

## Monthly Market Assessment Highlights for March 2019 Billing Month

### 1. Summary

The March billing month was marked by a growing level of demand as temperatures rose with the onset of the summer season. Meanwhile, effective supply increased due to lower level of outage capacity. Driven by the higher rate of increase in demand, some trading intervals observed narrow supply margin which eventually led to higher prices during the period.

### 2. Market Outcomes

#### 2.1. Capacity Profile

From 18,940 MW at the start of the March billing month, the WESM registered capacity decreased to 18,727 MW effective 1 March 2019 due to the deregistration of 213-MW oil-based facility of Therma Mobile, Inc., Navotas DPP (2TMO\_PB). By the end of the billing month, the WESM registered capacity increased to 19,062 MW following the entry of the new 335-MW third unit of the coal fired Masinloc facility starting 14 March 2019.

Of the said total WESM registered capacity, only about 63 percent or an average of 11,979 MW was offered in the market.

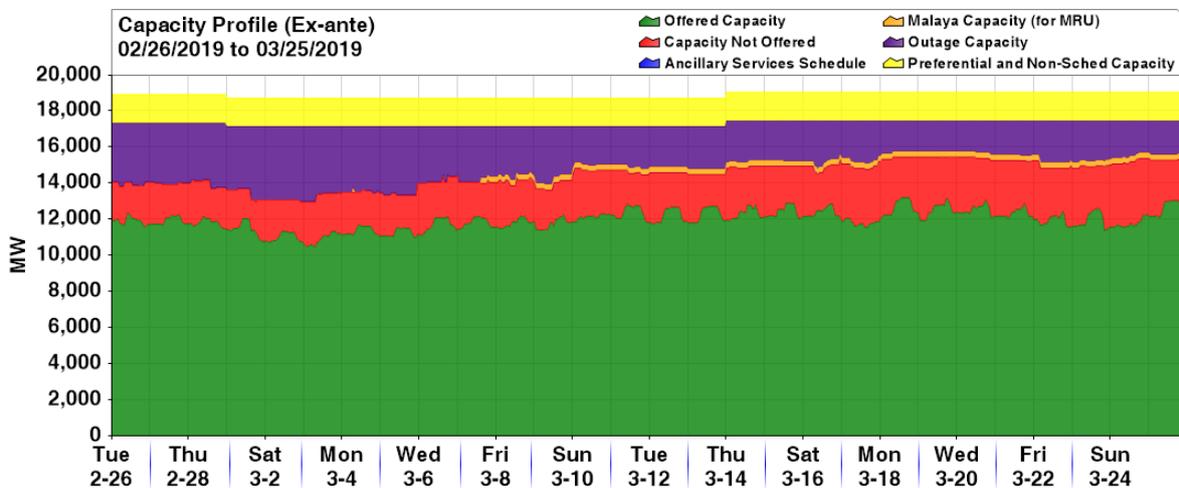


Figure 1. Capacity Profile

	March 2019		February 2019	
	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap
Preferential and Non-Sched Capacity	1,558	8%	1,524	8%
Outage Capacity	2,663	14%	3,756	20%
Malaya Capacity (for MRU)	300	1%	300	0.05%
Capacity Not Offered	2,496	13%	2,126	11%
Offered Capacity	11,979	63%	11,491	61%
Registered Capacity (by the end of the billing month)	19,062		18,940	

