

Monthly Market Assessment Highlights for February 2019 Billing Month

1. Summary

The February billing month observed a tighter supply and demand condition driven by the higher demand requirement this month at 10,013 MW relative to previous month's 9,819 MW following the observance of holidays in January. In addition, lower effective supply was recorded this month at 11,905 MW from previous month's 11,943 MW brought about by the higher level of outage capacity. This notwithstanding, market prices posted a lower average at PhP4,058/MWh compared to previous month's PhP4,727/MWh given that more frequent price spikes were recorded during the January billing month.

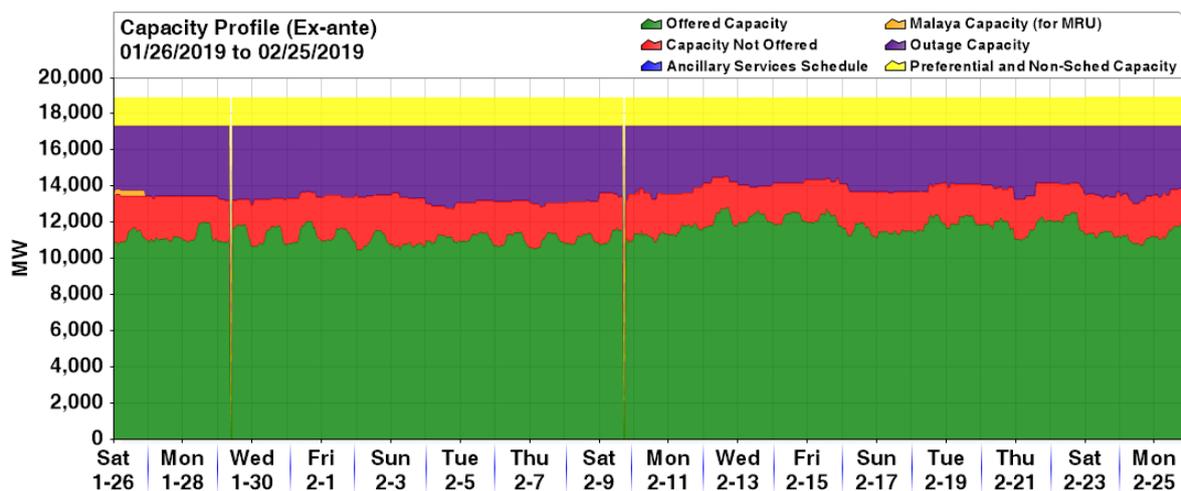
Market intervention was declared on 29 January at 1000H (system-wide) and on 9 February at 1800H (Luzon region only) which were both due to erroneous/unimplementable RTD schedule.

2. Market Outcomes

2.1. Capacity Profile

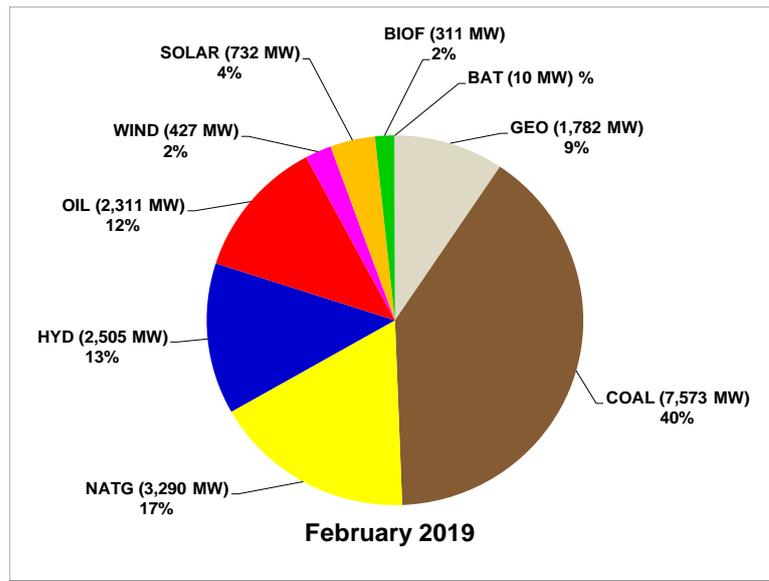
The WESM registered capacity increased to 18,940 MW with the entry of the additional 37.5 MW facility of Victorias Milling Company, Inc. Of the said total WESM registered capacity, only about 61 percent or an average of 11,491 MW was offered in the market.

