

Over-riding Constraints Report for 2nd Quarter of 2024

26 March to 25 June 2024

August 2024

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Philippine Electricity Market Corporation –
Market Assessment Group
and approved by the
Market Surveillance Committee

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The information contained in this document is based on data that are subject to continuous verification by the Philippine Electricity Market Corporation (PEMC). The same information is subject to change as updated figures come in.

TABLE OF CONTENTS

1. OVER-RIDING CONSTRAINTS MONITORING	1
1.1. Over-riding Constraints by Category	1
1.2. Over-riding Constraints by Incidents	3
1.3. Over-riding Constraints by Plant Type	6
1.4. Plants under Commissioning Test	7

LIST OF TABLES

Table 1. Summary of Over-riding Constraints by Category	1
Table 2. Summary of Over-riding Constraints by Category per Region	2
Table 3. Summary of Over-riding Constraints by Incidents	3
Table 4. Year-on-Year Comparison of Over-riding Constraints per Incidents	5
Table 5. Quarterly Comparison of Over-riding Constraints per Incidents	5
Table 6. Quarterly Comparison of Over-riding Constraints by Plant Type	6
Table 7. List of Power Plants with Extended Commissioning Test as of June 2024	8

LIST OF FIGURES

Figure 1. Monthly Comparison of Over-riding Constraints, by Category	1
Figure 2. Comparison of Over-riding Constraints by Category, 2023 vs 2024	2
Figure 3. Monthly Comparison of Over-riding Constraints, by Region	3
Figure 4. Monthly Comparison of Over-riding Constraints, by Incidents	4
Figure 5. Comparison of Over-riding Constraints by Incidents, 2023 vs 2024	4
Figure 6. Hourly Profile of Over-riding Constraints Imposition per Incident	6
Figure 7. Over-riding Constraints by Plant Type for 2024	7
Figure 8. Monthly Comparison of Over-riding Constraints, by Plant Type	7
Figure 9. Monthly Comparison of Over-riding Constraints due to Commissioning Test and the Corresponding Number of Power Plants	9

1. OVER-RIDING CONSTRAINTS MONITORING

In accordance with Section 1.6.2 of the WESM Rules and Sections 3.1 and 5.5 of the Market Surveillance Manual, the Market Surveillance Committee (MSC) shall undertake an assessment and analysis on the results of the monitoring of over-riding constraints¹ imposed by the System Operator (SO) on generators. Hence, this report is prepared covering the period of the 2nd quarter of 2024 (26 March to 25 June 2024).

1.1. Over-riding Constraints by Category

For the quarter in review, there was an observed increase of 25% in the total number of over-riding constraints by the System Operator. Similar to the previous quarterly and monthly reports, over-riding constraints² impositions (see Table 1) were dominated by non-security limit comprising of 97% of the total impositions for the period. The remaining impositions were categorized as security limits which were all related to Must Run Units (MRUs) of oil-based plants and experienced an 81% increase in order to address the system voltage requirements in the market. Generally, from the 1st quarter of 2024, the trend (see Figure 1) showed a continuing increase in the impositions towards the end of the 1st half of the year which can be attributed to several reasons (details of which are in Section 1.2 of the report).

Table 1. Summary of Over-riding Constraints by Category

By Category	Q1			Q2			Change	
	January	February	March	April	May	June	No. of Events	% Change
Non-Security Limit	84,091	100,288	80,626	98,259	108,999	114,912	57,165	▲ 22%
Security Limit	5,643	4,561	3,629	7,855	10,789	6,415	11,226	▲ 81%
Total	89,734	104,849	84,255	106,114	119,788	121,327	68,391	▲ 25%

