

Republic of the Philippines  
**ENERGY REGULATORY COMMISSION**  
San Miguel Avenue, Pasig City



**IN THE MATTER OF THE  
APPLICATION FOR APPROVAL  
OF THE POWER SUPPLY  
AGREEMENT (PSA) BETWEEN  
ORIENTAL MINDORO  
ELECTRIC COOPERATIVE,  
INC. AND ORMIN POWER, INC.  
WITH PRAYER FOR ISSUANCE  
OF PROVISIONAL AUTHORITY**

**ERC CASE NO. 2011-017 RC**

**ORIENTAL MINDORO ELECTRIC  
COOPERATIVE, INC. (ORMECO)  
AND ORMIN POWER, INC.  
(OPI),**

**Applicants.**

X ----- X

Promulgated:

MAR 07 2019

**ORDER**

On 17 October 2016, Ormin Power, Inc. (OPI) filed an *Omnibus Motion for Partial Reconsideration and Issuance of Status Quo Order* (Omnibus Motion) praying, among others, for the issuance of a Status Quo Order enjoining the Oriental Mindoro Electric Cooperative, Inc. (ORMECO) and National Power Corporation (NPC) to observe the status prevailing prior to the issuance of the Decision dated 21 June 2016.

Relative thereto, on 11 January 2017, OPI filed a *Supplemental Motion for Reconsideration* praying, among others, for the Commission to: a) Approve the billing determinant of 43,200 MWh per year representing the annual saleable generation of its diesel power plant by which its True Cost of Generation Rate (TCGR) shall be computed; b) Re-compute and approve the Base Tariff (net of fuel) for energy delivered by its pre-maximization to be PhP2.70/kWh, as the reasonable and recoverable TCGR for its diesel plant; c) Re-compute the appropriate Base Tariff (net of fuel) for energy delivered by its post-maximization to be PhP3.19/kWh, which rate shall be recognized as the reasonable TCGR for its diesel plant, post maximization; and d)

Approve the proposed PhP2.95/kwh, the rate agreed upon in the subject PSA to be the recoverable generation rate for its diesel plant, post-maximization, considering that the said PhP2.95/kWh is lower than the re-computed TCGR of PhP3.19/kWh.

On various dates, the Commission issued *Status Quo Ante Orders* which deferred the implementation of the Decision dated 21 June 2016, to wit:

1. *Status Quo Ante Order* dated 06 June 2017, which deferred the implementation of the said Decision for a period of not more than six (6) months or until ending 06 December 2017;
2. *Order* dated 05 December 2017, extending the effectivity of the *Status Quo Ante Order* for another six (6) months or until 05 June 2018 pending the submission of various documents and information required from ORMECO necessary for the evaluation and resolution of the said *Omnibus Motion*;
3. *Order* dated 05 June 2018, extending the effectivity of the *Status Quo Ante Order* for another six (6) months or until 05 December 2018. In the same Order, ORMECO was given, for the last time, additional period within which to submit the required documents. Failure to do so shall compel the Commission to resolve this case based on the documents submitted; and
4. *Order* dated 04 December 2018, extending the effectivity of the *Status Quo Ante Order* for another three (3) months or until 05 March 2019 or until the resolution of the *Omnibus Motion*, whichever comes earlier.

In the meantime, during the 08 August 2017 hearing of this case, the Commission directed the Distribution Management Committee (DMC) to conduct a study and evaluation on the dispatch protocol of ORMECO relative to the OPI's allegation of non-maximization of dispatch. It must be noted that ORMECO, being the designated System Operation in the Province of Oriental Mindoro, should ensure the efficient utilization and dispatch of all its power suppliers and adhere to its mandate of providing power to its consumers at the least possible cost.

Thus, on 22 May 2018, the DMC submitted a Report on the Dispatch Guidelines of ORMECO comprising the Merit Order Table Preparation Methodology and the detailed recommendations.

Republic Act No. 9136 (R.A. 9136), otherwise known as the “Electric Power Industry Reform Act of 2001” or EPIRA, mandates the Commission to protect the interest of electric consumers. Section 25 of the EPIRA requires that the retail rates charged by distribution utilities for the supply of electricity shall be subject to the Commission’s regulation based on the principle of full recovery of prudent and reasonable economic costs. Section 4 (e), Rule 5 of the EPIRA Implementing Rules and Regulations (IRR) on the other hand requires that the prices charged by a generation company for the supply of electricity shall be subject to the Commission’s regulation.

Upon evaluation of the *Omnibus Motion for Partial Reconsideration and Issuance of Status Quo Order and Supplemental Motion for Reconsideration*, the Commission deems it proper to review further this case in view of the discrepancies of the rate components prescribed under the subject Power Supply Agreement (PSA) and those presented in the *Omnibus Motion*.

**WHEREFORE**, the foregoing premises considered, the Commission hereby **EXTENDS** the *Status Quo Ante Order* for another **six (6) months effective 05 March 2019 to 04 September 2019**.

Accordingly, ORMECO is hereby directed to conduct the following:

- a. Verify the computation of the Subsidy Fees paid by the NPC-SPUG for each billing month and submit a certification under oath that the amounts were computed and paid based on the pricing structure of the approved PSA and the electricity delivered to it, within ten (10) days from end of the billing period; and
- b. For each billing period, prepare and submit to NPC-SPUG and the Commission a certified report that ORMIN POWER has been operating and maintaining its power plant in accordance with the requirements of the approved PSA, within fifteen (15) days from the end of the billing period.

Further, ORMECO, NPC-SPUG and all New Power Providers (NPP) operating within the franchise area of ORMECO are directed to submit their respective position papers on the Distribution Management Committee (DMC) Report within thirty (30) days from receipt of the Order. A copy of the said Report is hereto attached for reference of the parties.

**SO ORDERED.**

Pasig City, 05 March 2019.

FOR AND BY AUTHORITY  
OF THE COMMISSION:

  
**AGNES VST DEVANADERA**  
*Chairperson and CEO*



LS: JMS/MCC/BSA/GLO *9*

ROS: JFA/LOC/AJMO/FBD *12*

*12*

**Copy Furnished:**

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3. **Ormin Power, Incorporated (ORMIN POWER)**  
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4. **The Office of the Solicitor General**  
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5. **The Commission on Audit**  
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6. **The Senate Committee on Energy**  
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7. **The House Committee on Energy**  
Batasan Hills, Quezon City
8. **National Electrification Administration (NEA)**  
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9. **Office of the Provincial Governor**  
Province of Oriental Mindoro
10. **Office of the City Mayor**  
Calapan City, Oriental Mindoro
11. **Office of the Municipal Mayor**  
Baco, Oriental Mindoro
12. **Office of the Municipal Mayor**  
Naujan, Oriental Mindoro
13. **Office of the Municipal Mayor**  
Puerto Galera, Oriental Mindoro
14. **Office of the Municipal Mayor**  
San Teodoro, Oriental Mindoro
15. **Office of the Municipal May**  
Victoria, Oriental Mindoro
16. **Office of the Municipal Mayor**  
Bansud, Oriental Mindoro
17. **Office of the Municipal Mayor**  
Bongabong, Oriental Mindoro