Figure 1. Capacity Profile



	February 2019		January 2019	
	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap
Preferential and Non-Sched Capacity	1,524	8%	1,520	8%
Outage Capacity	3,756	20%	3,331	18%
Malaya Capacity (for MRU)	300	0.05%	300	2%
Capacity Not Offered	2,126	11%	2,101	11%
Offered Capacity	11,491	61%	11,649	62%
Registered Capacity (by the end of the billing month)	18,940		18,902	

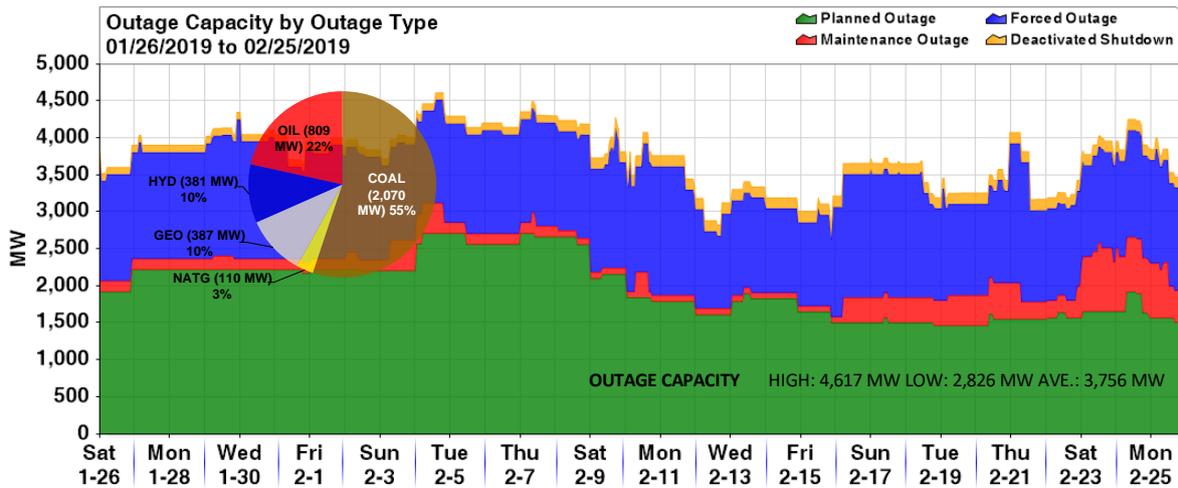
Figure 2. Registered Capacity Mix, February 2019



2.2. Outage Capacity

About 20 percent of the total registered capacity or an average of 3,756 MW were on outage. This was higher than previous month's average at 3,332 MW. Bulk of which, at 53 percent, were related to planned outages, averaging at 1,972 MW. Forced outages, averaging at 1,407 MW, accounted for 37 percent of the total outage capacity.

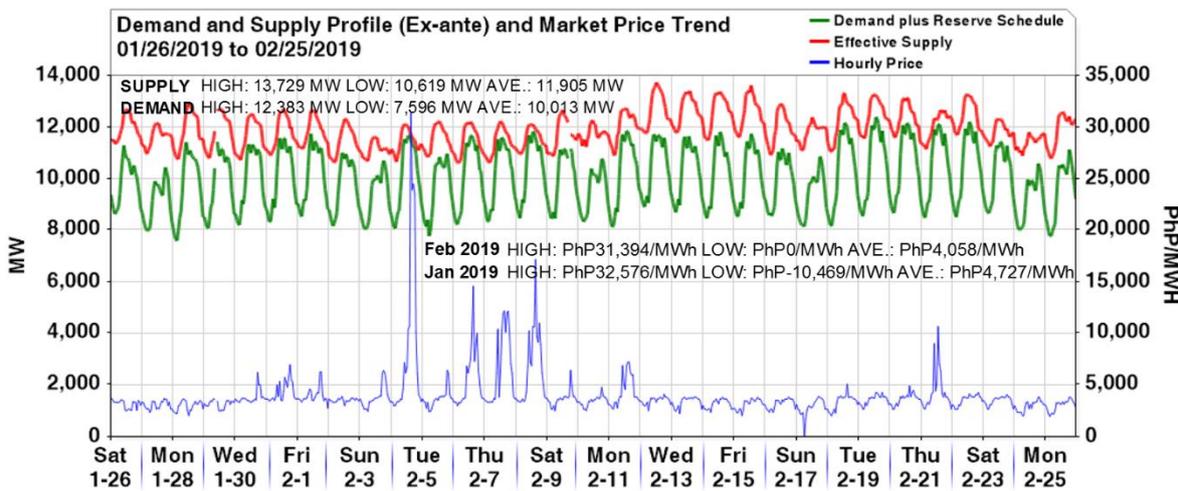
Figure 3. Outage Capacity by Outage Category