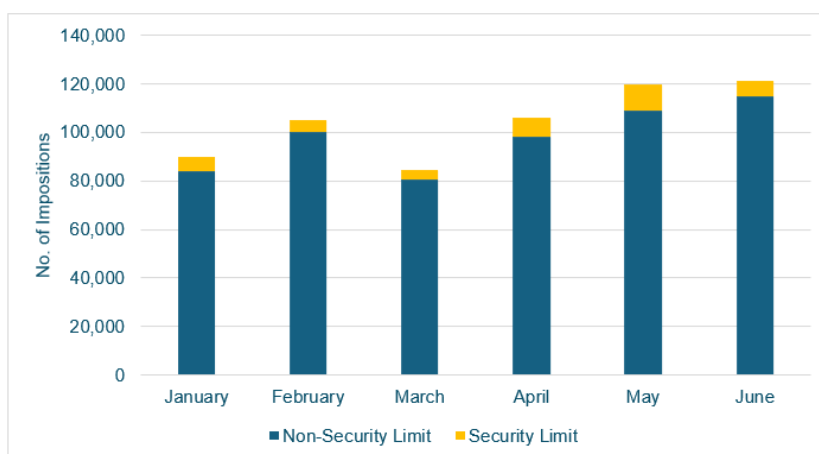


Figure 1. Monthly Comparison of Over-riding Constraints, by Category

¹ WESM Rules Clause 3.5.13.1 states that the SO may require the Market Operator (MO) to impose constraints on the power flow, energy generation of a specific facility in the grid to address system security threat, to mitigate the effects of a system emergency, or to address the need to dispatch generating units to comply with systems, regulatory and commercial tests requirements.

² The monitoring of the over-riding constraints on generators is done on a per generator trading node per trading interval. A constraint imposed on a generator trading node on a particular trading interval is considered as one **over-riding constraints**. 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).

The monitoring of over-riding constraints in Mindanao was incorporated into the assessment reports starting April 2023 billing period following the commencement of the WESM in the region. Comparing with 2023 impositions and as illustrated in Figure 2, the increase in the number of over-riding constraints impositions was observed mainly due to the aforementioned inclusion of the Mindanao region. Though the reason of impositions varies, the inclusion of the region in the grid contributed to the rise of the total events (further details on the last year's monitoring and effect of the commencement of WESM in Mindanao are discussed in the 2023 Annual Over-riding Constraints Monitoring Report³).

