



Market Surveillance Committee Monthly Over-riding Constraints Report

26 March to 25 April 2023

July 2023

This Report is prepared by the
Philippine Electricity Market Corporation –
Market Assessment Group for the
Market Surveillance Committee

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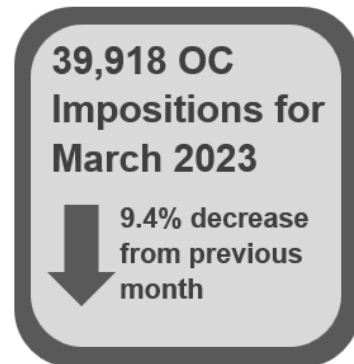
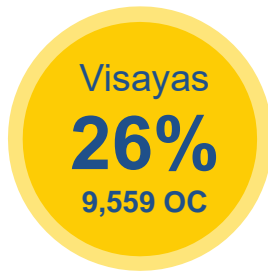
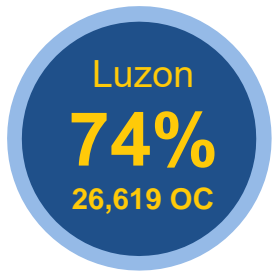
LUZON

VISAYAS

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY CATEGORY AND REGION

36,178 Total Impositions
91% of which were **non-security** limits.

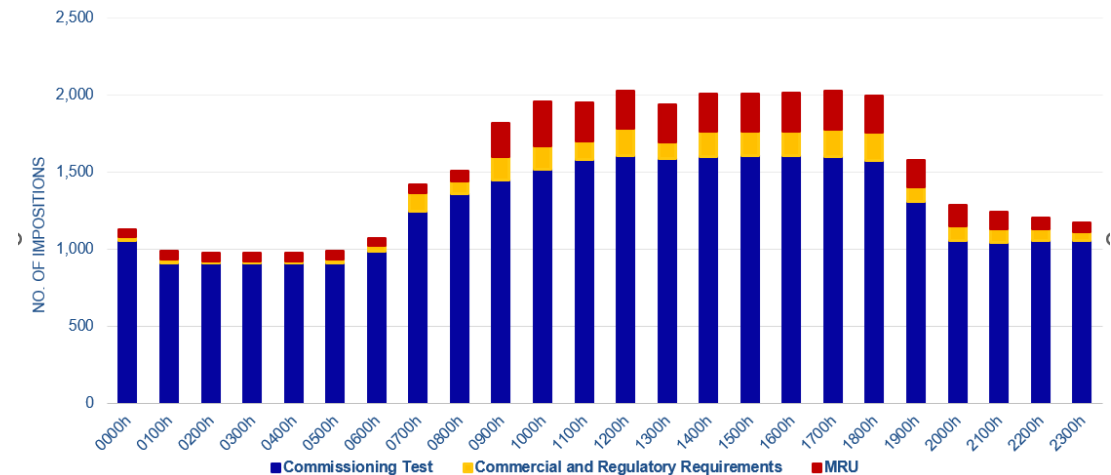


A decrease of **9.4%** in over-riding constraint (OC) impositions was observed during the April 2023 billing period involving **22 Luzon** and **16 Visayas plants**.

Note: Under the Dispatch Protocol Manual Issue 18.0, imposition of over-riding constraints falls into 2 categories – 1) security limit i.e., MRU and other types as may be recommended by SO and 2) non-security limit. Security limit is imposed to address possible threats in system security while non-security limit is related to 1) generating unit limitations, 2) commercial and regulatory requirements, and lastly, 3) conduct of commissioning test of plants.

The monitoring of the over-riding constraints is based on the data and information provided by MO (i.e., real time market results and MMS-input files on security limits) and SO (i.e., SO Data for Market Monitoring).

IMPOSITIONS BY HOUR



Majority of over-riding constraints imposed over a 24-hour period were caused by the conduct of commissioning tests which constituted **84% of the total impositions**. Most of which were imposed during peak hours, mainly **due to entry of new solar plants**.

Commercial and regulatory requirement tests likewise increased during peak hours due to tests conducted by Hydro and Oil-based plants. Also, impositions related to Must-Run Units (MRUs) during the same period were mainly attributable to the dispatch of Oil-based plants.