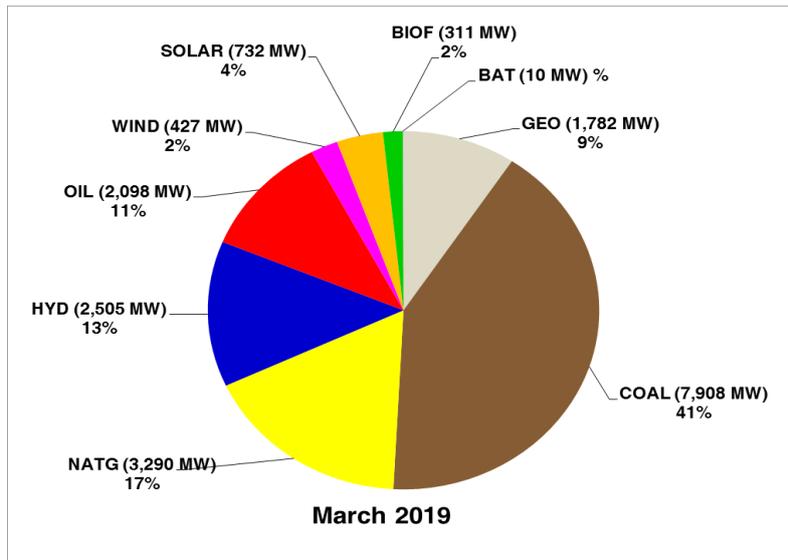


Figure 2. Registered Capacity Mix, March 2019

## 2.2. Outage Capacity

About 14 percent of the total registered capacity or an average of 2,663 MW were on outage. Bulk of which, at 47 percent, were forced outages, averaging at 1,254 MW. Planned outages, averaging at 1,030 MW, accounted for 39 percent of the total outage capacity.

On the other hand, based on type of resource, coal plants contributed 51 percent of the total outage capacity this month.

Overall, lower level of capacity on outage was recorded this month compared to an average of 3,756 MW in February.

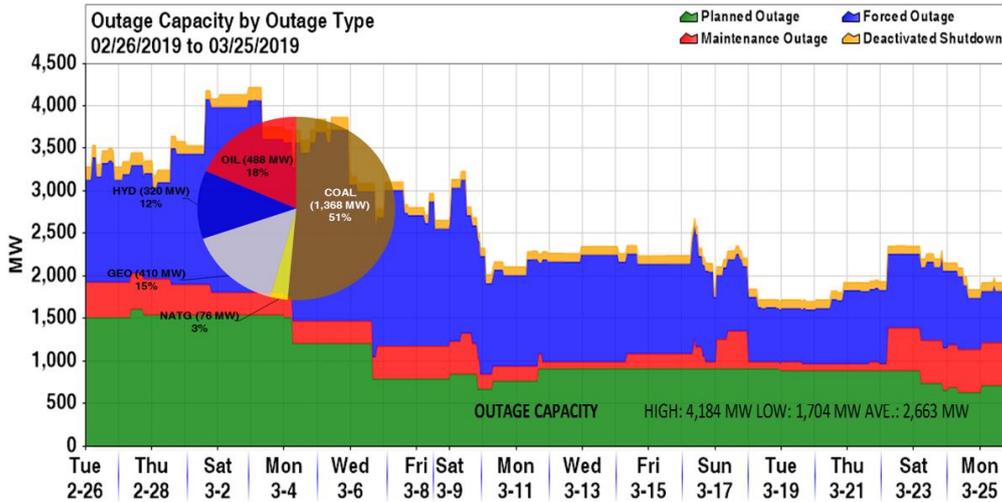


Figure 3. Outage Capacity by Outage Category

### 2.3. Supply and Demand

Higher average effective supply level was observed this month, increasing by 4.8 percent, at 12,481 MW from 11,905 MW in the previous month. Meanwhile, system demand<sup>1</sup> also increased by 8.2 percent to an average of 10,838 MW from 10,013 MW due to hotter temperatures with the onset of the summer months. Driven by the higher rate of increase in demand, supply margin tightened to an average of 1,644 MW from 1,891 MW in February.

