Feedwater Heaters And	6	0.01	44	0.09	5	0.01	1	0.01	0	0.01	0.10	0.01
44500	Deaerator, Storage Tank, And Auxiliaries	26	0.04	38	0.02	2	0.00	12	0.04	2	0.06	0.14	0.05
45000	Air Extraction System	11	0.01	19	0.01	0	0.00	0	0.00	0	0.00	0.02	0.01
45090	Air Extraction System And Piping Support	1	0.00	4	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
45100	Air Extraction System Vacuum Pumps	10	0.01	20	0.02	1	0.00	0	0.00	0	0.00	0.02	0.01
45200	Air Extraction System Vacuum Pump, Motor and Auxiliaries	4	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
45300	Steam Air Ejectors	6	0.01	5	0.00	0	0.00	3	0.01	0	0.00	0.02	0.01
46100	Turbine Bypass System	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
47000	Condensate Make-up System	3	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
48000	Feed Cycle Auxiliary Systems	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
48100	Extraction Steam System	3	0.02	13	0.01	0	0.00	3	0.01	0	0.00	0.03	0.02
48200	Feedwater Heater Drains System	4	0.01	25	0.03	3	0.00	3	0.00	0	0.00	0.04	0.01
48400	Feedwater Heater Relief Valve, Vent	1	0.00	37	0.03	5	0.00	0	0.00	0	0.00	0.03	0.00
48500	Turbine And Piping Drains	1	0.00	0	0.00	0	0.00	5	0.01	0	0.00	0.01	0.00
Heat Power Cycle Total		**300**	**0.76**	**2778**	**2.40**	**206**	**0.49**	**216**	**0.78**	**7**	**0.53**	**3.28**	**0.89**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Electrical Power Sys.



Electrical Power System ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

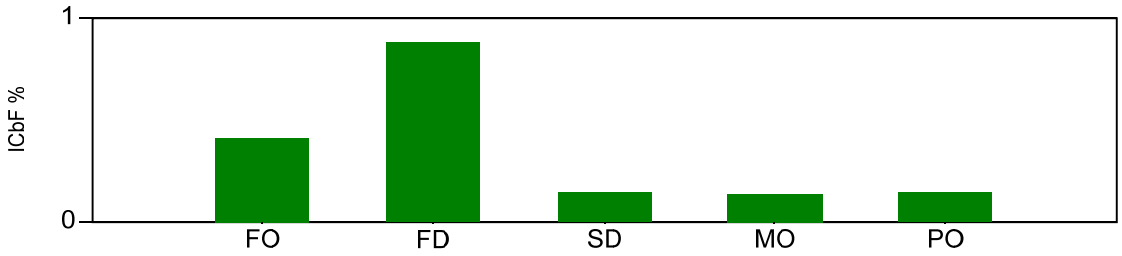
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Electrical Power System													
51100	Output System Generator Voltage Equipment	10	0.00	4	0.00	16	0.00	0	0.00	1	0.00	0.01	0.00
51120	Generator Power Transformers	38	0.15	89	0.06	6	0.01	2	0.01	2	0.01	0.20	0.18
51130	Switching Equipment-Generator Voltage	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
51133	Circuit Breakers-Generator Voltage	5	0.00	3	0.00	0	0.00	3	0.01	3	0.00	0.01	0.00
51136	Disconnect Switches-Generator Voltage	3	0.00	1	0.00	1	0.00	0	0.00	1	0.00	0.00	0.00
51150	Bus Duct, Bus, Cable	2	0.00	1	0.00	0	0.00	2	0.01	2	0.02	0.03	0.00
51151	Bus Duct Cooling System	0	0.00	4	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
51170	Generator Neutral Grounding Equipment	4	0.01	5	0.00	0	0.00	0	0.00	0	0.00	0.01	0.01
52100	Generator Voltage Supply System	6	0.00	4	0.00	1	0.00	0	0.00	1	0.01	0.02	0.00
52120	Station Service Transformer	9	0.01	10	0.01	8	0.00	0	0.00	0	0.00	0.02	0.01
52130	Unit Service Transformer	10	0.02	32	0.02	1	0.00	4	0.00	0	0.00	0.03	0.02
52140	Exciter XFMR	5	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
53200	Station Service Power Distribution	39	0.06	106	0.04	3	0.01	5	0.01	1	0.02	0.12	0.07
55000	Direct Current Power Supplies	9	0.05	5	0.00	0	0.00	5	0.01	1	0.01	0.07	0.06
Electrical Power System Total		**142**	**0.30**	**265**	**0.13**	**36**	**0.02**	**22**	**0.05**	**12**	**0.07**	**0.52**	**0.36**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Ins. and Control



Instrumentation and Control ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

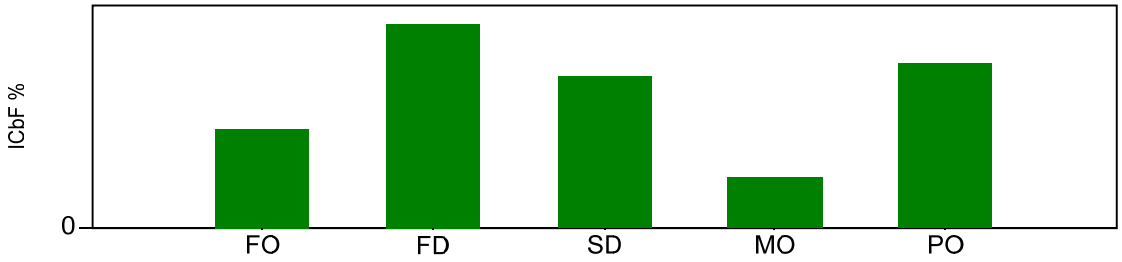
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Instrumentation and Control													
63100	Steam Generator Controls	115	0.09	1042	0.63	344	0.09	16	0.08	0	0.06	0.72	0.11
63200	Equipment Controls-Furnace Draft	19	0.01	39	0.02	2	0.00	0	0.00	0	0.00	0.03	0.01
63300	Primary Steam Instrumentation & Control	3	0.00	12	0.01	6	0.00	0	0.00	0	0.00	0.01	0.00
63400	Auxiliary Systems -Instrumentation and Control	4	0.00	8	0.01	3	0.00	2	0.00	0	0.00	0.01	0.00
63500	Waste Removal Systems - Instrumentation and Control	0	0.00	6	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
63600	Fuel Coal Management - Instrumentation and Control	19	0.01	124	0.03	1	0.01	1	0.01	0	0.01	0.04	0.01
63700	Fuel Oil Management - Instrumentation	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
63800	Sulphur Oxide Removal System - Instrumentation and Control	0	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
63900	Ignition Fuel,Fuel Gas, & Miscellaneous	18	0.01	18	0.00	0	0.00	0	0.00	1	0.01	0.01	0.01
64100	Steam Turbine And Auxiliaries -	53	0.03	41	0.03	13	0.00	14	0.01	0	0.00	0.06	0.03
64200	Generator And Auxiliaries - Instrumentation and Control	33	0.04	30	0.01	8	0.00	5	0.01	1	0.00	0.06	0.05
64300	Boiler Feedwater System -Instrumentation and Control	75	0.03	95	0.06	5	0.01	2	0.01	0	0.01	0.09	0.03
64400	Condensate System - Instrumentation and Control	8	0.01	20	0.01	1	0.00	0	0.00	0	0.00	0.01	0.01
64500	Condensate Air Extraction System - Instrumentation and Control	3	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64700	Condensate Make-up system - Instrumentation and Control	0	0.00	9	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64800	Feedwater Heating Anciliary Systems - Instrumentation and Control	4	0.01	24	0.03	0	0.00	0	0.00	0	0.00	0.03	0.01
65100	Main Power Output Systems - Control and Protection	16	0.01	13	0.01	2	0.00	1	0.00	3	0.00	0.01	0.01
65200	Station Service Main Transformation - Control and Protection	6	0.00	5	0.00	0	0.00	0	0.00	0	0.00	0.01	0.01
65300	Alternating Current Power Distribution - Control and Protection	15	0.00	14	0.00	1	0.00	0	0.00	1	0.00	0.01	0.01
65500	Direct Current Power Distribution - Control and Protection	18	0.02	3	0.00	0	0.00	0	0.00	0	0.00	0.02	0.02
65900	System Control Facilities	1	0.00	2	0.00	2	0.00	0	0.00	0	0.00	0.00	0.00
67000	Plant Auxiliary Processes And Services - Instrumentation and Control	3	0.01	23	0.01	4	0.01	0	0.00	0	0.00	0.02	0.00
69000	Computers	58	0.13	24	0.01	8	0.01	5	0.01	4	0.05	0.19	0.16
Instrumentation and Control Total		**472**	**0.41**	**1554**	**0.87**	**401**	**0.13**	**46**	**0.13**	**10**	**0.14**	**1.33**	**0.48**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Auxiliary Processes



Plant Aux. Processes and Services ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

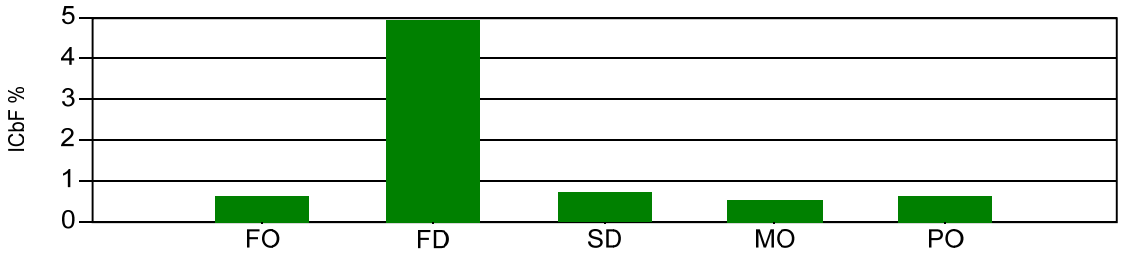
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Plant Aux. Processes and Services													
71000	Circulating Water Systems	6	0.01	78	0.06	12	0.01	12	0.03	1	0.02	0.09	0.02
71110	Travelling Water Screens	9	0.01	66	0.04	2	0.01	3	0.01	0	0.01	0.05	0.02
71120	Circulating Water Pumps	4	0.03	39	0.03	4	0.01	1	0.01	0	0.01	0.06	0.04
71127	Circulating Water Pump Motors	1	0.00	4	0.01	1	0.00	0	0.00	0	0.00	0.01	0.00
71140	Circulating Water Main Butterfly Valves and Operators	2	0.00	17	0.01	1	0.00	2	0.00	0	0.00	0.01	0.01
71190	Circulating Water Piping And Supports	0	0.00	16	0.01	2	0.00	2	0.00	0	0.00	0.01	0.00
71500	Circulating Water Screenwash System	0	0.00	4	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
71700	Circulating Water Cooling Towers	0	0.01	177	0.17	1	0.01	1	0.01	0	0.01	0.17	0.01
71800	Circulating Water Cooling Ponds	0	0.00	145	0.06	0	0.00	0	0.00	0	0.00	0.06	0.01
72000	Service Water Systems	3	0.04	17	0.00	1	0.00	3	0.01	2	0.07	0.12	0.05
72100	Service Water Low Pressure Open System	2	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
72800	Ash Transport Water Systems	1	0.05	12	0.05	0	0.01	0	0.01	0	0.01	0.08	0.06
73100	Auxiliary Steam And Condensate Systems	6	0.00	9	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
73200	Powerhouse Heating & Ventilating Systems	2	0.01	4	0.01	296	0.27	1	0.01	0	0.01	0.27	0.00
74000	Water Treatment Plant	11	0.03	14	0.01	0	0.00	2	0.00	4	0.11	0.14	0.04
75000	Compressed Air Systems	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
75110	Service Air System	1	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
75120	Instrument Air System	3	0.00	8	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
76000	Miscellaneous Services	1	0.00	0	0.00	2	0.00	0	0.00	2	0.10	0.11	0.00
78000	Fire Protection Systems	0	0.00	7	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
Plant Aux. Processes and Services Total		**53**	**0.19**	**619**	**0.47**	**322**	**0.32**	**29**	**0.09**	**9**	**0.35**	**1.19**	**0.26**

Fossil - Coal Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.8
Conditions



Conditions ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

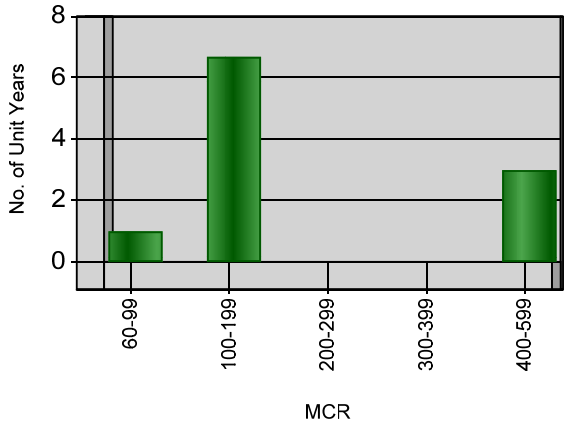
Number of Units:	67.00
Number of Unit Years:	296.76
Overall Operating Factor:	75.33

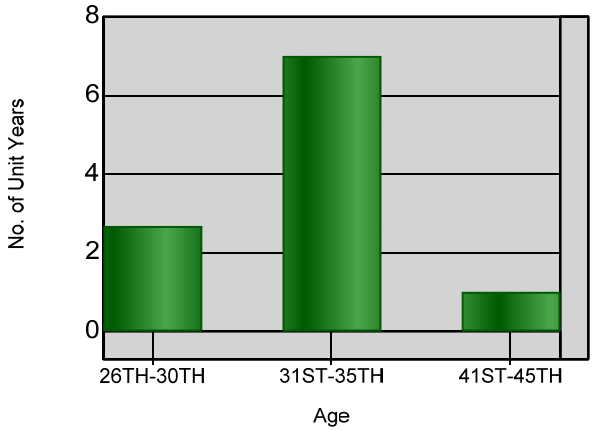
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Conditions													
00500	Regulatory Bodies	0	0.00	1	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
01410	Poor Quality Fuel, Heat Content	8	0.22	3607	2.37	129	0.40	2	0.22	0	0.22	2.55	0.26
01420	Problems - Primary Fuel for Units with Secondary Fuel Op.	1	0.06	206	0.44	4	0.06	0	0.06	0	0.06	0.44	0.08
04200	Synchronous Condenser Operation	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0.00	0.00
05200	Transmission Limitations	24	0.04	33	0.11	68	0.03	4	0.02	1	0.02	0.15	0.04
05201	Powerhouse Substation	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
05202	Transmission Line	4	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.01	0.00
07010	Site Environment, Storms, Floods	4	0.00	26	0.01	3	0.00	0	0.00	0	0.00	0.01	0.00
07110	Nitrous Oxides - Environmental Restriction	0	0.00	6	0.01	4	0.00	0	0.00	0	0.00	0.01	0.00
07120	Sulphur Dioxide - Environmental	3	0.03	660	0.13	2	0.03	0	0.03	0	0.03	0.13	0.04
07130	Particulates - Environmental Restriction	6	0.15	5401	1.62	4	0.14	0	0.14	0	0.14	1.63	0.18
07210	Cooling Water Discharge - Thermal Effects	9	0.07	261	0.22	0	0.04	0	0.04	0	0.04	0.24	0.09
07220	Liquid And Chemical Effluents	3	0.00	0	0.00	0	0.00	1	0.00	1	0.00	0.01	0.01
07230	Solid Waste Effluents	0	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
08160	Fire, General	5	0.04	23	0.01	0	0.00	0	0.00	0	0.00	0.05	0.05
08940	Labour Troubles	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
99999	Other	14	0.02	52	0.03	7	0.01	1	0.02	2	0.09	0.14	0.02
Conditions Total		**83**	**0.63**	**10282**	**4.95**	**223**	**0.71**	**8**	**0.53**	**5**	**0.60**	**5.37**	**0.77**