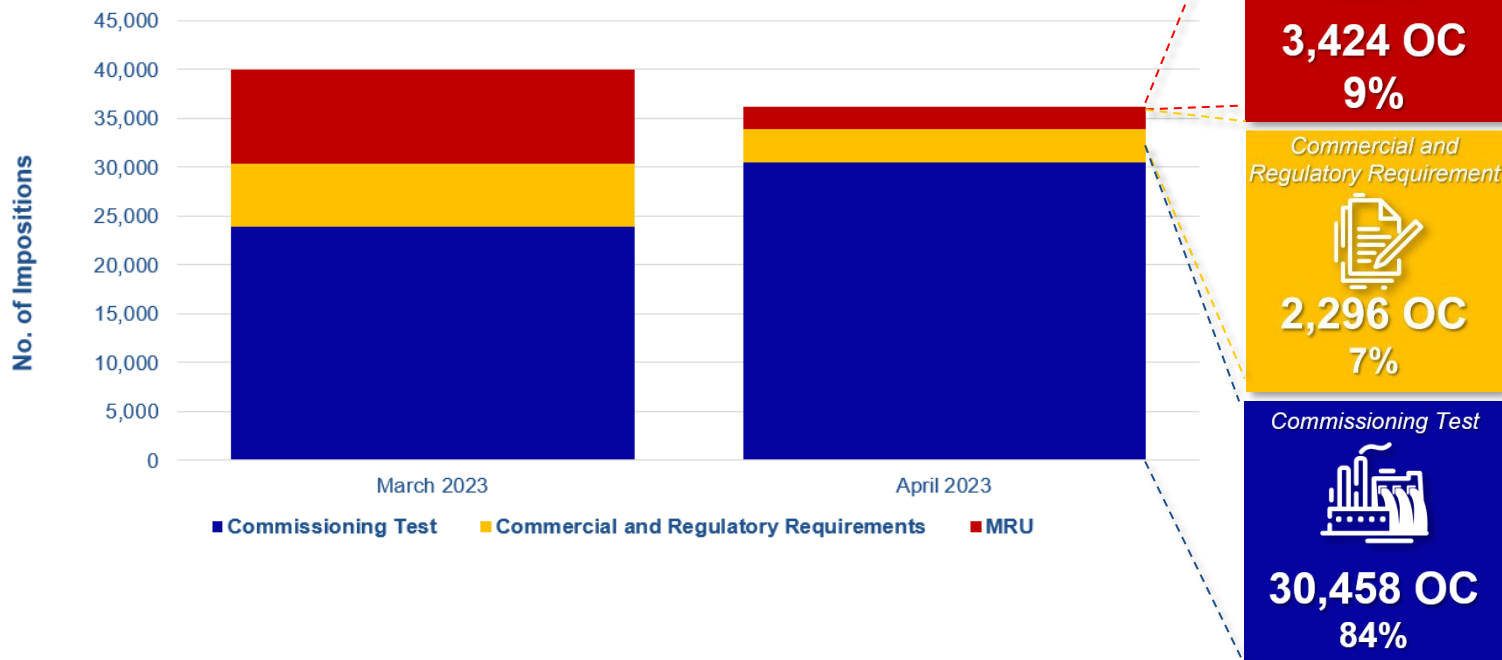
MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY INCIDENT

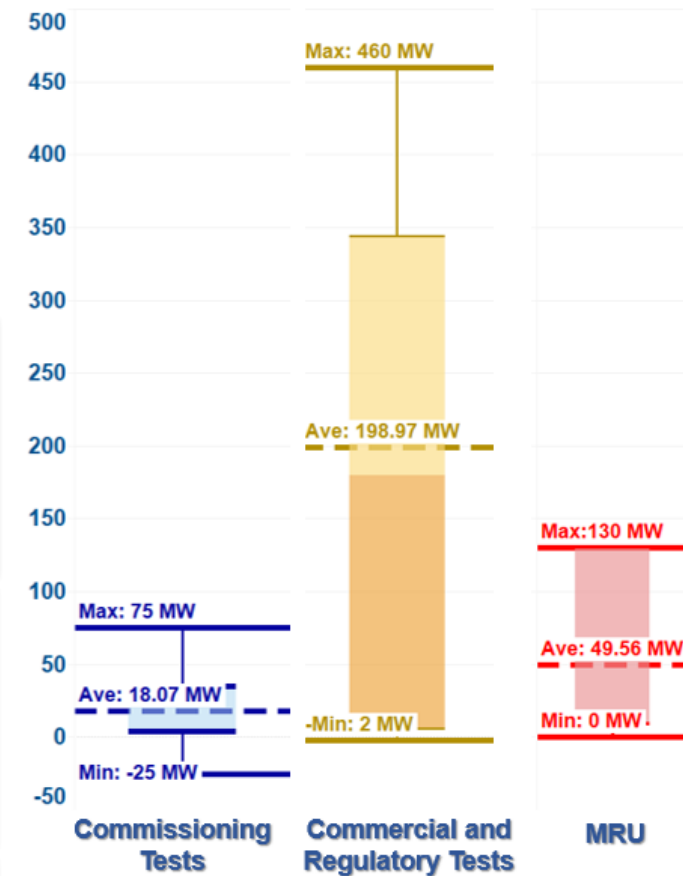
An increase in the number of impositions related to commissioning test was observed following the extension of testing period of one (1) Hydro and one (1) Solar plant. On the other hand, MRU impositions decreased during the period, specifically in Visayas which was mainly to address the thermal limit of lines in the area. Luzon grid was likewise experiencing impositions for MRU due to real power balancing and frequency control. Furthermore, incidents related to commercial and regulatory requirements (e.g., Ancillary Services Test, Grid Compliance Test, and Performance Test) decreased.

Plants imposed with OC due to the conduct of commercial and regulatory tests were scheduled at a higher MW level compared to plants imposed with commissioning tests and MRU due to their inherent large capacities.

The graph (on the right) shows the scheduled capacities corresponding to the impositions.