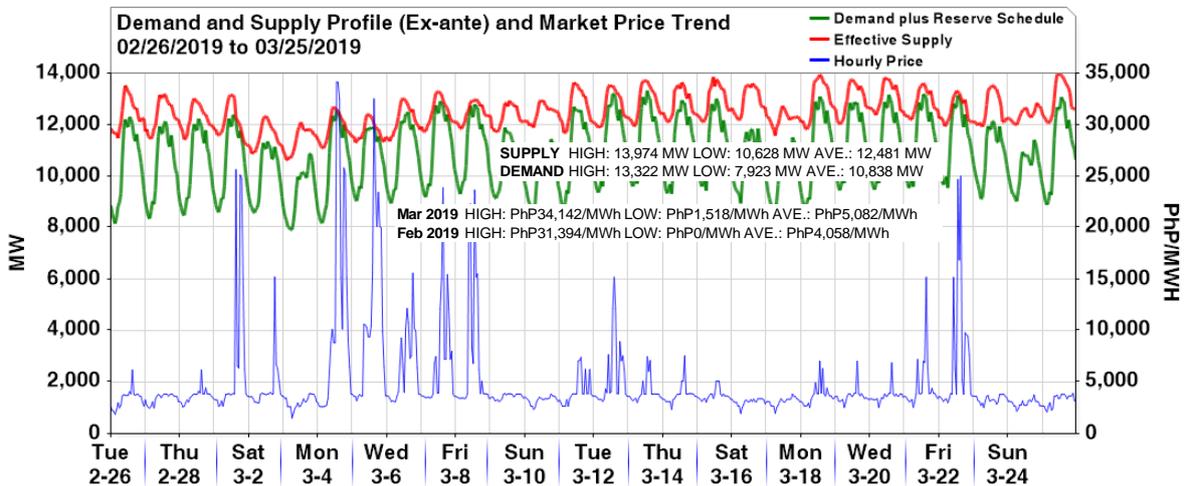


Figure 4. Demand and Supply Profile vs. Market Prices

<sup>1</sup> System demand including reserve requirement

## 2.4. Market Prices

Following the tighter supply margin this March billing month, average market price went up by 25.2 percent to PhP5,082/MWh from PhP4,058/MWh in February.

## 3. Structural Competition Indices

### 3.1. Pivotal Plants

The market RSI fell below the 100-percent mark for 40.5 percent of the time which indicates the presence of pivotal supplier. This was higher than previous month's 24.7 percent following the tighter supply margin this month. Most frequent pivotal suppliers during the billing month were Sual CFTPP, Ilijan NGPP, and Sta. Rita NGPP.