2.3. Supply and Demand

Lower average effective supply level was observed this month at 11,905 MW from 11,943 MW in the previous month driven by higher level of capacity on outage. Meanwhile, system demand¹ increased to an average of 10,013 MW from 9,819 MW relative to the low demand during the observance of holidays in January. As a result, supply margin tightened to an average of 1,891 MW.

Figure 4. Demand and Supply Profile vs. Market Prices



2.4. Market Prices

Notwithstanding the tighter supply margin this February billing month, lower average market price was recorded at PhP4,058/MWh compared to PhP4,727/MWh in January. More frequent prices falling above PhP20,000/MWh were observed during the January billing month at 18 trading

¹ System demand including reserve requirement

intervals while only 4 trading intervals (from 1600H to 1900H on 4 February, reaching as high as PhP31,394/MWh) recorded the same this billing month.

3. Structural Competition Indices

3.1. Pivotal Plants

The market RSI fell below the 100-percent mark which indicates the presence of pivotal supplier for 24.7 percent of the time. This was slightly lower than previous month's 29.6 percent. Most frequent pivotal suppliers during the billing month were Sual CFTPP, Ilijan NGPP, and Sta. Rita NGPP.

Figure 5. Market RSI vs. Pivotal Suppliers

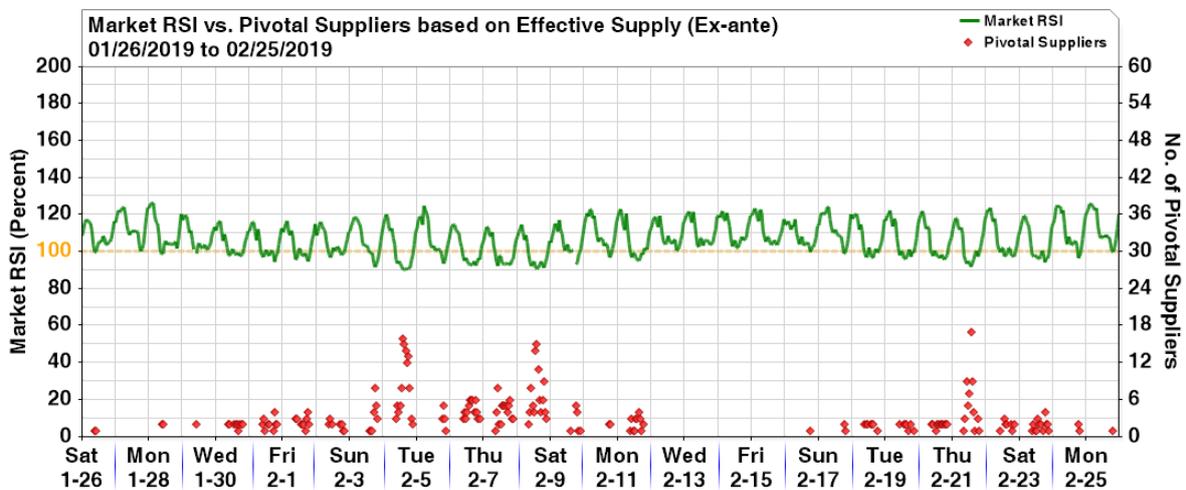
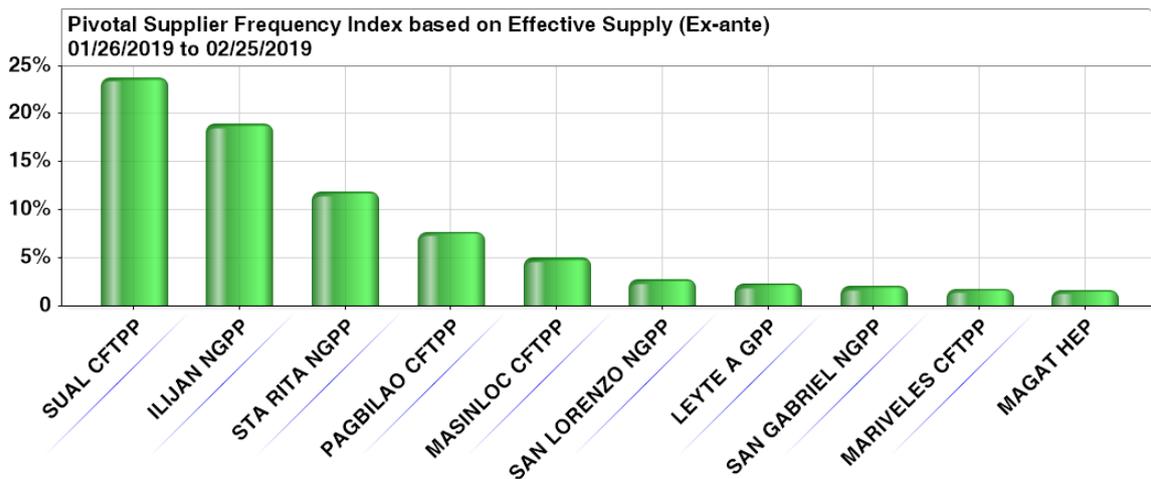