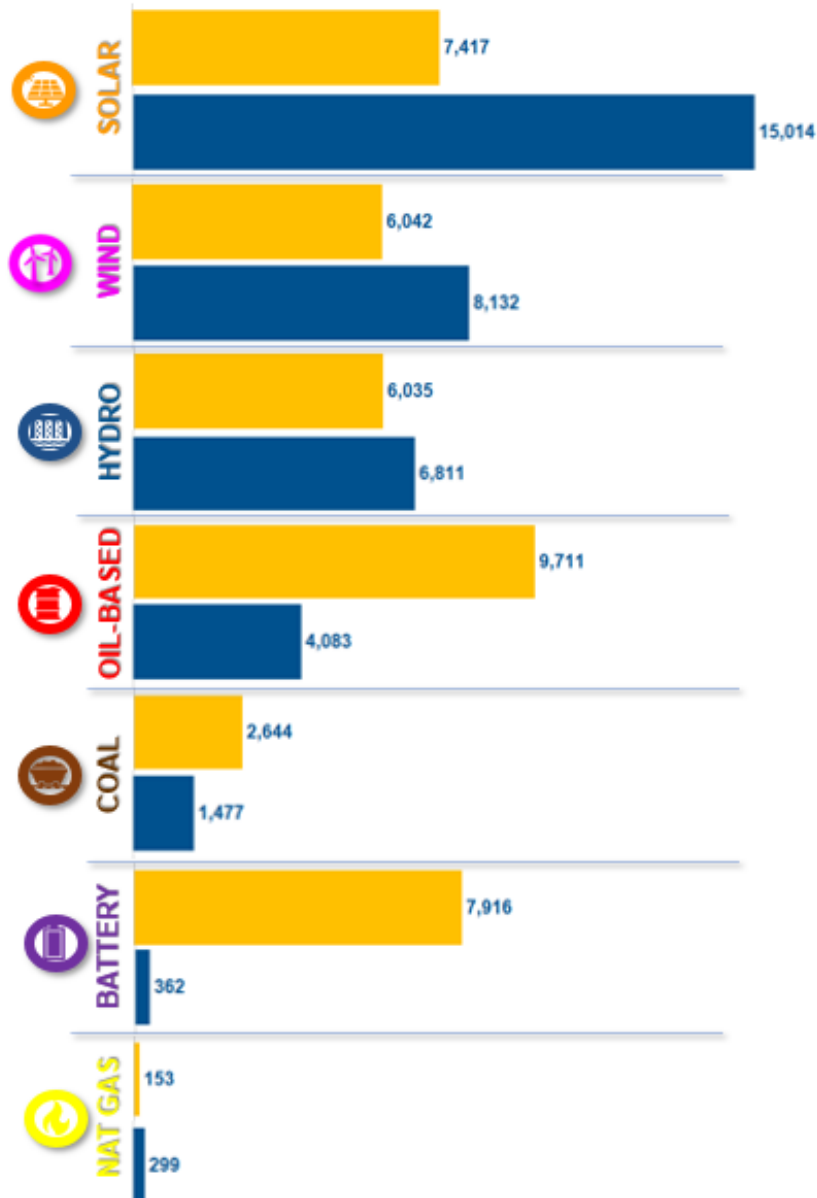
SCHEDULED CAPACITIES (MW)



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

 **March
2023**

 **April
2023**



IMPOSITIONS BY PLANT TYPE

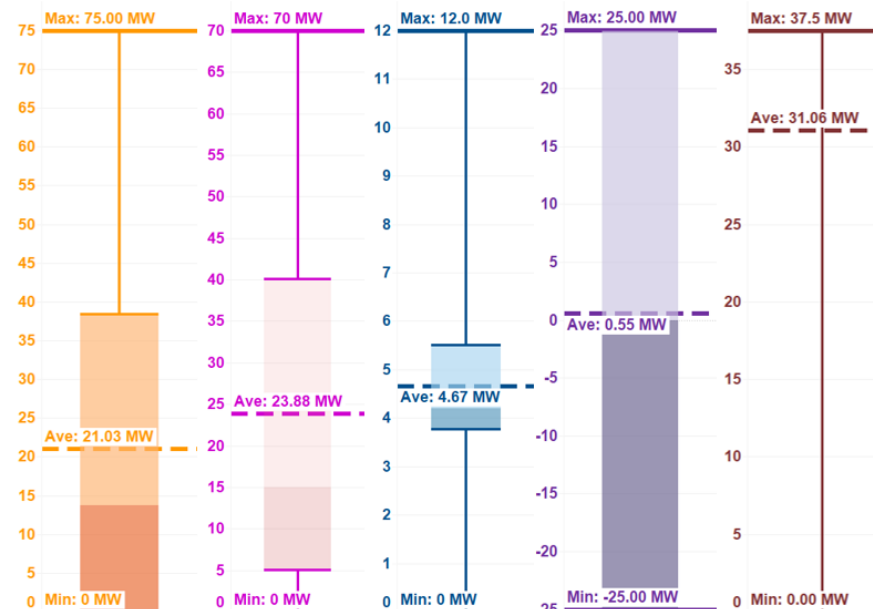
Overall, over-riding constraints impositions decreased in April 2023 as compared with the previous billing period. The reasons for the impositions per plant types were as follows:

- Extension of commissioning test of one (1) plant caused the increase in imposition for **Solar** plants.
- Increase in impositions of OC due to commissioning test of one (1) **Wind** plant was noted.
- Increase in the number of events related to the conduct of commissioning test caused the rise in the recorded impositions attributable to **Hydro** plants.
- Decrease in the number of impositions to **Oil-based** plants was due to the decline in MRU impositions.
- A decrease in the number of ancillary services and emission tests conducted by **Coal** plants caused the decrease in the impositions observed this billing period.
- Expiration of commissioning test of two (2) **Battery Energy Storage System (BESS)** was the reason for the decrease in the OC impositions for this resource type.
- Increase in the number of impositions related to **Natural gas** plants was observed due to conduct of performance test.

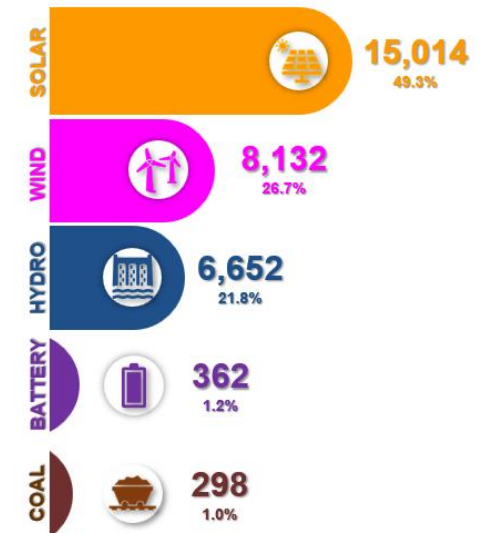
MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

PLANTS ON COMMISSIONING TEST

MW Schedule



Impositions



For April 2023, there was an observed **increase in the number of impositions of OCs** related to **commissioning tests**, logging a total of **30,458 impositions** with an average scheduled capacity of **18.07 MW**. Majority of these impositions were attributable to Solar plants, followed by Wind, BESS, and Hydro plants.