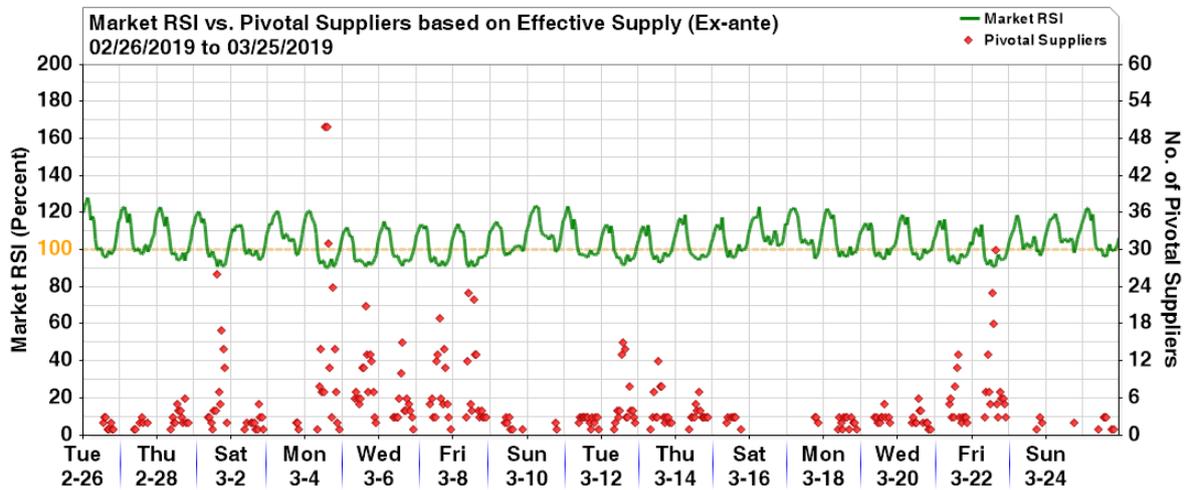


Figure 5. Market RSI vs. Pivotal Suppliers

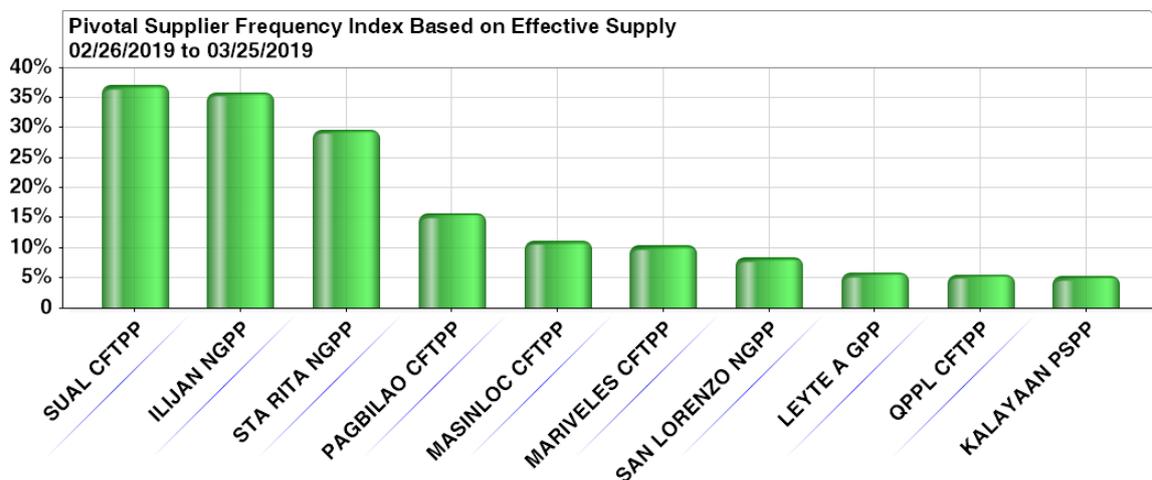


Figure 6. Top Pivotal Plants

### 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 70.8 percent of the total registered capacity in the WESM. SMC held the top spot at 24.5 percent followed closely by AP (19.9 percent), FGC (15.2 percent) and PSALM (11.2 percent).

