ANNEX 1

EURELECTRIC " THERPERF " NETWORK OF EXPERTS

STATISTICAL DATA ON THE PERFORMANCE OF FOSSIL-FUELLED POWER PLANTS

A.1 INTRODUCTION

Pursuing the programs undertaken by WANO (World Association of Nuclear Operators) and IAEA (International Atomic Energy Agency) for nuclear power plant performance monitoring, UNIPEDE/EURELECTRIC has developed a program for collecting, processing and publishing statistics relating to the performance of conventional fossil-fuelled power plants (UNIPEDE, International Union of Producers and Distributors of Electrical Energy, merged with EURELECTRIC in 1999).

The following five performance indicators have thus been defined, for international application, for the different areas in which operators must ensure a high degree of vigilance in order to achieve a satisfactory quality of service:

- Unit Capability Factor (UCF)
- Unplanned Capability Loss Factor (UCLF)
- Unplanned Automatic Grid Separations per 7000 hours of operation (UAGS 7)
- Successful Start-up Rate (SSR)
- Industrial Safety Accident Rate (ISAR).

Using precise terminology and definitions, the program has been launched in 1994 by UNIPEDE, and opened to all its Members (mostly: Western European countries).

This program was developed to be consistent with similar work carried out within the former Joint UNIPEDE/WEC Committee on the performance of thermal plants (fossil fuel and nuclear). Integration within the EURELECTRIC system makes it possible to contribute to the activities of the new WEC Committee on the Performance of Generating Plant without requiring collection of additional data.

The aim of the program is to create a high-quality management tool. These indicators are intended principally for use by operators to monitor their own performance and progress, to set their own challenging goals for improvement, and to gain an additional perspective on performance relative to that of other plants. Thus, the international exchanges will help foster a commitment to emulate the best practices, thereby maintaining the satisfactory level of performance observed. Data were submitted by representatives of the following countries (Western Europe, plus South Africa) : Austria (AT), Belgium (BE) – Czech Republic (CZ) , Germany (DE), Danmark (DK), Spain (ES), France (FR), Hungary (HU), Ireland (IE), Italy (IT), Netherlands (NL), Portugal (PT), Slovenia (SI), South Africa (ZA).

A.2 BRIEF DESCRIPTION OF THE FIVE PERFORMANCE INDICATORS MONITORED BY EURELECTRIC

Unit Capability Factor (UCF)

Unit capability factor is the percentage of maximum energy generation that a plant is capable of supplying to the electrical grid, limited only by factors within control of plant management. A high unit capability factor indicates effective plant programs and practices to minimise unplanned energy losses and to optimise planned outages, maximising available electrical generation.

NOTE: Energy Availability Factor (WEC indicator) is defined on the same basis; but EAF is reduced by losses that are not under the control of plant management. The Eurelectric "Therperf" program is able to produce EAF results, in addition to UCF.

Unplanned Capability Loss Factor (UCLF)

Unplanned capability loss factor is the percentage of maximum energy generation that a plant is not capable of supplying to the electrical grid because of unplanned energy losses (such as unplanned shutdowns, outage extensions or load reductions due to unavailability). Energy losses are considered unplanned if they are not scheduled at least four weeks in advance. A low value for this indicator indicates that important plant equipment is reliably operated and well maintained.

Unplanned automatic grid separations per 7 000 operating hours

This indicator expresses how often a generator is separated from the external grid, in both an unplanned and automatic (manual actions are excluded) manner; it is given as a rate per 7 000 operating hours, thereby taking into account the wide variety of operating regimes.

Successful start-up rate

One of the ways to measure quality of service rendered to an electrical grid – among other indicators – is the promptness with which a unit is connected to the external grid, in line with the grid operator's request. This indicator expresses the level of success in achieving a presence on the grid, at the moment requested, for all start-ups requested on the previous day (immediate start-up for peaking gas turbines).

Industrial Safety Accident Rate

Progress in improving industrial safety performance is monitored by the number of accidents that result in day away from work, days of restricted work or fatalities, per 1 000 000 man-hours worked.

A.3 BRIEF DESCRIPTION OF THE INSTALLATION FAMILIES MONITORED

The five performance indicators are monitored on a unit-by-unit basis, starting from the first full year of commercial service. Data is submitted anonymously using a unit "code", which is known only by the operator who supplies the data. To ensure complete confidentiality (no data can be used for commercial purposes), certain procedures have been defined for the exchange of this information.

Three categories of conventional thermal installations are monitored:

A – Steam turbines

B – Combined cycle, cogeneration

C – Combustion turbines.

Four types of fuel are monitored:

1 – Coal (excluding lignite and others)

2 – Lignite and others

3 – Liquid fuels

4 – Gaseous fuels.

The power rating categories are those recommended by the former Joint UNIPEDE/WEC Committee.

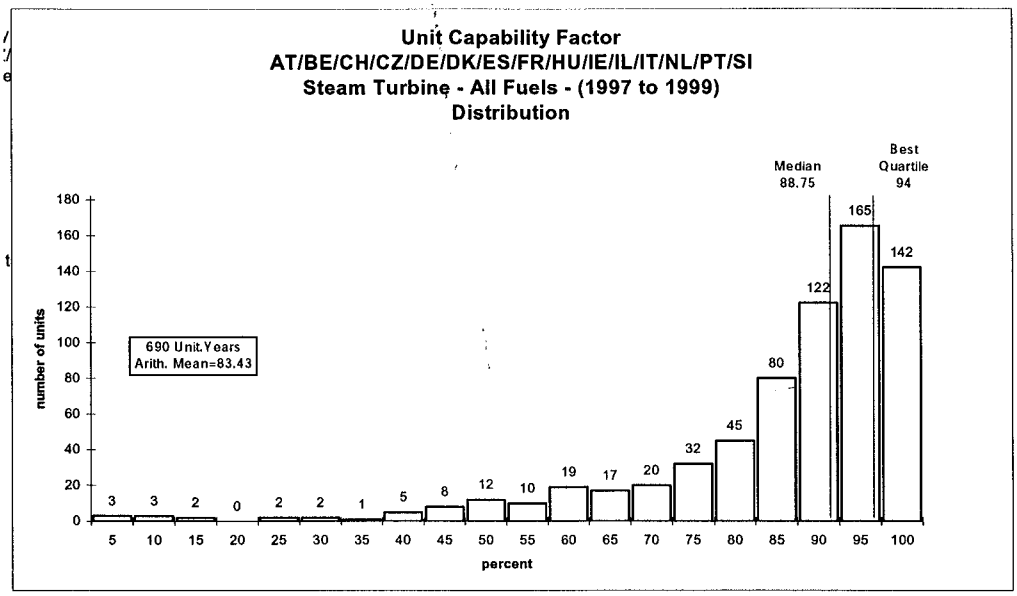
A.4 RESULTS IN GRAPH FORM (examples) (for UCF and UCLF indicators)

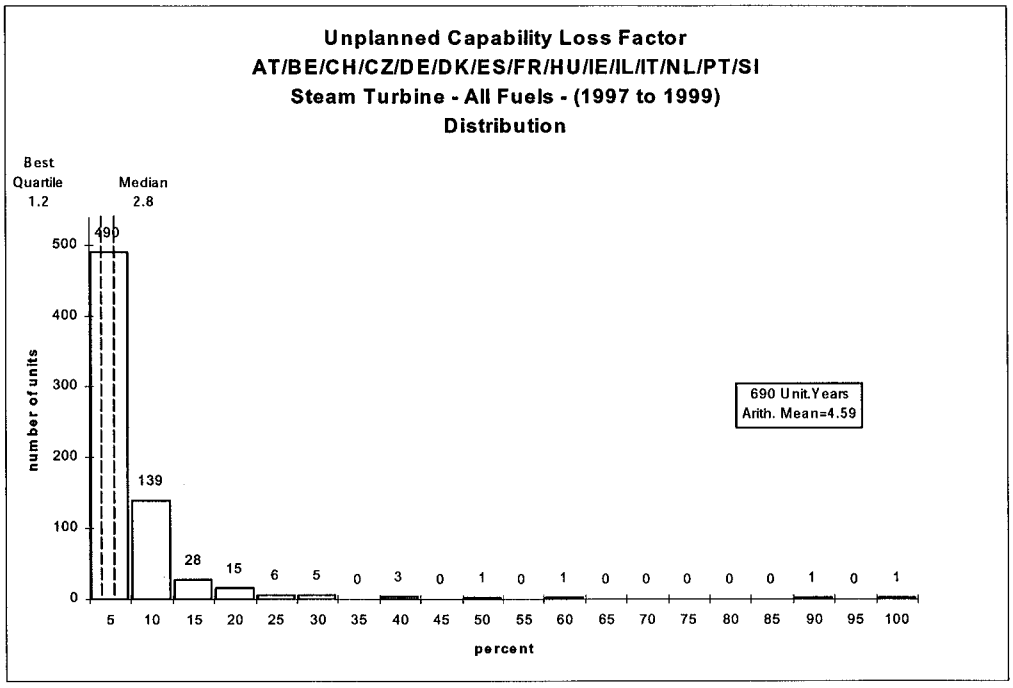
Unit Capability Factor,

Unplanned Capability Loss Factor

Steam turbines, 1997 to 1999, all fuels, all sizes, all Western European countries (distribution)

- All fuels, all sizes, all countries (distribution)


Unit Capability Factor
AT/BE/CH/CZ/DE/DK/ES/FR/HU/IE/IL/IT/NL/PT/SI
Steam Turbine - All Fuels - (1997 to 1999)
Distribution
Median 88.75
Best Quartile 94
690 Unit.Years
Arith. Mean=83.43
number of units
percent
3 3 2 0 2 2 1 5 8 12 10 19 17 20 32 45 80 122 165 142
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100


Unplanned Capability Loss Factor
AT/BE/CH/CZ/DE/DK/ES/FR/HU/IE/IL/IT/NL/PT/SI
Steam Turbine - All Fuels - (1997 to 1999)
Distribution
Best Quartile 1.2
Median 2.8
690 Unit.Years
Arith. Mean=4.59
number of units
percent
490 139 28 15 6 5 0 3 0 1 0 1 0 0 0 0 0 1 0 1
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

ANNEX 2
GENERATING AVAILABILITY DATA SYSTEM (GADS)
OF THE
NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

G. Michael Curley
Manager, GADS Services

What is GADS?