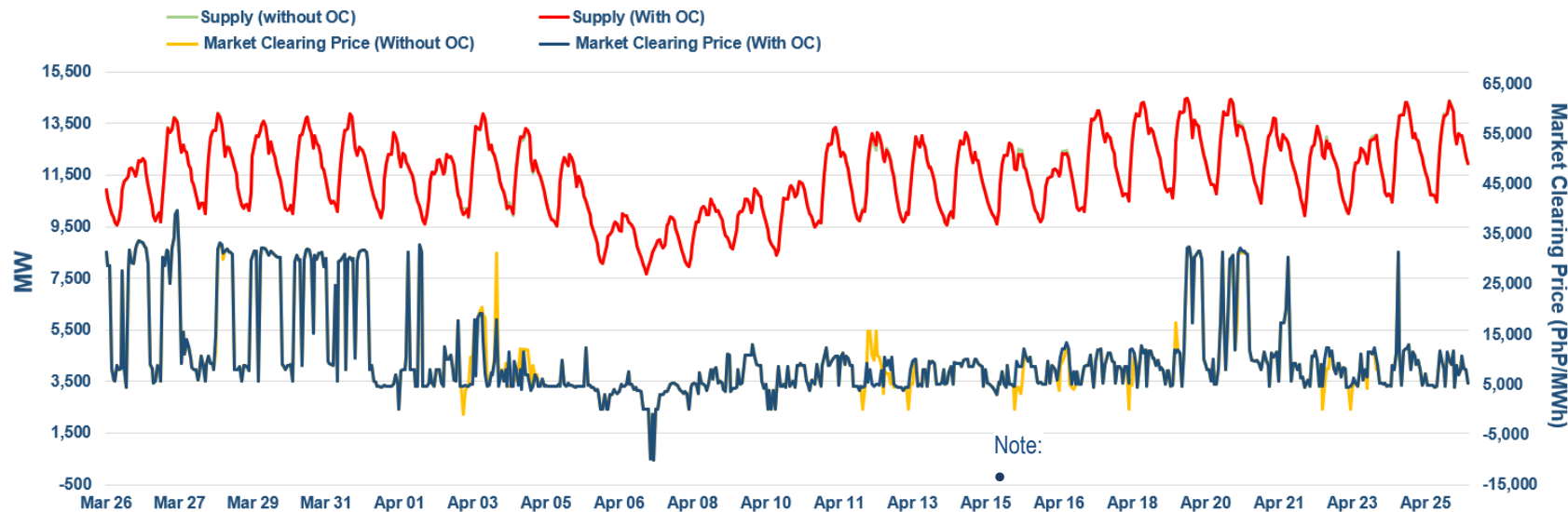
Based on the updates provided by the Independent Electricity Market Operator of the Philippines (IEMOP) and the System Operator as of 08 May 2023, the following were the updates on the **status of power plants under commissioning tests**:

- 1 Solar plant and 1 Hydro plant have **extended** their respective **commissioning test periods**.
- 1 Wind plant, 2 Solar plants, 1 BESS facility, and 1 coal plant were continuing their respective **commissioning test periods**.

Generally, the scheduled capacities imposed to plants undergoing commissioning tests were noted to be less than their registered capacity.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

PRICE IMPACT ON THE MARKET



Note:

- The simulation is assumed to be unconstrained.
- OC imposed with Commissioning Tests were not altered due to their restriction to submit offers through MMS.

The effects of impositions in terms of market prices may vary based on the offers of the over-ridden plants. It may be observed that when Hydro and Oil-based plants were imposed with OCs, there was an observed increase in the resulting market prices, at an average of **PHP 31.12/MWh**. Looking at the effects in terms of the supply, there was an observed decrease averaging at **5.30 MW** due to the scheduling of subject plants to lower levels of operations than being dispatched at their available capacities. However, it may also be noted that when Coal plants' offers are over-ridden, the market prices tend to increase brought about by the dispatch of plants with higher offered prices considering that these Coal plants had lower prices. Though there may be instances that OC impositions caused a decrease in the resulting market prices based on the simulation, it does not reflect the true cost of generation thereby affecting the outcomes of the market.

| Difference | MCP (PHP/MWh) | Supply (MW) |
|------------|------------------|----------------|
| Minimum | -7,456.20 | -273.00 |
| Average | -31.12 | 5.30 |
| Maximum | 13,370.60 | 191.00 |

* MCP Diff. = MCP (Without OC – With OC)

**Supply Diff. = Supply (With OC – Without OC)

| Date of Imposition | Plant Type |
|-----------------------|-------------|
| Apr 3-4, 12-13, 18-23 | Coal |
| Apr 13, 20, 23, 25 | Hydro |
| Apr 15-17, 22-23 | Natural Gas |
| Mar 26-31, Apr 13-20 | Oil - based |



MANDANA

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY CATEGORY

16,966

Total Impositions

93% of which were **security** limit.