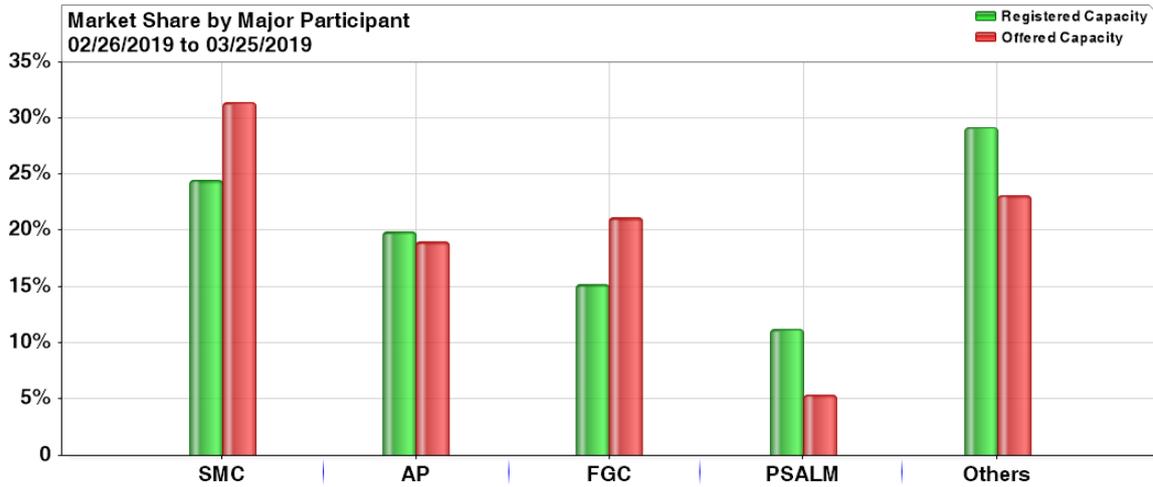


Figure 7. Market Share

With the unavailability of some plants, the market shares of SMC and FGC based on offered capacity increased to 31.4 percent and 21.1 percent, respectively. AP held a market share of 19 percent with some of its major power plants on outage. Accordingly, the Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by major participants' grouping indicated a concentrated market for 85.1 percent of the time and moderately concentrated market for 14.9 percent.