Since the earlier 1960's, the North American electric industry has been collecting unit-specific equipment outage data on power plants. The purpose of data collection was to improve performance of these units and increase the electrical output. If more power can be produced from existing power stations, then there will be less need or there could be a delay in the construction of new facilities while still providing the electrical need of the customers. Also, if generating operators and owners could learn what equipment and designs provide the most reliable service, the power plants could provide more reliable energy for a longer periods of time.

The Generating Availability Data System (GADS) came to NERC in 1979 and has filled its mission of providing its part to "keep the lights on." GADS contains the collection of unit-specific equipment outage and performance-related data on more than 3,700 generating stations in North America. With these data, GADS provide reports and software programs to allow industry analyst, manufacturers, and others interested people with access to information needed to improve plant equipment, analyze problem areas, and provide a service for determining ways to increase power productions. Currently GADS has more than 95,000 unit-years of history for use in completing our mission.

GADS consists of three databases: design, performance and event. The design database contains physical characteristics about the plants such as boiler manufacturer, the number of boiler feedwater pumps, and coal pulverizer type. The performance database collects data on the fuel used and the amount of electrical generation produced. It also summarizes the hours of outage by type and hours of operation by type. Finally, the event data describes each incident when the generating units were not available for full-load capability. An event can be a boiler tube leak, wet coal problem, fan vibration or a number of other reasons.

Once data is collected from a single generator/owner, the data is sent through a series of editing checks for logical errors. These errors include time validations, cross-referencing parts of outage record with the reported design and performance records, and cause code confirmation. A "cause code" is a four-digit number used to generally identify the area, equipment or cause of outage or derating. There are more than 2,200 cause codes recognized by the editing programs. GADS Services receives more than 500,000 records annually from its participating members.

GADS Services feels it is very important not only to collect data but also to report its results to the industry. Therefore, GADS provides an annual free report on the Internet entitled the "Generating Availability Report"(GAR). It is a five-year summary of outage problems by unit type and fuels. GADS Service contracts with generators/owners, manufacturers and other

interested parties for special studies of the data. One important and powerful product from GADS Services is its pc-GAR software program.

What is pc-GAR?

The data in GADS should not be limited to just a few. All people interested in power and reliability of power stations need access to the GADS data. For this reason, GADS Services created pc-GAR.

It was introduced in 1992 as a response to the many special data requests. It contains the histories of all reported units from 1982 to the present and allows each user to select the retrieval criteria from a list of unit design, performance and fuel characteristics. The resulting statistics and performance indices are calculated from the event and performance data fed into pc-GAR.

pc-GAR is different than GAR. GAR is a fix sent of reports produced by the GADS staff for use in general review of the industry. GAR contains read-only reports. Its reports are by fixed units sizes and fuel types. There is no flexibility in creating specialized reports.

Meanwhile, pc-GAR contains all the design, performance and event data provided by the utilities. The data is encrypted so that it remains confidential but still allows the user access to grouped outage information via menus. With pc-GAR, the user can select from any design, performance or fuel characteristic to retrieve reports for any time period starting in 1982. For example, in the GAR, the user can only see only review the performance statistics of coal-fired units 100-199 MW for five years. With pc-GAR, the user can investigate the outages, performance, and statistics of coal-fired units (1-3% sulfur coals), 155-235 MW, constructed between 1970-1985, balanced draft furnaces, etc. by year, multi-year or season of the year. The flexibility of pc-GAR has made it the most unique program of its kind in the world.

The software is designed to operate on a personal computer and can be adapted to operate on a LAN for multiple users. More than 300 copies of pc-GAR are in use in 12 different countries.