10,460 OC impositions for
March 2023

62.2% increase

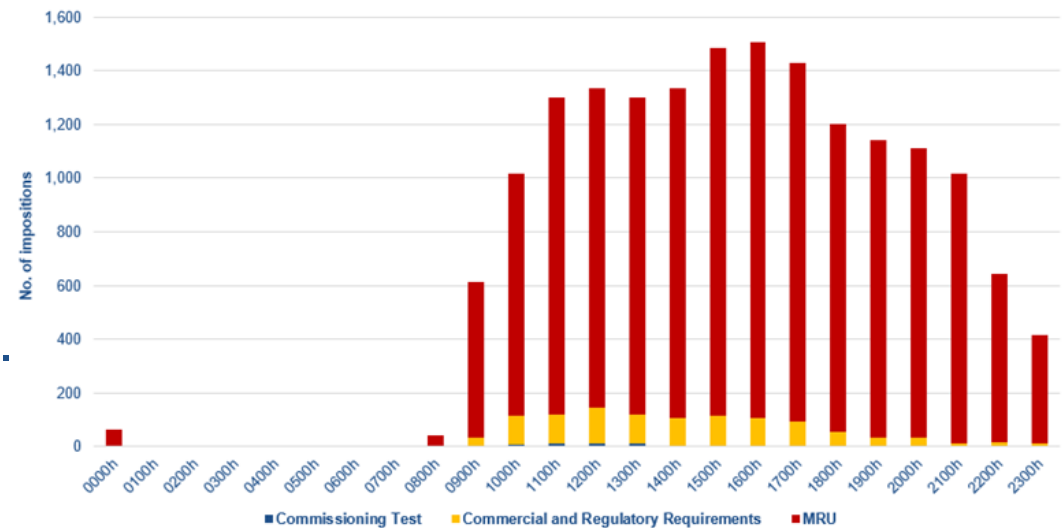


For April 2023, it was observed that the Mindanao region had a total of 16,966 OC impositions, a 62.2 percent increase from the previous billing period.

Note: Under the Dispatch Protocol Manual Issue 18.0, imposition of over-riding constraints falls into 2 categories – 1) security limit i.e., MRU and other types as may be recommended by SO and 2) non-security limit. Security limit is imposed to address possible threats in system security while non-security limit is related to 1) generating unit limitations, 2) commercial and regulatory requirements, and lastly, 3) conduct of commissioning test of plants.

The monitoring of the over-riding constraints is based on the data and information provided by MO (i.e., real time market results and MMS-input files on security limits) and SO (i.e., SO Data for Market Monitoring).

IMPOSITIONS BY HOUR



Majority of over-riding constraints imposed over a 24-hour period in Mindanao were for **Must-Run Units (MRUs)** constituting **93% of the total impositions**.

It can be observed that majority of the impositions, may it be non-security or security limits, were mainly imposed during peak hours when the demand is high.

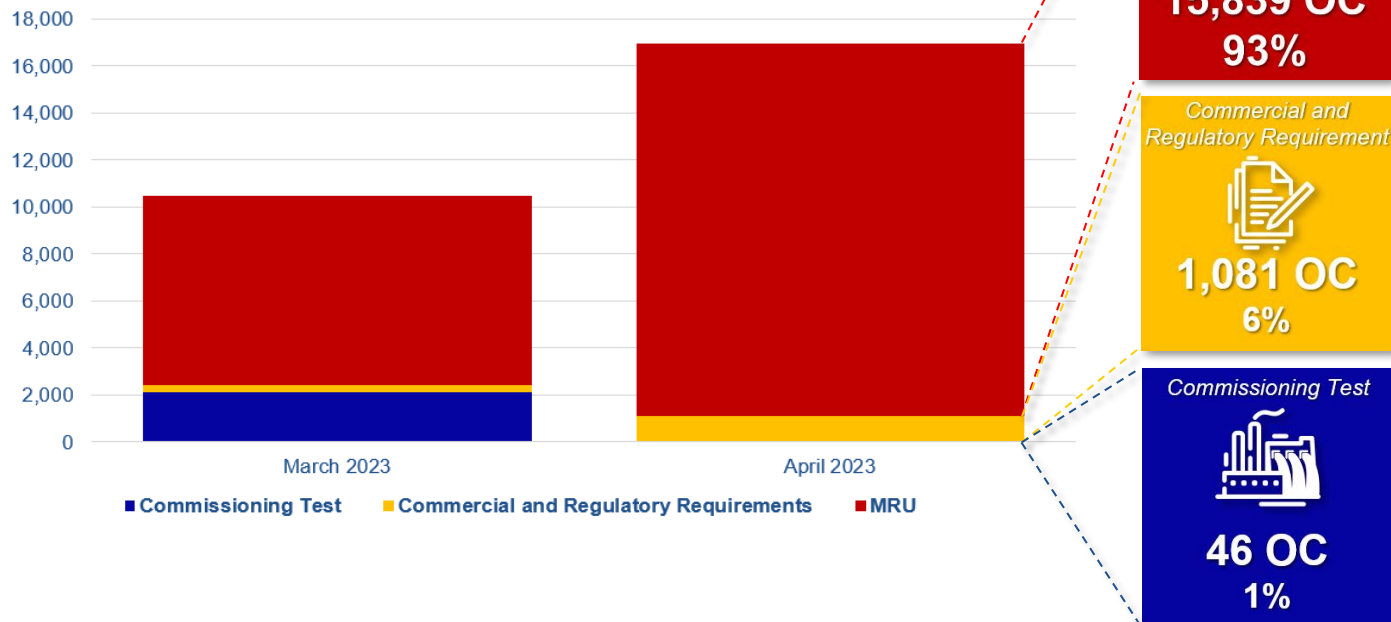
MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY INCIDENT