Fossil - Oil Units

External Causes Excluded, 2008 Data

Table 6.2.9



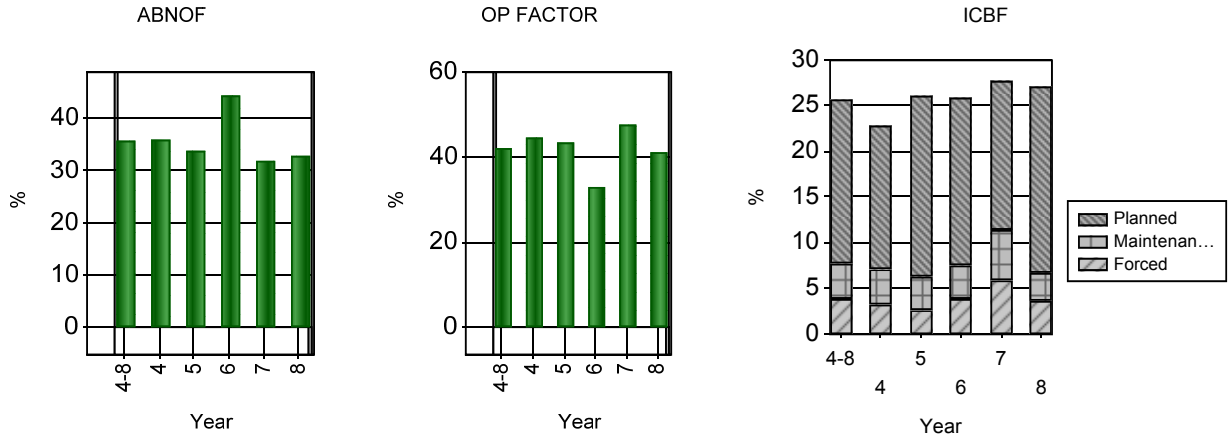


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	1.0	24.76	0.00	54.30	4	0.0	62.58	24.05	1.98	1.98	1.96	0.2	20.93	7.35	0.41	19.43
100-199	6.7	14.34	7.50	54.10	35	0.3	638.67	80.76	8.15	8.88	8.70	2.1	31.99	7.45	2.96	23.60
200-299	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
300-399	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
400-599	3.0	76.76	0.00	7.75	7	0.0	61.38	16.55	5.23	6.48	5.27	0.5	15.20	8.58	2.16	12.48
Classification By Year Of Service																
26TH-30TH	2.7	14.80	18.69	48.84	15	0.0	177.62	25.52	3.20	4.13	4.07	1.0	36.70	10.65	0.90	33.49
31ST-35TH	7.0	40.92	0.00	36.25	27	0.3	638.67	94.80	10.28	10.94	10.45	1.6	23.00	5.90	3.41	15.05
41ST-45TH	1.0	24.76	0.00	54.30	4	0.0	62.58	24.05	1.98	1.98	1.96	0.2	20.93	7.35	0.41	19.43
Classification By Operating Factor																
0-10	3.0	76.76	0.00	7.75	7	0.0	61.38	16.55	5.23	6.48	5.28	0.5	15.20	8.58	2.16	12.48
11-20	1.7	23.60	29.80	20.86	3	0.0	177.62	70.91	6.31	8.61	8.5	0.9	55.78	5.68	0.18	53.40
31-40	1.0	12.63	0.00	39.68	9	0.2	638.67	163.98	29.75	32.35	30.94	0.5	49.38	17.59	0.88	29.84
51-60	2.0	22.56	0.00	55.58	7	0.0	144.43	38.77	2.70	2.78	2.75	0.4	22.02	4.49	1.56	18.71
61-70	2.0	11.57	0.00	66.99	8	0.1	426.58	99.09	6.31	6.31	6.27	0.4	21.44	3.72	6.90	10.03
91-100	1.0	0.00	0.00	95.89	12	0.0	75.45	14.17	1.98	2.37	2.34	0.0	4.60	12.47	2.12	0.00
All Units	**10.7**	**32.85**	**4.69**	**41.10**	**46**	**0.4**	**638.67**	**66.06**	**7.28**	**7.95**	**7.69**	**2.8**	**26.24**	**7.50**	**2.50**	**20.09**

Fossil - Oil Units

Table 6.2.10

External Causes Excluded, 2004 to 2008 Data



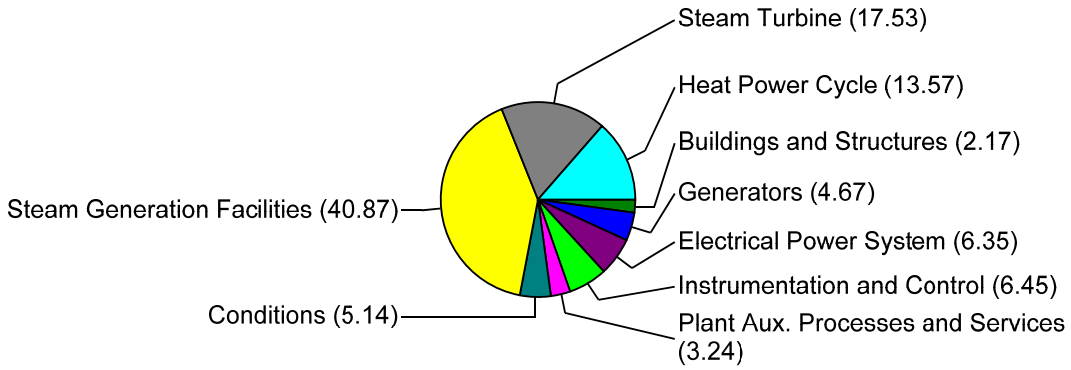
	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	5.0	38.65	0.00	46.89	12	0.0	89.50	23.12	1.33	1.33	1.32	0.7	14.36	4.69	1.01	12.72
100-199	32.1	19.35	5.49	54.58	189	1.1	878.76	51.67	5.71	8.16	7.96	8.5	25.91	8.75	2.24	18.61
200-299	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
300-399	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
400-599	14.9	69.24	0.00	11.56	60	0.2	480.03	28.98	10.17	14.38	10.86	2.9	19.38	12.04	3.95	13.38
Classification By Year Of Service																
21ST-25TH	5.9	29.21	14.39	46.39	24	0.2	595.98	66.77	5.93	7.57	6.83	1.4	23.12	6.22	0.88	18.20
26TH-30TH	34.2	34.86	2.68	41.10	198	0.8	878.76	37.09	5.40	8.58	7.96	8.4	24.16	10.17	2.98	17.14
31ST-35TH	7.0	40.92	0.00	36.25	27	0.3	638.67	94.80	10.28	10.94	10.67	1.6	23.00	5.90	3.41	15.05
36TH-40TH	2.0	28.40	0.00	57.64	3	0.0	26.55	15.50	0.46	0.46	0.45	0.3	13.70	2.60	1.51	11.92
41ST-45TH	3.0	45.48	0.00	39.72	9	0.0	89.50	25.66	2.16	2.16	2.15	0.4	14.80	6.71	0.68	13.25
Classification By Operating Factor																
11-20	15.9	67.79	0.05	12.07	63	0.3	595.98	39.80	12.79	16.40	13.13	3.3	20.31	11.85	3.70	14.13
31-40	1.0	48.93	1.33	31.23	2	0.0	10.63	7.06	0.50	0.50	0.5	0.2	19.36	3.19	0.00	19.20
41-50	21.3	22.02	5.78	46.98	113	0.8	878.76	59.78	6.79	10.49	10.07	6.8	31.17	8.56	1.75	23.66
51-60	5.0	30.89	0.00	55.95	13	0.0	173.16	24.33	1.27	1.27	1.27	0.7	13.15	4.64	3.01	9.42
61-70	4.9	17.53	0.00	66.44	20	0.1	426.58	50.73	3.25	3.78	3.76	0.7	13.77	4.51	4.22	6.87
71-80	1.0	11.02	52.06	77.48	2	0.0	56.86	32.03	0.93	0.93	0.93	0.1	11.49	1.29	0.00	10.76
81-90	3.0	0.00	0.00	86.42	48	0.1	126.78	23.15	4.63	5.99	5.8	0.4	14.36	18.49	1.42	7.35
All Units	**52.1**	**35.38**	**3.41**	**41.60**	**261**	**1.4**	**878.76**	**45.14**	**5.64**	**8.01**	**7.53**	**12.1**	**22.96**	**8.58**	**2.61**	**16.56**

Fossil - Oil Units

Table 6.2.11

Major Component Outage Code Report, 2004 to 2008

Major Componenent Contribution to Oil-Fired Fossil Unit ICbF based on 2004-2008 data.



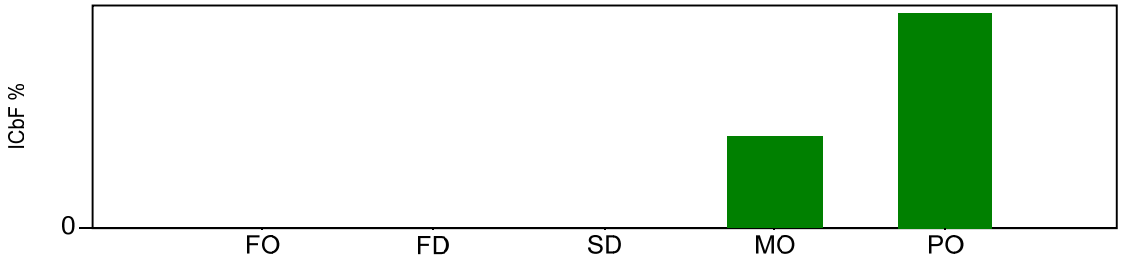
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Yars:	56.74
Overall Operating Factor:	41.99

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Buildings and Structures	0	0.00	0	0.00	0	0.00	9	0.06	3	0.13	0.19	0.00	0.00
Conditions	17	0.73	20	0.38	16	0.23	11	0.12	0	0.07	1.27	1.47	1.57
Electrical Power System	12	0.17	3	0.00	0	0.00	11	0.07	14	0.37	0.63	0.37	0.37
Generators	18	0.24	5	0.01	25	0.01	3	0.05	7	0.41	0.70	0.54	0.54
Heat Power Cycle	29	0.42	64	0.69	14	0.18	43	0.72	0	0.12	1.63	0.65	0.85
Instrumentation and Control	38	0.24	44	0.19	20	0.18	0	0.09	1	0.10	0.45	0.35	0.42
Plant Aux. Processes and Services	7	0.10	30	0.85	3	0.09	10	0.23	2	0.19	1.11	0.04	0.24
Steam Generation Facilities	87	2.09	319	4.17	33	0.99	97	2.05	41	10.23	16.02	2.64	4.51
Steam Turbine	48	0.49	35	0.03	31	0.04	19	0.53	30	6.20	7.26	1.05	1.05
TOTAL (External Causes Included)	256	4.48	520	6.32	142	1.72	203	3.92	98	17.82	29.26	7.11	9.55
TOTAL (External Causes Excluded)	240	3.83	504	6.04	126	1.56	194	3.88	98	18.03	28.33	5.78	8.20

Fossil - Oil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Building and Structure



Buildings and Structures ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

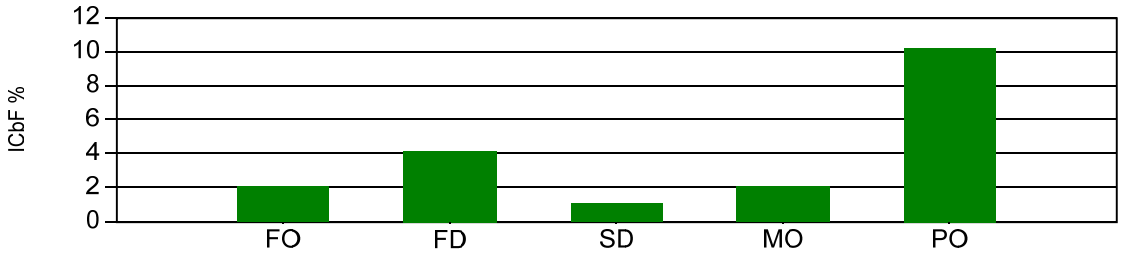
Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Buildings and Structures													
23290	Chimney	0	0.00	0	0.00	0	0.00	9	0.06	3	0.13	0.19	0.00
Buildings and Structures Total		**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**9**	**0.06**	**3**	**0.13**	**0.19**	**0.00**

Fossil - Oil Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Steam Generation



Steam Generation Facilities ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

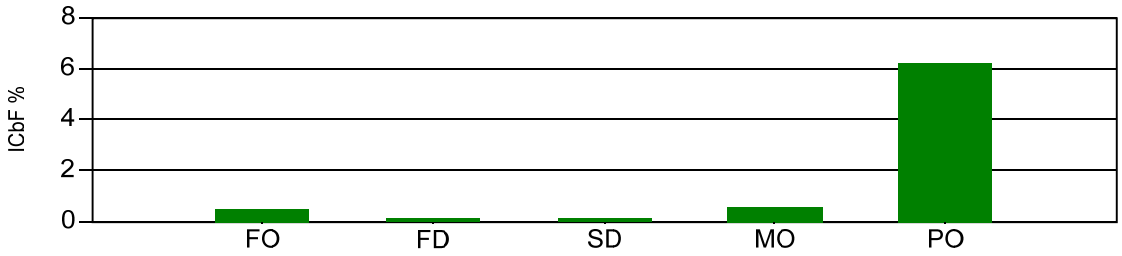
Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Steam Generation Facilities													
31000	Steam Generator/HRSG	12	0.15	39	0.48	1	0.11	6	0.16	34	8.54	9.00	0.34
31150	Air Heaters	2	0.15	51	1.14	0	0.13	31	0.40	0	0.13	1.42	0.33
31220	Pulverized Fuel Burner Piping And Valves	1	0.00	7	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
31230	Oil Burner Piping And Valves	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
31270	Burners And Windboxes	5	0.02	5	0.04	1	0.01	0	0.01	0	0.01	0.06	0.04
31280	Igniters	0	0.01	5	0.03	0	0.01	0	0.01	0	0.01	0.03	0.02
31300	Sootblower Systems	0	0.00	2	0.01	0	0.00	2	0.03	0	0.00	0.04	0.00
31530	Steam Generating Tubes (Between Steam Drum and Mud Drum)	5	0.15	1	0.13	0	0.03	5	0.13	0	0.03	0.33	0.33
31540	Waterwalls	10	0.24	4	0.03	0	0.00	15	0.37	0	0.00	0.63	0.52
31550	Circulating Pumps	0	0.04	11	0.15	0	0.04	0	0.04	0	0.04	0.15	0.09
31560	Circulating Pumps Drives	0	0.01	47	0.31	0	0.01	0	0.01	0	0.01	0.31	0.02
31570	Safety Valves	2	0.23	7	0.31	17	0.15	4	0.07	0	0.05	0.60	0.42
31701	Superheater/High Pressure Section	8	0.21	2	0.00	0	0.00	1	0.00	1	0.26	0.47	0.45
31702	Reheater	9	0.18	1	0.00	1	0.00	1	0.01	1	0.06	0.25	0.39
31703	Economizer/Low Pressure Section	1	0.02	0	0.00	0	0.00	3	0.02	0	0.00	0.04	0.03
31810	Attemperation	0	0.00	6	0.01	1	0.00	2	0.03	0	0.00	0.04	0.00
32100	Forced Draft Ducts	0	0.00	3	0.03	0	0.00	2	0.01	0	0.00	0.04	0.01
32310	Forced Draft Fans	16	0.61	27	1.10	0	0.43	10	0.50	0	0.43	1.35	1.34
32330	Forced Draft Fan Motors	0	0.03	10	0.11	1	0.04	0	0.03	0	0.03	0.12	0.06
32400	Induced Draft Flues	0	0.00	0	0.00	0	0.00	2	0.01	0	0.00	0.01	0.00
32510	Induced Draft Fans	3	0.01	12	0.02	2	0.01	2	0.05	0	0.01	0.06	0.02
32530	Induced Draft Fan Motors	1	0.01	66	0.25	0	0.01	0	0.01	1	0.13	0.38	0.03
33100	Main Steam Piping	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00	0.01	0.02
34100	Furnace And Water Gauge Television	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
34400	Boiler Drains System	1	0.00	0	0.00	0	0.00	2	0.01	0	0.00	0.02	0.01
35130	Fly Ash Removal System - Dry Transportation	0	0.00	0	0.00	0	0.00	3	0.13	0	0.00	0.13	0.00
35140	Fly Ash Removal System - Wet	3	0.00	0	0.00	5	0.01	4	0.01	0	0.00	0.02	0.00
35210	Precipitators-Electrostatic	0	0.00	0	0.00	0	0.00	0	0.00	1	0.14	0.14	0.00
35220	Precipitators-Mechanical	0	0.00	0	0.00	0	0.00	0	0.00	1	0.28	0.28	0.00
36100	Coal Receiving Systems	1	0.00	7	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
37300	Fuel Oil Transfer Systems	0	0.00	0	0.00	3	0.00	0	0.00	2	0.07	0.07	0.00
37400	Fuel Oil Forwarding Systems	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
37500	Fuel Oil Boosting Systems	3	0.01	3	0.01	0	0.00	1	0.00	0	0.00	0.01	0.02
37600	Fuel Oil Heating Systems	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
38000	Sulphur Oxides Removal System	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
Steam Generation Facilities Total		**87**	**2.09**	**319**	**4.17**	**33**	**0.99**	**97**	**2.05**	**41**	**10.23**	**16.02**	**4.51**