Figure 1 - Fossil Units in North America – 1997 to 1999

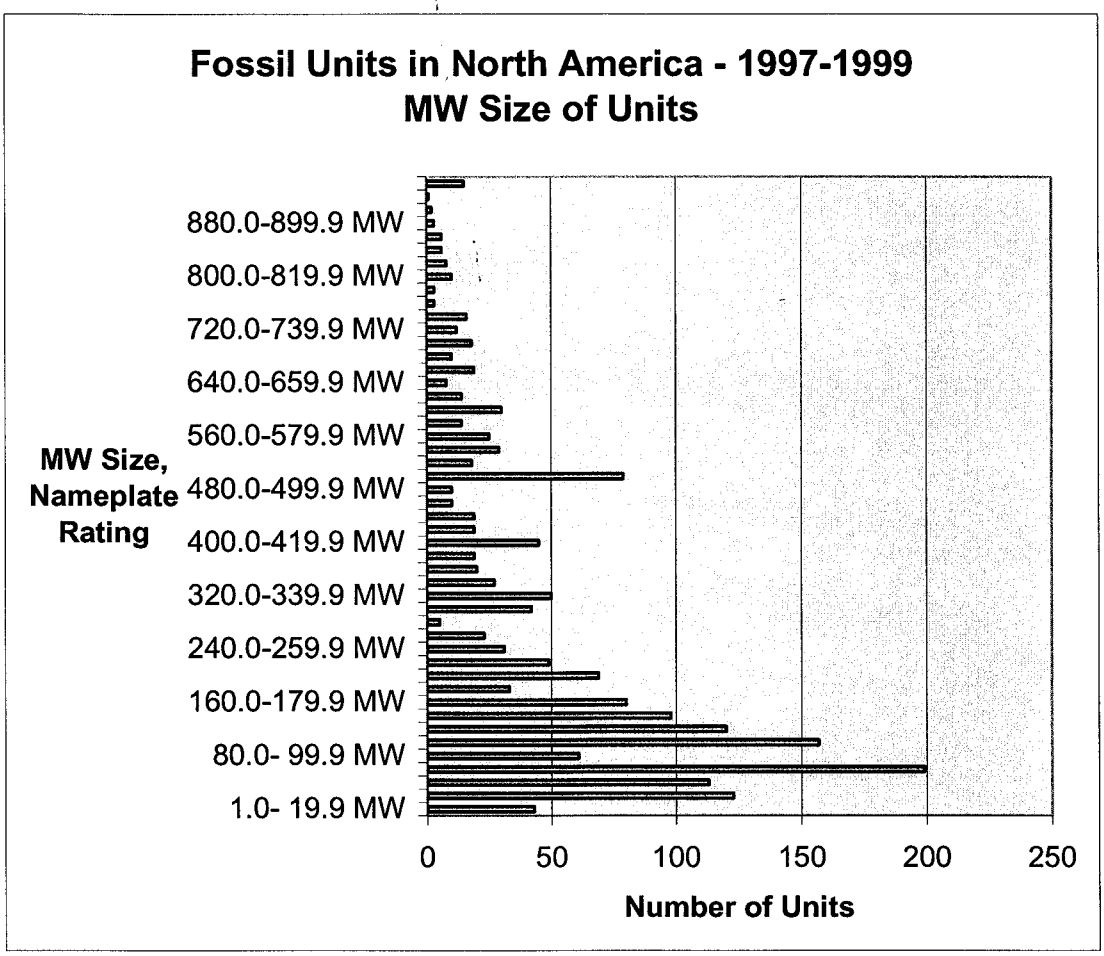


Figure 2 - Fossil Units – North America, Equivalent Availability Factor

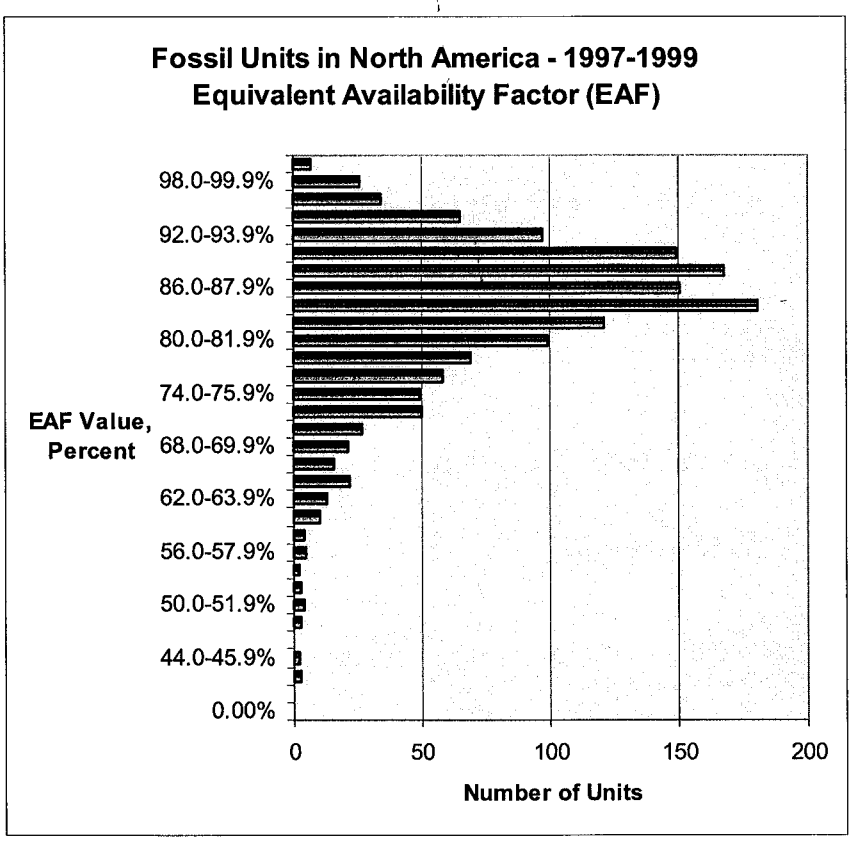
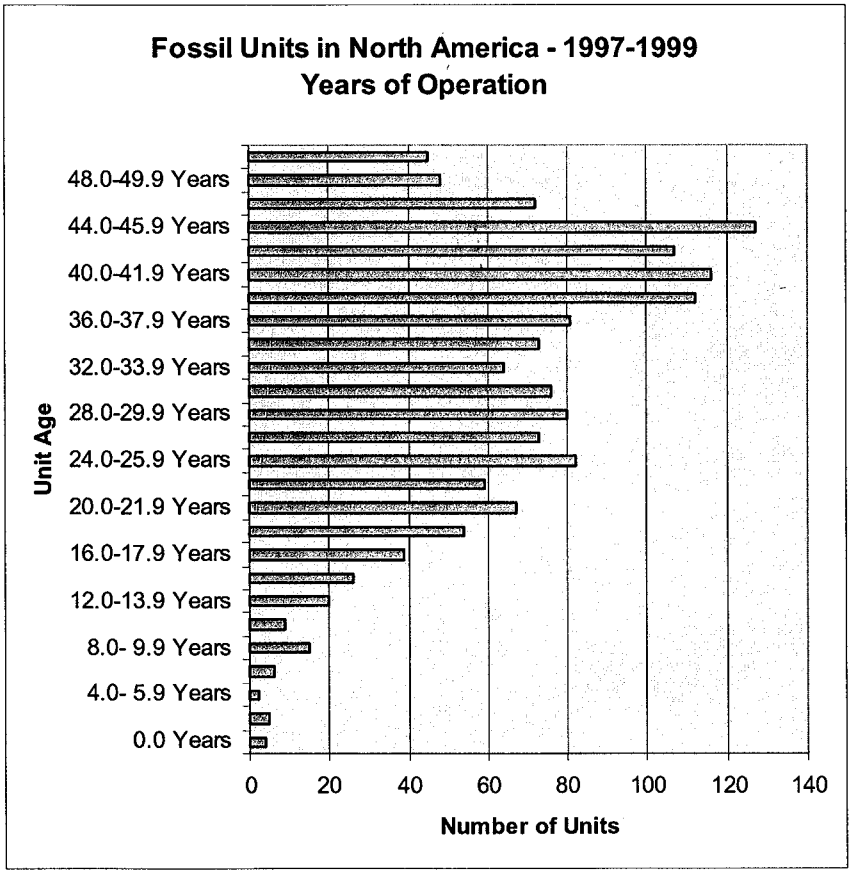


Figure 3 - Fossil Units in North America – Years of Operation



Generating Unit Statistical Brochure

1997–2001

March 2003

Generating
Availability
Data
System

788

EQUATIONS

Unweighted

Average Run Time - ART
[SH/Actual Unit Starts]

Starting Reliability - SR
[Actual Unit Starts/Attempted Unit Starts] x 100 (%)

Net Capacity Factor - NCF
[NAG/(PH x NMC)] x 100 (%)

Net Output Factor - NOF
[NAG/(SH x NMC)] x 100 (%)

Service Factor - SF
(SH/PH) x 100 (%)

Availability Factor - AF
(AH/PH) x 100 (%)

Equivalent Availability Factor - EAF
{[AH □ (EUDH + EPDH + ESEDH)]/PH} x 100 (%)

Forced Outage Rate - FOR
[FOH/(FOH + SH)] x 100 (%)

Equivalent Forced Outage Rate - EFOR
[(FOH + EFDH)/(FOH + SH + EFDHRS)] x 100 (%)

Scheduled Outage Factor - SOF
(SOH/PH) x 100 (%)

Forced Outage Factor - FOF
(FOH/PH) x 100 (%)

Equivalent Forced Outage Rate demand – EFORd

$$\frac{[(f*FOH) + (fp*EFDH)]*100}{[SH + (f*FOH)]}$$

where fp= (SH/AH)

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

r = Average Forced Outage duration = [FOH / (number of FO occurrences)]
D = Average demand time = [SH/ (number of actual unit starts)]
T = Average Reserve Shutdown time = [RSH / (number of attempted unit starts)]

*Weighted**

Weighted Service Factor - WSF
[Σ(SH x NMC)/ Σ(PH x NMC)] x 100 (%)

Weighted Availability Factor - WAF
[Σ(AH x NMC)/ Σ(PH x NMC)] x 100 (%)

Weighted Equivalent Availability Factor - WEAF
{Σ (AH x NMC) – Σ[(EUDH + EPDH + ESEDH) x NMC]/ Σ(PH x NMC)} x 100 (%)

Weighted Forced Outage Rate - WFOR
{Σ(FOH x NMC)/ Σ[(FOH + SH) x NMC]} x 100 (%)

Weighted Equivalent Forced Outage Rate - WEFOR
{Σ[(FOH + EFDH) x NMC]/
Σ[(FOH + SH + EFDHRS) x NMC]} x 100 (%)

Weighted Scheduled Outage Factor - WSOF
[Σ(SOH x NMC)/ Σ(PH x NMC)] x 100 (%)

Weighted Forced Outage Factor - WFOF
[Σ(FOH x NMC)/ Σ(PH x NMC)] x 100 (%)

*Applies to groups of units only.

Notes:

Equivalent hours are computed for each derating and then summed. Size of Reduction is determined by subtracting the Net Available Capacity (NAC) from the Net Dependable Capacity (NDC). In cases of multiple deratings, the Size of Reduction of each derating is the difference in the NAC of the unit prior to the initiation of the derating and the reported NAC as a result of the derating.

DEFINITIONS

Actual Unit Starts
Number of times the unit was synchronized to the transmission system.

Attempted Unit Starts
Number of attempts to bring the unit from shutdown to synchronization.

Available Hours - AH
Sum of all SH, RSH, Pumping Hours, and Synchronous Condensing Hours.

Equivalent Forced Derated Hours - EFDH
Product of the Forced Derated Hours and the Size of Reduction, divided by the NMC.

Equivalent Forced Derated Hours During Reserve Shutdowns - EFDHRS
Product of the Forced Derated Hours (during Reserve Shutdowns (RS) only) and the Size of Reduction, divided by the NMC.

Equivalent Planned Derated Hours - EPDH
Product of the Planned Derated Hours and the Size of Reduction, divided by the NMC.

Equivalent Seasonal Derated Hours - ESEDH
NMC less the NDC, times the Available Hours (AH), divided by the NMC.

Equivalent Unplanned Derated Hours - EUDH
Product of the Unplanned Derated Hours and the Size of Reduction, divided by the NMC.

Forced Derated Hours - FDH
Sum of all hours experienced during Forced Deratings.

Forced Outage Hours - FOH
Sum of all hours experienced during Forced Outages.

Net Available Capacity - NAC
The NDC, modified for equipment limitations.

Net Actual Generation - NAG
Net electrical megawatthours (MWh) produced by the unit during the period being considered.

Net Dependable Capacity - NDC
NMC modified for ambient limitations.

Net Maximum Capacity - NMC
Capacity a unit can sustain over a specified period when not restricted by ambient conditions or equipment deratings, minus the losses associated with station service or auxiliary loads.

Period Hours - PH
Number of hours a unit was in the active state. A unit generally enters the active state on its commercial date.

Reserve Shutdown Hours - RSH
Total number of hours the unit was available for service but not electrically connected to the transmission system for economic reasons.

Service Hours - SH
Total number of hours a unit was electrically connected to the transmission system.

Scheduled Outage Hours - SOH
Sum of all hours experienced during Planned Outages and Maintenance Outages plus any Scheduled Outage Extensions associated with those outages.

Unplanned Derated Hours - UDH
Sum of all hours experienced during Forced Deratings and Maintenance Deratings plus any Scheduled Derating Extensions of any Maintenance Deratings.

Unplanned Outage Hours - UOH
Sum of all hours experienced during Forced Outages and Maintenance Outages plus any Scheduled Outage Extensions of any Maintenance Outages.

INTRODUCTION

This brochure highlights some of the information from NERC's *Generating Availability Report* (GAR). Statistics are shown for the cumulative five years, 1997–2001, and are calculated using both the capacity-weighted technique and the traditional, unweighted method.

Generating Availability Report

Continuing the effort to bring timely, useful information to the industry in an efficient manner, NERC again will "publish" the *1997–2001 Generating Availability Report* in electronic format. The report is available for downloading from the Internet, and is also available on a 3 ½ inch diskette. Call us at 609-452-8060 to request a copy on diskette. A printed, bound version of the GAR is not available.

The electronic GAR consists of a series of formatted files ready for printing on any laser printer set to a condensed font. Included are all the tables and graphs found in previous printed editions of the report, and more. The traditional unit groupings – by generation technology, size and, in some cases, fuel type – have been retained.

The new GAR is available to everyone at no cost. To download the GAR from the NERC home page (http://www.nerc.com) go to "GADS Services," and then "Publications" and download the self-extracting zip file GAR2000.EXE. That's all there is to it!