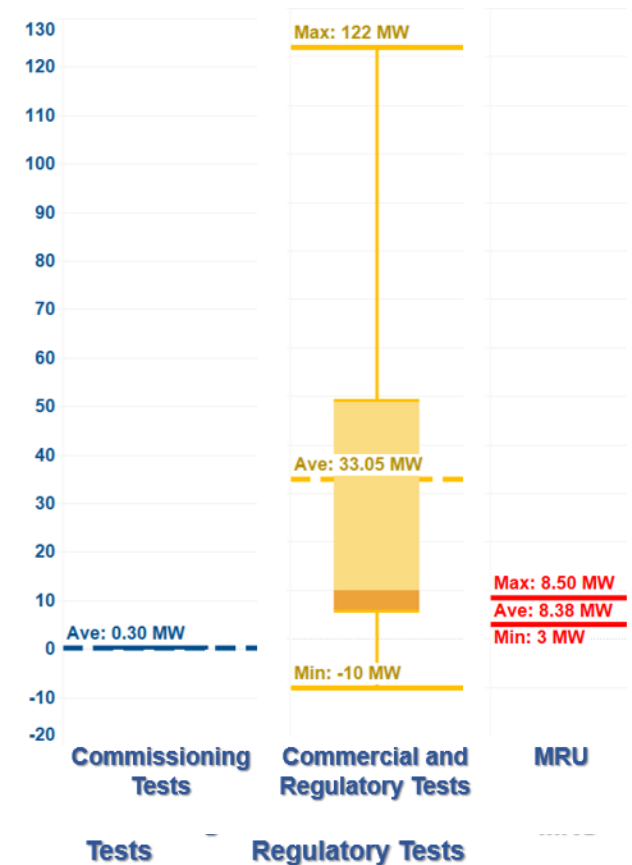
Most of the OCs in Mindanao were due to MRU impositions to address the system voltage requirement in the region. Increase in commercial and regulatory requirement impositions were attributed to the ancillary service and emission tests. Lastly, for plants under commissioning tests, it was noted that only one (1) plant was under this category.

Incidents related to commercial and regulatory requirements were imposed on plants with large capacities, specifically Coal plants, which had greater market impact than impositions for commissioning tests. It was however noted that despite the large capacities of these plants, majority were over-ridden to smaller capacities. Meanwhile, commissioning tests were mostly undertaken by renewable energy plants with relatively lower capacities.

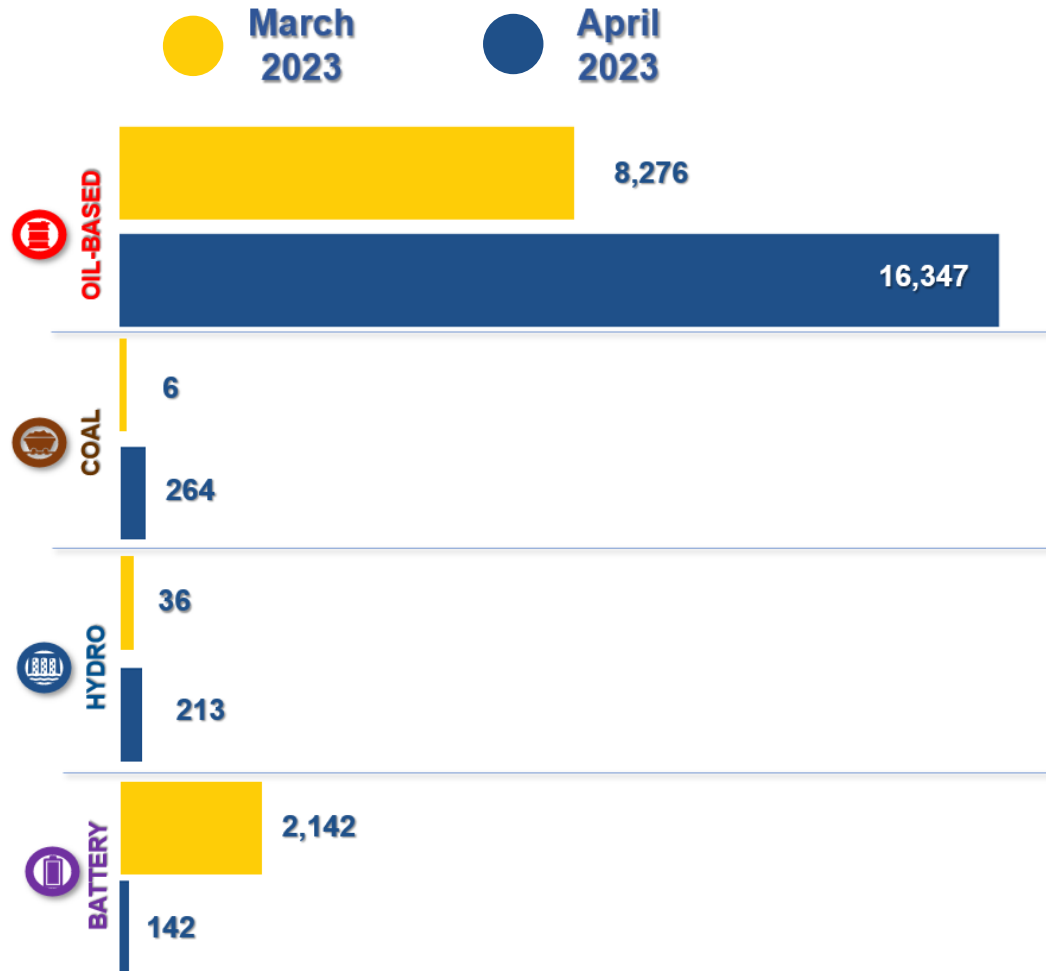
The graph (on the right) shows the scheduled capacities corresponding to the impositions.