Fossil - Oil Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Steam Turbine



Steam Turbine ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

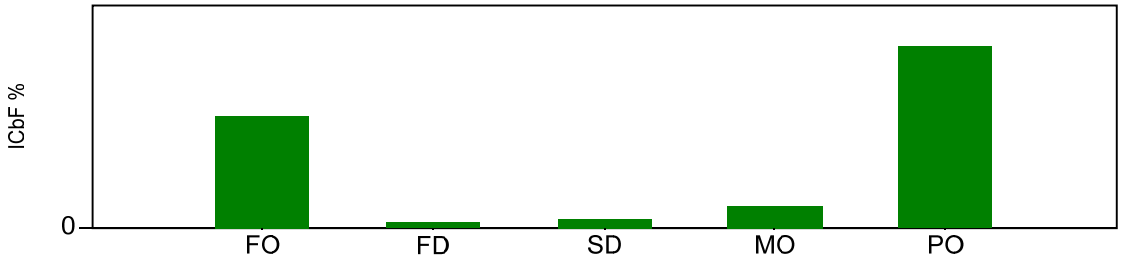
Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Turbine													
41100	Turbine	15	0.29	27	0.02	23	0.03	4	0.06	27	4.63	4.99	0.62
41120	Rotors	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
41121	Shaft Coupling Mechanism	1	0.01	0	0.00	0	0.00	3	0.18	2	1.39	1.58	0.02
41130	Blades	0	0.00	0	0.00	0	0.00	1	0.01	1	0.18	0.19	0.00
41140	Crossover Piping	1	0.01	1	0.00	0	0.00	0	0.00	0	0.00	0.01	0.02
41150	Turning Gear	2	0.06	0	0.00	0	0.00	0	0.00	0	0.00	0.06	0.13
41157	Turning Gear Motor	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
41160	Valve Gear	5	0.05	1	0.00	2	0.00	6	0.22	0	0.00	0.27	0.10
41170	Bearings And Pedestals	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
41200	Lubricating Oil System	3	0.00	0	0.00	0	0.00	1	0.02	0	0.00	0.03	0.01
41500	Gland Seal System-Steam	0	0.00	0	0.00	0	0.00	2	0.02	0	0.00	0.02	0.00
41600	Turbovisory	9	0.02	4	0.00	2	0.00	0	0.00	0	0.00	0.03	0.05
41700	Governing System	11	0.05	2	0.01	4	0.01	0	0.00	0	0.00	0.06	0.10
Steam Turbine Total		**48**	**0.49**	**35**	**0.03**	**31**	**0.04**	**19**	**0.53**	**30**	**6.20**	**7.26**	**1.05**

Fossil - Oil Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Generators



Generators ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

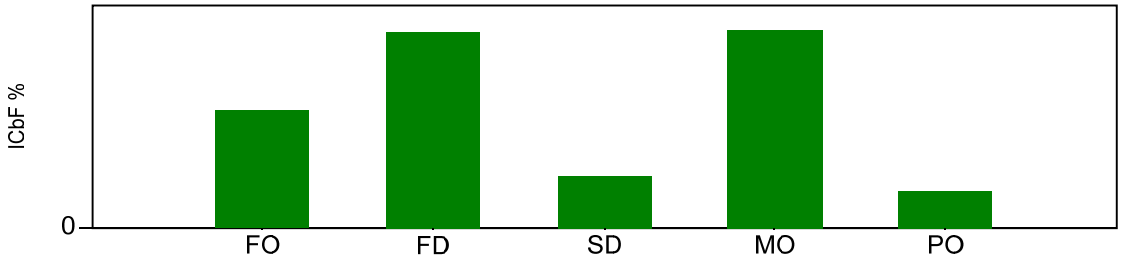
Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Generators													
42100	Generator	3	0.04	2	0.00	1	0.00	0	0.00	2	0.02	0.07	0.09
42110	Generator Rotor	7	0.19	0	0.00	5	0.00	0	0.00	2	0.37	0.57	0.43
42114	Generator Collector And Brushes	0	0.00	0	0.00	0	0.00	1	0.03	3	0.01	0.03	0.00
42120	Generator Stator	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
42200	Excitation Systems Equipment	8	0.01	1	0.01	19	0.01	1	0.01	0	0.01	0.02	0.02
42400	Generator Liquid Cooling System	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
42500	Seal Oil System	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
Generators Total		**18**	**0.24**	**5**	**0.01**	**25**	**0.01**	**3**	**0.05**	**7**	**0.41**	**0.70**	**0.54**

Fossil - Oil Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Heat Power Cycle



Heat Power Cycle ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

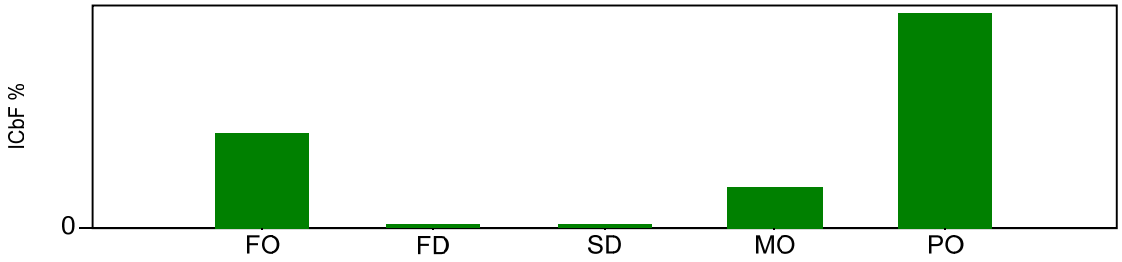
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Heat Power Cycle													
43090	Boiler Feedwater Piping And Supports	3	0.03	4	0.01	0	0.00	2	0.03	0	0.00	0.07	0.07
43100	High Pressure Feedwater Heaters And	6	0.05	6	0.13	1	0.02	4	0.04	0	0.01	0.20	0.10
43200	Boiler Feed Pumps And Auxiliaries	7	0.24	24	0.16	2	0.08	7	0.11	0	0.06	0.39	0.50
43260	Boiler Feed Pump Variable Speed Coupling	0	0.00	0	0.00	1	0.01	0	0.00	0	0.00	0.01	0.00
43300	Boiler Feed Pump Turbines & Auxiliaries	0	0.01	3	0.01	1	0.01	0	0.01	0	0.01	0.02	0.01
43400	Boiler Feed Pump Motors And Auxiliaries	2	0.04	2	0.00	0	0.00	2	0.03	0	0.00	0.07	0.09
44090	Condensate Piping And Supports	0	0.00	1	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
44110	Condensor	1	0.01	1	0.01	2	0.02	0	0.01	0	0.01	0.02	0.00
44120	Condensor Tubes	1	0.03	18	0.37	6	0.04	19	0.27	0	0.03	0.62	0.06
44200	Condensate Extraction Pumps And	1	0.00	2	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
44300	Condensate Extraction Pump Motors And	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
44500	Deaerator, Storage Tank, And Auxiliaries	3	0.01	1	0.00	0	0.00	4	0.06	0	0.00	0.07	0.02
45000	Air Extraction System	4	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
47000	Condensate Make-up System	1	0.00	0	0.00	0	0.00	2	0.05	0	0.00	0.05	0.00
48100	Extraction Steam System	0	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
48500	Turbine And Piping Drains	0	0.00	0	0.00	0	0.00	1	0.09	0	0.00	0.09	0.00
Heat Power Cycle Total		**29**	**0.42**	**64**	**0.69**	**14**	**0.18**	**43**	**0.72**	**0**	**0.12**	**1.63**	**0.85**

Fossil - Oil Units

Table 6.2.12

Detail Component Outage Code Report, 2004 to 2008

Electrical Power Sys.



Electrical Power System ICbF by event type for Fossil units based on 2004-2008 data.

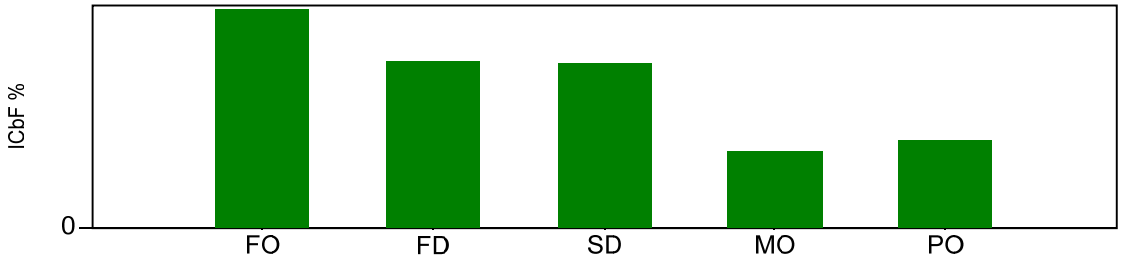
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Electrical Power System													
51100	Output System Generator Voltage Equipment	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0.00	0.00
51120	Generator Power Transformers	3	0.11	1	0.00	0	0.00	7	0.01	8	0.12	0.24	0.23
51130	Switching Equipment-Generator Voltage	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
51170	Generator Neutral Grounding Equipment	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
52100	Generator Voltage Supply System	1	0.04	0	0.00	0	0.00	0	0.00	0	0.00	0.04	0.08
52120	Station Service Transformer	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0.00	0.00
52130	Unit Service Transformer	1	0.00	0	0.00	0	0.00	2	0.04	1	0.00	0.05	0.01
52140	Exciter XFMR	2	0.02	0	0.00	0	0.00	0	0.00	2	0.23	0.26	0.05
53200	Station Service Power Distribution	3	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
55000	Direct Current Power Supplies	1	0.00	1	0.00	0	0.00	1	0.02	1	0.02	0.04	0.00
Electrical Power System Total		**12**	**0.17**	**3**	**0.00**	**0**	**0.00**	**11**	**0.07**	**14**	**0.37**	**0.63**	**0.37**

Fossil - Oil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Ins. and Control



Instrumentation and Control ICbF by event type for Fossil units based on 2004-2008 data.

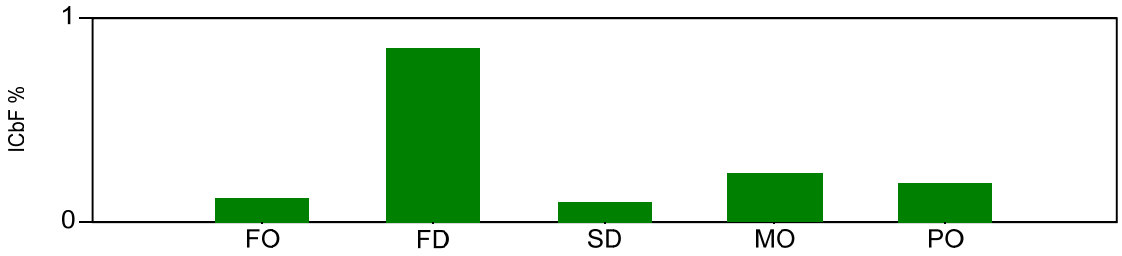
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Instrumentation and Control													
63100	Steam Generator Controls	10	0.02	23	0.05	0	0.01	0	0.01	0	0.01	0.05	0.04
63300	Primary Steam Instrumentation & Control	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0.00	0.00
63400	Auxiliary Systems -Instrumentation and Control	2	0.09	0	0.00	0	0.00	0	0.00	0	0.00	0.09	0.20
63700	Fuel Oil Management - Instrumentation	1	0.02	4	0.07	0	0.02	0	0.02	0	0.02	0.07	0.03
63900	Ignition Fuel,Fuel Gas, & Miscellaneous	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64100	Steam Turbine And Auxiliaries -	8	0.01	3	0.00	0	0.00	0	0.00	0	0.00	0.01	0.03
64200	Generator And Auxiliaries - Instrumentation and Control	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64300	Boiler Feedwater System -Instrumentation and Control	4	0.01	4	0.01	0	0.00	0	0.00	0	0.00	0.02	0.03
65100	Main Power Output Systems - Control and Protection	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00	0.01	0.02
65500	Direct Current Power Distribution - Control and Protection	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
69000	Computers	8	0.08	9	0.06	19	0.15	0	0.06	1	0.07	0.20	0.07
Instrumentation and Control Total		**38**	**0.24**	**44**	**0.19**	**20**	**0.18**	**0**	**0.09**	**1**	**0.10**	**0.45**	**0.42**

Fossil - Oil Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.12
Auxiliary Processes



Plant Aux. Processes and Services ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

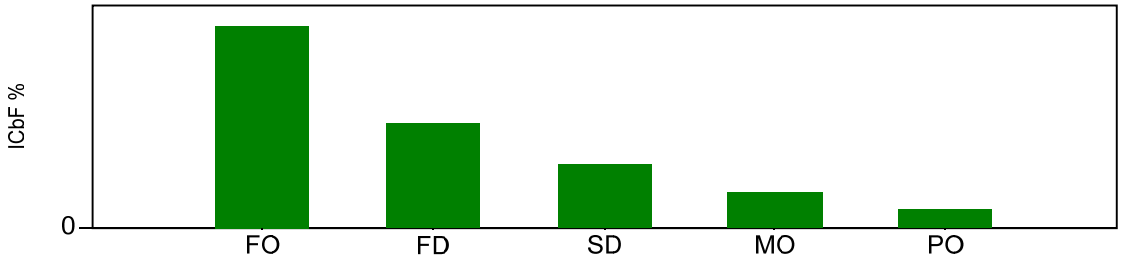
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Plant Aux. Processes and Services													
71000	Circulating Water Systems	1	0.00	1	0.00	1	0.00	5	0.09	1	0.05	0.14	0.00
71110	Travelling Water Screens	0	0.00	2	0.00	0	0.00	1	0.04	0	0.00	0.05	0.00
71120	Circulating Water Pumps	2	0.01	7	0.16	1	0.01	0	0.01	0	0.01	0.16	0.03
71127	Circulating Water Pump Motors	0	0.08	16	0.68	0	0.08	0	0.08	0	0.08	0.68	0.18
71140	Circulating Water Main Butterfly Valves and Operators	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
71190	Circulating Water Piping And Supports	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
72100	Service Water Low Pressure Open System	1	0.01	0	0.00	0	0.00	1	0.00	0	0.00	0.01	0.02
73000	Heating, Ventilating, And Air	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
73100	Auxiliary Steam And Condensate Systems	0	0.00	1	0.01	1	0.00	0	0.00	0	0.00	0.01	0.00
74000	Water Treatment Plant	2	0.00	1	0.00	0	0.00	0	0.00	1	0.05	0.05	0.00
75000	Compressed Air Systems	0	0.00	0	0.00	0	0.00	2	0.01	0	0.00	0.01	0.00
78000	Fire Protection Systems	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
Plant Aux. Processes and Services Total		**7**	**0.10**	**30**	**0.85**	**3**	**0.09**	**10**	**0.23**	**2**	**0.19**	**1.11**	**0.24**

Fossil - Oil Units

Table 6.2.12

Detail Component Outage Code Report, 2004 to 2008

Conditions



Conditions ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

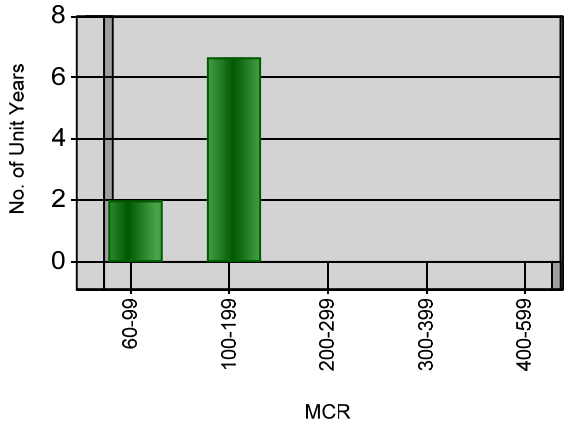
Number of Units:	14.00
Number of Unit Years:	56.74
Overall Operating Factor:	41.99

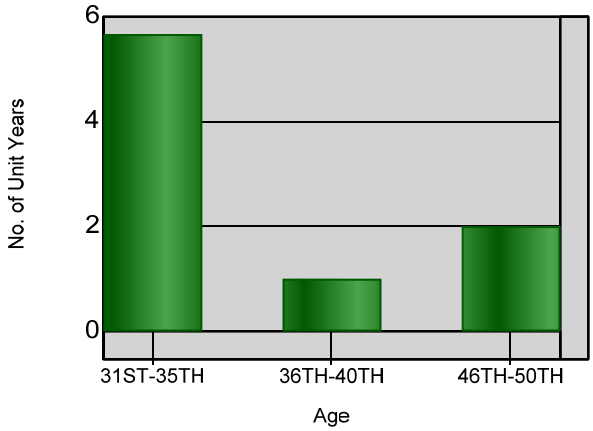
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Conditions													
01410	Poor Quality Fuel, Heat Content	0	0.00	1	0.00	0	0.00	1	0.00	0	0.00	0.01	0.00
05200	Transmission Limitations	6	0.05	2	0.02	9	0.17	6	0.03	0	0.02	0.21	0.07
07010	Site Environment, Storms, Floods	6	0.31	17	0.36	7	0.06	1	0.07	0	0.05	0.66	0.68
07120	Sulphur Dioxide - Environmental	0	0.00	0	0.00	0	0.00	2	0.01	0	0.00	0.01	0.00
07130	Particulates - Environmental Restriction	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
07210	Cooling Water Discharge - Thermal Effects	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
08160	Fire, General	1	0.03	0	0.00	0	0.00	0	0.00	0	0.00	0.03	0.07
08910	Staff Shortage	2	0.09	0	0.00	0	0.00	0	0.00	0	0.00	0.09	0.21
99999	Other	1	0.25	0	0.00	0	0.00	0	0.01	0	0.00	0.26	0.54
Conditions Total		**17**	**0.73**	**20**	**0.38**	**16**	**0.23**	**11**	**0.12**	**0**	**0.07**	**1.27**	**1.57**