Figure 6. Top Pivotal Plants

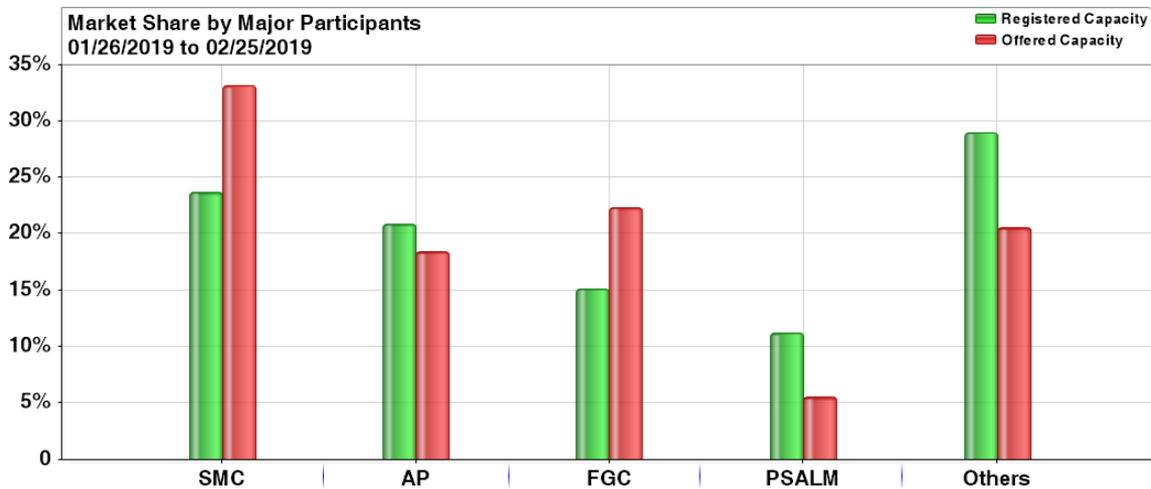


3.2. Market Concentration

San Miguel Corporation (SMC), Aboitiz Power (AP), First Gen Corporation (FGC) and Power Sector Asset and Liabilities Management (PSALM)