SCHEDULED CAPACITIES



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS



IMPOSITIONS BY PLANT TYPE

Majority of the impositions in the Mindanao region were attributable to Oil-based plants, with Coal, Hydro, and BESS plants having a small share in the total impositions. The following were the reasons for the impositions per plant types:

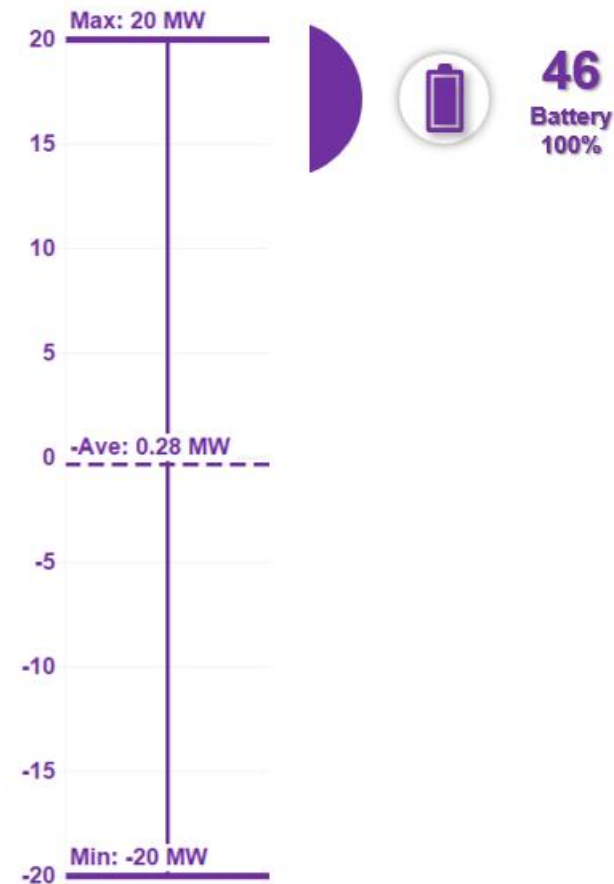
- Impositions to Oil-based plants were related to the dispatch of generators as MRUs in order address the system voltage requirement in the region.
- Impositions related to Coal plants were due to the conduct of ancillary service test.
- Conduct of commercial and regulatory requirement test was the reason for impositions related to Hydro plants during the billing period.
- Conduct of commissioning and ancillary service tests were the reason for impositions related to BESS.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

PLANTS ON COMMISSIONING TEST

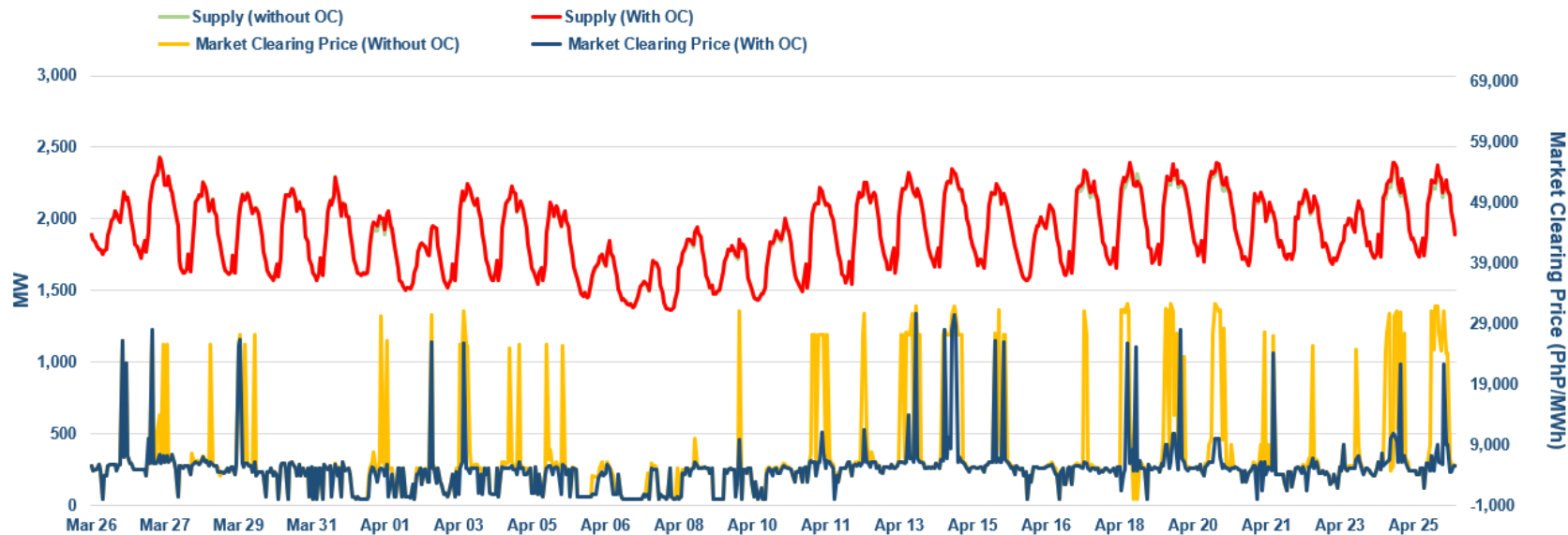
A total of **46 over-riding constraints impositions** was observed related to **commissioning tests**, with an average scheduled capacity of **-0.28 MW**. All of which were attributable to BESS plant, based on the updates provided by IEMOP and the System Operator as of 08 May 2023.

Generally, the scheduled capacities imposed to plants undergoing commissioning tests were noted to be less than their registered capacities.



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

PRICE IMPACT ON THE MARKET



| | MCP (PHP/MWh) | Supply (MW) |
|------------|------------------|----------------|
| Difference | | |
| Minimum | -19,133.10 | -53.00 |
| Average | 2,550.60 | 11.02 |
| Maximum | 29,857.85 | 71.00 |

Note:

- The simulation is assumed to be unconstrained.
- OC imposed with Commissioning Tests are not altered due to their restriction to submit through MMS.