Fossil – Natural Gas

External Causes Excluded, 2008 Data

Table 6.2.13



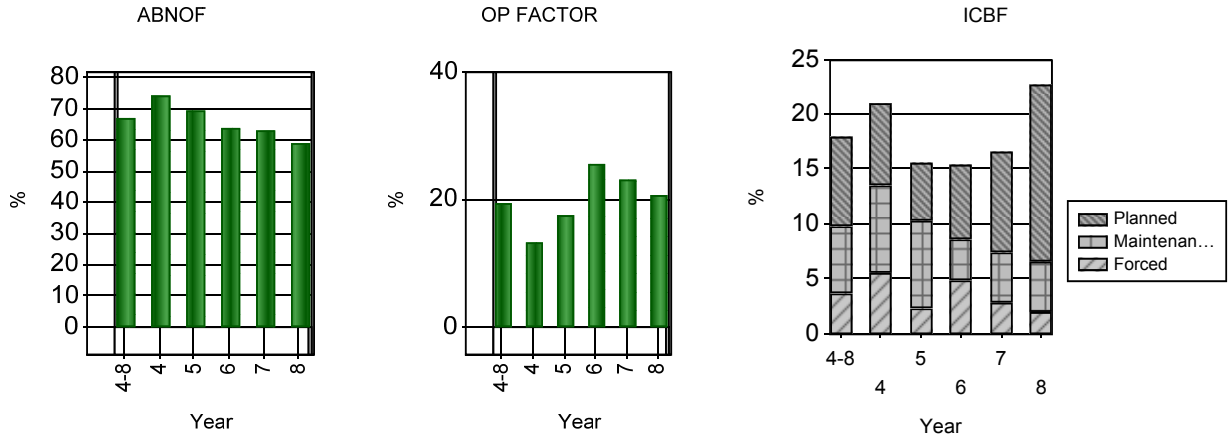


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	2.0	43.02	0.00	46.42	3	0.0	17.25	7.03	0.26	1.89	1.89	0.3	12.67	3.22	7.73	2.71
100-199	6.7	63.89	7.76	13.00	5	0.1	786.22	159.64	9.50	9.55	9.55	1.6	23.49	4.61	2.59	19.09
200-299	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
300-399	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
400-599	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
Classification By Year Of Service																
31ST-35TH	5.7	69.40	9.14	4.89	4	0.1	786.22	199.55	24.73	24.86	24.86	1.5	26.15	10.82	1.56	22.47
36TH-40TH	1.0	32.71	0.00	58.87	1	0.0	0.03	0.03	0.00	0.00	0	0.1	8.42	1.69	8.42	0.00
46TH-50TH	2.0	43.02	0.00	46.42	3	0.0	17.25	7.03	0.26	1.89	1.88	0.3	12.67	3.22	7.73	2.71
Classification By Operating Factor																
0-10	2.8	74.51	5.74	6.12	4	0.1	786.22	199.55	34.43	34.60	34.6	0.6	20.30	17.29	2.45	13.64
31-40	1.0	53.53	0.00	35.21	1	0.0	0.72	0.72	0.02	0.24	0.24	0.1	12.91	2.83	10.96	0.29
51-60	2.0	32.60	0.00	58.25	3	0.0	17.25	6.80	0.20	1.43	1.43	0.2	10.43	2.57	6.46	2.57
All Units	**8.7**	**59.06**	**5.97**	**20.72**	**8**	**0.1**	**786.22**	**102.42**	**4.94**	**5.77**	**5.75**	**1.8**	**20.99**	**3.89**	**3.78**	**15.31**

Fossil – Natural Gas

Table 6.2.14

External Causes Excluded, 2004 to 2008 Data

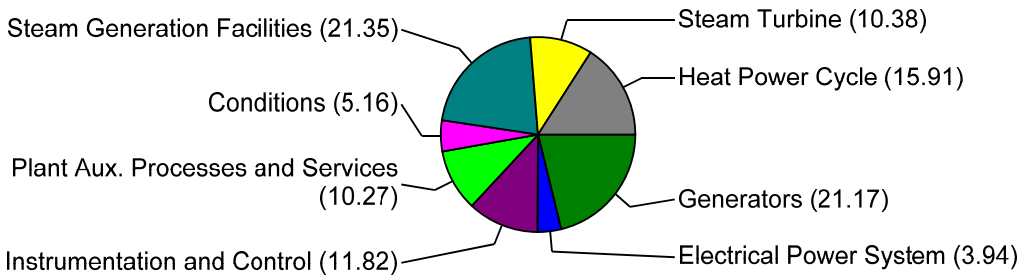


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
60-99	22.0	65.56	0.00	22.22	25	0.4	1737.25	144.40	7.76	15.99	14.72	3.2	14.75	4.50	9.48	0.84
100-199	42.7	67.85	11.92	18.02	50	0.9	1872.91	163.85	10.83	13.48	10.80	6.4	15.05	4.03	2.03	9.79
200-299	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
300-399	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
400-599	0.0	0.00	0.00	0.00	0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
Classification By Year Of Service																
21ST-25TH	4.0	87.07	0.00	12.30	4	0.0	39.33	12.02	1.10	1.13	1.13	0.0	0.63	6.08	0.49	0.00
26TH-30TH	40.0	77.67	11.42	12.97	40	0.8	1872.91	184.40	13.95	15.52	12.39	4.0	9.90	4.24	1.16	5.98
31ST-35TH	9.7	59.67	5.36	16.68	9	0.1	786.22	89.94	5.42	13.15	5.71	2.5	25.44	4.96	3.30	19.35
36TH-40TH	1.0	32.71	0.00	58.87	1	0.0	0.03	0.03	0.00	0.00	0	0.1	8.42	1.69	8.42	0.00
41ST-45TH	1.0	39.09	0.00	35.50	3	0.0	290.66	100.33	8.80	38.29	27.41	0.4	39.48	8.43	21.96	0.00
46TH-50TH	9.0	25.96	0.00	48.22	18	0.4	1737.25	181.58	7.90	14.40	14.2	2.7	30.45	3.68	20.50	1.11
Classification By Operating Factor																
0-10	30.9	85.78	0.00	6.22	33	0.4	1868.38	98.10	16.09	20.06	16.17	2.6	8.39	10.38	1.55	5.12
11-20	7.0	73.95	19.04	16.07	7	0.0	142.58	27.67	1.92	1.94	1.91	0.7	9.86	3.55	0.34	9.20
21-30	4.8	50.08	42.17	28.70	5	0.4	1872.91	630.60	20.60	20.60	19.69	1.2	23.85	2.16	0.03	13.73
31-40	9.9	45.53	17.36	34.85	9	0.2	1630.08	183.26	5.18	8.94	5.53	2.1	21.12	2.03	3.87	13.84
41-50	10.0	27.27	0.00	46.94	21	0.4	1737.25	169.97	7.97	16.51	15.21	3.1	31.35	4.04	20.65	1.00
All Units	**64.7**	**67.07**	**7.86**	**19.45**	**75**	**1.4**	**1,872.91**	**157.37**	**9.66**	**14.43**	**12.30**	**9.7**	**14.94**	**4.21**	**4.56**	**6.74**

Fossil - Natural Gas — Table 6.2.15

Major Component Outage Code Report, 2004 to 2008 Data

Major Componenent Contribution to Natural Gas-Fired Fossil Unit ICbF based on 2004-2008 data.



UNIT STATISTICS

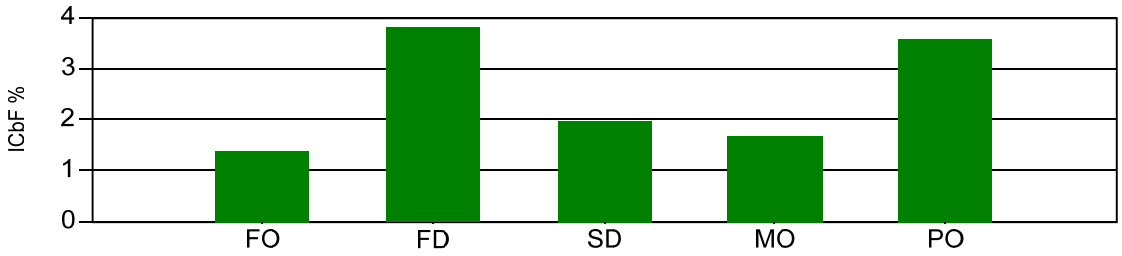
Number of Units:	16.00
Number of Unit Yars:	68.72
Overall Operating Factor:	19.45

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Conditions	5	0.01	0	0.00	0	0.00	7	0.04	3	0.03	0.09	0.07	0.07
Electrical Power System	6	0.01	0	0.00	0	0.00	6	0.01	0	0.00	0.02	0.06	0.06
Generators	10	1.14	1	0.00	0	0.00	41	0.94	8	1.02	3.13	5.33	5.23
Heat Power Cycle	10	0.43	52	1.58	8	0.67	28	1.13	5	0.65	2.79	0.04	1.63
Instrumentation and Control	24	0.13	25	0.56	0	0.05	10	0.10	0	0.05	0.69	0.38	0.60
Plant Aux. Processes and Services	1	0.00	6	0.00	0	0.00	13	0.24	12	1.27	1.51	0.00	0.02
Steam Generation Facilities	10	1.38	206	3.81	65	1.96	27	1.68	23	3.59	8.93	2.42	5.50
Steam Turbine	8	0.50	3	0.19	15	2.20	16	1.98	5	1.71	5.80	1.40	1.37
TOTAL (External Causes Included)	74	3.60	293	6.14	88	4.88	148	6.12	56	8.32	22.96	9.70	14.48
TOTAL (External Causes Excluded)	72	3.64	293	6.18	88	4.89	143	6.12	54	8.30	22.92	9.67	14.44

Fossil - Natural Gas

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Steam Generation Fac.



Steam Generation Facilities ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

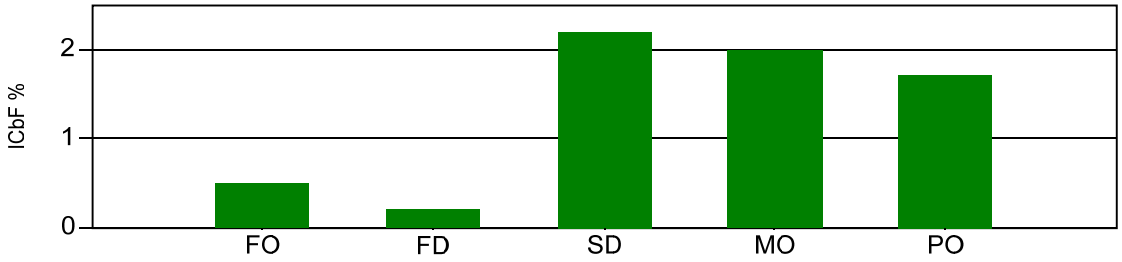
Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Generation Facilities													
31000	Steam Generator/HRSG	5	0.73	193	3.35	61	1.81	11	0.94	22	3.28	7.19	2.54
31240	Gas Burner Piping And Valves	0	0.00	8	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
31270	Burners And Windboxes	2	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
31530	Steam Generating Tubes (Between Steam Drum and Mud Drum)	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
31540	Waterwalls	0	0.00	1	0.05	0	0.00	8	0.35	0	0.00	0.40	0.01
31570	Safety Valves	0	0.00	0	0.00	4	0.01	0	0.00	0	0.00	0.01	0.00
31701	Superheater/High Pressure Section	1	0.33	0	0.00	0	0.00	0	0.00	0	0.00	0.33	1.50
31703	Economizer/Low Pressure Section	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00	0.02	0.10
32310	Forced Draft Fans	0	0.14	2	0.41	0	0.14	0	0.14	0	0.14	0.41	0.62
32510	Induced Draft Fans	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
33100	Main Steam Piping	0	0.14	0	0.00	0	0.00	2	0.02	1	0.17	0.32	0.63
33600	High Pressure Steam Piping	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
34400	Boiler Drains System	1	0.02	0	0.00	0	0.00	1	0.01	0	0.00	0.03	0.09
38000	Sulphur Oxides Removal System	0	0.00	0	0.00	0	0.00	2	0.20	0	0.00	0.20	0.00
Steam Generation Facilities Total		**10**	**1.38**	**206**	**3.81**	**65**	**1.96**	**27**	**1.68**	**23**	**3.59**	**8.93**	**5.50**

Fossil - Natural Gas

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Steam Turbine



Steam Turbine ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

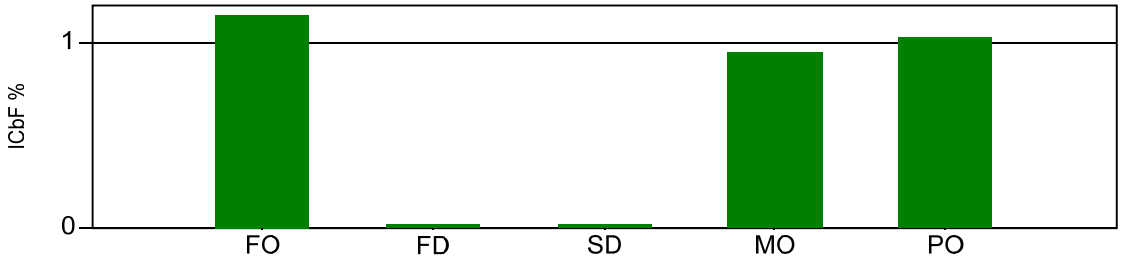
Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Turbine													
41100	Turbine	0	0.07	0	0.07	11	1.07	6	1.61	5	1.59	4.13	0.00
41120	Rotors	1	0.14	1	0.12	4	1.13	0	0.12	0	0.12	1.15	0.08
41121	Shaft Coupling Mechanism	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
41130	Blades	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
41160	Valve Gear	0	0.01	0	0.00	0	0.00	1	0.08	0	0.00	0.08	0.02
41170	Bearings And Pedestals	2	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
41200	Lubricating Oil System	2	0.03	0	0.00	0	0.00	3	0.05	0	0.00	0.07	0.12
41500	Gland Seal System-Steam	0	0.00	0	0.00	0	0.00	1	0.04	0	0.00	0.04	0.00
41540	Gland Seal System-Water	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
41600	Turbovisory	2	0.25	0	0.00	0	0.00	0	0.00	0	0.00	0.25	1.14
41700	Governing System	0	0.00	0	0.00	0	0.00	3	0.06	0	0.00	0.06	0.00
Steam Turbine Total		**8**	**0.50**	**3**	**0.19**	**15**	**2.20**	**16**	**1.98**	**5**	**1.71**	**5.80**	**1.37**

Fossil - Natural Gas

Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Generators



Generators ICbF by event type for Fossil units based on 2004-2008 data.

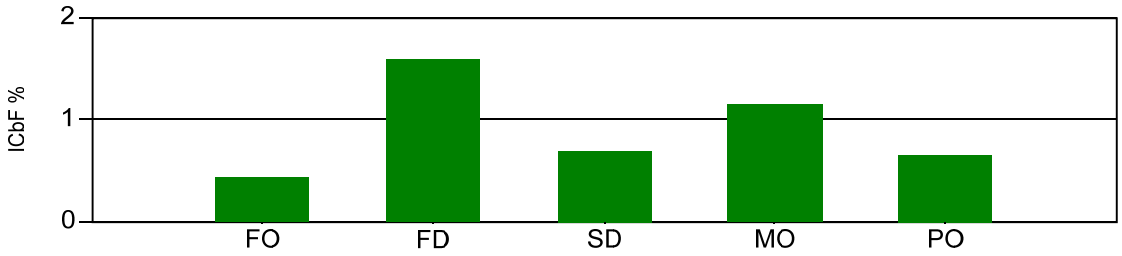
UNIT STATISTICS

Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Generators													
42100	Generator	1	0.00	1	0.00	0	0.00	1	0.01	5	0.69	0.70	0.01
42110	Generator Rotor	1	0.21	0	0.00	0	0.00	2	0.10	1	0.10	0.42	0.97
42111	Generator Bearings	2	0.59	0	0.00	0	0.00	2	0.13	0	0.00	0.73	2.70
42112	Generator Hydrogen Seals	1	0.33	0	0.00	0	0.00	0	0.00	2	0.23	0.56	1.50
42114	Generator Collector And Brushes	0	0.00	0	0.00	0	0.00	16	0.20	0	0.00	0.20	0.00
42200	Excitation Systems Equipment	5	0.01	0	0.00	0	0.00	12	0.33	0	0.00	0.35	0.05
42300	Hydrogen Gas Cooling System	0	0.00	0	0.00	0	0.00	4	0.06	0	0.00	0.06	0.00
42400	Generator Liquid Cooling System	0	0.00	0	0.00	0	0.00	2	0.06	0	0.00	0.06	0.00
42500	Seal Oil System	0	0.00	0	0.00	0	0.00	2	0.05	0	0.00	0.05	0.00
Generators Total		**10**	**1.14**	**1**	**0.00**	**0**	**0.00**	**41**	**0.94**	**8**	**1.02**	**3.13**	**5.23**

Fossil - Natural Gas
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Heat Power Cycle



Heat Power Cycle ICbF by event type for Fossil units based on 2004-2008 data.