GADS Data Applications

The statistics in this brochure and the GAR are calculated from data that electric utilities report voluntarily to NERC's Generating Availability Data System (GADS). Operating histories for more than 4,400 electric generating units reside in GADS. Data are reported by 178 utilities in the United States and Canada representing investor-owned, municipal, state, cooperative, provincial, and federal segments of the industry. NERC aggregates these data and presents the results annually in its GAR.

The GAR provides an overview of the availability performance of classes of generating units. More specific data are available from NERC's GADS database to use in detailed unit- or equipment-level reliability, availability, and maintainability (RAM) analyses. GADS data are used in a wide variety of deterministic and probabilistic applications to:

- benchmark unit performance against statistically validated peers,
- conduct loss-of-load and similar system-wide analyses,
- optimize maintenance schedules and prepare cost-benefit analyses,
- compare the reliability of original equipment manufacturers' (OEM) components, and
- prepare reports for state and federal regulators.

You can conduct your own GADS special analyses with a software product called pc-G.A.R., available from NERC on CD-ROM. GADS data for special applications are also available by calling NERC. Call or e-mail (gads@nerc.com) NERC for further information.

Historical Availability Statistics

Back again this year is the *1982-2001 Historical Availability Statistics* (HAS) report. Based on previous GAR publications, this report provides statistics for individual, five, ten, and seventeen-year periods. The HAS report is included when you order the annual GAR diskette.

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Unit Type	MW Trb/Gen Nameplate	# of Units	Unit-Years	ART	SR	NCF	NOF	SF	AF	EAF	FOR	EFOR	EFORd	SOF	FOF	WSF	WAF	WEAF	WFOR	WEFOR	WSOF	WFOF
FOSSIL	All Sizes	1,553	6,699.00	267.88	98.39	57.66	83.65	68.93	86.68	84.72	5.17	7.09	6.28	9.56	3.76	75.84	85.71	83.51	5.22	7.21	10.11	4.18
All Fuel Types	1-99	338	1,440.50	174.14	99.09	34.86	69.79	49.95	88.97	87.83	5.41	7.10	5.51	8.18	2.86	54.47	89.11	87.85	4.92	6.65	8.08	2.82
	100-199	448	1,880.08	228.90	98.86	48.39	71.19	67.97	87.16	85.07	4.88	6.77	5.89	9.36	3.49	68.70	87.00	84.92	4.84	6.72	9.50	3.50
	200-299	175	769.58	363.00	99.04	57.46	74.49	77.13	86.64	84.75	4.81	6.45	6.03	9.46	3.90	76.84	86.56	84.64	4.82	6.50	9.55	3.89
	300-399	155	633.42	281.76	96.78	52.41	70.39	74.46	84.59	82.31	5.54	7.67	7.09	11.05	4.37	74.04	84.60	82.35	5.54	7.66	11.05	4.34
	400-599	258	1,171.67	334.43	97.24	60.45	77.38	78.13	84.95	82.53	5.45	7.63	7.22	10.55	4.51	78.38	84.95	82.54	5.42	7.58	10.56	4.49
	600-799	123	573.00	433.53	97.54	65.39	81.35	80.38	85.75	83.39	5.20	7.36	7.08	9.85	4.41	80.32	85.69	83.34	5.23	7.41	9.88	4.44
	800-999	42	165.50	369.69	99.45	60.43	79.68	75.84	86.43	84.74	3.58	4.99	4.65	10.75	2.82	76.23	86.54	84.92	3.51	4.83	10.69	2.77
	1000 Plus	14	65.25	707.02	97.33	63.10	76.53	82.45	82.89	80.11	8.01	9.77	9.72	9.93	7.18	82.85	83.26	80.56	7.66	9.31	9.87	6.87
Coal	All Sizes	936	4,155.00	459.83	97.50	68.76	84.11	81.75	86.95	84.61	4.66	6.56	6.30	9.05	4.00	84.36	86.37	84.00	4.94	6.83	9.24	4.39
Primary	1-99	157	660.83	290.39	98.93	49.68	70.46	70.51	87.94	86.29	3.95	5.73	5.10	9.16	2.90	72.26	88.20	86.49	3.92	5.67	8.86	2.95
	100-199	270	1,165.42	476.95	97.92	62.94	76.63	82.13	87.93	85.28	4.22	6.15	5.88	8.45	3.62	82.63	87.91	85.33	4.18	6.03	8.48	3.61
	200-299	120	536.50	557.70	98.74	68.51	80.75	84.84	87.42	85.38	4.48	6.04	5.91	8.60	3.98	84.69	87.32	85.22	4.48	6.10	8.71	3.98
	300-399	90	403.75	414.03	94.73	65.50	78.71	83.23	85.56	83.01	5.45	7.50	7.35	9.64	4.80	83.54	85.70	83.19	5.38	7.40	9.55	4.75
	400-599	166	780.58	491.19	95.98	70.26	83.31	84.34	85.40	82.67	5.31	7.55	7.47	9.87	4.73	84.46	85.47	82.78	5.25	7.46	9.84	4.68
	600-799	92	431.42	633.34	97.08	72.98	84.51	86.35	86.63	84.34	5.06	6.96	6.94	8.77	4.60	86.35	86.62	84.32	5.10	7.01	8.75	4.64
	800-999	29	116.75	684.87	99.29	74.42	85.72	86.81	87.20	85.77	3.50	4.73	4.71	9.65	3.15	86.85	87.24	85.91	3.43	4.57	9.67	3.08
	1000 Plus	12	59.75	707.96	97.19	65.41	77.93	83.93	84.22	81.70	6.83	8.24	8.22	9.63	6.16	84.03	84.33	81.84	6.71	8.08	9.63	6.05
Oil	*All Sizes	194	586.17	81.43	99.26	26.63	64.42	41.34	86.37	84.91	7.06	9.54	6.50	10.49	3.14	46.50	83.75	81.67	7.27	10.20	12.60	3.65
Primary	1-99	54	193.50	57.32	99.59	22.41	73.63	30.43	90.52	89.82	6.16	8.12	4.23	7.48	2.00	37.31	90.31	89.59	4.40	6.13	7.97	1.72
	100-199	44	130.08	88.74	99.22	25.42	61.84	41.11	86.60	85.24	7.18	9.44	6.43	10.22	3.18	43.02	85.36	83.75	7.04	9.67	11.38	3.26
	200-299	12	35.25	91.98	99.60	27.26	61.44	44.38	86.05	85.01	11.21	12.44	9.00	8.34	5.60	42.28	86.42	85.42	10.88	12.17	8.42	5.16
	300-399	25	71.50	142.69	99.63	34.76	61.62	56.41	80.87	78.47	6.71	10.11	8.24	15.07	4.06	55.60	80.77	78.39	6.98	10.38	15.06	4.17
	400-599	34	78.17	96.77	98.69	31.72	57.60	55.08	83.55	82.23	6.58	8.23	6.55	12.57	3.88	54.57	83.38	82.01	6.56	8.28	12.79	3.83
	600-799	12	45.17	54.64	98.39	19.88	54.85	36.25	83.71	80.43	6.92	13.26	8.33	13.59	2.70	36.01	83.29	80.14	7.31	13.44	13.87	2.84
	800-999	11	28.25	81.13	99.76	20.30	48.65	41.74	86.03	83.80	3.38	4.85	3.50	12.51	1.46	41.61	86.01	83.78	3.38	4.86	12.53	1.45
Gas	All Sizes	495	1,811.92	129.35	99.08	29.86	62.69	47.63	86.05	84.83	6.59	8.42	6.24	10.60	3.36	57.45	83.88	82.25	6.15	8.30	12.35	3.77
Primary	1-99	143	567.25	122.41	98.96	18.85	59.18	31.85	89.74	89.04	8.36	9.80	6.57	7.36	2.91	36.53	90.02	89.17	7.31	8.99	7.10	2.88
	100-199	156	573.67	89.09	99.39	24.48	53.21	46.01	85.66	84.56	6.53	8.17	5.78	11.12	3.22	46.61	85.47	84.28	6.58	8.34	11.25	3.29
	200-299	47	178.50	179.97	99.47	31.36	51.10	61.36	84.36	82.73	5.35	7.37	6.09	12.17	3.47	61.75	84.34	82.70	5.36	7.36	12.16	3.50
	300-399	58	158.08	164.31	98.41	29.66	49.22	60.26	83.83	82.28	5.36	7.21	6.01	12.76	3.41	59.99	83.83	82.26	5.43	7.33	12.72	3.45
	400-599	69	254.75	184.75	98.60	33.20	52.13	63.69	83.02	81.22	6.34	8.53	7.25	12.67	4.31	63.59	82.77	80.93	6.40	8.66	12.89	4.35
	600-799	16	58.17	324.23	97.16	36.34	55.14	65.91	79.84	77.80	6.37	8.98	8.02	15.68	4.48	66.16	80.07	78.04	6.30	8.88	15.49	4.45
	800-999	5	20.25	263.25	98.52	32.48	54.11	60.03	82.57	80.09	4.52	7.35	6.26	14.59	2.84	60.76	83.02	80.54	4.37	7.14	14.21	2.77
Lignite Primary	All Sizes	26	112.25	602.82	97.42	78.82	89.32	88.25	88.58	86.17	3.71	5.66	5.64	8.02	3.40	88.21	88.46	86.02	3.91	5.96	7.96	3.59

1997-2001 Generating Unit Statistical Brochure (Revised March 6, 2003)