**ERC CASE NO. 2011-017 RC**  
**ORDER/05 March 2019**

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18. **Office of the Municipal Mayor**  
Gloria, Oriental Mindoro
19. **Office of the Municipal Mayor**  
Mansalay, Oriental Mindoro
20. **Office of the Municipal Mayor**  
Pinamalayan, Oriental Mindoro
21. **Office of the Municipal Mayor**  
Pola, Oriental Mindoro
22. **Office of the Municipal Mayor**  
Roxas, Oriental Mindoro
23. **Office of the Municipal Mayor**  
Socoro, Oriental Mindoro
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Bulalacao, Oriental Mindoro
25. **Atty. Melchor Ridulme, Atty. Comie Doromal**  
*Counsels for NPC-SPUG National Power Corporation*  
Agham Road, Diliman,  
Quezon City

*Ad*



DMC-2018-046

08 March 2018

**Hon. Agnes Vicenta S. Torres-Devanadera**  
Chairperson  
Energy Regulatory Commission  
Pacific Center Building, San Miguel Avenue  
Ortigas Center, Pasig City

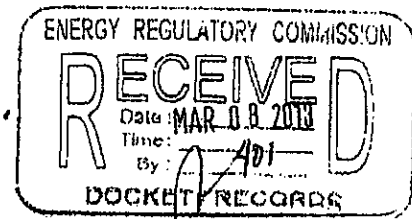
**Subject: DMC's Report on the Issues on ORMECO's Dispatch Protocol**

Dear Hon. Devanadera:

In line with the directive of the Commission to submit a report on issues of dispatch protocol in Oriental Mindoro Electric Cooperative, Inc. (ORMECO), the Distribution Management Committee (DMC) held several meetings with representatives from ORMECO, National Power Corporation-Small Power Utilities Group (NPC-SPUG), and New Power Providers (NPPs). Following are the information gathered during the meetings:

**1. ORMECO's Present System Condition**

- 1.1 The passage of Typhoon Nona last December 2015 in the Mindoro Island damaged ORMECO's 69 kV transmission backbone line, subsequently dividing the transmission operation into North and South grids (Figure 1). As a result, modular generating plants were installed in both grids to meet the power demand requirements, majority of which were installed in the North. Currently, ORMECO has Power Supply Agreements with five (5) New Power Providers (NPPs) with a combined installed capacity of 77.67 MW but the Contracted Capacity (CC) and actual available capacity were only 45.40 MW (net) and 40.10 MW (net), respectively. In addition, ORMECO owns two (2) run-of-river hydro plants with a combined installed capacity of 5.41 MW but the actual available capacity is 1.70



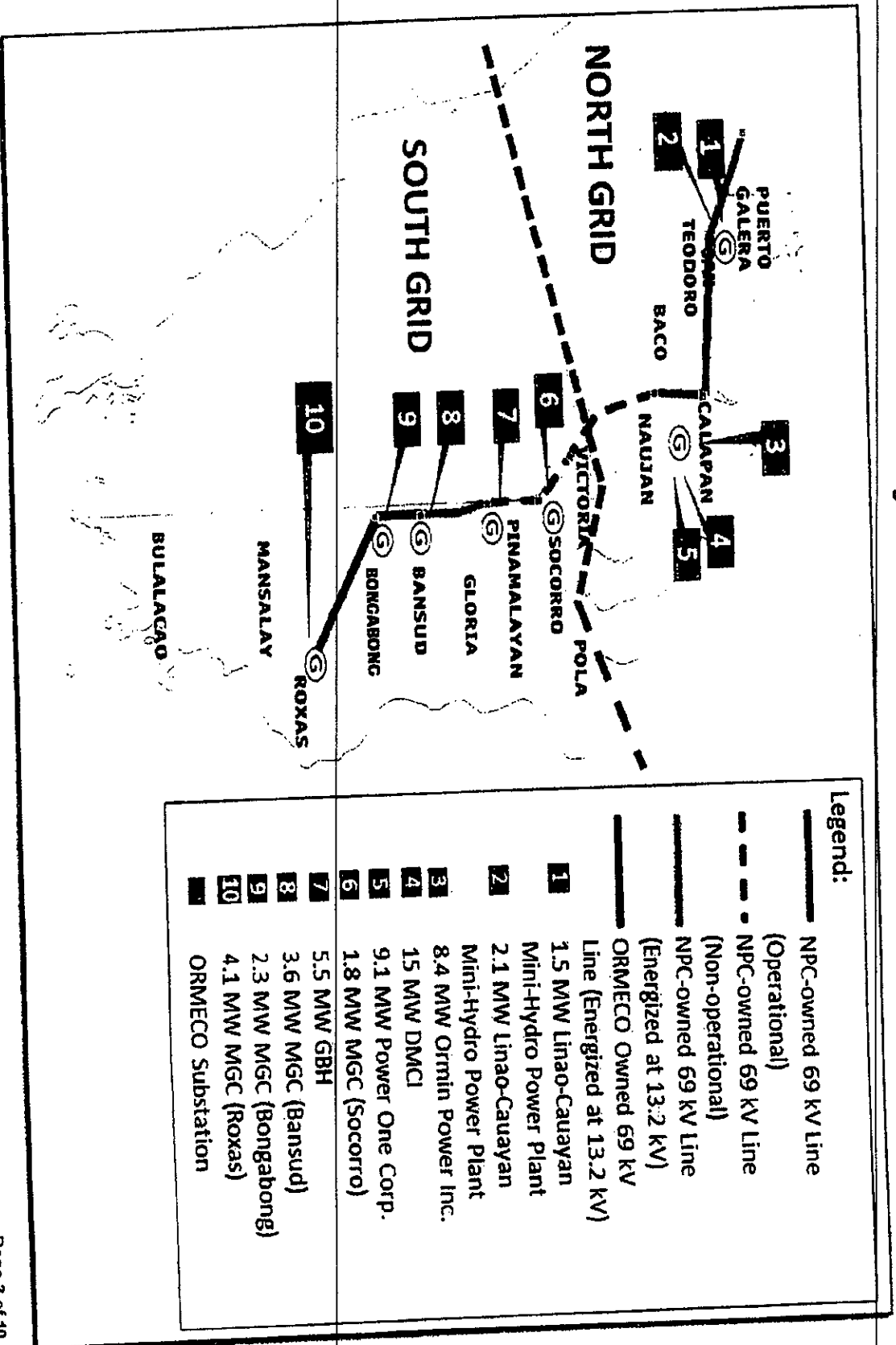
MW. Table 1 shows the data for each NPP. The non-coincident actual peak demand of ORMECO was recorded at 38.90 MW on 17 July 2017;

**Table 1. NPP's Data**

	<b>NPP</b>	<b>Nature of Operation</b>	<b>Plant Type</b>	<b>Installed Capacity (MW)</b>	<b>Contracted Capacity (MW)</b>	<b>Available Capacity (MW)</b>
1	Linao-Cauayan Mini-Hydro Power Plant (Lower Cascade)	Base Load	Mini-Hydro	2.18		0.70
2	Linao-Cauayan Mini-Hydro Power Plant (Upper Cascade)	Base Load	Mini-Hydro	3.24		1.00
3	Power One Corporation (POC)	Base Load	Bunker-C	15.30	9.00	8.10
4	Ormin Power, Inc. (OPI)	Base Load	Bunker-C	9.89	6.40	7.00
5	DMCI Power Corporation	Base Load and Regulation	Bunker-C	15.56	15.00	11.80
6	GBH Power Resources, Inc.	Base Load	Bunker-C	7.50	5.00	5.50
7	Mindoro Grid Corporation (MGC) - Calapan	Base Load and Regulation	*Diesel	12.50	5.00	4.50
8	Mindoro Grid Corporation (MGC) - Bongabong	Base Load	*Diesel	11.50	5.00	3.20
			<b>Total</b>	<b>77.67</b>	<b>45.40</b>	<b>40.10</b>
*High Speed Diesel Engines - Not recommended for continuous or base load operations. These units are primarily designed for peaking or stand-by operations						