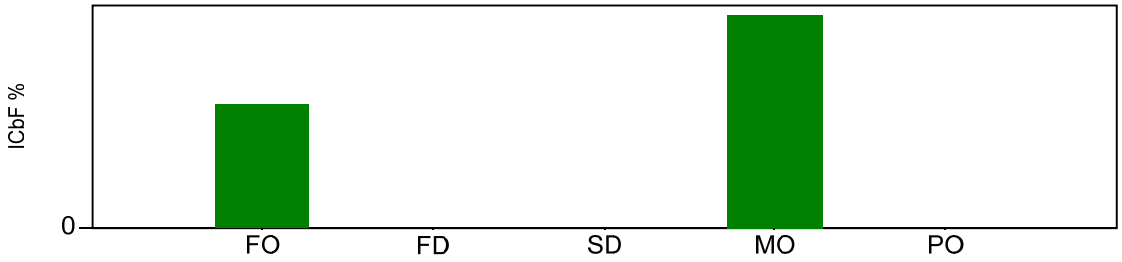
UNIT STATISTICS

Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Heat Power Cycle													
43090	Boiler Feedwater Piping And Supports	1	0.00	0	0.00	0	0.00	2	0.06	0	0.00	0.07	0.01
43100	High Pressure Feedwater Heaters And	1	0.00	3	0.03	0	0.00	0	0.00	1	0.00	0.03	0.01
43200	Boiler Feed Pumps And Auxiliaries	4	0.20	32	0.87	1	0.20	4	0.27	0	0.20	0.95	0.92
43260	Boiler Feed Pump Variable Speed Coupling	0	0.04	9	0.15	1	0.04	0	0.04	0	0.04	0.16	0.17
43400	Boiler Feed Pump Motors And Auxiliaries	1	0.19	6	0.52	6	0.43	0	0.18	1	0.21	0.78	0.49
44090	Condensate Piping And Supports	0	0.00	0	0.00	0	0.00	2	0.02	0	0.00	0.02	0.00
44110	Condensor	1	0.00	0	0.00	0	0.00	6	0.15	3	0.20	0.36	0.02
44120	Condensor Tubes	0	0.00	1	0.01	0	0.00	5	0.15	0	0.00	0.16	0.01
44200	Condensate Extraction Pumps And	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
44500	Deaerator, Storage Tank, And Auxiliaries	0	0.00	0	0.00	0	0.00	2	0.05	0	0.00	0.05	0.00
45000	Air Extraction System	0	0.00	1	0.00	0	0.00	2	0.08	0	0.00	0.08	0.00
45100	Air Extraction System Vacuum Pumps	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
45300	Steam Air Ejectors	1	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
47000	Condensate Make-up System	0	0.00	0	0.00	0	0.00	1	0.12	0	0.00	0.12	0.00
48400	Feedwater Heater Relief Valve, Vent	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
48500	Turbine And Piping Drains	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
Heat Power Cycle Total		**10**	**0.43**	**52**	**1.58**	**8**	**0.67**	**28**	**1.13**	**5**	**0.65**	**2.79**	**1.63**

Fossil - Natural Gas
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Electrical Power Sys.



Electrical Power System ICbF by event type for Fossil units based on 2004-2008 data.

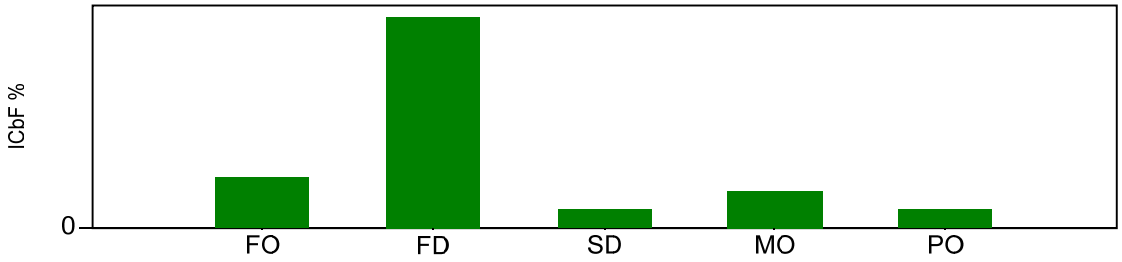
UNIT STATISTICS

Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Electrical Power System													
51100	Output System Generator Voltage Equipment	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
51120	Generator Power Transformers	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	0.01	0.00
51130	Switching Equipment-Generator Voltage	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
51133	Circuit Breakers-Generator Voltage	1	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.01
51136	Disconnect Switches-Generator Voltage	2	0.01	0	0.00	0	0.00	1	0.00	0	0.00	0.01	0.03
51150	Bus Duct, Bus, Cable	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
52130	Unit Service Transformer	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
53200	Station Service Power Distribution	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.02
Electrical Power System Total		**6**	**0.01**	**0**	**0.00**	**0**	**0.00**	**6**	**0.01**	**0**	**0.00**	**0.02**	**0.06**

Fossil - Natural Gas
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Ins. and Control



Instrumentation and Control ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Instrumentation and Control													
63100	Steam Generator Controls	2	0.03	13	0.45	0	0.03	1	0.03	0	0.03	0.45	0.12
63200	Equipment Controls-Furnace Draft	2	0.00	2	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
63300	Primary Steam Instrumentation & Control	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
63900	Ignition Fuel,Fuel Gas, & Miscellaneous	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64100	Steam Turbine And Auxiliaries -	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
64200	Generator And Auxiliaries - Instrumentation and Control	10	0.02	0	0.00	0	0.00	3	0.04	0	0.00	0.06	0.11
64300	Boiler Feedwater System -Instrumentation and Control	3	0.02	7	0.05	0	0.01	1	0.02	0	0.01	0.06	0.07
64400	Condensate System - Instrumentation and Control	0	0.01	2	0.05	0	0.01	0	0.01	0	0.01	0.05	0.04
65100	Main Power Output Systems - Control and Protection	4	0.05	0	0.00	0	0.00	2	0.00	0	0.00	0.06	0.25
65300	Alternating Current Power Distribution - Control and Protection	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
67000	Plant Auxiliary Processes And Services - Instrumentation and Control	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
69000	Computers	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
Instrumentation and Control Total		**24**	**0.13**	**25**	**0.56**	**0**	**0.05**	**10**	**0.10**	**0**	**0.05**	**0.69**	**0.60**

Fossil - Natural Gas
Detail Component Outage Code Report, 2004 to 2008

Table 6.2.16
Auxiliary Processes

Plant Aux. Processes and Services ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

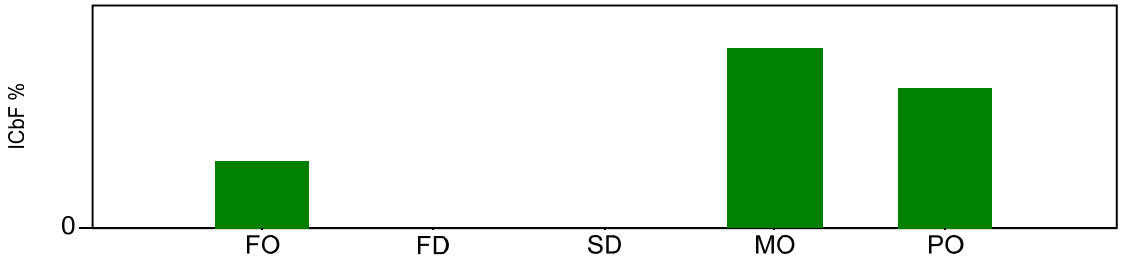
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Plant Aux. Processes and Services													
71000	Circulating Water Systems	0	0.00	1	0.00	0	0.00	9	0.10	11	1.26	1.36	0.01
71110	Travelling Water Screens	0	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
71120	Circulating Water Pumps	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
71190	Circulating Water Piping And Supports	0	0.00	0	0.00	0	0.00	3	0.04	1	0.01	0.05	0.00
73100	Auxiliary Steam And Condensate Systems	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
74000	Water Treatment Plant	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
76000	Miscellaneous Services	0	0.00	0	0.00	0	0.00	0	0.10	0	0.00	0.10	0.00
Plant Aux. Processes and Services Total		**1**	**0.00**	**6**	**0.00**	**0**	**0.00**	**13**	**0.24**	**12**	**1.27**	**1.51**	**0.02**

Fossil - Natural Gas

Table 6.2.16

Detail Component Outage Code Report, 2004 to 2008

Conditions



Conditions ICbF by event type for Fossil units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	16.00
Number of Unit Years:	68.72
Overall Operating Factor:	19.45

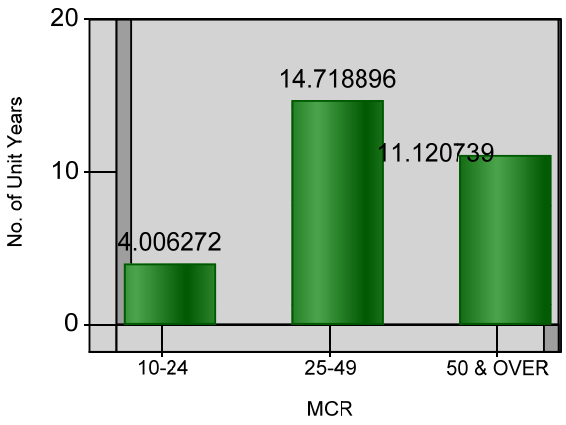
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Conditions													
05200	Transmission Limitations	2	0.01	0	0.00	0	0.00	1	0.00	2	0.00	0.02	0.07
07010	Site Environment, Storms, Floods	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
99999	Other	1	0.00	0	0.00	0	0.00	6	0.04	1	0.03	0.07	0.00
Conditions Total		**5**	**0.01**	**0**	**0.00**	**0**	**0.00**	**7**	**0.04**	**3**	**0.03**	**0.09**	**0.07**

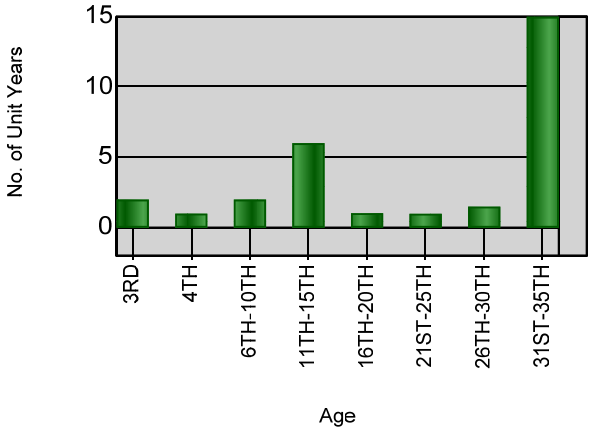
6.3 Combustion Turbine Summary Statistics

Combustion Turbine Units

External Causes Excluded , 2008 Data

Table 6.3.1



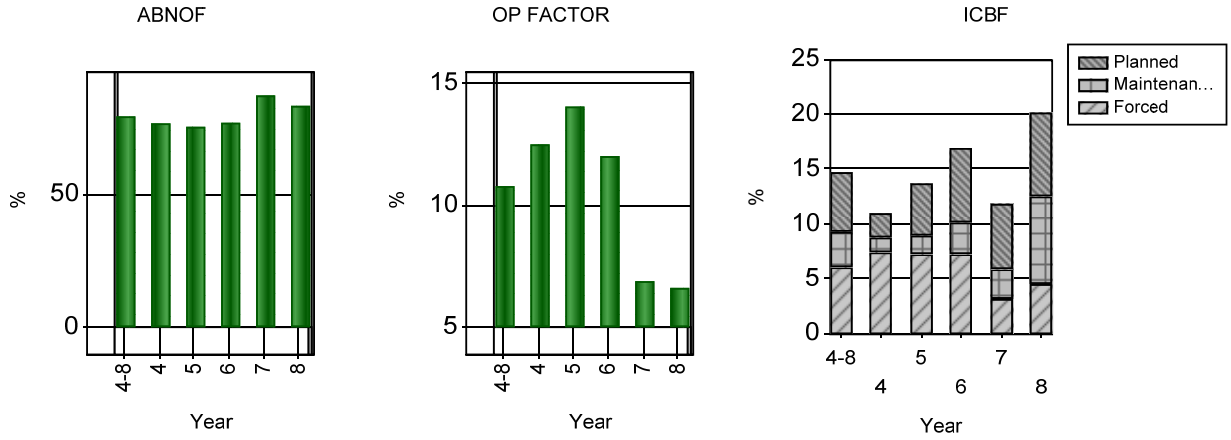


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	UFOP (%)	DAUFOP (%)	SR	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
10-24	4.01	95.80	2.12	0.26	3	0.0	29.17	20.05	40.07	31.88	31.88	1.00	3.82	194.77	1.01	2.64
25-49	14.72	78.03	12.10	11.82	84	0.2	454.00	22.34	10.94	10.62	10.99	1.00	10.18	24.69	7.11	1.54
50 & OVER	11.12	85.92	12.11	1.98	35	0.1	250.00	28.25	33.62	32.77	61.48	0.98	20.74	9.02	2.51	8.09
Classification By Year Of Service																
3RD	2.0	29.96	0.00	66.50	33	0.0	9.27	1.99	0.56	0.56	1.07	1.00	4.03	21.74	0.93	2.21
4TH	1.0	67.46	0.00	28.90	18	0.0	6.87	2.81	1.95	1.94	1.94	1.00	3.63	34.50	0.01	3.05
6TH-10TH	2.0	92.17	0.00	0.69	6	0.1	230.00	95.61	82.03	82.03	82.03	1.00	7.09	0.00	2.63	1.20
11TH-15TH	6.0	95.19	7.24	0.12	11	0.0	179.70	34.56	85.08	70.38	70.38	1.00	4.68	0.00	3.42	0.55
16TH-20TH	1.0	94.53	0.00	4.40	1	0.0	31.47	31.47	7.29	7.29	7.29	1.00	1.07	21.89	0.72	0.00
21ST-25TH	1.0	84.81	82.53	4.88	10	0.1	454.00	87.79	66.07	57.62	57.85	0.98	10.10	20.44	0.06	0.00
26TH-30TH	1.5	87.60	28.91	7.95	14	0.0	20.37	4.86	5.92	5.92	77.36	0.99	33.09	16.21	0.37	0.24
31ST-35TH	15.3	84.31	9.86	0.72	29	0.1	328.48	30.28	47.45	41.94	42.67	0.98	18.33	36.12	7.04	7.21
Classification By Operating Factor																
0-10	26.8	87.93	11.97	1.30	71	0.3	454.00	39.57	48.71	40.94	56.94	0.99	14.32	22.88	5.01	4.32
21-30	1.0	67.46	0.00	28.90	18	0.0	6.87	2.81	1.95	1.94	1.94	1.00	3.63	34.50	0.01	3.05
31-40	1.0	59.88	0.00	36.97	29	0.0	8.43	1.43	1.26	1.26	1.26	1.00	3.16	67.44	0.10	2.59
91-100	1.0	0.04	0.00	96.03	4	0.0	9.27	6.08	0.29	0.29	1.00	1.00	4.91	4.15	1.76	1.84
All Units	**29.8**	**83.36**	**10.76**	**6.60**	**122**	**0.3**	**454.00**	**23.98**	**14.45**	**13.97**	**18.42**	**0.99**	**13.27**	**23.81**	**4.57**	**4.14**