Unit Type	MW Trb/Gen Nameplate	# of Units	Unit-Years
NUCLEAR	*All Sizes	128	542.75
All Types	400-799	23	84.58
	800-999	50	213.42
	1000 Plus	54	244.08
PWR	All Sizes	75	328.08
	400-799	10	46.00
	800-999	27	116.00
	1000 Plus	38	166.08
BWR	*All Sizes	33	146.42
	400-799	4	9.75
	800-999	12	58.00
	1000 Plus	16	78.00
CANDU	All Sizes	20	68.25
JET ENGINE**	All Sizes	361	1,399.00
	1-19	66	258.75
	20 Plus	295	1,140.25
GAS TURBINE**	All Sizes	895	3,333.50
	1-19	207	817.83
	20-49	291	1,004.00
	50 Plus	397	1,511.67
COMB. CYCLE	All Sizes	80	297.33
HYDRO	All Sizes	823	3,831.00
	1-29	326	1,380.00
	30 Plus	497	2,451.00
PUMPED STORAGE	All Sizes	80	346.00
MULTI-BOILER/ MULTI-TURBINE	All Sizes	65	258.83
GEOTHERMAL	All Sizes	16	34.50
DIESEL**	All Sizes	165	455.83

ART	SR	NCF	NOF	SF	AF	EAF	FOR	EFOR	EFORd	SOF	FOF
2,688.50	97.83	80.50	97.16	82.85	82.88	80.30	7.83	9.47	9.47	10.09	7.04
2,441.94	99.66	77.75	96.19	80.83	80.83	77.99	5.16	6.93	6.93	14.79	4.40
2,506.25	96.07	80.80	96.37	83.84	83.84	81.11	7.12	9.45	9.45	9.74	6.43
2,984.48	99.18	80.84	97.69	82.75	82.81	80.47	9.22	10.20	10.20	8.79	8.40
2,914.72	98.06	82.93	98.56	84.14	84.14	82.39	7.31	8.13	8.13	9.23	6.64
3,003.30	100.00	85.34	99.62	85.67	85.67	83.92	1.92	2.71	2.71	12.68	1.68
2,750.04	97.10	82.02	97.55	84.09	84.09	83.09	7.70	8.26	8.26	8.90	7.01
3,020.58	98.38	83.08	99.20	83.75	83.75	81.48	8.47	9.48	9.48	8.50	7.75
2,696.07	98.53	77.92	94.51	82.44	82.54	80.05	8.29	9.37	9.37	10.01	7.45
2,784.23	96.52	76.61	87.02	88.03	88.03	84.88	6.39	7.65	7.65	5.96	6.01
2,460.73	97.09	81.42	96.68	84.22	84.22	81.91	4.72	5.94	5.94	11.61	4.17
2,919.63	100.00	76.01	94.29	80.61	80.80	78.33	10.83	11.77	11.76	9.41	9.79
1,903.51	95.70	72.62	93.69	77.51	77.52	70.72	9.45	16.51	16.51	14.40	8.09
4.76	96.87	2.31	58.07	3.98	91.58	90.01	40.70	51.58	12.42	5.69	2.73
9.11	97.01	0.86	24.39	3.54	92.81	92.56	48.32	51.70	13.04	3.89	3.31
4.36	96.85	2.43	59.51	4.08	91.30	89.43	38.93	51.55	12.46	6.10	2.60
7.77	95.04	3.87	83.15	4.66	90.33	90.21	41.63	42.33	10.62	6.35	3.32
7.85	88.02	1.48	59.67	2.48	91.67	91.67	57.79	57.89	12.79	4.93	3.40
6.59	94.95	1.60	61.38	2.61	89.49	89.31	61.77	63.46	13.80	6.29	4.23
8.11	96.54	4.66	64.85	7.19	90.17	90.02	27.16	27.58	8.28	7.15	2.68
54.62	98.44	48.18	78.59	61.30	90.31	85.94	3.24	6.62	5.07	7.64	2.05
76.26	99.60	47.50	82.11	57.85	90.62	90.61	4.68	4.69	4.26	6.54	2.84
120.53	99.40	45.65	76.78	59.45	91.02	91.01	5.61	5.61	5.40	5.45	3.53
62.71	99.66	47.63	83.65	56.95	90.39	90.38	4.13	4.15	3.64	7.15	2.45
4.69	99.32	15.65	74.14	21.11	88.98	88.91	9.21	9.35	5.85	8.88	2.14
316.81	96.54	54.02	80.98	66.71	91.08	86.93	4.29	8.14	6.71	5.93	2.99
682.61	95.56	47.60	51.64	92.19	93.53	68.36	1.78	19.96	19.77	4.80	1.67
7.02	99.10	5.38	123.85	4.34	93.97	93.88	49.64	50.36	12.57	1.75	4.28

WSF	WAF	WEAF	WFOR	WEFOR	WSOF	WFOF
83.29	83.33	80.77	7.81	9.36	9.61	7.06
81.55	81.55	78.72	4.94	6.59	14.23	4.24
83.80	83.80	81.03	7.05	9.42	9.84	6.36
83.27	83.33	80.97	8.77	9.77	8.67	8.00
84.41	84.41	82.57	7.40	8.26	8.85	6.75
86.43	86.43	84.77	1.83	2.56	11.99	1.61
84.18	84.18	83.20	7.58	8.13	8.92	6.91
84.24	84.24	81.93	8.06	9.08	8.37	7.38
82.35	82.47	80.01	8.27	9.32	10.10	7.43
88.16	88.16	84.90	6.30	7.62	5.91	5.93
83.79	83.79	81.47	4.68	5.87	12.09	4.11
81.18	81.38	78.89	10.30	11.25	9.29	9.33
78.93	78.94	71.52	9.18	16.91	13.09	7.97
3.73	91.59	89.43	40.87	56.27	5.83	2.58
3.37	93.06	92.81	46.92	50.57	3.96	2.98
3.77	91.45	89.09	40.27	56.82	6.01	2.54
6.23	90.12	89.96	32.76	33.31	6.85	3.03
2.30	92.08	92.07	58.15	58.22	4.73	3.19
2.69	89.98	89.79	59.31	61.00	6.10	3.92
7.44	89.92	89.75	27.53	27.96	7.25	2.83
65.15	91.29	86.34	2.52	5.03	7.03	1.68
58.97	90.00	89.99	3.60	3.62	7.79	2.21
55.93	92.01	92.00	4.75	4.75	5.20	2.79
59.18	89.87	89.86	3.53	3.54	7.97	2.17
22.24	90.44	90.29	6.85	7.16	7.93	1.64
76.90	88.89	82.72	3.07	7.76	8.68	2.43
92.93	94.16	66.10	1.56	22.71	4.37	1.47
7.31	94.15	93.87	34.94	36.78	1.92	3.93

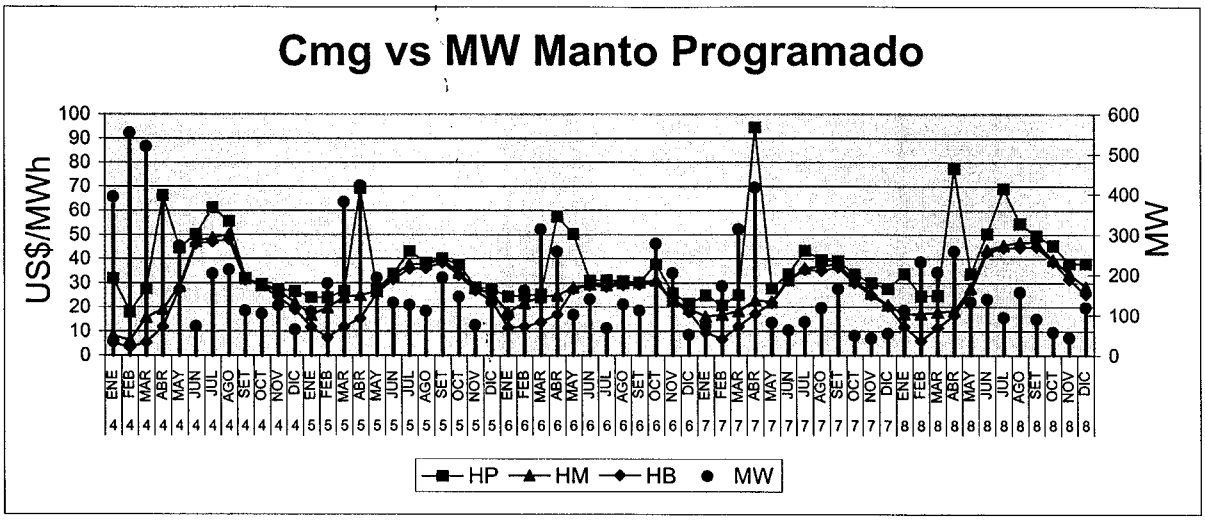
*Statistics for groups of 1 to 2 units are included in the all sizes category but are not shown separately.
**Caution: EFOR and WEFOR values may be low since deratings during reserve shutdown periods may not have been reported for a large number of these units.