Figure 1. Substation and NPP Locations



- 1.2 The 69 kV lines from Puerto Galera to Bansud are still owned and maintained by NPC. On the other hand, ORMECO has already acquired the 42km-69 kV Bansud to Roxas line and repaired the 18km-69 kV Pinamalayan to Bansud line. However, the latter was energized at 13.2 kV since the 5 MVA 69/13.2 kV step-up transformer at Bansud Substation was damaged due to the passage of Typhoon Nona. Further, ORMECO is currently responsible for maintaining the said line;
- 1.3 The ORMECO-owned Mini-Hydro Power Plants in Linao-Cauayan are of run-of-river types, which operate throughout the year but have low power generation output during March-May and August-September of the year;
- 1.4 ORMECO has a Broadband Power Line (BPL) for real time monitoring of frequency, voltage, current, and output of New Power Providers (NPPs). However, the BPL has limited coverage of only 5-km radius from its control room which is located in Calapan Substation and has no capability yet to download the data from its storage system. In addition, ORMECO has also the capability to remotely control the three (3) feeders (R2A, R2B, R3) as back-up to existing Automatic Load Dropping (ALD) program to prevent system collapse;
- 1.5 The 69 kV Calapan-Puerto Galera line in the North grid is still under rehabilitation. Hence, the MGC installed six (6) units of 1 MW modular diesel generators to meet the power requirements of Puerto Galera; and
- 1.6 NPC is currently undertaking the rehabilitation works on the 69 kV lines in Oriental Mindoro, including the tele-protection projects and its completion is expected in 2019. NPC plans to shut down the Pinamalayan-Bansud 69 kV line for rehabilitation. Relative to this, ORMECO is requesting NPC to retain the existing 69 kV Pinamalayan-Bansud line while the rehabilitation is on-going, and have a new line constructed along the road instead, since a right-of-way was already been granted by the Department of Public Works and Highways (DPWH) for the project. This scheme would avoid power interruption to the customers in the area during the rehabilitation period. However, NPC and ORMECO will still have to negotiate regarding the request since the project cost would be affected.

## 2. Turn-over of the System Operator (SO) function from NPC to ORMECO

When ORMECO's Electricity Supply Agreement (ESA) with NPC-SPUG expired in May 2014, ORMECO assumed the function of System Operator (SO) from NPC in the Mindoro Island in June 2014. In preparation for ORMECO's function as SO, NPC conducted a one (1)-month training for ORMECO personnel on the dispatch operations. ORMECO also visited the NGCP-SO office in Diliman, Quezon City to have greater understanding on the role of SO. However, ORMECO expressed that it still needs further personnel trainings and tools to effectively perform the roles of SO.

3. Dispatch Criteria and Protocol

3.1 ORMECO's Merit Order

The Merit Order of ORMECO is based on the following:

- a. Regulating Plants;
- b. Renewable Energy Plants (e.g. run-of-river hydro);
- c. Other plants – the allocation of the load schedule of each generating unit for the Day Ahead Dispatch Schedule (DADS) is based on the pro rata of the contracted energy in the Power Supply Agreement (PSA) to the forecasted demand;

3.2 Currently, ORMECO does not have any pure Ancillary Service Contract (e.g. contingency reserve, dispatchable reserve, reactive support, black start) with NPPs. However, ORMECO has two (2) NPPs, namely: (1) DMCI and (2) MGC, that provide a combination of regulating and base load capacity. The rest of NPPs are contracted on base load operation;

3.3 NPPs do not submit planned maintenance schedule to SO on a regular basis. The generator's notices for maintenance shutdown are only transmitted through radio communication on the day of implementation; and

3.4 Most of the NPPs do not submit their Day-Ahead Plant Nomination (DAPN) to ORMECO. Only Power One Corporation (POC) submits its capability report, resulting in unrealistic DADS. ORMECO uses the actual available capacity for a certain day as the basis in determining the DADS.

4. Study of ORMECO's System

DMC, through the assistance of its members, conducted system study to establish the integrity of the ORMECO system, using different scenarios (Annex). In summary, the study shows that the transmission capacity is not adequate to address any contingencies.

5. Maintenance Schedule and DADS

5.1 There is no confirmation of the daily load schedule from ORMECO to its NPPs;

5.2 Global Business Holdings (GBH) submits maintenance schedules to ORMECO for the succeeding year and advises ORMECO in case there are changes on its maintenance schedule;

- 5.3 POC regularly sends notices to ORMECO days ahead of the maintenance schedule on a weekly basis, and submits its DAPN for the availability of its units on a daily basis;
- 5.4 DMCI Power Corporation (DMCI Power) submits maintenance schedule of its generating units prior to the conduct of its Preventive Maintenance Schedule (PMS); and
- 5.5 MGC regularly submits maintenance schedule on a weekly, monthly, and yearly basis. It also provides ORMECO its PMS before the start of the succeeding year.

NPPs stated that, since August 2017, there was no more coordination meeting held among ORMECO and the NPPs to discuss the concerns on the dispatch. Moreover, owing to inadequate power supply, ORMECO frequently advised the NPPs to postpone and/or defer maintenance schedules.

#### 6. Dispatch Prioritization and Contractual Energy Obligation

- 6.1 DMCI Power and MGC were contracted and operated as a base load and regulating plant. The available capacity of DMCI Power was maximized until it reaches a certain load requirement of ORMECO;
- 6.2 POC, GBH and Ormin Power, Incorporated (OPI) were also contracted as base load plant and with annual energy quantity. However, payment of ORMECO to NPPs is based on actual energy delivered/generated;
- 6.3 Dispatching is proportionately shared among NPPs based on their contracted energy with ORMECO. However, according to OPI, it was observed that some NPPs get a better proportion than the others;
- 6.4 The issues on dispatch are being discussed and resolved during the monthly meetings between ORMECO and NPPs; however, the dispatch arrangement as agreed during the said meeting are not being followed few days after;
- 6.5 There was no dispatch protocol being implemented in the Southern part of ORMECO due to the separation of grids caused by the passage of Typhoon Nona; and
- 6.6 ORMECO would only pay for the energy delivered by DMCI during instances when it was not able to meet the Minimum Energy Off-Take (MEOT).

7. Other Concerns of NPPs

7.1 The Mindoro grid dispatch issues already exist even before the separation of the said grid due to "Typhoon Nona". According to the NPPs, the separation of the Mindoro grid only aggravated the situation;

7.2 For the last three years, GBH experienced significant revenue loss caused by frequent plant trippings due to alleged line faults, which according to them, resulted in damage of plant breakers. It suggested that the DMC be holistic in its evaluation of the issues, and that they have no budget for preventive maintenance since the company is already bankrupt and that they are just "running to fail";

7.3 GBH additionally shared that the amount of vegetation present in the vicinity causes a lot of plant forced outages;

7.4 In 2016, only 73.58% of OPI's contracted capacity was dispatched. OPI cannot dispatch according to its capacity and that it was given a final low Capital Recovery Factor (CRF) by the ERC as the billing determinant is based on the full capacity of its system. Since the ORMECO took over as the Mindoro grid SO, there is no proper nomination for the NPPs to be dispatched. Moreover, the NPPs shared that they were dispatched by ORMECO through phone calls.