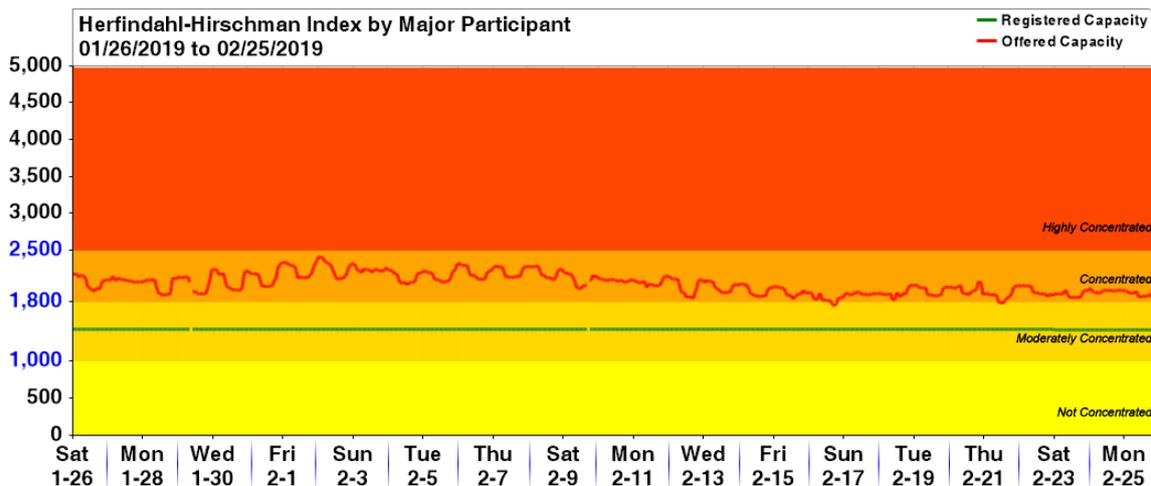
continued to dominate the market. Their combined market share comprised 71 percent of the total registered capacity in the WESM. SMC held the top spot at 23.7 percent followed by AP (20.9 percent), FGC (15.2 percent) and PSALM (11.2 percent).

Figure 7. Market Share



With the unavailability of some plants, the market shares of SMC and FGC based on offered capacity increased to 33.1 percent and 22.4 percent, respectively. AP held a market share of 18.4 percent. Accordingly, the Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by major participants' grouping indicated a concentrated market for 98.7 percent of the time and moderately concentrated market for 1.1 percent.