PROGRAMA DE MANTENIMIENTO

Anexo 2

Unidad : CAMIS2 gt-50 TGN 125 MW

Año	Mes	Generación MW			MantoProg	Fortuitas	Operación	Arranques	HEO		MANTO	Intervalo
		Punta	Media	Base	Horas	Horas	Horas		mensual	acumulada		HEO
										0		0
2003	ENE	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	FEB	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	MAR	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	ABR	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	MAY	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	JUN	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	JUL	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	AGO	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	SET	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	OCT	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	NOV	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2003	DIC	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	ENE	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	FEB	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	MAR	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	ABR	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	MAY	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	JUN	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	JUL	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	AGO	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	SET	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	OCT	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	NOV	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2004	DIC	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2005	ENE	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2005	FEB	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2005	MAR	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2005	ABR	0.00	0.00	0.00	0	0	0	0	0	0	-	-
2005	MAY	120.00	90.81	54.06	0	30	489	4	752	752	-	-
2005	JUN	120.00	118.81	110.11	0	29	667	1	937	1689	-	-
2005	JUL	120.00	120.00	117.39	0	30	708	1	994	2683	-	-
2005	AGO	120.00	120.00	115.04	0	30	703	1	987	3670	-	-
2005	SET	106.15	105.48	105.70	72	26	609	4	917	4587	MANTO	4587
2005	OCT	120.00	108.88	97.08	0	30	633	1	891	5478	-	-
2005	NOV	119.97	91.26	64.96	0	29	498	4	764	6242	-	-
2005	DIC	109.37	35.56	25.98	0	30	261	12	599	6841	-	-
2006	ENE	119.86	5.94	3.24	0	30	143	22	637	7478	-	-
2006	FEB	106.48	4.31	3.24	0	27	119	22	604	8082	-	-
2006	MAR	88.89	12.54	0.57	168	23	130	22	619	8701	MANTO	4114
2006	ABR	120.00	18.29	7.08	0	29	175	22	680	9381	-	-
2006	MAY	120.00	69.19	55.02	0	30	433	4	675	10056	-	-
2006	JUN	120.00	120.00	116.21	0	29	683	1	959	11016	-	-
2006	JUL	120.00	120.00	114.66	0	30	702	1	986	12001	-	-
2006	AGO	106.15	108.86	105.92	72	27	639	1	898	12899	MANTO	4199
2006	SET	120.00	120.00	113.51	0	29	677	1	951	13850	-	-
2006	OCT	120.00	116.76	113.48	0	30	691	1	970	14821	-	-
2006	NOV	69.13	32.69	34.54	0	29	229	22	754	15575	-	-
2006	DIC	43.70	17.94	16.55	0	30	128	22	617	16192	-	-
2007	ENE	120.00	3.24	3.24	0	30	136	22	627	16819	-	-
2007	FEB	85.00	8.11	3.28	168	20	108	22	588	17407	MANTO	4507
2007	MAR	120.00	37.77	0.00	0	30	229	22	755	18162	-	-
2007	ABR	120.00	102.83	12.86	0	29	414	4	649	18811	-	-
2007	MAY	120.00	78.78	57.84	0	30	465	4	719	19530	-	-
2007	JUN	120.00	117.53	116.76	0	29	678	1	952	20482	-	-
2007	JUL	120.00	119.61	116.76	0	30	706	1	991	21473	-	-
2007	AGO	106.15	108.43	105.92	72	27	637	1	896	22369	MANTO	4963
2007	SET	120.00	120.00	115.75	0	29	682	1	958	23327	-	-
2007	OCT	120.00	115.83	108.44	0	30	677	1	951	24278	-	-
2007	NOV	120.00	92.39	72.56	0	29	517	4	791	25069	-	-
2007	DIC	119.65	53.02	40.57	0	30	352	4	564	25633	-	-


Cmg vs MW Manto Programado
US$/MWh
MW
100
90
80
70
60
50
40
30
20
10
0
600
500
400
300
200
100
0
ENE FEB MAR ABR MAY JUN JUL AGO SET OCT NOV DIC
4 4 4 4 4 4 4 4 4 4 4 4
ENE FEB MAR ABR MAY JUN JUL AGO SET OCT NOV DIC
5 5 5 5 5 5 5 5 5 5 5 5
ENE FEB MAR ABR MAY JUN JUL AGO SET OCT NOV DIC
6 6 6 6 6 6 6 6 6 6 6 6
ENE FEB MAR ABR MAY JUN JUL AGO SET OCT NOV DIC
7 7 7 7 7 7 7 7 7 7 7 7
ENE FEB MAR ABR MAY JUN JUL AGO SET OCT NOV DIC
8 8 8 8 8 8 8 8 8 8 8 8
HP
HM
HB
MW

ANEXO 4

MANGT COD	AÑO	MM	DM	HP	HF	
gt-1		2004	3	1	0	8
gt-1		2004	4	1	0	8
gt-1		2004	9	1	0	8
gt-1		2004	10	1	0	8
gt-1		2005	3	2	0	11
gt-1		2005	4	1	0	11
gt-1		2005	9	1	0	11
gt-1		2005	10	1	0	11
gt-1		2006	3	1	0	11
gt-1		2006	4	1	0	11
gt-1		2006	9	1	0	11
gt-1		2006	10	1	0	11
gt-1		2007	3	1	0	11
gt-1		2007	4	1	0	11
gt-1		2007	9	1	0	11
gt-1		2007	10	1	0	11
gt-1		2008	3	2	0	11
gt-1		2008	4	1	0	11
gt-1		2008	9	1	0	11
gt-1		2008	10	1	0	11
gt-2		2004	1	3	0	8
gt-2		2004	2	3	0	8
gt-2		2004	3	1	2	9
gt-2		2004	3	3	0	10
gt-2		2004	4	3	0	8
gt-2		2004	5	3	0	8
gt-2		2004	6	4	0	8
gt-2		2004	7	3	0	8
gt-2		2004	8	3	0	8
gt-2		2004	9	4	0	8
gt-2		2004	10	3	0	8
gt-2		2004	11	3	0	8
gt-2		2004	12	4	0	8
gt-3		2004	5	2	0	8
gt-3		2004	7	2	0	8
gt-3		2004	8	3	0	8
gt-3		2004	9	2	0	8
gt-4		2004	1	1	1	4
gt-4		2004	1	15	5	19
gt-4		2004	1	1	0	10
gt-4		2004	2	1	5	18
gt-4		2004	2	4	5	19
gt-4		2004	5	2	0	10
gt-4		2004	7	1	0	8
gt-4		2004	9	2	0	10
gt-4		2004	11	1	0	8
gt-4		2005	1	2	0	10
gt-4		2005	5	2	0	10
gt-4		2005	7	1	0	4
gt-4		2005	9	2	0	10
gt-4		2005	11	1	0	4
gt-4		2006	1	2	0	10

gt-4	2006	5	2	0	10
gt-4	2006	7	1	0	8
gt-4	2006	9	2	0	10
gt-4	2006	11	1	0	8
gt-4	2007	1	2	0	10
gt-4	2007	5	2	0	10
gt-4	2007	7	1	0	8
gt-4	2007	9	2	0	10
gt-4	2007	11	1	0	8
gt-4	2008	1	2	0	10
gt-4	2008	5	2	0	10
gt-4	2008	7	1	0	8
gt-4	2008	9	2	0	10
gt-4	2008	11	1	0	8
gt-6	2004	1	1	0	12
gt-6	2004	2	1	0	10
gt-6	2004	3	1	0	16
gt-6	2004	4	2	0	9
gt-6	2004	5	1	0	13
gt-6	2004	6	2	0	9
gt-6	2004	7	1	0	10
gt-6	2004	8	1	0	10
gt-6	2004	9	2	0	12
gt-6	2004	10	1	0	9
gt-6	2004	11	1	0	9
gt-6	2004	12	1	0	11
gt-7	2004	1	1	0	1
gt-7	2004	1	7	0	5
gt-7	2004	2	1	0	1
gt-7	2004	2	5	0	9
gt-7	2004	3	4	0	11
gt-7	2004	4	3	0	6
gt-7	2004	5	3	0	10
gt-7	2004	6	1	0	1
gt-7	2004	6	2	0	7
gt-7	2004	7	2	0	5
gt-7	2004	8	1	0	11
gt-7	2004	9	1	0	12
gt-7	2004	10	1	0	11
gt-7	2004	11	2	0	4
gt-7	2004	12	1	0	7
gt-8	2004	1	1	0	3
gt-8	2004	2	2	0	5
gt-8	2004	3	1	0	7
gt-8	2004	4	1	0	4
gt-8	2004	5	1	0	5
gt-8	2004	6	4	0	7
gt-8	2004	7	1	0	1
gt-8	2004	7	4	0	7
gt-8	2004	8	1	1	7
gt-8	2004	8	1	5	19
gt-8	2004	8	1	0	8
gt-8	2004	9	1	0	3
gt-8	2004	10	1	0	4
gt-8	2004	11	1	0	8
gt-8	2004	12	1	0	7
gt-9	2004	1	1	0	3
gt-9	2004	2	1	0	3

gt-9	2004	3	1	0	3
gt-9	2004	4	1	0	3
gt-9	2004	5	1	0	6
gt-9	2004	6	1	0	3
gt-9	2004	7	1	0	3
gt-9	2004	8	1	0	3
gt-9	2004	9	1	0	3
gt-9	2004	10	1	0	4
gt-9	2004	11	1	0	4
gt-9	2004	12	1	0	4
gt-12	2004	2	1	5	11
gt-12	2004	2	9	5	19
gt-12	2004	3	31	5	19
gt-12	2004	4	1	0	18
gt-12	2004	4	29	5	19
gt-12	2004	5	1	0	10
gt-12	2004	5	14	5	19
gt-12	2004	7	1	5	11
gt-12	2004	7	15	5	19
gt-12	2004	8	1	0	18
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gt-38	2006	4	1	0	1
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gt-38	2006	6	1	0	1
gt-38	2006	7	1	0	1
gt-38	2006	8	1	0	2
gt-38	2006	9	1	0	1
gt-38	2006	10	2	0	8
gt-38	2006	11	1	0	1
gt-38	2006	12	1	0	1
gt-38	2007	2	1	0	2
gt-38	2007	3	1	0	1
gt-38	2007	4	1	0	1
gt-38	2007	5	1	0	1
gt-38	2007	6	1	0	1
gt-38	2007	7	1	0	1
gt-38	2007	8	1	0	2
gt-38	2007	9	1	0	1
gt-38	2007	10	2	0	8
gt-38	2007	11	1	0	1
gt-38	2007	12	1	0	1
gt-38	2008	2	1	0	2