**Recommendations**

Based on the information gathered, the DMC recommends the following:

1. ORMECO

a) Generation Planning

- Determine or establish future base load, mid-merit, peaking and ancillary service requirements to ensure system security and reliability;
- Review its supply and demand requirements to avoid over contracting, which may be the reason of dispatch issues;
- Record all the emergency shutdowns of all NPPs and declare as forced outages. Likewise, monitor the performance indices of all generators in terms of their reliability and availability;
- Require all NPPs to submit their monthly, annual, and three-year maintenance programs to monitor and ensure sufficient reserve in the grid;

b) Dispatch Scheduling and Operation

- Require all NPPs to submit their Day-Ahead Plant Nominations (DAPN) and may enforce this by first discussing the provisions of the Philippine Small Grid Guidelines (PSGG) and Philippine Small Grid Dispatch Protocol (PSGDP) during the monthly coordination meeting. Make a follow-up on the

generator's available capacity through phone calls and electronic mail if generators fail to submit the DAPN;

- Establish and prepare the Day-Ahead Dispatch Schedule (DADS) by 1400H of the current day based on an hourly interval (0001H-2400H), using as reference the Day-Ahead Plant Nomination, the Customer's Demand Forecast, the Generator's agreed percentage allocation and all planned/forced outages;
- Provide and transmit by 1600H of the current day a copy to the Generators their respective DADS for each interval of the relevant day;
- Implement timely and accurate Dispatch Instructions to all Generators based on the DADS;
- Update its DADS on the actual day of implementation at 0800H for any change in the supply, demand and system update for a more accurate dispatch schedule;
- Monitor and log the actual dispatch of each plant hourly and compare to the scheduled dispatch (DADS), so that it can be the basis of dispatch for the following days. Also, record the generation discrepancies of NPPs for compliance monitoring;
- Establish an Operational Reporting for Daily Operation Report (Actual NPP's generation, unit outages, High voltage lines outages and others) and Daily Operation Highlights (Expected system condition, NPP's generation and others);
- Update its Generator's percentage allocation considering the NPP's running actual generation and non-compliance with the Dispatch schedule as the basis for the computation of new percentage allocation of NPPs to be used in the next DADS;
- Require all NPPs to submit their plant operating characteristics (i.e. number of units, minimum stable load, start-up time, generator capability curve, heat rates, etc.) which will also serve as reference for dispatch scheduling;
- Assign two (2) personnel per shift, responsible for monitoring and implementing the load dispatch schedule i.e. one generation dispatcher and one High Voltage (HV) dispatcher. The dispatchers should be able to report any non-compliance of the NPPs with the DADS; and
- Defer a generator's maintenance if the reserve is critical.

c) Others:

- Establish an adequate Automatic Load Dropping (ALD) Scheme, generator, feeder and line protection relay coordination setting, and a documented standard operating procedures during normal and emergency conditions satisfying all requirements of the Philippine Small Grid Guidelines (PSGG) in terms of reliability, protection and system integrity;

- For the purpose of effective planning and operational simulation and system studies, invest in capacity building for the enhancement of its personnel's skills in using its existing Synergi power system analysis software. Other software such as PSS/E or ETAP can also be used for the same purpose;
- Enhance the capability of its existing SCADA (additional real time monitoring of substation/line/breaker status/voltage/equipment and feeders loading and remote controlling of PCBs);
- Establish Blackstart provider connected to Power Restoration Highway (PRH) in the event of total system blackout; and
- Undertake line clearing on a regular basis.

2. NPPs

- Submit by 1000H of the current day the day-ahead plant Unit capacity nomination (Day-Ahead Plant Nomination or DAPN) of all their Generating Units to the System Operator;
- Provide the generator status units such as planned outages, force outages and de-rating capability to the System Operator;
- Execute instructions of the System Operator during normal and/or emergency conditions;
- Provide ORMECO with the following data, as required in the Philippine Small Grid Dispatch Protocol:
  - Day-Ahead Schedule;
  - Week-Ahead Schedule
  - Monthly Maintenance Schedule
  - Annual Maintenance Schedule
  - Three-year Maintenance Schedule.

3. NPC

- Expedite the rehabilitation of the 69 kV lines;
- Immediate transfer of the 69 kV backbone line operation and maintenance to ORMECO for them to have over-all control as SO.

Lastly, the DMC will assist ORMECO in establishing the appropriate Merit Order Table (MOT) to optimize the generation cost and eventually reduce cost of subsidies. The MOT will be based on variable and fixed costs given the contractual obligation under

all Power Supply Agreement. The DMC will likewise prepare additional guideline/policy for ancillary services in the PSGG to ensure reliability of the system.

Rest assured that the DMC will keep the Commission updated on any developments.

Thank you and more power.

Sincerely yours,

  
Jaime V. Mendoza, ACPE, APEC, FIIIE  
Chairman

  
LING | AFP | GNR | MABN | JGM | RCR

Cc: Commissioner Josefina Patricia M. Asrit  
Energy Regulatory Commission



## System Study

## Load Flow Analysis

- *Case 1: Isolated North and South Grids (Based on MOT Load Allocation)*
  1. The voltage level dropped to 0.936 pu at Roxas Substation, considering the assumption that MGC-Roxas is offline since it does not have a contracted energy based on the submitted MOT;
  2. There will be a transformer overloading in Bansud and Roxas substations;
  3. If MGC-Roxas is energized (5MW), the lowest voltage level is at Minolo Substation with 0.965 pu;
  4. South Grid will have insufficient regulating reserve since its load is at 17.67 MW, while its total capacity, considering MGC-Roxas and MGC-Socorro are online, is 18 MW.
- *Case 2: Worst Case Simulation – 1 unit shutdown at North Grid (POC), 1 unit shutdown at South Grid (GBH)*
  1. Since DMC1 has a high capacity, North Grid can still accommodate its demand, and the voltage will be at 0.95 pu; and
  2. South Grid's total plant capacity will not be able to accommodate the demand.
- *Case 3: Interconnected North and South Grid*
  1. Assuming MGC-Roxas is offline, voltage problems will still exist. Otherwise, Minolo substation will have a voltage problem, where the voltage level drops to 0.956 pu.
- *Case 4: Optimized North Generation Scenario (Assumption: North Grid power plants are prioritized in the MOT)*
  1. The generating capacity is insufficient compared to the demand of ORMECO; hence, 1 unit from the South Grid (Bansud) is energized
  2. The voltage level in the farthest substation in the South Grid (Roxas) dropped to 0.826 pu, which is below the allowable voltage limits.
  3. This case is not feasible. Assuming all the plants in North Grid are least cost, they cannot be prioritized since it will cause voltage problems which could affect the security of the grid. This will also lead to an out-of-merit dispatch, which the SO could justify based on the results of the study.

## **Annex A**

### Annex

- *Case 5: Optimized South Grid Scenario (Assumption: South Grid power plants are prioritized in the MOT)*
  1. South Grid has insufficient energy capacity; thus, it still needs all the power plants from the North Grid;
  2. Assuming that MGC-Roxas is offline since it is not included in the submitted MOT, the lowest voltage level will occur at Minolo substation.

#### **Short Circuit Analysis**

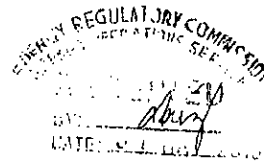
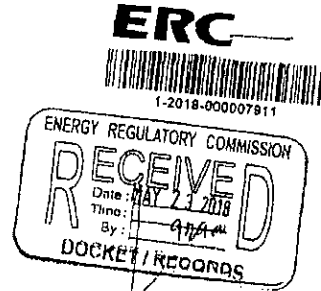
- The highest fault level is around 25 kA at DMCI;
- With the expansion of the grids, there will also be a significant increase in fault levels due to added fault contributions from the generators.