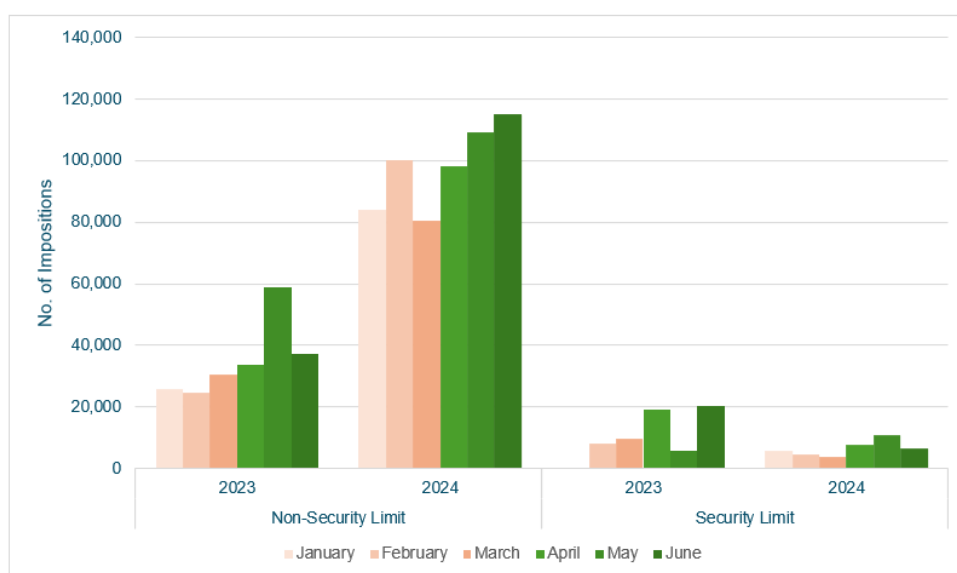


Figure 2. Comparison of Over-riding Constraints by Category, 2023 vs 2024

Most over-riding constraints were imposed in Luzon, with about 79% of the total impositions. Meanwhile, the over-riding constraints related to Visayas plants came in second with 11% while Mindanao came in last with 10% share which were mostly caused by the need of the region to address its system voltage requirements by scheduling oil-based plants as MRUs. Compared with the previous quarter, there has been a significant increase noted for all the regions but with a notable rise observed in the Visayas and Mindanao region attributable to MRU-related impositions and commissioning tests. Generally, a significant rise in the total impositions occurred during the 2nd quarter of 2024.

Table 2. Summary of Over-riding Constraints by Category per Region

By Category	Q1			Q2			Change	
	January	February	March	April	May	June	No. of Events	% Change
Luzon	82,621	93,711	68,063	90,085	90,178	95,154	31,022	▲ 13%
Visayas	462	3,455	7,365	7,326	18,191	12,638	26,873	▲ 238%
Mindanao	6,651	7,683	8,827	8,703	11,419	13,535	10,496	▲ 45%
Total	89,734	104,849	84,255	106,114	119,788	121,327	68,391	▲ 25%

³ <https://www.wesm.ph/market-outcomes/over-riding-constraints-report/annual-over-riding-constraints-report>

The historical trend for the 1st half of 2024 showed that, on average, there was a consistent increase in the number of impositions across all regions (See Figure 3), which indicates a surge in the number of imposed constraints on the power flow, energy generation of a specific facility in the grid to address system security threat, to mitigate the effects of a system emergency, or to address the need to dispatch generating units to comply with systems, regulatory, and commercial tests requirements.

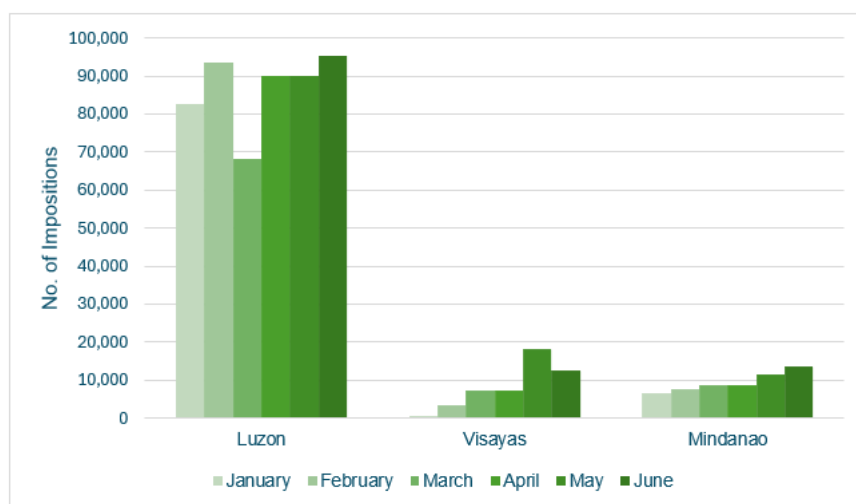


Figure 3. Monthly Comparison of Over-riding Constraints, by Region

1.2. Over-riding Constraints by Incidents

Further looking at the reason for the impositions in Table 3, it can be observed that for the 1st half of the year, security limit incidents are all imposed on oil-based plants as MRUs. For non-security limits, conduct of commissioning tests remained to be the major reason of plants with over-riding constraints, either related to the entry of new plants to the market or those with extended commissioning tests. This was followed by several tests related to the commercial and regulatory requirements of plants.