Figure 8. Hourly HHI based on Major Participant Grouping



List of Major Plant Outages

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks
LUZON	GEO	Tiwi 3	43.7	10/23/2005 13:26			Deactivated Shutdown	Tiwi 3 decommissioned since May 26 2009
LUZON	GEO	Makban 6	55	04/11/2013 22:44			Deactivated Shutdown	Conducted gas compressor test
VISAYAS	GEO	PGPP2 Unit 4	20	06/27/2014 6:07			Forced Outage	Steam being utilized by Nasulo plant
LUZON	HYD	Angat M 3	50	01/29/2018 0:01	02/07/2019 9:51	374.41	Planned Outage	Annual overhauling until 29 July 2018
LUZON	OIL	Malaya 2	350	05/19/2018 13:01			Forced Outage	Burn air heater 2A
LUZON	COAL	SLTEC 2	122.9	06/18/2018 6:14			Forced Outage	Isolated due to tripping Calaca-Salong Line
VISAYAS	GEO	Upper Mahiao 2	32	09/03/2018 6:01			Forced Outage	Tripped
LUZON	OIL	SLPGC 4	25	11/22/2018 11:56			Maintenance Outage	On extended maintenance shutdown until 24 April 2019
LUZON	OIL	TMO Unit 2	49	11/26/2018 13:01			Deactivated Shutdown	Unavailable due to cooling tower trouble. RECLASSIFIED FROM FORCE. OMC OUTAGE. TMO ceased WESM participation effective 05 February 2019 at 1037H
LUZON	OIL	TMO Unit 2	49	11/26/2018 13:01			Forced Outage	Unavailable due to cooling tower trouble
LUZON	GEO	Tiwi 1	59	11/29/2018 13:31			Maintenance Outage	Maintenance Outage
LUZON	GEO	Tiwi 2	59	12/30/2018 13:04	02/04/2019 20:24	36.31	Forced Outage	Emergency shutdown due to oil leak at well site 13 of hot brine pipeline
LUZON	GEO	Tiwi 6	57	12/30/2018 16:07	02/09/2019 7:00	40.62	Forced Outage	Emergency shutdown due to steam leak
LUZON	COAL	Calaca 1	300	12/30/2018 22:38			Planned Outage	APMT until 25 June 2019 (GOMP)
VISAYAS	COAL	Keppo Salcon 2	103	01/03/2019 2:50	02/08/2019 14:51	36.50	Planned Outage	For APMS
LUZON	COAL	SMC 3	150	01/04/2019 19:24	02/05/2019 10:37	31.63	Planned Outage	Planned outage until 25 January 2019
LUZON	COAL	Pagbilao 3	420	01/06/2019 1:22			Planned Outage	Planned outage until 4 February 2019. GOMP
LUZON	OIL	Limay 5	60	01/07/2019 0:01	02/25/2019 15:56	49.66	Planned Outage	Annual Overhauling until 2-21-2019
LUZON	COAL	GN Power 1	316	01/07/2019 0:03	02/10/2019 0:55	34.04	Planned Outage	Maintenance Outage until 2-11-19
LUZON	GEO	Makban 10	20	01/07/2019 23:40			Forced Outage	On reserve shutdown pending availability of steam supply (steam optimization)
LUZON	GEO	Makban 3	63	01/13/2019 15:07	02/08/2019 1:03	25.41	Maintenance Outage	Maintenance outage
LUZON	COAL	SLPGC 2	150	01/14/2019 7:01			Forced Outage	Emergency shutdown due to boiler tube leak
VISAYAS	GEO	Malibog BC	14	01/16/2019 0:07	02/02/2019 10:57	17.45	Planned Outage	Cut-out from the System. Annual PMS
LUZON	COAL	SLPGC 1	150	01/17/2019 11:09	02/01/2019 22:13	15.46	Forced Outage	Boiler Tube Leak
LUZON	COAL	QPPL	459	01/18/2019 23:58	02/08/2019 23:55	21.00	Planned Outage	Maintenance Outage until 02 February 2019
LUZON	NATG	Avion 2	50.3	01/20/2019 0:17	01/31/2019 18:00	11.74	Planned Outage	Maintenance Outage until 04 February 2019
LUZON	COAL	Masinloc 2	344	01/25/2019 19:47	01/31/2019 8:02	5.51	Forced Outage	Emergency shutdown due to IDF 1 and 2 inlet vane reaching their upper limits and positive furnace draft
VISAYAS	COAL	CEDC 3	82	01/26/2019 4:35	02/15/2019 12:13	20.32	Forced Outage	Unit tripped
LUZON	OIL	Malaya 1	300	01/26/2019 21:25			Planned Outage	Planned outage
VISAYAS	COAL	PALM 1	135	01/27/2019 2:50	01/27/2019 4:28	0.07	Forced Outage	High vibration
LUZON	COAL	SLTEC 1	121	01/29/2019 0:05	02/01/2019 1:24	3.05	Forced Outage	Lube Oil contamination
VISAYAS	GEO	Malibog 2	72	01/29/2019 4:22	01/29/2019 18:38	0.59	Forced Outage	Replacement of Proximity Sensor of Stage Bearing 2. Y-axis