DMC-2018-132

22 May 2018

**ATTY. AGNES VST DEVANADERA**  
Chairperson and CEO  
Energy Regulatory Commission (ERC)  
Pacific Center Building, San Miguel Avenue  
Ortigas Center, Pasig City



Dear Chairperson Devanadera:

In reference to Department of Energy's (DOE's) letter to ERC which was referred to the DMC, dated 03 April 2018 requesting a copy of our report on the review of ORMECO's dispatch operations and specific recommendations in addressing the following issues:

1. Specific dispatch protocol for ORMECO including an appropriate Merit Order Table (MOT) to optimize the generation cost;
2. Short and medium term actions for Oriental Mindoro Electric Cooperative, Inc. (ORMECO) to improve its system operations;
3. Possible need to review some of ORMECO's existing power supply contracts to identify specific provisions that may be deemed as onerous, disadvantageous to the consumers, and/or against public interest;
4. Measures to improve the operational performance of the NPPs in the off-grid areas; and
5. Compelling the National Power Corporation (NPC) to fast-track the implementation of CAPEX program funded under Universal Charge-Missionary Electrification, such as transmission line.

With regard to the abovementioned issues and as a result of the Distribution Planning Subcommittee meeting held last 16 May 2018, we are providing the Commission the following:

1. A Dispatch Guidelines, specifically for ORMECO, comprising the Merit Order Table preparation methodology (Annex A); and
2. Detailed recommendations for ORMECO, NPPs, and NPC (Annex B);

In addition, please also find in Annex C a copy of the DMC report on the issue of ORMECO's dispatch protocol, which was submitted to the ERC on March 8, 2018. For issues 3 and 5, we would like to respectfully state that the review of the Power Supply Agreements of ORMECO with its NPPs, and compelling the NPC to fast-track

its projects is beyond DMC's mandate. The DMC can only recommend and/or request but cannot compel the NPC to fast-track its rehabilitation projects.

Furthermore, following is the latest status of 69kV lines in Mindoro, as submitted by the NPC:

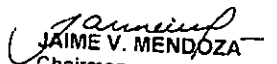

Project Name	Length	Completion Status	Remarks
1. Rehabilitation of Calapan-Bansud 69kV Transmission Line (Schedule 1)	44	90.37%	On-going
2. Rehabilitation of Calapan-Puerto Galera 69kV Transmission Line	41	98.45%	<ul style="list-style-type: none"> <li>Joint Final Inspection (April 23-27, 2018): 337 Punchlist items were identified</li> <li><b>Target Completion/Energization Date: May 15, 2018</b></li> </ul>
3. Supply and Erection/Installation of Bansud-Mansalay 69kV, SC/SP-CP Transmission Line	Schedule 1: 31.7	96.67%	<ul style="list-style-type: none"> <li>JFI of completed T/L section was conducted on Feb. 26-March 9, 2018. 624 punchlist items were identified;</li> <li>Awaiting resolution of expropriation cases filed at Pinamalayan RTC</li> </ul>
	Schedule 2: 30.9		
4. Supply and Erection/Installation of Mansalay-San Jose 69kV Transmission Line	67		Bids opening conducted on March 27, 2018. Bid under evaluation/post-qualification
5. Rehabilitation of Calapan-Bansud 69kV Transmission Line (Schedule 2)	42		<ul style="list-style-type: none"> <li>Target date of implementation: June 2018</li> <li>Bid report approved on April 11, 2018</li> <li>For ManComm and Board presentation</li> </ul>

Please note that the completion of the 69 kV Calapan-Puerto Galera line (Item 2) will help in maximizing the dispatch of the available capacity from Ormin, Power One and DMCI and improve the reliability and security of supply in the North Grid of ORMECO.

In addition, DMC would like to request DOE to implement the Disposal of Surplus NPC-SPUG Assets pursuant to Section 4 of the DOE Circular No. 2004-01-001 entitled, "Prescribing the Rules and Procedures for Private Sector Participation in Existing NPC-SPUG Areas Pursuant to Rule 13 of the Implementing Rules and Regulations of the Electric Power Industry Reform Act of 2001 (EPIRA-IRR)" to enable ORMECO to have its over-all control as SO in the Mindoro Island.

Thank you very much.

Very truly yours,

  
JAIME V. MENDOZA  
Chairman  
  
LUNG | GNR | MAB | QGM | RCR

**DISPATCH GUIDELINES  
FOR ORIENTAL MINDORO ELECTRIC COOPERATIVE, INC. (ORMECO)**

**I. Introduction**

"Dispatch is the process of apportioning the total demand with the available generating capacity through the issuance of Dispatch Instruction to the Scheduled Generating Units in order to ensure the security and reliability at the least cost to the end-users in the Small Grid."<sup>1</sup> There are dispatch criteria that should be considered in the scheduling and dispatching of Generating Units, in accordance with the following rank of priority order:

**1<sup>st</sup> Priority**

**System Security**

Security is "the continuous operation of a power system in the Normal State, ensuring safe and adequate supply of power to End-Users, even when some parts or Components of the System are on Outage."<sup>2</sup> This requires the System Operator (SO) to maintain normal system voltage and frequency and prevent the system from collapse by preventing the overloading of lines and transformers.

**2<sup>nd</sup> Priority**

**System Reliability**

Reliability pertains to adequacy of reserve to meet the demand at specified time. The SO should ensure that there is adequate reserve requirements, which include regulating, contingency, and dispatchable (stand-by) reserves, to balance the supply and demand during load fluctuation, loss of generating units and/or any grid contingency events.

**3<sup>rd</sup> Priority**

**Economic Aspects**

Economic Dispatching is "the operation of generation facilities to produce energy at the least cost to end-users, recognizing any operational limits of generation and transmission facilities."<sup>3</sup> The Economic Aspects introduce the use of the Merit Order Table (MOT) which is defined in the Philippine Small Grid Dispatch Protocol (PSGDP) as "the list prepared by the System Operator showing the capacity of the Scheduled Generating Units arranged from lowest to highest variable cost of each generating units/ plants

**II. Objective**

To enable the Distribution Utilities or System Operator to establish an appropriate dispatch schedule of available capacity of all generating units in the Off-Grid areas.

<sup>1</sup> Philippine Small Grid Dispatch Protocol, 2014

<sup>2</sup> Philippine Distribution Code, 2017

<sup>3</sup> Energy Policy Act (United States), 1992

### III. Definitions

The following terms as used in this Guidelines shall have the following meanings. All capitalized terms used herein and not defined herein have the respective meanings provided therefor in the Philippine Small Grid Guidelines and Philippines Small Grid Dispatch Protocol.

**Base/Capacity Fee.** The cost for the recovery of capital or investment incurred in putting up a Generating Plant, or computed in accordance with the following formula, whichever is agreed by the parties in the PSA:

$$CF = CR \times CC \times \frac{\$ \text{ current}}{\$ \text{ base}}$$

Where:

CF	Capacity Fee
CR	Capacity Rate equivalent to an agreed amount
CC	Contracted capacity
\$ base	Foreign exchange offered in the bid
\$ current	Foreign exchange during the time of billing period

**Base Load.** The Generating Plant's operational function which provides for the minimum level of electricity demand over a period of 24 hours. It is needed for the continuous supply of electricity.