Table 3. Summary of Over-riding Constraints by Incidents

Incidents	January	February	March	April	May	June
Per Security Limit						
Must Run Units	5,643	4,561	3,629	7,855	10,789	6,415
Emergency De-Rating/Outage of Specific Transmission	-	-	-	-	-	-
Other Types	-	-	-	-	-	-
Total	5,643	4,561	3,629	7,855	10,789	6,415
Per Non-security Limit						
Testing and Commissioning	45,447	66,842	69,945	88,327	85,633	110,642
Commercial and Regulatory Requirements	38,644	33,446	10,681	9,932	23,366	4,270
Generating Unit Limitations	-	-	-	-	-	-
Total	84,091	100,288	80,626	98,259	108,999	114,912

Impositions related to the conduct of commissioning tests were increasing steadily mainly due to commencement of testing of nine (9) new plants during the covered billing period, as shown in Figure 4. Meanwhile, over-riding constraints caused by the commercial and regulatory requirements

decreased towards the end of the quarter following the completion of the necessary testing during the plants’ commercial operations.

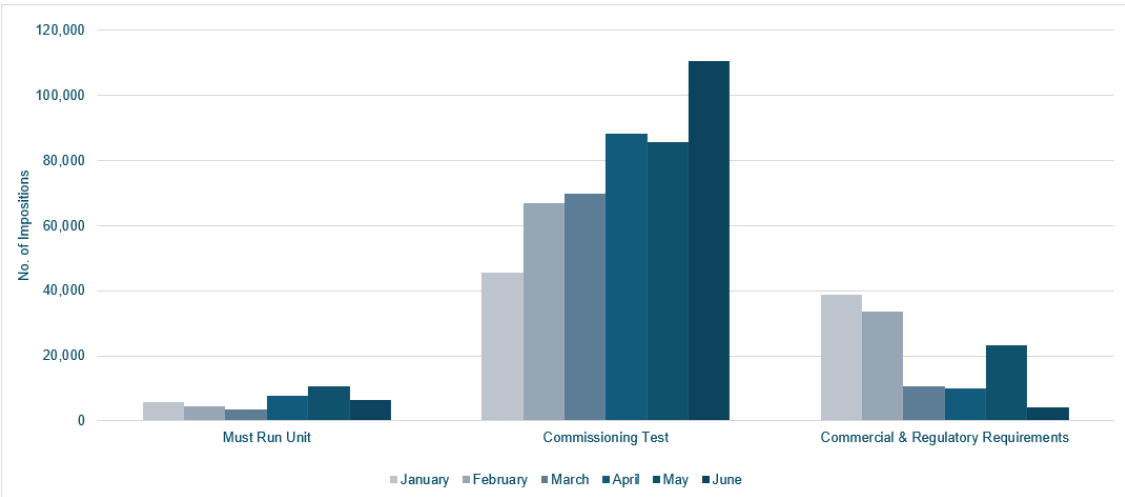


Figure 4. Monthly Comparison of Over-riding Constraints, by Incidents

Examining the number of impositions implemented using the same period from last year, it can be seen in Figure 5 that a significant increase in the impositions related to conduct of commissioning test were prevalent, reaching a 310% increase from the same period from last year. It is likewise notable that the inclusion of Mindanao in the monitoring of over-riding constraints started in April 2023.

Another notable observation was the decrease of about 57% in the impositions related to MRUs from last year indicating the decline in the need for oil-based plants to address any system voltage requirements in the market. Meanwhile, the surge noted for commercial and regulatory requirements of about 243% from last year was mainly due to the conduct of performance test of natural gas plants related to shifting to Liquefied Natural Gas (LNG) fuel.