Combustion Turbine Units

Table 6.3.2

External Causes Excluded, 2004 to 2008 Data



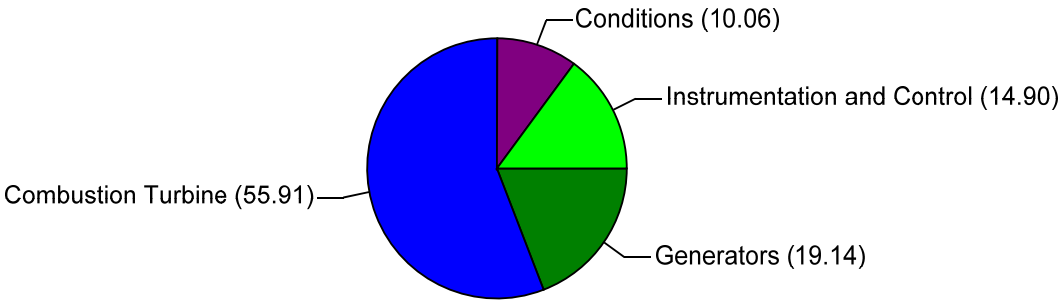
	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	UFOP (%)	DAUFOP (%)	SR	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
10-24	24.0	88.14	3.73	0.22	24	2.4	4150.36	866.85	97.78	83.48	83.48	0.98	11.49	168.18	0.58	1.02
25-49	73.9	81.92	18.37	10.46	418	1.7	8016.01	35.83	17.92	17.01	17.29	0.99	7.27	25.31	2.55	2.19
50 & OVER	73.4	74.87	15.71	14.62	223	1.9	6406.30	74.96	14.22	13.85	14.65	0.97	13.08	5.44	0.64	6.16
Classification By Year Of Service																
0	2.6	40.34	0.00	53.71	49	0.0	107.95	6.64	2.61	2.6	3.4	1.00	5.69	18.06	0.47	3.34
1ST	3.0	51.32	0.00	45.24	37	0.0	36.56	3.41	1.05	1.04	1.19	1.00	3.21	21.35	0.54	1.79
2ND	5.0	63.88	0.00	30.35	39	0.1	621.46	31.21	8.30	5.5	5.82	1.00	5.33	18.37	0.66	1.59
3RD	4.9	62.67	0.00	33.19	55	0.1	154.00	8.88	3.24	2.11	2.62	1.00	6.82	19.86	0.71	1.02
4TH	3.0	84.07	0.00	10.97	29	0.0	29.91	4.19	4.04	3.27	3.27	0.99	3.90	36.43	0.60	2.84
5TH	2.0	88.49	0.00	2.07	13	0.1	603.96	52.72	65.33	48.16	48.38	0.96	8.47	96.58	0.11	4.43
6TH-10TH	6.0	89.42	0.00	3.27	14	0.1	230.00	77.33	38.56	27.21	27.21	0.95	7.30	0.00	0.88	4.36
11TH-15TH	29.9	94.17	8.23	0.80	46	0.2	355.95	38.99	45.70	38.82	38.82	0.97	4.75	24.82	1.36	2.71
16TH-20TH	4.0	92.45	21.60	4.79	11	0.0	77.00	21.06	11.05	9.67	9.67	1.00	2.28	25.85	0.83	0.79
21ST-25TH	17.4	51.26	31.41	23.36	49	3.1	8783.98	558.27	39.04	28.93	28.94	0.96	22.06	4.98	0.13	4.20
26TH-30TH	73.5	79.94	18.90	10.04	258	3.8	8016.01	128.51	33.84	23.18	24.26	0.97	12.69	11.50	1.08	3.63
31ST-35TH	22.1	86.21	14.81	0.72	67	0.1	328.48	17.82	45.89	29.67	30.29	0.98	14.37	106.03	4.86	6.55
Classification By Operating Factor																
0-10	138.4	89.09	13.64	1.46	430	6.3	8783.98	127.69	75.52	71.54	73.03	0.97	10.61	55.26	1.73	2.78
11-20	11.3	56.41	12.38	16.29	30	1.3	6406.30	383.81	33.48	29.74	29.74	0.89	21.79	8.69	0.20	10.65
21-30	8.5	69.22	0.00	27.17	158	0.0	29.80	2.46	1.85	1.84	1.94	1.00	3.13	42.03	0.56	1.79
31-40	2.0	58.83	0.00	35.99	14	0.1	165.75	41.62	8.45	8.30	8.30	1.00	5.17	5.55	0.33	1.52
81-90	9.0	1.95	64.17	86.75	10	0.0	5.96	1.86	0.03	0.03	0.03	0.97	18.82	1.15	0.00	11.27
91-100	4.0	0.12	0.00	95.81	25	0.0	107.95	14.68	1.08	1.08	1.67	1.00	4.67	6.52	0.61	2.34
All Units	**173.3**	**78.98**	**15.02**	**10.70**	**667**	**7.7**	**8,783.98**	**101.61**	**28.51**	**26.92**	**27.42**	**0.98**	**11.24**	**14.17**	**1.44**	**3.69**

Combustion Turbine Units

Table 6.3.3

Major Component Outage Code Report, 2004 to 2008

Major Componenent Contribution to Combustion Unit ICbF based on 2004-2008 data.



UNIT STATISTICS

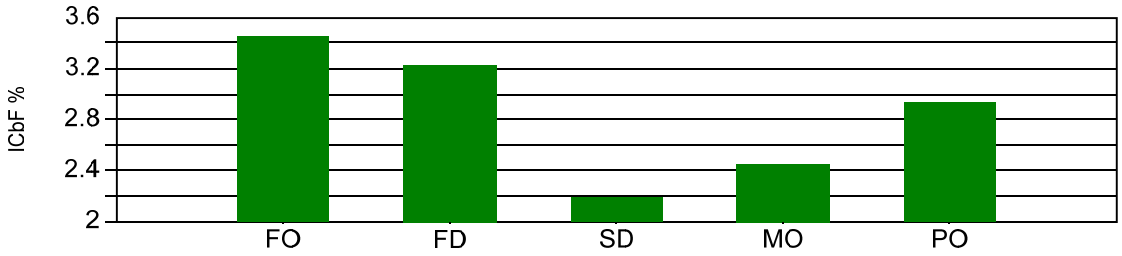
Number of Units:	45.00
Number of Unit Yars:	184.58
Overall Operating Factor:	10.71

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Combustion Turbine	332	3.46	470	3.22	34	2.19	228	2.41	227	2.91	9.07	13.86	17.94
Conditions	89	0.49	41	0.15	2	0.06	25	0.22	32	0.18	0.84	2.69	2.87
Generators	113	1.82	10	0.14	4	0.05	63	0.30	95	1.69	3.80	11.29	10.81
Instrumentation and Control	126	0.52	11	0.04	1	0.00	48	0.03	32	0.41	0.97	3.25	3.03
TOTAL (External Causes Included)	660	6.29	532	3.55	41	2.30	364	2.96	386	5.19	14.68	31.09	34.65
TOTAL (External Causes Excluded)	587	5.83	492	3.44	39	2.27	339	2.81	359	5.08	13.98	29.28	32.80

Combustion Turbine Units

Detail Component Outage Code Report, 2004 to 2008 Data

Table 6.3.4
Combustion Turbine



Combustion Turbine ICbF by event type forCombustion units based on 2004-2008 data.

UNIT STATISTICS

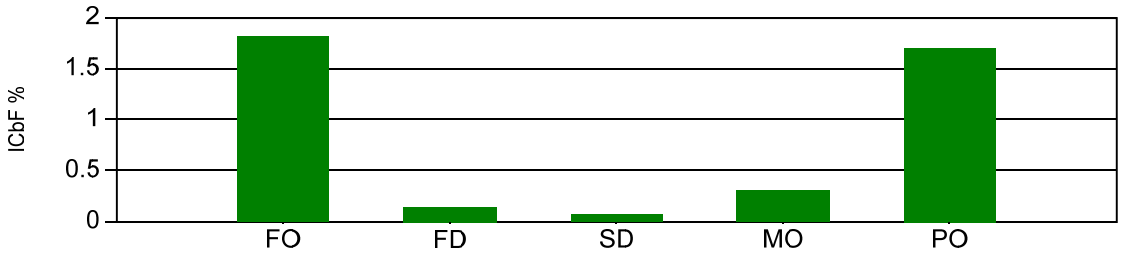
Number of Units:	45.00
Number of Unit Yars:	184.58
Overall Operating Factor:	10.71

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Combustion Turbine													
49100	Combustion Turbine	82	2.22	374	2.34	26	1.84	55	1.28	88	1.81	5.62	10.70
49101	Combustion Turbine - Exhaust Emission	6	0.02	14	0.09	3	0.02	4	0.02	2	0.14	0.23	0.08
49210	Compressor	6	0.00	0	0.00	0	0.00	33	0.57	16	0.04	0.61	0.01
49211	Compressor Shaft And Bearings For Tow-shaft Machine	21	0.00	0	0.00	0	0.00	2	0.00	2	0.01	0.02	0.01
49220	Combustion System	4	0.01	1	0.00	1	0.01	0	0.00	2	0.05	0.06	0.02
49221	Combustion Chamber	18	0.17	3	0.22	1	0.10	8	0.14	6	0.15	0.37	1.01
49230	Turbine(High Pressure If More Than One)	3	0.03	0	0.00	1	0.00	1	0.00	0	0.00	0.03	0.17
49231	Low Pressure Turbine	9	0.00	0	0.00	0	0.00	0	0.00	2	0.02	0.02	0.01
49232	Interstage Gas Passages	1	0.00	0	0.00	0	0.00	1	0.00	1	0.00	0.00	0.00
49240	Turbine Load Shaft And Bearing	3	0.01	0	0.00	0	0.00	2	0.00	0	0.00	0.01	0.04
49241	Reduction Gear	2	0.01	0	0.00	0	0.00	0	0.00	11	0.06	0.07	0.05
49242	Main Coupling	1	0.02	0	0.00	0	0.00	1	0.00	1	0.00	0.03	0.14
49243	Clutch	9	0.56	16	0.32	0	0.12	4	0.13	6	0.15	0.80	3.33
49244	Braking System	3	0.00	0	0.00	0	0.00	3	0.00	1	0.00	0.00	0.00
49251	Inlet Air Ducts And Vanes	7	0.08	0	0.00	0	0.00	3	0.00	7	0.09	0.17	0.46
49252	Air Filters	0	0.00	0	0.00	0	0.00	5	0.00	1	0.00	0.00	0.00
49253	Intercoolers	1	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
49260	Turning Gear System	4	0.02	0	0.00	0	0.00	2	0.00	2	0.00	0.02	0.10
49270	Starting System	35	0.04	2	0.00	0	0.00	7	0.01	14	0.10	0.15	0.23
49280	Battery And Charger System	2	0.00	0	0.00	0	0.00	10	0.01	2	0.00	0.01	0.01
49291	Regenerators	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
49292	Exhaust Chamber Vanes	1	0.00	1	0.00	0	0.00	0	0.00	4	0.00	0.00	0.00
49293	Exhaust Stack And Silencer	4	0.01	2	0.00	0	0.00	7	0.05	14	0.15	0.21	0.06
49294	Exhaust Hood/Doors	3	0.00	0	0.00	0	0.00	4	0.00	2	0.00	0.00	0.00
49311	Internal Cooling And Seal Air System	5	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.01
49312	Heat Shields	0	0.00	0	0.00	0	0.00	1	0.00	1	0.00	0.00	0.00
49313	Supercharging Fan	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
49314	Fuel Supply System To Unit	26	0.06	43	0.11	0	0.03	19	0.05	8	0.05	0.19	0.37
49315	Unit Fuel Controls And Conditioning	19	0.05	10	0.13	1	0.05	7	0.08	6	0.05	0.18	0.28
49316	Ignition System	17	0.04	1	0.01	1	0.02	1	0.01	0	0.01	0.06	0.21
49317	Lubrication System	25	0.09	1	0.00	0	0.00	13	0.03	5	0.01	0.13	0.51
49318	Lubrication System - Power Turbine	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
49319	Cooling Water System	6	0.01	2	0.00	0	0.00	2	0.00	1	0.00	0.01	0.05
49321	External Cooling Air System	0	0.00	0	0.00	0	0.00	3	0.01	2	0.00	0.02	0.00
49322	Service Air Systems	2	0.00	0	0.00	0	0.00	22	0.02	0	0.00	0.02	0.02
49323	Building Heating	1	0.00	0	0.00	0	0.00	2	0.00	0	0.00	0.00	0.00
49324	Building Venting	0	0.00	0	0.00	0	0.00	2	0.00	0	0.00	0.00	0.00
49325	Building Fire Protection	2	0.01	0	0.00	0	0.00	3	0.00	20	0.02	0.03	0.06
Combustion Turbine Total		**332**	**3.46**	**470**	**3.22**	**34**	**2.19**	**228**	**2.41**	**227**	**2.91**	**9.07**	**17.94**

Combustion Turbine Units

Detail Component Outage Code Report, 2004 to 2008 Data

Table 6.3.4
Generator



Generators ICbF by event type forCombustion units based on 2004-2008 data.

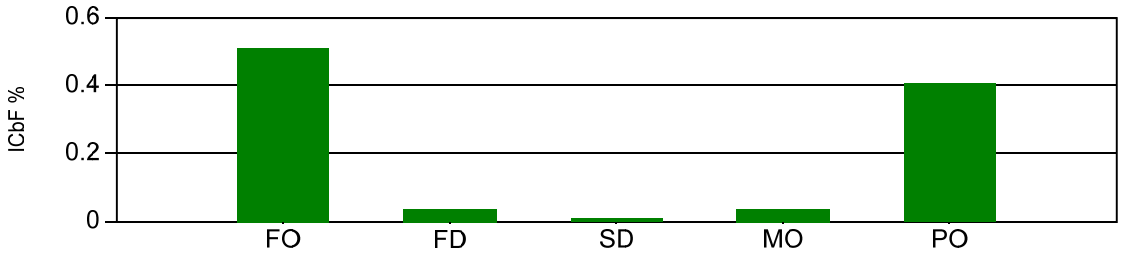
UNIT STATISTICS

Number of Units:	45.00
Number of Unit Yars:	184.58
Overall Operating Factor:	10.71

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Generators													
49800	Generator	23	0.09	1	0.03	2	0.01	18	0.14	58	1.14	1.37	0.55
49810	Generator Rotor	0	0.00	0	0.00	0	0.00	2	0.00	2	0.41	0.41	0.00
49811	Generator Bearings	20	0.09	7	0.10	0	0.04	1	0.10	2	0.04	0.22	0.55
49812	Generator Lubrication System	17	0.01	1	0.00	0	0.00	3	0.00	4	0.01	0.02	0.06
49813	Generator Collector And Brushes	0	0.00	0	0.00	0	0.00	13	0.01	1	0.00	0.01	0.00
49820	Generator Stator	4	0.53	0	0.00	0	0.00	2	0.02	1	0.00	0.55	3.14
49830	Generator Heaters	0	0.00	0	0.00	0	0.00	3	0.00	0	0.00	0.00	0.00
49840	Excitation System	18	0.07	0	0.00	2	0.00	1	0.00	6	0.03	0.10	0.39
49850	Synchronous Condensor Equipment	8	0.00	0	0.00	0	0.00	0	0.00	1	0.01	0.01	0.00
49860	Generator Output System	4	0.01	1	0.01	0	0.00	6	0.02	7	0.02	0.05	0.05
49870	Automatic Synchronizing Equipment	8	0.01	0	0.00	0	0.00	3	0.00	3	0.00	0.01	0.05
49880	Voltage Control Equipment	2	0.00	0	0.00	0	0.00	3	0.00	1	0.02	0.02	0.00
49890	Electrical Distribution System	9	1.01	0	0.00	0	0.00	8	0.01	9	0.01	1.03	6.02
Generators Total		**113**	**1.82**	**10**	**0.14**	**4**	**0.05**	**63**	**0.30**	**95**	**1.69**	**3.80**	**10.81**

Combustion Turbine Units
Detail Component Outage Code Report, 2004 to 2008 Data

Table 6.3.4
Ins. And Control



Instrumentation and Control ICbF by event type forCombustion units based on 2004-2008 data.

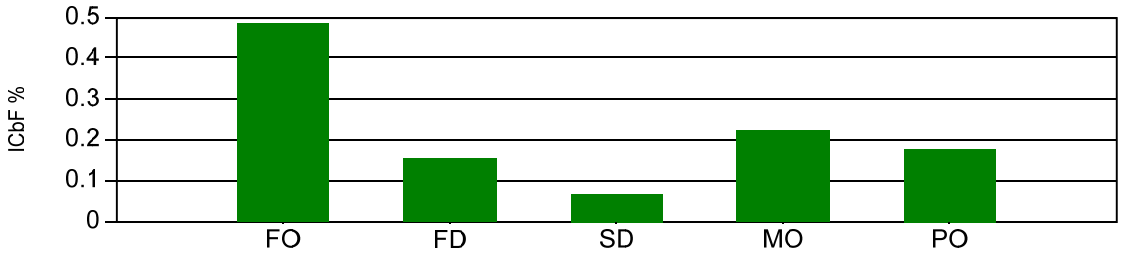
UNIT STATISTICS

Number of Units:	45.00
Number of Unit Yars:	184.58
Overall Operating Factor:	10.71

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Instrumentation and Control													
49900	Controls And Instrumentation-General	40	0.14	1	0.00	0	0.00	31	0.03	15	0.01	0.17	0.81
49910	Governing Systems	6	0.00	0	0.00	0	0.00	0	0.00	1	0.04	0.04	0.01
49920	Combustion Turbine Controls And	41	0.04	8	0.02	0	0.00	4	0.00	2	0.01	0.06	0.22
49940	Generator Controls And Instrumentation	12	0.01	0	0.00	1	0.00	5	0.00	1	0.00	0.01	0.04
49945	Supervisory Control & Data Acquisition -	1	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0.00	0.00
49950	Fuel Management Controls And	11	0.01	2	0.02	0	0.00	1	0.00	6	0.01	0.02	0.04
49970	Main Power Output Systems -	6	0.16	0	0.00	0	0.00	4	0.00	2	0.00	0.16	0.94
49980	Auxiliaries Controls And Instrumentation	5	0.00	0	0.00	0	0.00	2	0.00	5	0.34	0.35	0.02
64210	Supervisory Control & Data Acquisition -	4	0.16	0	0.00	0	0.00	0	0.00	0	0.00	0.16	0.95
Instrumentation and Control Total		**126**	**0.52**	**11**	**0.04**	**1**	**0.00**	**48**	**0.03**	**32**	**0.41**	**0.97**	**3.03**

Combustion Turbine Units
Detail Component Outage Code Report, 2004 to 2008 Data

Table 6.3.4
Conditions



Conditions ICbF by event type forCombustion units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	45.00
Number of Unit Yars:	184.58
Overall Operating Factor:	10.71