**Contracted Capacity.** The agreed plant net power output in megawatts (MW) that the Generating Plant shall maintain.

**Distribution Utility (DU).** An Electric Cooperative, private corporation, government-owned utility or existing local government unit that has an exclusive franchise to operate a Distribution System.

**Economic Aspects.** Has the same meaning as stated in Section I of this Guidelines.

**Energy Fee/ Fuel Recovery Fee.** A pass-through cost to allow recovery of fuel consumed to generate power.

**Fixed Costs.** The costs offered by the NPP which include Base/Capacity Fee, Energy Fee, Operation and Maintenance Fee and Other Fees.

**Foreign Operation and Maintenance Fee.** The fixed/variable foreign operation and maintenance fee to be paid by the DU to the NPP which shall be computed in accordance with the following formula, if not stated in the PSA:

$$FOMF = FOMR \times DE \times \frac{CPI \text{ current}}{CPI \text{ base}}$$

Where:  
 FOMF Foreign Operation and Maintenance Fee  
 FOMR Foreign Operation and Maintenance Rate equivalent to an agreed amount  
 DE Delivered Energy  
 CPI base The Philippine Consumer Price Index as published by the NSO for the month listed in the bid of the winning NPP  
 CPI current The latest Philippine Consumer Price Index as published by the NSO applicable during the billing period

**Fuel Cost.** Cost of fuel offered by the NPP/NPC-SPUG for the applicable billing period.

**Fuel Type.** The type of fuel used by the Generating Plant to generate power.

**Generating Plant.** A facility, consisting of one or more Generating Units, where electric energy is produced from some other form of energy by means of a suitable apparatus.

**Generating Unit.** A conversion apparatus, including auxiliaries and associated Equipment, functioning as a single unit, which is used to produce electrical energy from some other form of energy.

**Guaranteed Fuel Consumption.** The guaranteed fuel consumption offered by the NPP but not higher than an agreed cost.

**Guaranteed Lube Oil Consumption.** The guaranteed lube oil consumption offered by the NPP but not higher than an agreed cost.

**Installed Capacity.** The nameplate capacity of the Generating Plant in megawatts (MW).

**Local Operation and Maintenance Fee.** The fixed/variable local operation and maintenance fee to be paid by the DU to the NPP equivalent to an agreed cost, regardless of the delivered energy, or computed in accordance with the following formula, if not stated in the PSA:

$$LOMF = LOMR \times CC \times \frac{CPI \text{ current}}{CPI \text{ base}}$$

Where:  
 LOMF Local Operation and Maintenance Fee  
 LOMR Local Operation and Maintenance Rate offered by the winning NPP  
 CC Contracted Capacity



CPI base      The Philippine Consumer Price Index as published by the NSO for the month listed in the bid of the winning NPP  
CPI current    The latest Philippine Consumer Price Index as published by the NSO applicable during the billing period

**Merit Order Table (MOT).** The list prepared by the System Operator showing the capacity of the Scheduled Generating Units arranged in a manner such as the highest (lowest) operational cost is on the top of the list.

**Mid-Merit.** An operational function of a Generating Plant which adjusts the plant's output as the demand of electricity fluctuates or if there is a sudden change of load.

**Monthly Contracted Energy.** The agreed monthly energy output in megawatt-hour (MWh) that the Generating Plant shall maintain at any period of time

**Nature of Operation.** Refers to the type of operation of a Generating Plant, which includes, but not limited to, Base Load, Mid-Merit, Peaking, or Ancillary.

**New Power Provider (NPP).** Any person or entity authorized by the ERC to operate a facility used in the generation of electricity in Off-Grid Areas.

**Off-Grid Area.** An area whose supply of electricity is through the Small Grid.

**Operation and Maintenance Fee.** Could be a fixed or variable cost which is composed of Local and Foreign Operation and Maintenance Fee, if the cost is not stated in the contract.

**Peaking.** A Nature of Operation of a Generating Plant which runs only during peak hours.

**Plant Location.** The geographical location of a Generating Plant.

**Power Delivery (Contract Terms).** The interpretations of the Supply of Electricity Clause in the DU's contract with the NPP (Take or Pay, and Take and Pay) which should be the basis in the determination of the cost components of the Total Generation Cost (TGC).

**Regulating Reserve.** A Nature of Operation of a Generating Plant with synchronized generating capacity that is allocated to restore the system frequency from the quasi-steady state value as established by the primary responses of Generating Units to the nominal frequency of 60 Hz.

**Reliability.** Has the same definition as stated in Section I of this Guidelines.

**Security.** Has the same definition as stated in Section I of this Guidelines.

**Small Grid.** The backbone system of interconnected High Voltage (HV) lines or Medium Voltage (MV) lines, substations and other related facilities not connected to the National Grid in Luzon, Visayas, and Mindanao.

**System Operator (SO).** The party responsible for generation dispatch, or the implementation of the Generation Dispatch Schedule based on the nomination of the Distribution Utilities from its PSAs with the Generators, the provision of Ancillary Services and operation to ensure safety, power quality, stability, reliability and security of the Small Grid.

**Variable Costs.** The costs offered by the NPP for the operation of the Generating Plant which include Fuel Cost, Lube Oil Cost, Operation and Maintenance Fee and Other Fees.

#### **IV. Operational Responsibilities**

The SO, Small Grid Owner, DUs, and NPPs shall comply with their respective operational responsibilities as provided in *Section 4 of the PSGDP*.

#### **V. Merit Order Table Preparation**

##### **a. General Consideration**

The SO shall consider the first two (2) dispatch criteria before using the MOT. The Security and Reliability of the Small Grid shall always be observed in all aspects of scheduling and dispatching of the available Generating Units. Should there be any Security and Reliability issues in the Small Grid, the SO shall address and resolve these first. Upon achieving the Security and Reliability requirements, the SO shall then use the MOT as basis for the dispatch schedule of the available Generating Units.

##### **b. Merit Order Principle**

Section 6.3.4 of the PSGDP states that the MOT shall be established based on the following criteria:

- Renewable energy plants/units with 24-hour load nominations or with declared capability shall be prioritized based on cost/kWh production.
- Other plants/units shall be prioritized based on variable cost/kWh production.

Section 5.2.2.4 of the PSGDP also states that renewable energy resources shall be given priority in dispatch whenever available to the extent of the capacity the island/area grid can accommodate without affecting the system Reliability and Security.

##### **c. Data Requirements and Calculations**

The following are the data required for the establishment of the MOT:

1. NPP's Nature of Operation;

2. Fuel Type;
3. Installed Capacity (MW);
4. Power Delivery (Contract Terms)

Schemes for the supply of electricity are the following:

- a. **Take or Pay.** The DU is obliged to pay the NPP at the cost equivalent to the Minimum Energy Off-Take (MEOT), whether the actual energy delivered is at the MEOT level or below the MEOT level, provided that the capacity as declared by NPP is available. Refer to the following cases for the Total Generation Cost (TGC) calculations:

Case 1. If the actual energy delivered is within the MEOT level, the calculation for the TGC will only include the Variable Costs

$$\text{Total Generation Cost} = \text{Total Variable Costs}$$

Case 2. If the actual energy delivered is above the MEOT level, the calculation for TGC will include both Variable Costs and Fixed Costs.

$$\text{Total Generation Cost} = \text{Total Variable Costs} + \text{Total Fixed Costs}$$

In cases where the actual energy delivered is below MEOT level but the fault is caused by the NPP, the NPP will be paid only at the price equivalent to the actual energy delivered.