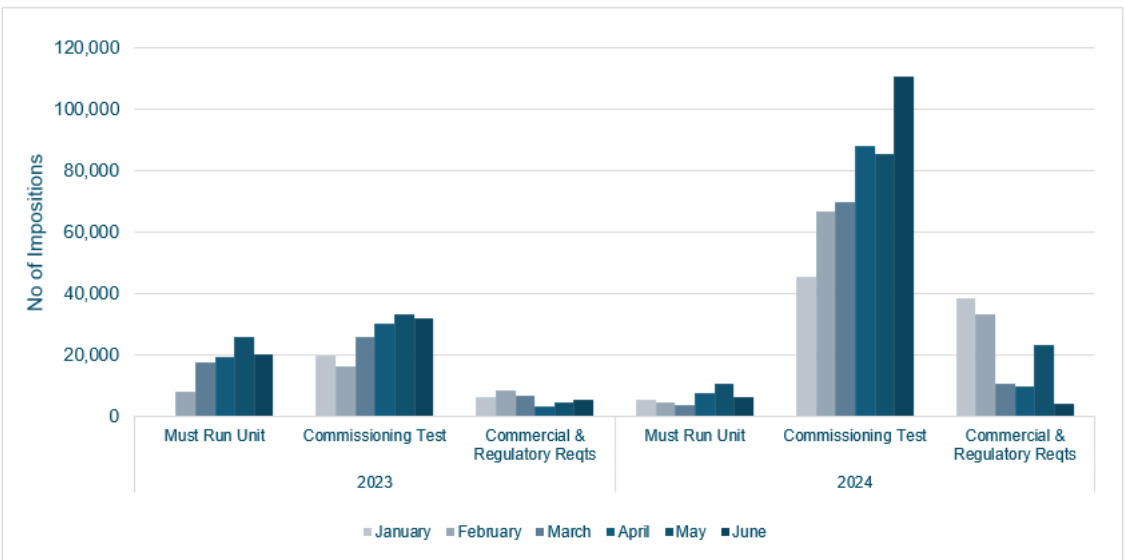


Figure 5. Comparison of Over-riding Constraints by Incidents, 2023 vs 2024

Table 4. Year-on-Year Comparison of Over-riding Constraints per Incidents

Incidents	Year-on-Year Comparison		
	Must Run Unit	Commissioning Test	Commercial & Regulatory Reqts
January	▲	▲	▲
February	▼	▲	▲
March	▼	▲	▲
April	▼	▲	▲
May	▼	▲	▲
June	▼	▲	▼

Overall, there was an observed increase in the total number of over-riding constraints impositions. However, looking closely at the actual incidents, commissioning tests remained to be the top reason for the recorded impositions for the past two (2) quarters. While the MRU and performance test interchangeably come second. The drop noted for the performance test was attributable to the end of impositions related to the testing of new LNG of natural gas plants. Despite the dip observed during the 2nd quarter, impositions attributed to the Ancillary Service test remained in the top 4 reasons. Further, there was an observed significant surge in the number of impositions caused by the emission test during the covered period. The abovementioned tests were distantly followed by the conduct of capacity / capability, net contracted, and dependable tests. Meanwhile, there were impositions noted during the 1st quarter of the year which were not observed during the 2nd quarter such as the conduct of ERC Audit, and Net Contracted Capacity (NCC) and Net Dependable Capacity (NDC) tests.

Table 5. Quarterly Comparison of Over-riding Constraints per Incidents

By Incidents	Q1 2024				Q2 2024				Q-on-Q Comparison
	January	February	March	Total	April	May	June	Total	
Ancillary Service Test	7,130	1,761	4,166	13,057	654	6,336	1,664	8,654	▼
Capacity Test	-	-	-	-	204	-	12	216	▲
NCC Test	599	-	-	599	-	23	-	23	▼
NDC Test	4,320	157	-	4,477	-	-	-	-	▼
Capability Test	-	-	230	230	24	825	-	849	▲
Commissioning Test	45,447	66,842	69,945	182,234	88,327	85,633	110,642	284,602	▲
Emission Test	601	847	533	1,981	2,423	1,133	1,108	4,664	▲
Grid Compliance Test	144	2,287	3,825	6,256	105	-	-	105	▼
MRU	5,643	4,561	3,629	13,833	7,855	10,789	6,415	25,059	▲
Performance Test	25,800	28,094	1,927	55,821	6,522	15,049	1,486	23,057	▼
Heat Rate Test	-	300	-	300	-	-	-	-	▼
ERC Audit	50	-	-	50	-	-	-	-	▼
Total	89,734	104,849	84,255	278,838	106,114	119,788	121,327	347,229	▲