VISAYAS	GEO	Leyte 1	35	01/29/2019 5:37	01/29/2019 19:31	0.58	Maintenance Outage	Maintenance Outage
LUZON	OIL	SLPGC 3	25	01/29/2019 19:56	02/03/2019 17:09	4.88	Forced Outage	Declared unavailable due to arcing at power cable at generator circuit breaker
LUZON	COAL	Calaca 2	300	01/29/2019 21:54	01/30/2019 0:12	0.10	Forced Outage	Generator excitation trouble
LUZON	COAL	Calaca 2	300	01/31/2019 20:22	02/12/2019 5:02	11.36	Forced Outage	Emergency shutdown due to boiler tube leak
LUZON	NATG	Avion 1	50.3	02/01/2019 0:01	02/10/2019 17:36	9.73	Planned Outage	Planned Outage
LUZON	COAL	SLTEC 1	121	02/01/2019 13:38	02/03/2019 0:46	1.46	Forced Outage	Boiler Tube Leak
VISAYAS	GEO	PGPP1 Unit 2	37.5	02/02/2019 0:04	02/02/2019 13:44	0.57	Forced Outage	Offline to conduct replacement of the AVR Controller. G60M1 and T60M1 Multiline Power Supply. Ground Fault Detector Lever and other Steam field opportunity works
VISAYAS	COAL	TPC Sangi 2	85	02/02/2019 0:43	02/02/2019 8:26	0.32	Maintenance Outage	Rectification of seawater leak
LUZON	NATG	San Lorenzo 2	261.8	02/03/2019 6:30	02/04/2019 19:23	1.54	Maintenance Outage	Compressor off-line washing
LUZON	HYD	Kalayaan 3	180	02/04/2019 0:01	02/11/2019 23:21	7.97	Planned Outage	Planned outage until 11 February 2019
LUZON	HYD	Kalayaan 4	180	02/04/2019 0:01	02/14/2019 21:50	10.91	Planned Outage	Planned outage until 11 February 2019
LUZON	HYD	San Roque 1	145	02/04/2019 4:01	02/15/2019 21:00	11.71	Planned Outage	Planned outage until 16 February 2019
LUZON	COAL	SLPGC 1	150	02/04/2019 13:38	02/13/2019 23:02	9.39	Forced Outage	Tripped at 104MW load
VISAYAS	OIL	Bohol 3	4.2	02/04/2019 18:03	02/07/2019 8:44	2.61	Forced Outage	Surging observed at turbo charger
LUZON	COAL	SMC 1	150	02/06/2019 23:14			Planned Outage	Planned outage until 28 February 2019. RECLASSIFIED FROM FORCE. OMC OUTAGE. RECLASSIFIED FROM FORCE. OMC OUTAGE
LUZON	OIL	Limay 2	60	02/06/2019 23:59	02/12/2019 14:38	5.61	Forced Outage	Blow-off valve failed to closed during synchronization. As RR
LUZON	GEO	Makban 5	55	02/08/2019 16:08			Forced Outage	Low Steam Supply. Divert Steam Supply to unit 3
LUZON	GEO	Tiwi 6	57	02/09/2019 7:01			Planned Outage	Turbine generator overhauling until 29 March 2019
VISAYAS	COAL	CEDC 1	82	02/09/2019 12:51	02/09/2019 17:32	0.20	Forced Outage	WATER CONTAMINATION
VISAYAS	COAL	CEDC 2	82	02/09/2019 12:55	02/11/2019 22:03	2.38	Forced Outage	WATER CONTAMINATION
LUZON	COAL	GN Power 2	316	02/09/2019 16:47	02/09/2019 19:08	1.01	Forced Outage	Tripped due to actuation of generator differential protection
LUZON	COAL	GN Power 1	316	02/10/2019 2:12	02/10/2019 3:04	0.04	Forced Outage	Tripped
LUZON	NATG	Sta. Rita 4	264	02/10/2019 6:38	02/10/2019 15:40	0.38	Maintenance Outage	GT off-line Compressor Washing
LUZON	COAL	GN Power 1	316	02/10/2019 11:42	02/11/2019 16:35	1.20	Forced Outage	Induced Draft Fan. IDF trouble
LUZON	COAL	Calaca 2	300	02/12/2019 17:39			Forced Outage	Boiler tube leak
LUZON	HYD	Kalayaan 1	180	02/13/2019 0:01			Planned Outage	Maintenance Outage until 06 March 2019
LUZON	HYD	Ambuklao 3	35	02/13/2019 8:01	02/18/2019 18:14	5.43	Planned Outage	Maintenance Outage until 18 February 2019
VISAYAS	GEO	Mahanagdong A2	5	02/13/2019 14:05	02/13/2019 15:51	0.07	Forced Outage	To effect emergency replacement of defective battery bank
LUZON	HYD	San Roque 2	145	02/15/2019 21:01	02/18/2019 15:37	2.77	Forced Outage	Tunnel inspection. repair of U1 inlet valve mechanical failure
LUZON	HYD	San Roque 2	145	02/15/2019 21:01	02/18/2019 11:37	2.61	Forced Outage	Tunnel inspection. repair of U1 inlet valve mechanical failure