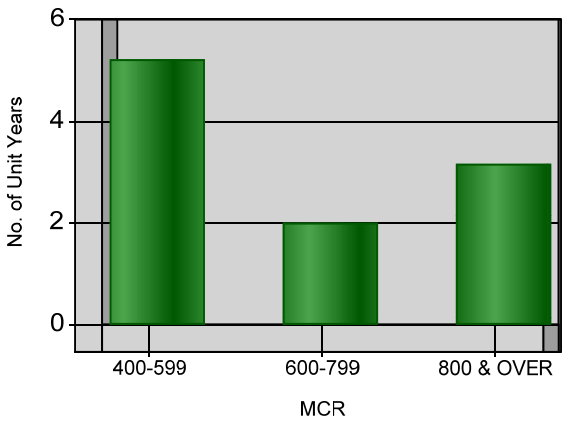
CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Conditions													
01410	Poor Quality Fuel, Heat Content	3	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
01420	Problems - Primary Fuel for Units with Secondary Fuel Op.	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
05200	Transmission Limitations	12	0.01	3	0.00	0	0.00	8	0.02	13	0.05	0.08	0.08
05201	Powerhouse substation (none-generating Equipment)	15	0.02	0	0.00	0	0.00	0	0.00	3	0.01	0.02	0.09
05203	Transmission Equipment (Beyon transmission line)	0	0.00	0	0.00	0	0.00	0	0.00	2	0.01	0.01	0.00
07010	Site Environment, Storms, Floods	7	0.01	5	0.00	0	0.00	2	0.00	0	0.00	0.01	0.03
07110	Nitrous Oxides	1	0.00	3	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
07220	Liquid And Chemical Effluents	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
07510	Noise, Noise Complaints	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0.00	0.00
08160	Fire, General	4	0.00	0	0.00	0	0.00	3	0.00	3	0.00	0.00	0.00
99999	Other	44	0.45	30	0.15	2	0.06	12	0.20	10	0.11	0.72	2.67
Conditions Total		**89**	**0.49**	**41**	**0.15**	**2**	**0.06**	**25**	**0.22**	**32**	**0.18**	**0.84**	**2.87**

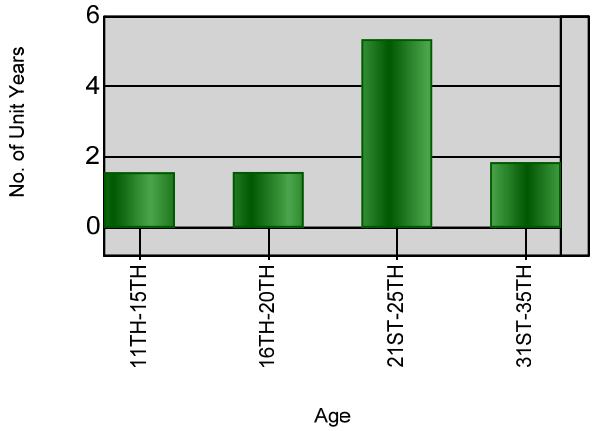
6.4 Nuclear Summary Statistics

Nuclear Units

External Causes Excluded, 2008 Data

Table 6.4.1



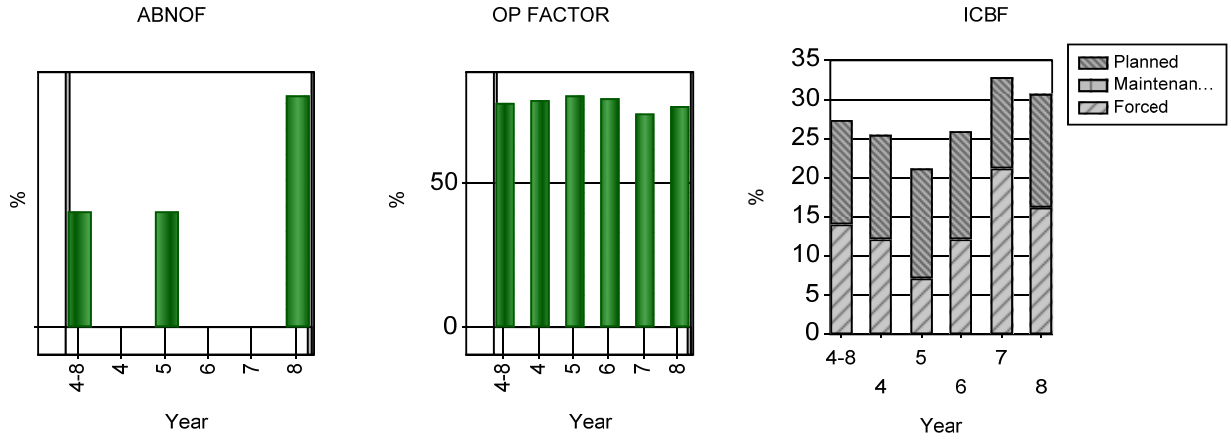


	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
400-599	5.2	0.00	0.00	62.74	22	1.3	5700.87	506.81	21.77	25.60	25.60	1.7	28.08	4.15	0.00	2.83
600-799	2.0	0.00	0.00	62.02	0	0.0	0.00	0.00	0.00	0.00	0.00	0.9	44.55	0.00	0.00	37.98
800 & OVER	3.2	0.05	0.00	73.52	3	0.0	88.48	62.45	0.56	0.77	0.77	0.2	5.55	0.79	0.00	4.72
Classification By Year Of Service																
11TH-15TH	1.6	0.11	0.00	77.98	2	0.0	50.43	49.44	0.56	0.82	0.82	0.0	0.88	1.00	0.00	0.00
16TH-20TH	1.6	0.00	0.00	69.06	1	0.0	88.48	88.48	0.56	0.71	0.71	0.2	10.21	0.55	0.00	9.44
21ST-25TH	5.4	0.00	0.00	59.22	9	0.9	5700.87	840.84	16.99	18.64	18.64	2.0	33.66	1.66	0.00	15.49
31ST-35TH	1.9	0.00	0.00	72.59	13	0.4	1418.63	275.56	20.39	27.37	27.37	0.6	27.81	7.52	0.00	0.00
Classification By Operating Factor																
31-40	1.0	0.00	0.00	35.05	1	0.7	5700.87	5700.87	64.90	65.92	65.92	0.7	65.92	2.84	0.00	0.00
41-50	0.5	0.00	0.00	45.65	2	0.0	257.60	192.94	4.41	6.98	6.98	0.1	8.20	1.05	0.00	0.46
51-60	1.7	0.00	0.00	58.13	4	0.1	617.63	304.57	16.61	10.75	10.75	0.5	26.93	1.98	0.00	17.70
61-70	3.0	0.00	0.00	64.95	7	0.3	1418.63	366.16	29.18	16.50	16.50	1.3	42.29	3.07	0.00	25.32
71-80	2.4	0.00	0.00	76.27	7	0.1	563.95	158.24	6.30	6.34	6.34	0.2	6.39	2.43	0.00	0.00
81-90	0.8	0.22	0.00	82.28	2	0.0	50.43	49.44	1.13	1.56	1.56	0.0	1.67	2.02	0.00	0.00
91-100	0.9	0.00	0.00	91.68	2	0.0	203.98	131.26	2.99	4.08	4.08	0.0	4.08	2.06	0.00	0.00
All Units	**10.4**	**0.02**	**0.00**	**66.22**	**25**	**1.3**	**5,700.87**	**453.49**	**11.86**	**13.99**	**13.99**	**2.8**	**23.31**	**2.29**	**0.00**	**9.32**

Nuclear Units

Table 6.4.2

Major Component Outage Code Report, 2004 - 2008



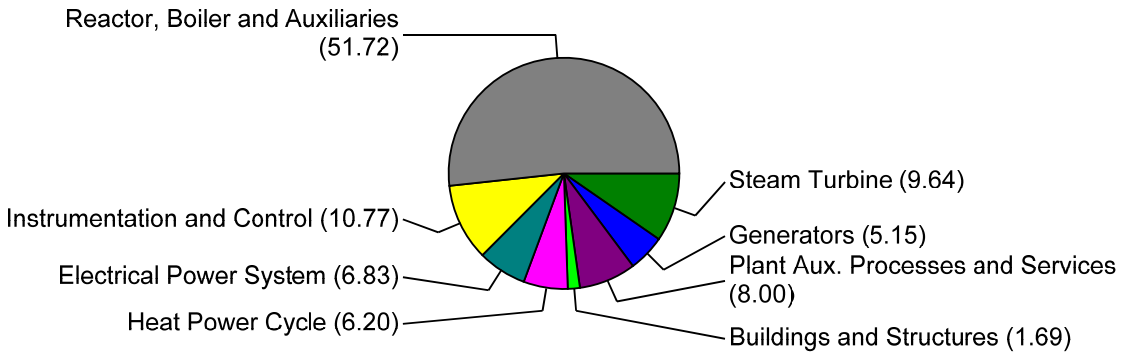
	Unit years (A)	ABNOF (%)	SynCD Factor (%)	OP Factor (%)	No. Forced Outages	Total F.O.T. (A)	Maximum F.O.D. (H)	Mean F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	Total EQ. Out. Time (A)	ICBF (%)	Fail Rate	MOF (%)	POF (%)
Classification By MCR (MW)																
400-599	25.3	0.00	0.00	63.82	93	4.7	5700.87	446.90	18.58	21.28	21.28	8.1	28.80	3.41	0.00	9.20
600-799	7.0	0.02	0.00	79.70	11	0.2	559.06	161.24	3.50	3.75	3.75	1.7	24.81	1.61	0.00	17.39
800 & OVER	15.5	0.01	0.00	68.11	32	0.4	544.91	122.86	2.41	3.12	3.12	2.0	9.93	1.37	0.00	6.90
Classification By Year Of Service																
11TH-15TH	12.3	0.01	0.00	67.37	29	0.4	544.91	132.00	2.92	3.75	3.06	1.6	10.06	1.51	0.00	6.42
16TH-20TH	8.6	0.00	0.00	67.17	20	0.6	1752.80	256.93	6.70	7.52	7.52	1.9	19.26	1.84	0.00	12.46
21ST-25TH	19.3	0.01	0.00	69.35	49	2.1	5700.87	372.24	11.35	13.13	13.09	5.4	25.79	2.15	0.00	12.63
26TH-30TH	5.8	0.00	0.00	59.39	25	1.9	5026.83	659.13	32.10	35.01	35.01	2.3	37.80	5.28	0.00	4.24
31ST-35TH	1.9	0.00	0.00	72.59	13	0.4	1418.63	275.56	20.39	27.37	27.37	0.6	27.81	7.52	0.00	0.00
Classification By Operating Factor																
51-60	7.3	0.00	0.00	56.92	25	0.5	591.91	180.84	5.79	7.37	7.37	1.8	17.81	2.38	0.00	10.90
61-70	20.5	0.00	0.00	64.12	74	4.0	5700.87	476.76	18.74	21.12	21.12	6.2	26.94	3.21	0.00	7.10
71-80	17.0	0.01	0.00	73.85	32	0.7	1752.80	202.32	4.39	5.48	5.48	3.4	17.97	1.49	0.00	11.40
81-90	3.0	0.05	0.00	86.62	5	0.1	559.06	198.20	4.17	4.17	4.17	0.4	13.33	1.92	0.00	9.56
All Units	**47.8**	**0.01**	**0.00**	**67.39**	**136**	**5.4**	**5,700.87**	**347.55**	**10.80**	**12.47**	**12.47**	**11.8**	**21.45**	**2.36**	**0.00**	**9.40**

Nuclear Units

Table 6.4.3

Major Component Outage Code Report, 2004 - 2008

Major Componenent Contribution to Nuclear Unit ICbF based on 2004-2008 data.



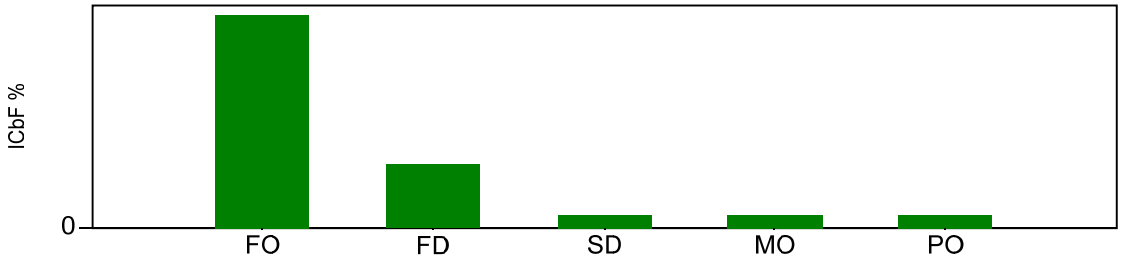
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Yars:	57.21
Overall Operating Factor:	80.73

	FORCED OUTAGES		FORCED DERATINGS		SCHEDULED DERATINGS		MAINTENANCE OUTAGES		PLANNED OUTAGES		CONTRIBUTION TO UNIT		
MAJOR COMPONENT	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	FOR (%)	DAFOR (%)
Buildings and Structures	3	0.10	10	0.02	0	0.01	0	0.01	0	0.01	0.12	0.10	0.11
Conditions	0	0.47	755	13.80	0	0.47	0	0.47	0	0.47	13.80	0.00	0.51
Electrical Power System	11	3.38	39	0.27	0	0.05	0	0.05	0	0.05	3.61	3.68	3.73
Generators	9	0.68	31	0.43	0	0.10	0	0.10	0	0.10	1.03	0.66	0.76
Heat Power Cycle	11	0.54	369	5.14	4	0.31	0	0.24	0	0.24	5.50	0.31	0.59
Instrumentation and Control	17	0.96	1220	5.91	16	0.44	0	0.41	2	0.65	6.70	0.57	1.04
Plant Aux. Processes and Services	13	1.04	148	1.27	14	0.31	0	0.16	0	0.16	2.28	0.97	1.13
Reactor, Boiler and Auxiliaries	55	4.70	271	3.73	141	6.66	0	1.07	30	9.96	21.86	4.00	4.39
Steam Turbine	14	0.64	122	1.58	20	0.44	0	0.21	3	0.48	2.52	0.48	0.68
TOTAL (External Causes Included)	133	12.51	2965	32.15	195	8.79	0	2.72	35	12.12	57.42	10.77	12.94
TOTAL (External Causes Excluded)	133	13.91	2216	21.27	196	9.58	0	0.00	35	13.49	50.38	12.67	14.63

Nuclear Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Building and Structures



Buildings and Structures ICbF by event type forNuclear units based on 2004-2008 data.

UNIT STATISTICS

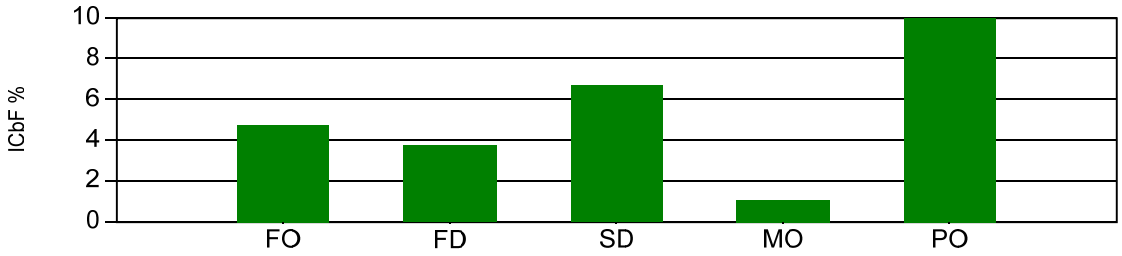
Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Buildings and Structures													
21000	Reactor Building And Fueling Facilities	3	0.10	8	0.02	0	0.01	0	0.01	0	0.01	0.12	0.11
22000	Powerhouse	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
Buildings and Structures Total		**3**	**0.10**	**10**	**0.02**	**0**	**0.01**	**0**	**0.01**	**0**	**0.01**	**0.12**	**0.11**

Nuclear Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Reactor, Boiler and Aux.



Reactor, Boiler and Auxiliaries ICbF by event type forNuclear units based on 2004-2008 data.