gt-38	2008	3	1	0	1
gt-38	2008	4	1	0	1
gt-38	2008	5	1	0	1
gt-38	2008	6	1	0	1
gt-38	2008	7	1	0	1
gt-38	2008	8	1	0	2
gt-38	2008	9	1	0	1
gt-38	2008	10	2	0	8
gt-38	2008	11	1	0	1
gt-38	2008	12	1	0	1
gt-39	2004	3	1	0	8
gt-39	2004	3	6	5	19
gt-39	2004	9	1	0	8
gt-39	2004	9	6	5	19
gt-39	2005	3	7	5	19
gt-39	2005	9	7	5	19
gt-39	2006	3	7	5	19
gt-39	2006	9	7	5	19
gt-39	2007	3	7	5	19
gt-39	2007	9	7	5	19
gt-39	2008	1	30	5	19
gt-39	2008	2	28	5	19
gt-39	2008	3	2	5	19
gt-39	2008	8	7	5	19
gt-40	2004	1	1	0	16
gt-40	2004	1	26	5	19
gt-40	2004	2	28	5	19
gt-40	2004	3	1	0	16
gt-40	2004	3	4	5	19
gt-40	2004	5	1	0	8
gt-40	2004	5	6	5	19
gt-40	2004	12	1	0	8
gt-40	2004	12	6	5	19
gt-40	2005	1	1	0	4
gt-40	2005	2	7	5	19
gt-40	2005	3	1	0	8
gt-40	2005	7	1	0	4
gt-40	2005	9	1	0	8
gt-40	2005	9	7	5	19
gt-40	2006	1	1	0	4
gt-40	2006	3	1	0	8
gt-40	2006	4	7	5	19
gt-40	2006	7	1	0	4
gt-40	2006	9	1	0	6
gt-40	2006	11	7	5	19
gt-40	2007	1	1	0	4
gt-40	2007	3	1	0	8
gt-40	2007	3	7	5	19
gt-40	2007	7	1	0	4
gt-40	2007	9	1	0	4
gt-40	2007	9	7	5	19
gt-40	2008	1	1	0	4
gt-40	2008	3	1	0	8
gt-40	2008	3	7	5	19
gt-40	2008	7	1	0	4
gt-40	2008	9	1	0	8
gt-40	2008	10	7	5	19
gt-41	2004	3	1	0	8

gt-41	2004	3	13	5	19
gt-41	2004	10	1	0	8
gt-41	2004	10	6	5	19
gt-41	2005	3	1	0	4
gt-41	2005	5	1	0	8
gt-41	2005	5	7	5	19
gt-41	2005	9	1	0	4
gt-41	2005	12	1	0	8
gt-41	2005	12	7	5	19
gt-41	2006	3	1	0	4
gt-41	2006	5	1	0	4
gt-41	2006	5	7	5	19
gt-41	2006	9	1	0	4
gt-41	2006	12	1	0	8
gt-41	2006	12	7	5	19
gt-41	2007	3	1	0	4
gt-41	2007	5	1	0	8
gt-41	2007	5	7	5	19
gt-41	2007	9	1	0	4
gt-41	2007	11	1	0	8
gt-41	2007	12	7	5	19
gt-41	2008	3	1	0	4
gt-41	2008	5	1	0	8
gt-41	2008	5	7	5	19
gt-41	2008	9	1	0	4
gt-41	2008	11	1	0	8
gt-41	2008	12	7	5	19
gt-43	2004	3	1	5	11
gt-43	2004	3	2	5	19
gt-43	2004	4	1	0	16
gt-43	2004	4	1	5	19
gt-43	2005	4	1	0	4
gt-43	2005	6	1	0	8
gt-43	2005	9	1	0	4
gt-43	2005	12	1	0	8
gt-43	2006	4	1	0	4
gt-43	2006	6	1	0	8
gt-43	2006	9	1	0	4
gt-43	2006	12	1	0	4
gt-43	2007	4	1	0	4
gt-43	2007	6	1	0	8
gt-43	2007	9	1	0	4
gt-43	2007	12	1	0	8
gt-43	2008	4	1	0	4
gt-43	2008	6	1	0	8
gt-43	2008	9	1	0	4
gt-43	2008	12	1	0	8
gt-44	2004	2	1	0	4
gt-44	2004	2	11	5	19
gt-44	2004	3	1	0	8
gt-44	2004	4	1	0	8
gt-44	2004	4	4	5	19
gt-44	2005	4	1	0	4
gt-44	2005	6	1	0	8
gt-44	2005	9	1	0	4
gt-44	2005	12	1	0	8
gt-44	2006	4	1	0	4
gt-44	2006	6	1	0	8

gt-44	2006	9	1	0	4
gt-44	2006	12	1	0	4
gt-44	2007	4	1	0	4
gt-44	2007	6	1	0	8
gt-44	2007	9	1	0	4
gt-44	2007	12	1	0	8
gt-44	2008	4	1	0	4
gt-44	2008	6	1	0	8
gt-44	2008	9	1	0	4
gt-44	2008	12	1	0	8
gt-45	2004	4	1	0	8
gt-45	2004	4	11	5	19
gt-45	2005	2	1	5	19
gt-45	2005	3	31	5	19
gt-45	2005	4	28	5	19
gt-45	2006	3	12	5	19
gt-45	2007	2	12	5	19
gt-45	2008	2	12	5	19
gt-49	2006	10	30	5	19
gt-49	2007	4	3	5	19
gt-49	2007	9	7	5	19
gt-49	2008	3	3	5	19
gt-49	2008	8	7	5	19
gt-50	2004	1	1	0	1
gt-50	2004	1	2	0	6
gt-50	2004	2	1	2	8
gt-50	2004	2	5	5	19
gt-50	2004	2	1	0	4
gt-50	2004	3	1	3	11
gt-50	2004	3	4	5	19
gt-50	2004	3	1	0	5
gt-50	2004	4	1	0	1
gt-50	2004	4	2	5	19
gt-50	2004	4	1	0	6
gt-50	2004	5	1	0	1
gt-50	2004	5	3	0	5
gt-50	2004	6	2	0	4
gt-50	2004	7	2	0	5
gt-50	2004	8	2	5	19
gt-50	2004	8	1	0	3
gt-50	2004	9	1	0	1
gt-50	2004	9	3	0	4
gt-50	2004	10	1	0	4
gt-50	2004	11	2	0	5
gt-50	2004	12	3	0	5

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gt-1	truji	TGD	21.72 MW				
2004	2005	2006	2007	2008	Total		
438	435	436	436	436	2,181	hr fortuitas	
32	55	44	44	55	230	hr programadas	
0	0	0	0	0	0	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
4.98%	4.97%	4.97%	4.97%	4.97%	4.97%	ind fortuita	
0.36%	0.63%	0.50%	0.50%	0.63%	0.52%	ind programada	DENTRO
5.35%	5.60%	5.48%	5.48%	5.59%	5.50%	ind total	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	% hr operación	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	factor de planta	
0	0	0	0	0	0	HEO	

gt-2	chimbo	TGD	67.449 MW				
2004	2005	2006	2007	2008	Total		
423	438	438	438	439	2,176	hr fortuitas	
329	0	0	0	0	329	hr programadas	
0	0	0	0	0	0	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
4.81%	5.00%	5.00%	5.00%	5.00%	4.96%	ind fortuita	
3.75%	0.00%	0.00%	0.00%	0.00%	0.75%	ind programada	DENTRO
8.56%	5.00%	5.00%	5.00%	5.00%	5.71%	ind total	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	% hr operación	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	fp	
0	0	0	0	0	0	HEO	

gt-3	tgpiur	TGD	21.11 MW				
2004	2005	2006	2007	2008	Total		
871	876	876	876	878	4,378	hr fortuitas	
72	0	0	0	0	72	hr programadas	
0	0	0	0	0	0	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
9.92%	10.00%	10.00%	10.00%	10.00%	9.98%	ind fortuita	
0.82%	0.00%	0.00%	0.00%	0.00%	0.16%	ind programada	DENTRO
10.74%	10.00%	10.00%	10.00%	10.00%	10.15%	ind total	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	% hr operación	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	fp	
0	0	0	0	0	0	HEO	

gt-4	rosanu	TGD	105.809 MW				
2004	2005	2006	2007	2008	Total		
412	435	434	434	435	2,150	hr fortuitas	
550	68	76	76	76	846	hr programadas	
0	0	0	0	1	1	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
4.69%	4.96%	4.96%	4.96%	4.96%	4.90%	ind fortuita	
6.26%	0.78%	0.87%	0.87%	0.87%	1.93%	ind programada	DENTRO
10.95%	5.74%	5.82%	5.82%	5.82%	6.83%	ind total	
0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	% hr operación	
0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	fp	
0	0	0	0	22	22	HEO	

gt-6	PIUD2	RD	27.85 MW				
2004	2005	2006	2007	2008	Total		
259	263	263	263	264	1,311	hr fortuitas	
160	0	0	0	0	160	hr programadas	
30	8	0	5	232	276	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
2.95%	3.00%	3.00%	3.00%	3.00%	2.99%	ind fortuita	
1.82%	0.00%	0.00%	0.00%	0.00%	0.36%	ind programada	DENTRO
4.77%	3.00%	3.00%	3.00%	3.00%	3.35%	ind total	
0.34%	0.10%	0.00%	0.06%	2.64%	0.63%	% hr operación	
0.34%	0.10%	0.00%	0.06%	2.64%	0.63%	fp	
30	8	0	5	232	276	HEO	

gt-7	CHIC-D	RD	25.139 MW				
2004	2005	2006	2007	2008	Total		
256	263	263	263	264	1,308	hr fortuitas	
248	0	0	0	0	248	hr programadas	
0	0	0	0	197	197	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
2.92%	3.00%	3.00%	3.00%	3.00%	2.98%	ind fortuita	