Figure 6 illustrates the trend of over-riding constraints throughout the day during the covered period. It is evident that a notable increase in the over-riding constraints occur from early morning until early evening, specifically starting at 0500h and begins to decrease at 2000h. This was mainly on account of the conduct of commissioning tests of solar plants and most plants conducting their commercial and regulatory requirements test during the peak hours.

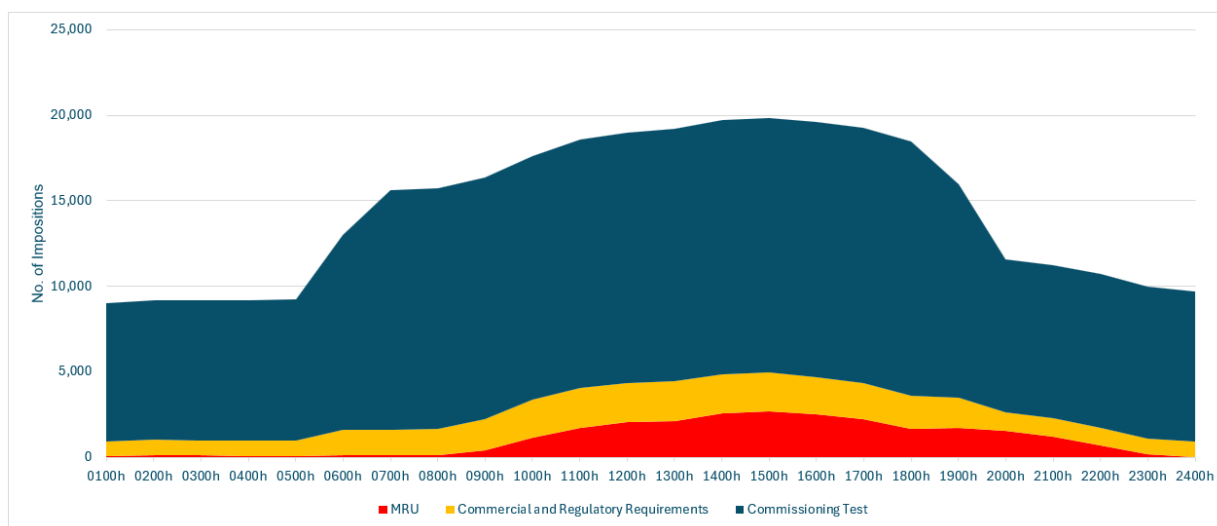


Figure 6. Hourly Profile of Over-riding Constraints Imposition per Incident

1.3. Over-riding Constraints by Plant Type

Overall, renewable energy plants continue to accumulate the greatest number of impositions during the covered period. Across the quarter, solar plants topped the list accounting for 31% of the total impositions attributed to the extended commissioning tests observed during the period, followed by wind plants at 16%.

Aside from the renewable energy plants, there were notable impositions recorded for geothermal and hydro plants related to the conduct of commissioning tests. During the period, there has been an observed declining trend in the impositions related to conventional plants, such as coal plants, caused by the end of commissioning test of Mariveles CFTPP Unit 2. Compared with the previous quarter, a significant decline in the impositions to natural gas plants conducting performance tests for the shifting to LNG fuel was observed. Meanwhile, impositions related to biomass were noted to be declining during the period.