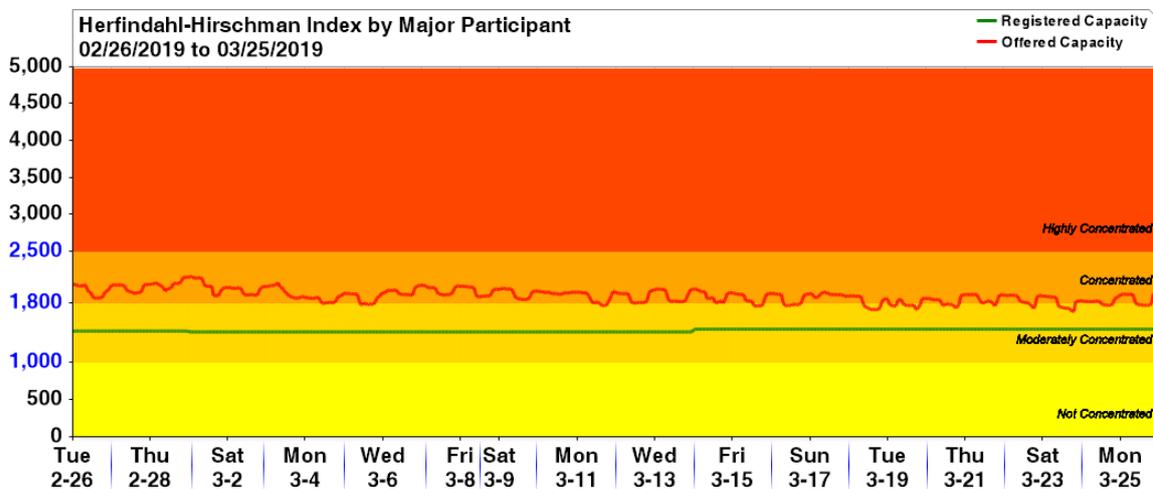


Figure 8. Hourly HHI based on Major Participant Grouping

## 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	OIL	Malaya 1	300	01/26/2018 21:25	03/04/2019 5:57	401.36	Planned Outage	Planned outage
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	03/04/2019 11:48	259.23	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	OMC OUTAGE. TMO ceased WESM participation effective 05 February 2019 at 1037H
LUZON	GEO	Tiwi 1	59	11/29/2018 13:31			Maintenance Outage	Maintenance Outage
LUZON	COAL	Calaca 1	300	12/30/2018 22:38			Planned Outage	APMT until 25 June 2019 (GOMP)
LUZON	COAL	Pagbilao 3	420	01/06/2019 1:22	03/06/2019 15:22	59.58	Planned Outage	Planned outage until 4 February 2019. GOMP
LUZON	GEO	Makban 10	20	01/07/2019 23:40			Forced Outage	On reserve shutdown pending availability of steam supply (steam optimization)
LUZON	COAL	SLPGC 2	150	01/14/2019 7:01	03/08/2019 5:24	52.93	Forced Outage	Emergency shutdown due to boiler tube leak
LUZON	COAL	SMC 1	150	02/06/2019 23:14	03/23/2019 4:31	44.22	Planned Outage	Planned outage until 28 February 2019.RECLASSIFIED FROM FORCE. OMC OUTAGE. RECLASSIFIED FROM FORCE. OMC OUTAGE
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
LUZON	COAL	Calaca 2	300	02/12/2019 17:39	03/16/2019 22:14	32.19	Forced Outage	Boiler tube leak
LUZON	HYD	Kalayaan 1	180	02/13/2019 0:01	03/09/2019 19:53	24.83	Planned Outage	Maintenance Outage until 06 March 2019
VISAYAS	GEO	Mahanagdong B1	5	02/20/2019 20:47	03/03/2019 3:08	10.26	Forced Outage	Replaced 125V DC battery charger
VISAYAS	GEO	PGPP2 Unit 2	20	02/22/2019 0:07	03/18/2019 21:01	24.87	Planned Outage	Offline due to scheduled preventive maintenance activities
VISAYAS	GEO	Makban 4	63	02/22/2019 20:55	02/28/2019 13:00	5.67	Maintenance Outage	Maintenance Outage
VISAYAS	COAL	PEDC 1	83.7	02/23/2019 0:49	03/23/2019 20:01	28.80	Planned Outage	Annual Preventive Maintenance shutdown as per GOP
LUZON	HYD	Kalayaan 2	180	02/24/2019 0:00	03/09/2019 21:45	13.91	Maintenance Outage	Maintenance Outage
LUZON	COAL	SLPGC 1	150	02/24/2019 7:56	02/28/2019 0:17	3.68	Forced Outage	Tripped due to detached governor valve drain line
LUZON	HYD	Magat 1	95	02/25/2019 7:01	03/01/2019 18:01	4.46	Maintenance Outage	Reprogramming of governor system. Until 28 February 2019
LUZON	NATG	Sta. Rita 2	255.7	02/26/2019 4:34	02/26/2019 7:12	0.11	Forced Outage	Tripped at 161MW load
LUZON	NATG	Ilijan A1	190	02/26/2019 11:53	02/26/2019 20:48	0.37	Forced Outage	Fuel gas pilot pressure control valve trouble
LUZON	HYD	Ambukiao 2	35	02/27/2019 8:01	03/03/2019 23:03	4.63	Planned Outage	Planned Outage until 04 March 2019
LUZON	GEO	Makban 8	20	02/27/2019 18:15	03/11/2019 22:39	12.18	Forced Outage	Shutdown due to hotspot correction at C to D 230kV tieline
LUZON	COAL	QPPL	459	02/28/2019 13:53	03/03/2019 7:53	2.75	Forced Outage	hotspot correction on phase B high side bushing
LUZON	COAL	Sual 2	647	03/01/2019 14:57	03/05/2019 19:08	4.17	Forced Outage	Boiler tube leak
VISAYAS	COAL	CEDC 2	82	03/02/2019 21:37	03/06/2019 4:32	3.29	Forced Outage	Boiler problem
LUZON	OIL	Malaya 1	300	03/04/2019 7:17	03/07/2019 14:45	3.31	Forced Outage	Motor boiler feed pump trouble