- b. **Take and Pay.** The NPP will be paid for the cost equivalent to the actual energy delivered.
5. Contracted Capacity (MW);
  6. Monthly Contracted Energy (MWh);
  7. Guaranteed Fuel Consumption (L/kWh);
  8. Guaranteed Lube Oil Consumption (L/kWh);
  9. Variable Costs:
    - a. Fuel Cost

$$\text{Fuel Cost} = \text{Guaranteed Fuel Consumption} * \text{Fuel Cost of Previous Month's Billing}$$

- b. Energy Fee
- c. Operation and Maintenance Fee
- d. Other Fees (Lube Oil Costs, etc.)

$$\text{Lube Oil Cost} = \text{Guaranteed Lube Oil Consumption} * \text{Lube Oil Cost of Previous Month's Billing}$$

10. Fixed Costs (Other Cost Component)

- a. Base/Capacity Fee
- b. Operation and Maintenance Fee and Other Fees

The SO may fill-in the prescribed Merit Order Table template attached as Annex A.

**VI. Implementation of MOT**

The implementation and optimization of the MOT will eliminate ORMECO's interim dispatch protocol which is based on pro-rated energy dispatch from ORMECO's contracted energy in its PSAs; thus, UC-ME will be minimized.

The SO shall stack the Generating Plants in accordance with the following order:

1. Scheduled Conventional Plants at their Plant Minimum Stable Load (Pmin);
2. Plants for voltage and overloading correction or N-1 compliance, to address system security issues and constraints. Disregard if there is no system constraint;
3. Regulating Reserve Plants;
  - 50% upward Regulating Reserve
  - 50% downward Regulating Reserve
4. Must-Dispatch Plants
  - Wind and Solar Plants
5. Priority Dispatch
  - Biomass Plants
6. Scheduled Conventional Plants stacked from least to highest total generation cost based on the updated MOT

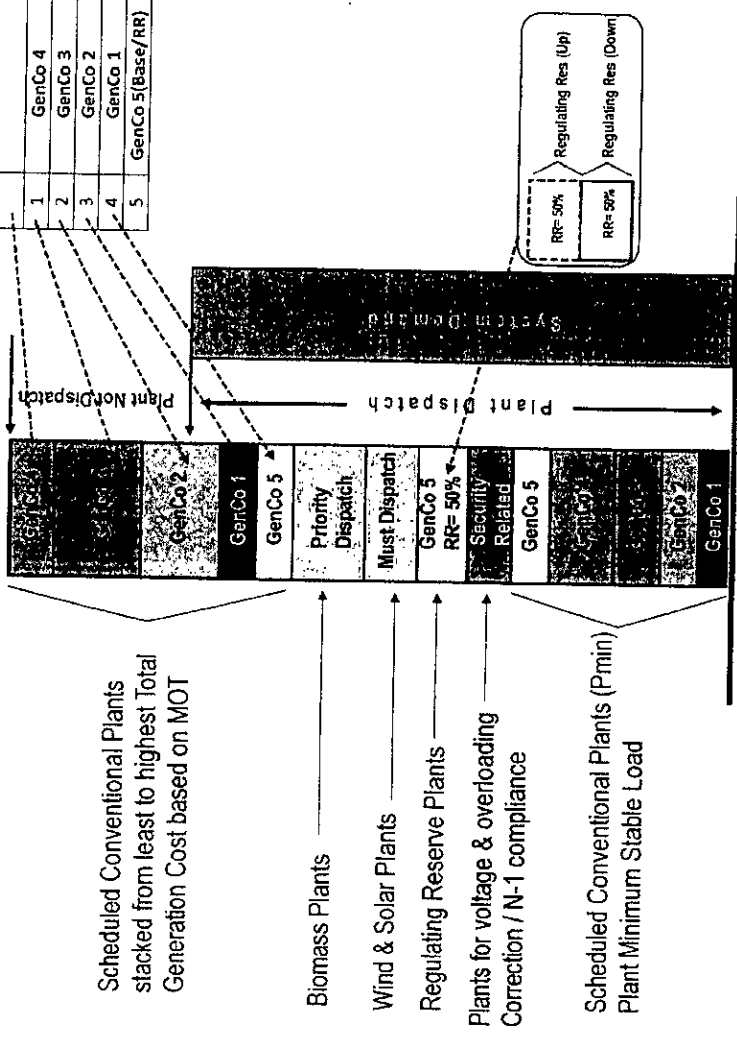
An illustration is attached as Annex B.

Annex A

New Power Provider	Nature of Operation	Plant Location	Fuel Type	Installed Capacity (MW)	Power Delivery (Contract Terms)	Contracted Capacity (MW)	Monthly Contracted Energy (MWh)	Guaranteed Fuel Consumption (t/kWh)	Guaranteed Lubrication Consumption (l/kWh)	Variable Cost, (Php/kWh)				Fixed Costs, Other Cost Components (Php/kWh)			Total Generation Cost (Php/kWh)
										Fuel Cost	Energy Fee	O&M Fee and Others	TOTAL Variable Cost	Base/Capacity fee	O&M Fee and Others	TOTAL Fixed Cost	
GenCo1	Base Load Plant		Bunker-C		Take and Pay			0.3	0.0020	6.5	0.4	0.4	6.9	1.4	0.400	1.8	8.7
GenCo2	Mid-Merit Plant		Diesel		Take and Pay			0.3	0.0010	7.1	0.2	0.2	7.3	2.0	0.9	2.9	10.2
GenCo3	Peaking Plant		Bunker-C		Take All			0.2	0.0009	6.1	0.7	0.7	6.8	3.1	0.5	3.6	10.4
GenCo4	Base Load Plant		Diesel		Take All			0.15	0.0005	6.1	0.7	0.7	6.8	3.2	0.6	3.8	10.6
GenCo5	Base Load & Regulating Plant		Bunker-C		Take or Pay			0.3	0.0003	5.8	1.2	0.2	7.2	2.7	0.7	3.4	7.2

**Merit Order Table (MOT)  
(from Annex A)**

Plants	Total Generation Cost (Php/kWh)
1 GenCo 4	10.6
2 GenCo 3	10.4
3 GenCo 2	10.2
4 GenCo 1	8.7
5 GenCo 5(Base/RR)	7.2



Merit Order Table (MOT) Implementation

Scheduled Conventional Plants stacked from least to highest Total Generation Cost based on MOT

Biomass Plants

Wind & Solar Plants

Regulating Reserve Plants

Plants for voltage & overloading Correction / N-1 compliance

Scheduled Conventional Plants (Pmin) Plant Minimum Stable Load

Legend:

- GenCo 1
- GenCo 2
- GenCo 3
- GenCo 4
- GenCo 5

**DMC's Recommendations**

**Annex B**

No.	General Recommendation	Details	Timeline	Entity Involved
1.	Upgrade/Enhance SCADA Capability	<ul style="list-style-type: none"> <li>• Monitor all Real-time data such as frequency, voltages, real and reactive power loading of generators, transformers, transmission lines and feeders, and breakers' status including remote control</li> <li>• Develop Grid Power Flow Diagram, Station/Substation Diagram, Generation Loading and Voltage Monitoring reflecting the real-time data.</li> <li>• SCADA data storage for future reference.</li> </ul>	Short Term	ORMECO
2.	Enhance the Day-Ahead Dispatch Schedule	<ul style="list-style-type: none"> <li>• Establish and prepare the Day-Ahead Dispatch Schedule based on the PSGDP timeline and requirements. (PSGDP 6.2.3)</li> <li>• The schedule must be based on dispatch criteria in accordance with rank of priority order (i.e. security, reliability, economic or cost).</li> <li>• Establish an agreed Plants/Unit minimum stable load.</li> <li>• Establish MOT (monthly) for reference in scheduling of generators' loading.</li> <li>• Ensure Ancillary Services for Regulating Reserve (e.g. 10% of forecasted demand) and Spinning Reserve (e.g. highest unit on line) at all times. For Regulating Reserve, it must be set on 50% loading for downward and upward response.</li> <li>• Revise/update the Day-ahead Dispatch Schedule on the actual day of implementation at 0800H for a more accurate dispatch schedule. This is to incorporate any changes in the system (i.e. generator or line tripping, forecast adjustment based on actual condition and others).</li> </ul>	Short Term	ORMECO

**DMC's Recommendations**

**Annex B**

No.	General Recommendation	Details	Timeline	Entity Involved
3.	Formulate a Compliance Monitoring Program for Generators	<ul style="list-style-type: none"> <li>• Implement timely and accurate Dispatch Instructions to all Generators based on DADS. (PSSGDP 6.3)</li> <li>• Require all NPPs to submit their Day-Ahead Plant Nominations (DAPN).</li> <li>• Establish an agreed deviation of generators' loading in percentage (ex: for Luzon +/-3%) as the basis for compliance monitoring.</li> <li>• Monitor/record all non-compliances and generation discrepancies (Day-Ahead Dispatch Schedule or Dispatch Instruction vs Actual Generation) on hourly basis for monitoring and future reference purposes.</li> <li>• Establish an Operational Reporting for the Daily Operational Report (DOR) which includes the actual NPP's generation, unit outages, transmission and feeders' outages and others. Also, establish Daily Operational Highlights (DOH) which includes the expected system condition, NPP's generation, unit outages, transmission line and feeders' outages, and others.</li> <li>• Record all the emergency shutdowns of all NPPs and classify them as forced outages. Likewise, monitor the performance indices of all generators in terms of their reliability and availability.</li> </ul>	Short Term	ORMECO
4.	Additional Blocks(MW) for Automatic Load Dropping (ALD)	<ul style="list-style-type: none"> <li>• Establish additional ALD blocks starting at frequency 59.0Hz with corresponding 2MW and another block of 2MW thereafter for every 0.2Hz decrease in frequency up to</li> </ul>	Short Term	ORMECO



**DMC's Recommendations**

**Annex B**

No.	General Recommendation	Details	Timeline	Entity Involved
		57.8Hz. A simulation study must be conducted every activation of ALD for evaluation of ALD effectiveness. <ul style="list-style-type: none"> <li>• Selection of ALD scheme must be based on given priority (residential, commercial, industrial).</li> <li>• Rotation of ALD blocks must be established (ex. 10 ALD activation or every four (4) months whichever comes first).</li> </ul>		
5.	Generator Under and Over frequency resetting	<ul style="list-style-type: none"> <li>• Conduct actual inspection and resetting of generator's over and under frequency relay (O/UFR).</li> <li>• A 62.4 Hz Over Frequency and 57.6 Hz Under Frequency of all Generating Unit shall remain in synchronism with the Small Grid for at least five (5) seconds.</li> </ul>	Short Term	ORMECO
6.	Establish a Small Grid Operating Maintenance Program	<ul style="list-style-type: none"> <li>• Monthly Operating Program;</li> <li>• Weekly Operating Program; and</li> <li>• Daily Operating Program.</li> <li>• Require all NPPs to submit their weekly, monthly and annual maintenance programs to monitor and ensure sufficient reserve in the grid.</li> </ul>	Short Term	ORMECO
7.	Undertake line cleaning on a regular basis.	This activity should be done at least before and after rainy season or as need arises to prevent vegetation problem	Short Term	ORMECO
8.	Submit Day-Ahead Plant Nomination (DAPN) to the System Operator	PSGDP 6.2.3.3. The Generators shall submit by 1000H of the current day the DAPN of all their Generating Units to satisfy the generation requirement forecast by the SO.	Short Term	NPPs

**DMC's Recommendations**

**Annex B**

No.	General Recommendation	Details	Timeline	Entity Involved
9.	Expedite the rehabilitation of 69kV lines in Mindoro Island	This is to address the current system congestion problem and maximize the dispatch of existing available plant capacity in Mindoro	Short Term	NPC
10.	As interim, designate ORMECO and NPC as System Operator with delineation of responsibilities,	This is to allow ORMECO to have full understanding on their role as a System Operator and pending the rehab completion and full transfer on the ownership and O & M of the 69 kV lines	Short Term	NPC
11.	For purposes of effective planning and operational simulation and system studies, invest in the capacity building for the enhancement of its personnel's skills in using its existing Synergy power system analysis software. Other software such as PSS/E or ETAP can also be used for the purpose.	This is to enhance the technical capability of ORMECO as System Operator.	Long Term	ORMECO
12	Establish a Small Grid Operating Maintenance Program	<ul style="list-style-type: none"> <li>• Three year Operating Program</li> <li>• Annual Operating Program</li> <li>• Require all NPPs to submit their annual and three years maintenance programs to monitor and insure sufficient reserve in the grid.</li> </ul>	Long Term	ORMECO
13.	Enhance the Manual Load Dropping (MLD) scheme	<ul style="list-style-type: none"> <li>• Selection of MLD scheme must be based on given priority (residential, commercial, industrial)</li> <li>• Additional MLD scheme</li> <li>• Exempt or last priority loads to be dropped (Hospitals and schools)</li> </ul>	Long Term	ORMECO

DMC's Recommendations

Annex B

No.	General Recommendation	Details	Timeline	Entity Involved
		<ul style="list-style-type: none"> <li>Identify customer load with such Voluntary Load Curtailment (VLC) capability (ex. Industrial curtail load at specific time)</li> </ul>		
14.	Review ORMECO's supply and demand requirements to avoid over-contracting which may be the reason of dispatch issues		Long Term	ORMECO
15.	Determine or establish future base load, mid-merit, peaking and ancillary services requirements to ensure security and reliability.		Long Term	ORMECO
16.	Require all NPPs to submit their plant operating characteristics (i. e. number of units, minimum plant/unit stable load, start-up time for cold and hot, generator capability curve, heat rate, etc) which serve as reference for dispatch scheduling.		Long Term	ORMECO
17.	Conduct Emergency drills	<ul style="list-style-type: none"> <li>Shall be conducted at least once a year to familiarize all personnel responsible for emergency and Small Grid restoration activities with the emergency and restoration procedures.</li> <li>Implement Table Top Simulation Drill and Blackout Simulation Drill once a year.</li> </ul>	Long Term	ORMECO

**DMC's Recommendations**

**Annex B**

No.	General Recommendation	Details	Timeline	Entity Involved
18.	Establish Reactive Dispatch Procedure.	<ul style="list-style-type: none"> <li>• Conduct testing of generators' Reactive Power (MVAR) capability to determine its limitations.</li> <li>▪ Establish a Reactive Power (MVAR) capability of each unit as reference in dispatching.</li> </ul>	Long Term	ORMECO
19.	Enhance Black Start Procedure	<ul style="list-style-type: none"> <li>• Set-up alternative Black Start provider in case the DMCI fails to restore/provide power with corresponding Power Restoration Highway.</li> </ul>	Long Term	ORMECO