When Hydro and Oil-based plants were imposed with OCs, there was an observed decrease in the resulting market prices that yielded an average price difference of **PHP 2,550.60/MWh**. Looking at the effect of impositions to the supply, a supply difference averaging at **11.02 MW** was likewise noted. The variability in supply difference is attributed to the offer behavior of the plants being imposed with OCs. Though there may be instances that OC impositions caused a decrease in the resulting market prices based on the simulation, it does not reflect the true cost of generation thereby affecting the outcomes of the market.

| Date of Imposition | Plant Type |
|--------------------|-------------|
| Apr 14 | Battery |
| Apr 18-19 | Coal |
| Apr 1-2, 11-12 | Hydro |
| Mar 26 - Apr 25 | Oil - based |

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

ANNEX A. LIST OF PLANTS WITH OVER-RIDING CONSTRAINTS¹

| Plant/Unit Name | Plant Type | Registered Capacity (MW) ² |
|---|------------|---------------------------------------|
| LUZON | | |
| Arayat-Mexico Solar Power Plant Project Phase 2 | Solar | 30.9 |
| Balaoi and Caunayan Wind Power Project Phase 1 | Wind | 80 |
| Concepcion Battery Energy Storage System | Battery | 60 |
| Currimaos 2 Solar Power Plant | Solar | 68.7 |
| Magat Hydroelectric Power Plant Unit 1 | Hydro | 97 |
| Magat Hydroelectric Power Plant Unit 2 | Hydro | 97 |
| Mariveles Coal-fired Thermal Power Plant- Phase 1 | Coal | 150 |
| Masinloc Coal-Fired Thermal Power Plant Unit 1 | Coal | 315 |
| Pinugay Solar Power Plant | Solar | 75 |
| Caliraya Hydro Electric Power Plant | Hydro | 28 |
| Pililla Diesel Power Plant Sector 1 | Oil-Based | 28 |
| Pililla Diesel Power Plant Sector 2 | Oil-Based | 22 |
| Pililla Diesel Power Plant Sector 3 | Oil-Based | 22 |
| Pililla Diesel Power Plant Sector 4 | Oil-Based | 28 |
| Pililla Diesel Power Plant Sector 5 | Oil-Based | 22 |
| Pililla Diesel Power Plant Sector 6 | Oil-Based | 28 |
| Malaya Thermal Power Plant Unit 2 | Oil-Based | 130 |

¹ In accordance with the Market Operator Information Disclosure and Confidentiality (MO IDC) Manual Issue 7.0

² As of 02 June 2023

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

| Plant/Unit Name | Plant Type | Registered Capacity (MW) ² |
|---|-------------|---------------------------------------|
| Pagbilao 3 Power Plant | Coal | 420 |
| QPPL Coal-Fired Power Plant | Coal | 460 |
| SBPL Coal Fired Power Plant | Coal | 455 |
| Sta. Rita Natural Gas Power Plant 2 | Natural Gas | 255.7 |
| San Lorenzo Combined-Cycle Gas Turbine Power Plant Unit 60 (San Lorenzo CCGTPP) | Natural Gas | 265 |
| VISAYAS | | |
| Tubig Hydroelectric Power Plant | Hydro | 15.2 |
| CPPC Bunker C-Fired Diesel Power Plant Unit 1 | Oil-Based | 6.5 |
| CPPC Bunker C-Fired Diesel Power Plant Unit 2 | Oil-Based | 6.5 |
| CPPC Bunker C-Fired Diesel Power Plant Unit 3 | Oil-Based | 6.5 |
| CPPC Bunker C-Fired Diesel Power Plant Unit 4 | Oil-Based | 6.5 |
| EAUC Bunker C-Fired Power Plant Unit 1 | Oil-Based | 11.5 |
| EAUC Bunker C-Fired Power Plant Unit 2 | Oil-Based | 11 |
| EAUC Bunker C-Fired Power Plant Unit 3 | Oil-Based | 11.5 |
| EAUC Bunker C-Fired Power Plant Unit 4 | Oil-Based | 11.5 |
| Unit 1 Calumangan Bunker C-Fired Diesel Power Plant | Oil-Based | 4.5 |
| Unit 2 Calumangan Bunker C-Fired Diesel Power Plant | Oil-Based | 4.5 |
| Unit 3 Calumangan Bunker C-Fired Diesel Power Plant | Oil-Based | 4.5 |
| Unit 4 Calumangan Bunker C-Fired Diesel Power Plant | Oil-Based | 6.7 |
| Unit 5 Calumangan Diesel Power Plant | Oil-Based | 6.7 |
| Power Barge 104 Unit 1 | Oil-Based | 7 |

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

| Plant/Unit Name | Plant Type | Registered Capacity (MW) ² |
|--|------------|---------------------------------------|
| Timbaban Hydro Power Plant | Hydro | 18.9 |
| MINDANAO | | |
| Misamis Occidental Bunker C-Fired Diesel Power Plant 3 | Oil-Based | 15.5 |
| Misamis Occidental Bunker C-Fired Power Plant 2 | Oil-Based | 15.7 |
| Bunker-C Fired Diesel Power Plant Unit 1 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 2 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 3 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 4 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 5 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 7 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 8 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 9 | Oil-Based | 10.7 |
| Bunker-C Fired Diesel Power Plant Unit 10 | Oil-Based | 10.7 |
| Agus I Hydroelectric Power Plant Unit 1 | Hydro | 35 |
| Agus I Hydroelectric Power Plant Unit 2 | Hydro | 35 |
| Agus II Hydroelectric Power Plant Unit 2 | Hydro | 60 |
| Iligan Diesel Power Plant (Units 1-19) | Oil-Based | 102 |
| Jasaan Battery Energy Storage System | Battery | 20 |
| Bukidnon Bunker C-Fired Diesel Power Plant 2 | Oil-Based | 7.5 |
| Villanueva Battery Energy Storage System | Battery | 20 |
| Mobile 1 Bunker C-Fired Power Plant Unit 1 | Oil-Based | 49 |
| Mobile 1 Bunker C-Fired Power Plant Unit 2 | Oil-Based | 50 |

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

| Plant/Unit Name | Plant Type | Registered Capacity (MW) ² |
|---------------------------------|------------|--|
| Phase1 Coal - Fired Power Plant | Coal | 118.5 |
| Phase 2 Coal-Fired Power Plant | Coal | 118.5 |