Table 6. Quarterly Comparison of Over-riding Constraints by Plant Type

Plant type	Q1				Q2				Q-on-Q Comparison
	January	February	March	Total	April	May	June	Total	
Battery Energy Storage	566	533	556	1,655	890	5,384	6,153	12,427	▲
Biomass	60	1,941	4,318	6,319	88	4,594	-	4,682	▼
Coal	8,926	18,730	11,992	39,648	15,738	10,176	10,722	36,636	▼
Geothermal	2,475	10,511	11,190	24,176	13,921	16,968	19,655	50,544	▲
Hydro	9,724	9,733	14,285	33,742	13,306	13,958	16,917	44,181	▲
Natural Gas	29,116	27,048	432	56,596	486	888	5,849	7,223	▼
Oil-based	9,188	4,480	7,161	20,829	9,919	11,863	6,732	28,514	▲
Solar	20,784	22,961	20,075	63,820	33,411	36,007	37,134	106,552	▲
Wind	8,895	8,912	14,246	32,053	18,355	19,950	18,165	56,470	▲
Total	89,734	104,849	84,255	278,838	106,114	119,788	121,327	347,229	▲

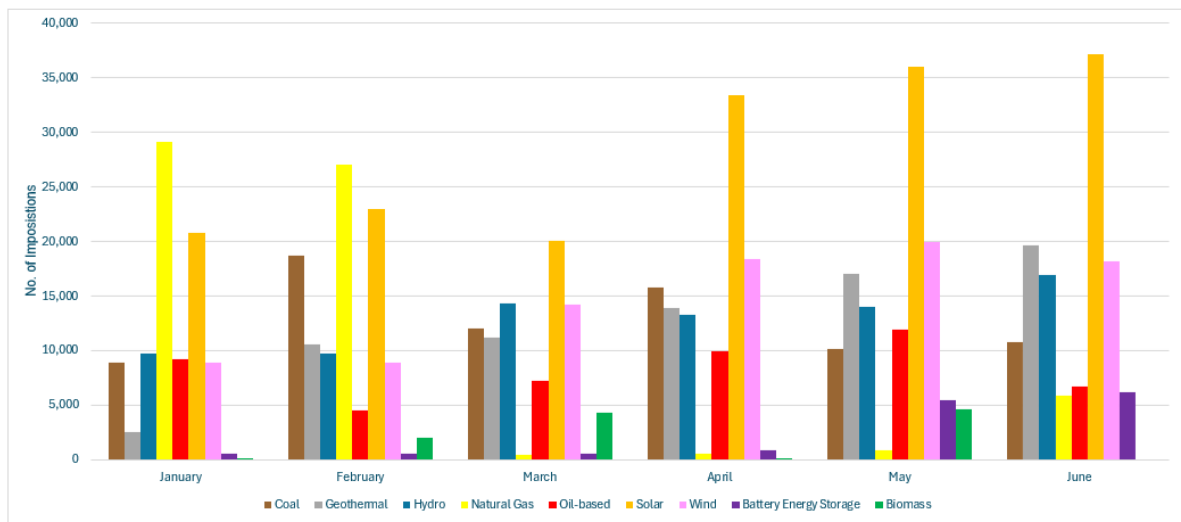


Figure 7. Over-riding Constraints by Plant Type for 2024

Looking at the impositions on a monthly basis for the 1st half of the year (see Figure 8), there was an observed increasing trend across all plant types except for biomass, natural gas, and oil-based, and coal plants which showed an opposite trend with a decreasing trend towards the end of the quarter, with the aforementioned completion of testing by one (1) coal power plant.