LUZON	COAL	SLTEC 2	122.9	03/04/2019 18:33	03/05/2019 6:35	0.50	Forced Outage	Manual Turbine tripped
LUZON	COAL	SLTEC 1	121	03/04/2019 22:20	03/14/2019 15:24	9.71	Forced Outage	Boiler Tube leak
LUZON	COAL	SMC 2	150	03/05/2019 9:47	03/24/2019 14:22	19.19	Forced Outage	Suspected boiler tube leak
LUZON	COAL	Sual 2	647	03/05/2019 19:43	03/05/2019 22:44	0.13	Forced Outage	HP turbine bypass valve trouble
LUZON	COAL	Pagbilao 3	420	03/06/2019 15:28	03/06/2019 17:05	0.07	Forced Outage	Tripped by reverse power
LUZON	COAL	SLTEC 2	122.9	03/06/2019 18:35	03/09/2019 15:52	2.89	Maintenance Outage	Primary air fan problem
LUZON	COAL	GN Power 2	316	03/07/2019 0:20	03/10/2019 1:18	3.04	Forced Outage	Boiler Tube Leak
LUZON	NATG	Sta. Rita 1	257.3	03/08/2019 8:51	03/08/2019 12:49	0.17	Forced Outage	Gas line vent valve trouble
LUZON	GEO	Bacman 1	60	03/08/2019 23:46	03/24/2019 7:53	15.34	Planned Outage	Maintenance Outage until 29 March 2019
LUZON	COAL	Pagbilao 3	420	03/09/2019 0:40	03/09/2019 11:37	0.46	Forced Outage	Tripping of Induced Draft Fan A and B
LUZON	HYD	Magat 3	95	03/09/2019 7:01	03/11/2019 18:46	2.49	Maintenance Outage	Reprogramming of governor system.
LUZON	HYD	Magat 1	95	03/10/2019 6:01			Planned Outage	Annual preventive maintenance and testing (GOMP)
VISAYAS	OIL	Bohol 4	4	03/11/2019 10:50	03/15/2019 17:20	4.27	Forced Outage	Emergency shutdown due to an observed sudden explosion and heavy smoke coming out frm B bank
LUZON	HYD	San Roque 2	145	03/11/2019 15:01			Planned Outage	Planned outage until September 11 2019
LUZON	COAL	SLTEC 2	122.9	03/11/2019 18:01	03/18/2019 6:20	6.51	Forced Outage	Tripped at 123 MW load. Commissioning Test
VISAYAS	COAL	TPC Sangi 2	85	03/12/2019 22:00	03/14/2019 1:34	1.15	Forced Outage	Busted CT PT at switchyard
LUZON	HYD	Magat 4	95	03/14/2019 7:01	03/16/2019 9:48	2.12	Maintenance Outage	Reprogramming of governor system.
VISAYAS	OIL	Bohol 1	4	03/15/2019 11:02	03/21/2019 9:02	5.92	Forced Outage	High exhaust gas temperature on cylinder 6
VISAYAS	OIL	Bohol 4	4	03/15/2019 17:33	03/18/2019 9:50	2.68	Forced Outage	Maintenance outage
LUZON	NATG	Sta. Rita 2	255.7	03/16/2019 6:22	03/16/2019 11:56	0.23	Forced Outage	Tripped due to GT power supply trouble
LUZON	NATG	San Lorenzo 2	261.8	03/17/2019 0:29	03/17/2019 23:12	0.95	Maintenance Outage	Offline GT compressor washing
VISAYAS	COAL	PEDC 3	83.7	03/17/2019 5:14	03/17/2019 19:05	0.58	Forced Outage	Affected by line fault
LUZON	NATG	Avion 1	50.3	03/17/2019 8:17	03/17/2019 23:58	0.65	Maintenance Outage	Not available due to maintenance of Bay 2 PCB and gen step up xformer
LUZON	NATG	Avion 2	50.3	03/17/2019 8:17	03/17/2019 23:58	0.65	Maintenance Outage	Not available due to maintenance of Bay 2 PCB and gen step up xformer
VISAYAS	COAL	Keppo Salcon 2	103	03/20/2019 11:16	03/24/2019 11:25	4.01	Forced Outage	TRIPPING. BOILER TUBE LEAK
LUZON	COAL	SLTEC 1	121	03/20/2019 20:30			Forced Outage	Boiler Tube Leak
VISAYAS	OIL	PDP3 C	12	03/21/2019 19:05	03/25/2019 17:03	3.92	Forced Outage	Emergency stop
LUZON	NATG	San Gabriel	420	03/22/2019 4:30			Maintenance Outage	Maintenance outage until 24 March 2019
VISAYAS	GEO	Leyte 1	35	03/24/2019 0:29			Planned Outage	Annual PMS of TGPP unit 1. up to 29 March 2019
VISAYAS	COAL	CEDC 1	82	03/25/2019 0:33			Planned Outage	APMS