LUZON	HYD	San Roque 3	145	02/15/2019 21:01	02/18/2019 11:37	2.61	Forced Outage	Tunnel inspection. repair of U1 inlet valve mechanical failure
LUZON	HYD	Kalayaan 2	180	02/16/2019 4:15			Forced Outage	Spherical valve leak
LUZON	NATG	Sta. Rita 1	257.3	02/16/2019 4:59	02/21/2019 6:49	5.08	Maintenance Outage	Maintenance outage until 2400H of 2-20-2019
VISAYAS	GEO	Upper Mahiao 1	32	02/17/2019 18:44	02/17/2019 19:14	0.02	Forced Outage	Tripped. Cause of tripping - Loss of excitation
VISAYAS	GEO	Upper Mahiao 1	32	02/18/2019 9:05	02/18/2019 19:01	0.41	Forced Outage	Emergency cut-out to rectify control valve hunting problem. Gen. load - 18.39 MW. ETC - 1700H
VISAYAS	GEO	Mahanagdong B1	5	02/18/2019 18:09	02/20/2019 20:47	2.11	Forced Outage	Under assessment.
VISAYAS	GEO	Mahanagdong A1	5	02/18/2019 20:49	02/18/2019 21:26	0.03	Forced Outage	Indication - Purifier level high
LUZON	NATG	Sta. Rita 3	265.5	02/19/2019 0:36	02/19/2019 2:10	0.07	Forced Outage	Resetting of GT Automation processor communication fault
LUZON	GEO	Makban 3	63	02/19/2019 4:20	02/22/2019 20:38	3.68	Maintenance Outage	Maintenance Outage until 22 February 2019
LUZON	HYD	Ambuklao 1	35	02/20/2019 8:01	02/24/2019 22:41	4.61	Planned Outage	Planned Outage until 25 February 2019
LUZON	HYD	Botocan	20.8	02/20/2019 8:01	02/24/2019 13:57	4.25	Planned Outage	Maintenance Outage until 24 February 2019
LUZON	HYD	Cairaya 1	14	02/20/2019 8:01	02/24/2019 21:08	4.55	Planned Outage	Maintenance Outage until 24 February 2019
LUZON	HYD	Cairaya 2	14	02/20/2019 8:01	02/24/2019 21:08	4.55	Planned Outage	Maintenance Outage until 24 February 2019
LUZON	OIL	Limay 4	90	02/20/2019 8:04	02/25/2019 5:14	4.88	Maintenance Outage	NGCP works. dismantling of existing steel gantry column and beam structures.
LUZON	COAL	SLPGC 1	150	02/20/2019 14:00	02/20/2019 18:36	0.19	Forced Outage	Tripped with 150MW load
VISAYAS	GEO	Mahanagdong B1	5	02/20/2019 20:47			Forced Outage	Replaced 125V DC battery charger
LUZON	COAL	Sual 2	647	02/20/2019 22:30	02/21/2019 10:42	0.51	Forced Outage	High Furnace Pressure. System Frequency is 58.822hz.
LUZON	COAL	Sual 2	647	02/21/2019 10:48	02/21/2019 11:49	0.04	Forced Outage	Tripped with 86MW load
LUZON	COAL	Sual 2	647	02/21/2019 11:55	02/21/2019 12:24	0.02	Forced Outage	Tripped with 75MW load
VISAYAS	GEO	PGPP2 Unit 2	20	02/22/2019 0:07			Planned Outage	Offline due to scheduled preventive maintenance activities
VISAYAS	GEO	Nasulo	48.3	02/22/2019 16:59	02/23/2019 1:21	0.35	Forced Outage	Problem on segment protector of gas extraction system
LUZON	NATG	Ilijan A2	190	02/22/2019 20:46	02/23/2019 21:08	1.02	Maintenance Outage	Maintenance Outage until 24 February 2019
LUZON	GEO	Makban 4	63	02/22/2019 20:55			Maintenance Outage	Maintenance Outage
LUZON	COAL	Masinloc 1	315	02/22/2019 23:43	02/25/2019 11:03	2.47	Maintenance Outage	Maintenance Outage until 25 February 2019
VISAYAS	COAL	PEDC 1	83.7	02/23/2019 0:49			Planned Outage	Annual Preventive Maintenance shutdown as per GOP
LUZON	NATG	Ilijan A1	190	02/23/2019 23:07	02/25/2019 20:28	1.89	Maintenance Outage	Maintenance Outage
LUZON	NATG	San Lorenzo 1	264.8	02/24/2019 6:34	02/24/2019 17:49	0.47	Planned Outage	GT off line compressor washing
LUZON	COAL	SLPGC 1	150	02/24/2019 7:56			Forced Outage	Tripped due to detached governor valve drain line
LUZON	COAL	SMC 3	150	02/25/2019 2:12	02/25/2019 4:11	0.08	Forced Outage	Low furnace pressure
LUZON	HYD	Magat 1	95	02/25/2019 7:01			Maintenance Outage	Reprogramming of governor system. Until 28 February 2019