2.82%	0.00%	0.00%	0.00%	0.00%	0.57%	ind programada DENTRO
5.74%	3.00%	3.00%	3.00%	3.00%	3.55%	ind total
0.00%	0.00%	0.00%	0.00%	2.24%	0.45%	% hr operación
0.00%	0.00%	0.00%	0.00%	2.24%	0.45%	fp
0	0	0	0	197	197	HEO

gt-8 **dsulla** RD 11.084 MW

2004	2005	2006	2007	2008	Total	
259	263	263	263	264	1,311	hr fortuitas
148	0	0	0	0	148	hr programadas
0	0	0	0	89	89	hr operación
8,784	8,760	8,760	8,760	8,784	43,848	hr año
2.95%	3.00%	3.00%	3.00%	3.00%	2.99%	ind fortuita
1.68%	0.00%	0.00%	0.00%	0.00%	0.34%	ind programada DENTRO
4.63%	3.00%	3.00%	3.00%	3.00%	3.33%	ind total
0.00%	0.00%	0.00%	0.00%	1.01%	0.20%	% hr operación
0.00%	0.00%	0.00%	0.00%	1.01%	0.20%	fp
0	0	0	0	89	89	HEO

gt-9 **dpaita** RD 9.031 MW

2004	2005	2006	2007	2008	Total	
262	263	263	263	264	1,314	hr fortuitas
42	0	0	0	0	42	hr programadas
0	0	0	0	0	0	hr operación
8,784	8,760	8,760	8,760	8,784	43,848	hr año
2.99%	3.00%	3.00%	3.00%	3.00%	3.00%	ind fortuita
0.48%	0.00%	0.00%	0.00%	0.00%	0.10%	ind programada DENTRO
3.46%	3.00%	3.00%	3.00%	3.00%	3.09%	ind total
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	% hr operación
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	fp
0	0	0	0	0	0	HEO

gt-12 **tgven3** TGN 164.142 MW

2004	2005	2006	2007	2008	Total	
246	341	115	0	0	702	hr fortuitas
2,640	240	0	0	0	2,880	hr programadas
1,102	4,176	454	0	0	5,732	hr operación
8,784	8,760	2,880	0	0	20,424	hr año
2.80%	3.89%	4.00%	-	-	3.44%	ind fortuita
30.05%	2.74%	0.00%	-	-	14.10%	ind programada [redacted]
32.85%	6.63%	4.00%	-	-	17.54%	ind total
12.55%	47.67%	15.76%	-	-	28.07%	% hr operación
12.55%	47.67%	15.76%	0.00%	0.00%	28.07%	fp
2,756	8,222	2,284	0	0	13,262	HEO

gt-13 **tgven4** TGN 160.522 MW

2004	2005	2006	2007	2008	Total	
270	341	320	348	342	1,619	hr fortuitas
2,046	240	767	72	240	3,365	hr programadas
1,747	5,911	4,115	3,645	4,654	20,073	hr operación
8,784	8,760	8,760	8,760	8,784	43,848	hr año
3.07%	3.89%	3.65%	3.97%	3.89%	3.69%	ind fortuita
23.29%	2.74%	8.76%	0.82%	2.73%	7.67%	ind programada [redacted]
26.36%	6.63%	12.41%	4.79%	6.62%	11.37%	ind total
19.89%	67.48%	46.98%	41.61%	52.98%	45.78%	% hr operación
19.89%	67.48%	46.98%	41.61%	52.98%	45.78%	fp
3,463	9,568	7,658	7,792	8,679	37,161	HEO

gt-14 **TG_WES** TGD 121.331 MW

2004	2005	2006	2007	2008	Total	
260	262	261	261	262	1,305	hr fortuitas
112	40	60	60	60	332	hr programadas
0	1	0	80	156	236	hr operación
8,784	8,760	8,760	8,760	8,784	43,848	hr año
2.96%	2.99%	2.98%	2.98%	2.98%	2.98%	ind fortuita
1.28%	0.46%	0.68%	0.68%	0.68%	0.76%	ind programada DENTRO
4.24%	3.44%	3.66%	3.66%	3.66%	3.73%	ind total
0.00%	0.01%	0.00%	0.91%	1.77%	0.54%	% hr operación
0.00%	0.01%	0.00%	0.91%	1.77%	0.54%	fp
0	21	0	517	947	1,485	HEO

gt-15 **TGagt1** TGN 84.157 MW

2004	2005	2006	2007	2008	Total	
153	157	170	169	160	810	hr fortuitas
1,110	930	240	312	767	3,359	hr programadas
6,749	7,208	7,903	7,820	7,379	37,059	hr operación
8,784	8,760	8,760	8,760	8,784	43,848	hr año

1.75%	1.79%	1.95%	1.93%	1.83%	1.85%	ind fortuita
12.64%	10.62%	2.74%	3.56%	8.73%	7.66%	ind programada
14.38%	12.40%	4.68%	5.49%	10.56%	9.51%	ind total
76.83%	82.29%	90.22%	89.27%	84.01%	84.52%	% hr operación
76.83%	82.29%	90.22%	89.27%	84.01%	84.52%	fp
10,120	10,571	11,287	11,232	10,606	53,817	HEO

gt-16 **TGagt2** TGN 78.146 MW

2004	2005	2006	2007	2008	Total		
173	169	160	170	157	829	hr fortuitas	
126	312	767	240	930	2,375	hr programadas	
6,590	7,532	7,116	7,564	7,082	35,883	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
1.97%	1.93%	1.82%	1.95%	1.79%	1.89%	ind fortuita	
1.43%	3.56%	8.76%	2.74%	10.59%	5.42%	ind programada	DENTRO
3.41%	5.49%	10.58%	4.68%	12.38%	7.31%	ind total	
75.02%	85.98%	81.24%	86.34%	80.62%	81.83%	% hr operación	
75.02%	85.98%	81.24%	86.34%	80.62%	81.83%	fp	
10,481	10,896	10,345	10,880	10,377	52,979	HEO	

gt-17 **TGMALA1** TGD 14.853 MW

2004	2005	2006	2007	2008	Total		
338	350	350	350	351	1,741	hr fortuitas	
328	0	0	0	0	328	hr programadas	
0	0	0	0	0	0	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
3.85%	4.00%	4.00%	4.00%	4.00%	3.97%	ind fortuita	
3.73%	0.00%	0.00%	0.00%	0.00%	0.75%	ind programada	DENTRO
7.58%	4.00%	4.00%	4.00%	4.00%	4.72%	ind total	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	% hr operación	
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	fp	
0	0	0	0	0	0	HEO	

gt-17B **TGMALA2** TGN 15.037 MW

2004	2005	2006	2007	2008	Total		
338	320	348	344	348	1,698	hr fortuitas	
328	767	72	168	72	1,407	hr programadas	
2,239	1,758	1,062	1,489	2,843	9,391	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
3.85%	3.65%	3.97%	3.92%	3.97%	3.87%	ind fortuita	
3.73%	8.76%	0.82%	1.92%	0.82%	3.21%	ind programada	DENTRO
7.58%	12.41%	4.79%	5.84%	4.79%	7.08%	ind total	
25.49%	20.07%	12.12%	17.00%	32.36%	21.42%	% hr operación	
25.49%	20.07%	12.12%	17.00%	32.36%	21.42%	fp	
5,659	4,477	5,080	5,128	6,249	26,593	HEO	

gt-17C **TGMALA3** TGN 15.101 MW

2004	2005	2006	2007	2008	Total		
347	348	323	348	342	1,706	hr fortuitas	
112	72	695	72	240	1,191	hr programadas	
2,307	2,007	1,008	1,782	2,958	10,064	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
3.95%	3.97%	3.68%	3.97%	3.89%	3.89%	ind fortuita	
1.28%	0.82%	7.93%	0.82%	2.73%	2.72%	ind programada	DENTRO
5.22%	4.79%	11.62%	4.79%	6.62%	6.61%	ind total	
26.27%	22.92%	11.51%	20.35%	33.68%	22.95%	% hr operación	
26.27%	22.92%	11.51%	20.35%	33.68%	22.95%	fp	
5,833	5,160	4,646	4,951	6,408	26,998	HEO	

gt-18 **TG4MAL** TGN 81.151 MW

2004	2005	2006	2007	2008	Total		
237	258	256	261	241	1,252	hr fortuitas	
876	168	240	72	757	2,113	hr programadas	
3,263	3,585	3,432	3,305	4,111	17,696	hr operación	
8,784	8,760	8,760	8,760	8,784	43,848	hr año	
2.70%	2.94%	2.92%	2.98%	2.74%	2.86%	ind fortuita	
9.97%	1.92%	2.74%	0.82%	8.62%	4.82%	ind programada	DENTRO
12.67%	4.86%	5.66%	3.80%	11.36%	7.67%	ind total	
37.15%	40.93%	39.18%	37.73%	46.81%	40.36%	% hr operación	
37.15%	40.93%	39.18%	37.73%	46.81%	40.36%	fp	
7,207	7,370	6,759	6,664	7,333	35,333	HEO	

gt-18A **TG4MALconIn** TGN 16.201 MW

2004	2005	2006	2007	2008	Total	
237	258	256	261	241	1,252	hr fortuitas
876	168	240	72	757	2,113	hr programadas
1,692	1,214	833	1,107	1,924	6,770	hr operación