UNIT STATISTICS

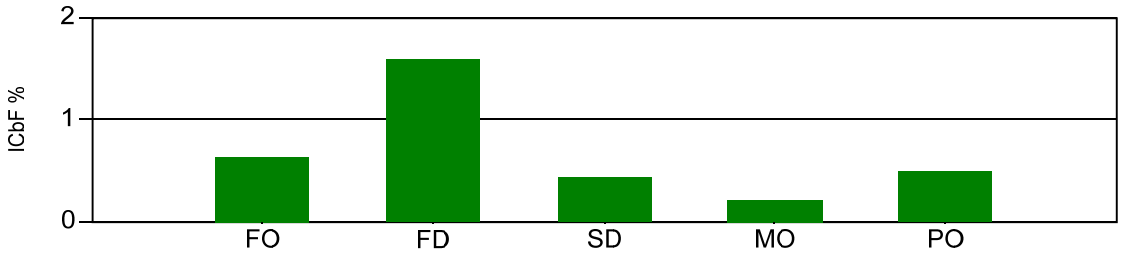
Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

		Forced Outages		Forced Deratings		Scheduling Deratings		Maintenance Outages		Planned Outages		Contribution To Unit	
CODE	CAUSE	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	NO. OCC.	ICBF (%)	ICBF (%)	DAFOR (%)
Reactor, Boiler and Auxiliaries													
31000	Reactor	0	0.00	0	0.00	0	0.00	0	0.00	2	1.70	1.70	0.00
31100	Reactor Fuel Channel Assemblies	2	0.37	1	0.08	27	0.27	0	0.07	10	3.39	3.89	0.33
31700	Reactor Reactivity Control Units	8	1.16	35	0.80	47	5.63	0	0.58	4	0.89	6.73	0.67
31800	Reactor Shut-Off Units	1	0.04	4	0.06	0	0.01	0	0.01	0	0.01	0.09	0.05
32100	Main Moderator System	3	0.09	9	0.12	0	0.01	0	0.01	0	0.01	0.21	0.10
32300	Moderator Level & Pressure Control	1	0.03	0	0.00	0	0.00	0	0.00	0	0.00	0.03	0.03
33100	Main Heat Transport Circuit	12	1.12	24	0.17	11	0.13	0	0.06	4	1.36	2.61	1.22
33110	Main Heat Transport Circuit Steam	1	0.21	1	0.03	12	0.12	0	0.03	3	0.94	1.21	0.19
33120	Main Heat Transport Circuit Heat Transport Pumps	1	0.06	5	0.01	0	0.00	0	0.00	0	0.00	0.07	0.07
33300	Primary Heat Transport And Inventory Control Systems	5	0.17	12	0.16	6	0.06	0	0.04	1	0.12	0.40	0.18
33400	Primary Heat Transport Shut-Down Cooling Systems	8	0.42	7	0.07	1	0.02	0	0.02	1	0.05	0.51	0.46
33500	Primary Heat Transport Gas Control	0	0.00	1	0.02	0	0.00	0	0.00	0	0.00	0.02	0.00
33600	Primary Heat Transport Overpressure	1	0.04	0	0.00	3	0.01	0	0.00	0	0.00	0.05	0.04
33700	Primary Heat Transport Transfer System	1	0.13	0	0.00	0	0.00	0	0.00	0	0.00	0.13	0.14
33800	Primary Heat Transport Heavy Water Collection Systems	1	0.09	0	0.00	0	0.00	0	0.00	0	0.00	0.09	0.10
34200	Negative Pressure Containment System	1	0.01	1	0.00	0	0.00	0	0.00	0	0.00	0.01	0.01
34300	Emergency Cooling Systems	1	0.04	6	0.02	0	0.00	0	0.00	0	0.00	0.05	0.04
35000	Fuel Handling	3	0.61	111	1.62	12	0.25	0	0.19	2	0.66	2.57	0.66
35200	Fueling Machine	2	0.06	17	0.22	0	0.02	0	0.02	1	0.31	0.56	0.06
35300	Irradiated Fuel Transfer And Storage	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
36000	Boiler Steam And Water Systems	2	0.04	30	0.25	19	0.10	0	0.03	2	0.51	0.81	0.03
36100	Steam System	0	0.00	1	0.00	3	0.02	0	0.00	0	0.00	0.02	0.00
36400	Controlled Boiler Blow-Off System	0	0.00	1	0.03	0	0.00	0	0.00	0	0.00	0.03	0.00
36700	Steam Generator Emergency Cooling	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
37000	Fuel	0	0.01	4	0.07	0	0.01	0	0.01	0	0.01	0.07	0.01
Reactor, Boiler and Auxiliaries Total		**55**	**4.70**	**271**	**3.73**	**141**	**6.66**	**0**	**1.07**	**30**	**9.96**	**21.86**	**4.39**

Nuclear Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Steam Turbine



Steam Turbine ICbF by event type forNuclear units based on 2004-2008 data.

UNIT STATISTICS

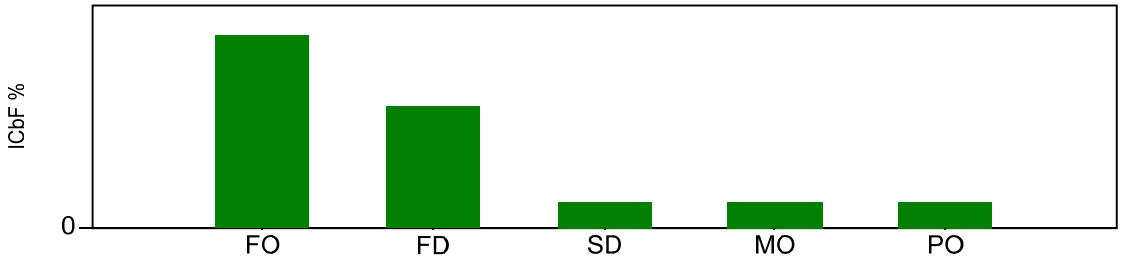
Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Steam Turbine													
41100	Turbine	10	0.45	49	0.77	3	0.15	0	0.12	2	0.33	1.33	0.48
41700	Governing System	4	0.14	19	0.20	0	0.04	0	0.04	0	0.04	0.31	0.16
41810	Moisture Separator	0	0.01	10	0.04	3	0.04	0	0.01	0	0.01	0.07	0.01
41830	Steam Reheater	0	0.04	44	0.57	14	0.21	0	0.04	1	0.10	0.81	0.03
Steam Turbine Total		**14**	**0.64**	**122**	**1.58**	**20**	**0.44**	**0**	**0.21**	**3**	**0.48**	**2.52**	**0.68**

Nuclear Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Generator



Generators ICbF by event type forNuclear units based on 2004-2008 data.

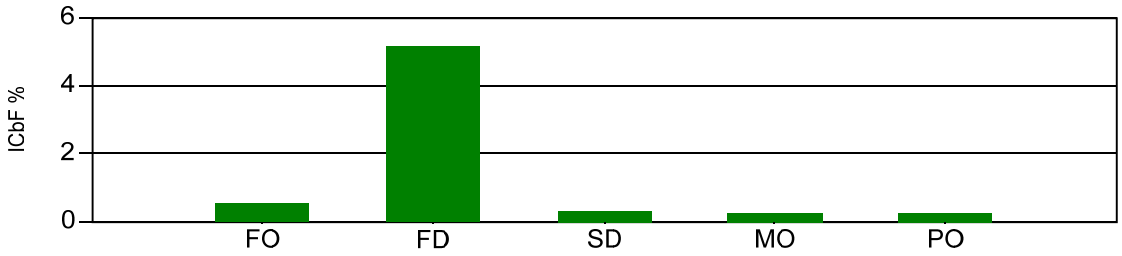
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Generators													
42100	Generator	4	0.09	14	0.06	0	0.02	0	0.02	0	0.02	0.14	0.10
42200	Excitation Systems Equipment	3	0.05	10	0.05	0	0.01	0	0.01	0	0.01	0.09	0.06
42400	Generator Liquid Cooling System	2	0.54	7	0.32	0	0.07	0	0.07	0	0.07	0.80	0.60
Generators Total		**9**	**0.68**	**31**	**0.43**	**0**	**0.10**	**0**	**0.10**	**0**	**0.10**	**1.03**	**0.76**

Nuclear Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Heat Power Cycle



Heat Power Cycle ICbF by event type forNuclear units based on 2004-2008 data.

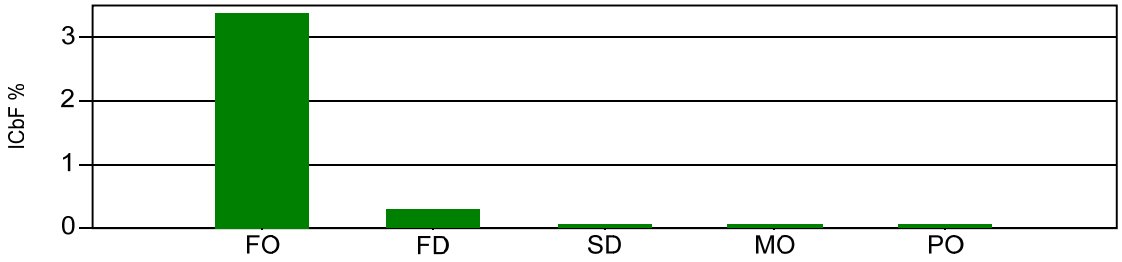
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Heat Power Cycle													
43100	High Pressure Feedwater Heaters And Auxiliaries	1	0.02	2	0.03	0	0.00	0	0.00	0	0.00	0.05	0.02
43200	Boiler Feed Pumps And Auxiliaries	8	0.32	39	0.50	1	0.06	0	0.06	0	0.06	0.75	0.35
43500	Auxiliary Boiler Feed Pump Motors And Auxiliaries	0	0.00	1	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
44030	Main Condensate Circuit	0	0.10	204	3.14	2	0.14	0	0.10	0	0.10	3.18	0.11
44110	Condensor	0	0.05	96	0.97	1	0.08	0	0.05	0	0.05	1.00	0.06
44120	Condensor Tubes	0	0.02	14	0.33	0	0.02	0	0.02	0	0.02	0.33	0.02
44200	Condensate Extraction Pumps And Auxiliaries	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
48100	Extraction Steam System	0	0.00	2	0.02	0	0.00	0	0.00	0	0.00	0.02	0.00
48200	Feedwater Heater Drains System	2	0.03	8	0.14	0	0.01	0	0.01	0	0.01	0.16	0.03
48500	Turbine And Piping Drains	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
Heat Power Cycle Total		**11**	**0.54**	**369**	**5.14**	**4**	**0.31**	**0**	**0.24**	**0**	**0.24**	**5.50**	**0.59**

Nuclear Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Electrical Power System



Electrical Power System ICbF by event type forNuclear units based on 2004-2008 data.

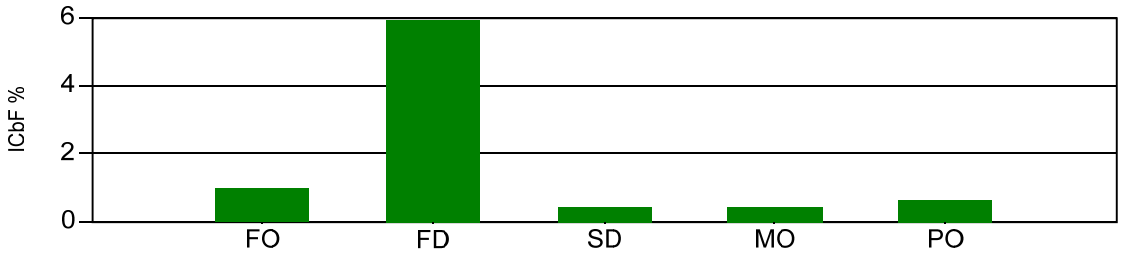
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Electrical Power System													
51100	Output System Generator Voltage Equipment	2	1.22	11	0.07	0	0.02	0	0.02	0	0.02	1.27	1.34
51120	Generator Power Transformers	2	0.10	6	0.02	0	0.01	0	0.01	0	0.01	0.11	0.11
51136	Disconnect Switches-Generator Voltage	0	0.00	4	0.03	0	0.00	0	0.00	0	0.00	0.03	0.00
53200	Station Service Power Distribution	7	2.06	18	0.15	0	0.02	0	0.02	0	0.02	2.20	2.28
Electrical Power System Total		**11**	**3.38**	**39**	**0.27**	**0**	**0.05**	**0**	**0.05**	**0**	**0.05**	**3.61**	**3.73**

Nuclear Units
Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Instrumentation & Control



Instrumentation and Control ICbF by event type forNuclear units based on 2004-2008 data.

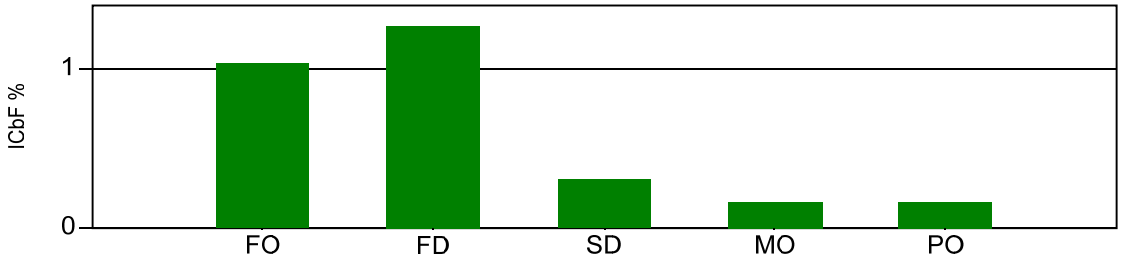
UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Instrumentation and Control													
63100	Reactor And Auxiliaries -Instrumentation and Control	3	0.20	267	1.84	9	0.14	0	0.13	0	0.13	1.92	0.22
63300	Heat Transport System - Instrumentation and Control	1	0.06	0	0.00	0	0.00	0	0.00	0	0.00	0.06	0.06
63400	Reactor Auxiliary System - Instrumentation and Control	1	0.08	11	0.10	3	0.01	0	0.00	1	0.11	0.28	0.09
63500	Fuel Handling Instrumentation & Control	1	0.21	12	0.36	0	0.11	0	0.11	0	0.11	0.46	0.23
63700	Reactor Control Systems (Reactor Regulating Systems) Instrum. & Control	5	0.28	901	3.32	4	0.17	0	0.16	0	0.16	3.44	0.30
64100	Steam Turbine And Auxiliary - Instrumentation and Control	0	0.00	2	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
64200	Generator And Auxiliaries - Instrumentation and Control	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
64300	Boiler Feedwater Systems - Instrumentation and Control	0	0.00	4	0.11	0	0.00	0	0.00	0	0.00	0.11	0.00
64400	Condensate System - Instrumentation and Control	1	0.01	3	0.01	0	0.00	0	0.00	0	0.00	0.02	0.01
64700	Condensate Make-up System - Instrumentation and Control	0	0.00	1	0.05	0	0.00	0	0.00	0	0.00	0.05	0.00
65100	Main Power Output Systems - Control and Protection	1	0.00	4	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
65900	System Control Facilities	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00	0.01	0.01
68000	Safety Systems Control	3	0.11	5	0.02	0	0.01	0	0.01	1	0.14	0.25	0.12
69000	Computers	0	0.00	8	0.08	0	0.00	0	0.00	0	0.00	0.08	0.00
Instrumentation and Control Total		**17**	**0.96**	**1220**	**5.91**	**16**	**0.44**	**0**	**0.41**	**2**	**0.65**	**6.70**	**1.04**

Nuclear Units — Table 6.4.4

Detail Component Outage Code Report, 2004 to 2008 — Plant Aux. Processes & Services



Plant Aux. Processes and Services ICbF by event type forNuclear units based on 2004-2008 data.

UNIT STATISTICS

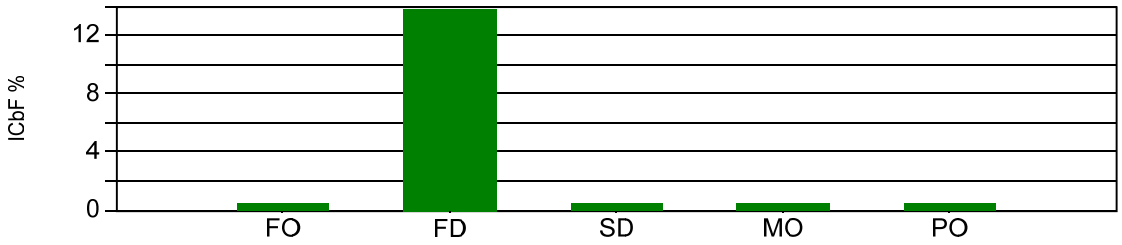
Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Plant Aux. Processes and Services													
71109	Circulating Water Piping	2	0.11	98	0.72	14	0.21	0	0.06	0	0.06	0.90	0.11
71110	Circulating Water Travelling H2O Screens	0	0.00	5	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
72100	Service water Low Pressure Open System	6	0.38	30	0.31	0	0.02	0	0.02	0	0.02	0.67	0.42
73200	Powerhouse Heating & Ventilating System	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
73700	Containment Atmosphere System Heating, Ventilationand Cooling Systems	2	0.13	8	0.06	0	0.01	0	0.01	0	0.01	0.18	0.14
74000	Water Treatment Plant	3	0.42	3	0.16	0	0.07	0	0.07	0	0.07	0.51	0.46
78000	Fire Protection Systems	0	0.00	3	0.01	0	0.00	0	0.00	0	0.00	0.01	0.00
Plant Aux. Processes and Services Total		**13**	**1.04**	**148**	**1.27**	**14**	**0.31**	**0**	**0.16**	**0**	**0.16**	**2.28**	**1.13**

Nuclear Units

Detail Component Outage Code Report, 2004 to 2008

Table 6.4.4
Conditions



Conditions ICbF by event type forNuclear units based on 2004-2008 data.

UNIT STATISTICS

Number of Units:	14.00
Number of Unit Years:	57.21
Overall Operating Factor:	80.73

CODE	CAUSE	Forced Outages NO. OCC.	Forced Outages ICBF (%)	Forced Deratings NO. OCC.	Forced Deratings ICBF (%)	Scheduling Deratings NO. OCC.	Scheduling Deratings ICBF (%)	Maintenance Outages NO. OCC.	Maintenance Outages ICBF (%)	Planned Outages NO. OCC.	Planned Outages ICBF (%)	Contribution To Unit ICBF (%)	Contribution To Unit DAFOR (%)
Conditions													
05200	Transmission Limitations	0	0.02	22	0.10	0	0.02	0	0.02	0	0.02	0.10	0.02
07010	Site Environment, Storms, Floods	0	0.02	26	0.17	0	0.02	0	0.02	0	0.02	0.17	0.02
07210	Cooling Water Discharge Thermal Effects	0	0.24	397	7.79	0	0.24	0	0.24	0	0.24	7.79	0.26
99999	Other	0	0.19	310	5.74	0	0.19	0	0.19	0	0.19	5.74	0.21
Conditions Total		**0**	**0.47**	**755**	**13.80**	**0**	**0.47**	**0**	**0.47**	**0**	**0.47**	**13.80**	**0.51**