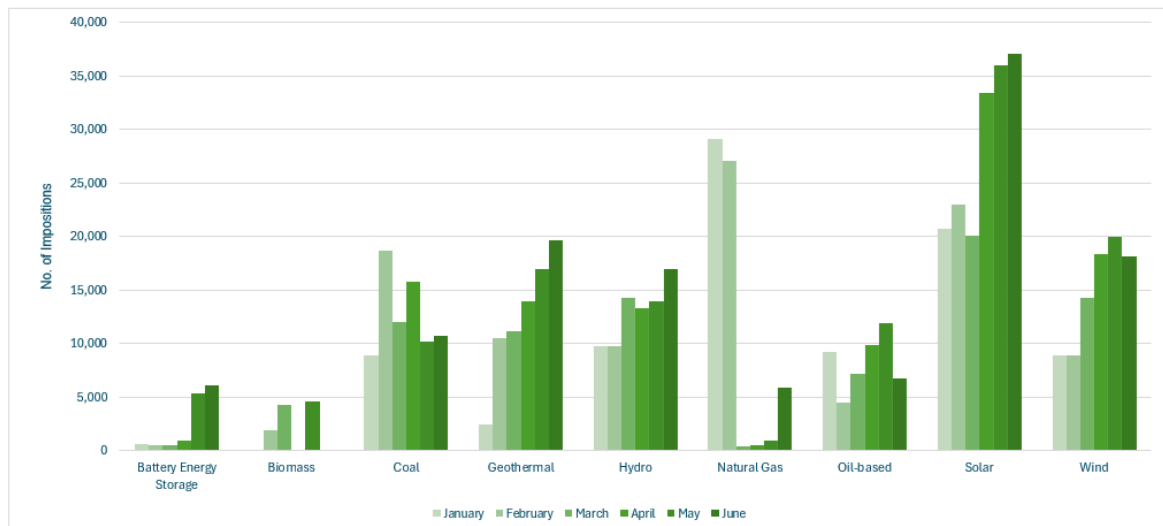


Figure 8. Monthly Comparison of Over-riding Constraints, by Plant Type

1.4. Plants under Commissioning Test

As part of its mandate under the Market Surveillance Manual to regularly monitor the participants' over-riding constraints impositions, especially those plants under commissioning tests, the MSC regularly coordinated with both Market and System Operators, as well as the power plants as to the reasons for the reported extended tests. The received responses were counter-checked if the same are aligned with the procedures set forth in the Market Rules and Manuals and other relevant issuances.

Throughout the covered period in review, conduct of commissioning test remained the dominant reason of power plants for over-riding constraints impositions. As compared to the 1st quarter, there was a 56% increase in the total number of impositions attributed to the abovementioned test. One of the reasons was the observed commencement of commissioning test at the start of the quarter of six (6) plants of the following Luzon plants:

- Gamu Battery Energy Storage System (BESS)
- Ibulao Hydroelectric Power Project (HEP)
- Laoag Solar Power Plant (SPP)
- Calabanga SPP
- Lumban BESS
- Tiwi Geothermal Binary Power Plant

In addition, Central Azucarera de San Antonio (CASA) Biomass Co-Generation Power Plant and Nabas Wind Power Plant Phase 2 (Nabas-2) in Visayas, and Siguil HEP in Mindanao likewise commenced their respective commissioning during the covered period.

Also, there have been a few extensions granted to the power plants as shown in Table 7, for the conduct of its commissioning tests. Pursuant to the DOE Department Circular No. DC2021-06-0013⁴, the prescribed period of commissioning test is only two (2) months with one (1) month allowable extension subject to the reasons allowed under the Circular.

Table 7. List of Power Plants with Extended Commissioning Test as of June 2024

Plant Type	Power Plants	No. of Observed Extension/s
Battery	Gamu BESS	1
Coal	MPGC U3	5
Geothermal	Palayan Binary PP	5
Hydro	Matuno HEP	7
	Ibulao HEP	3
Natural Gas	Batangas CCPP U1	1
Solar	Cagayan North SPP	5
	Cayanga-Bugallon SPP	3
	Calabanga SPP	1
	Balaoi Caunayan SPP	11
	Laoag Solar	1
	Subic PV Solar	2
	Pavi Green SPP	3
Wind	Caparispisan WPP	2
	PWEI Nabas WPP	2

As shown in Figure 9, renewable energy plants such as solar and wind plants under commissioning

⁴ Adopting a General Framework Governing the Test and Commissioning of Generation Facilities for Ensuring Readiness to Deliver Energy to the Grid or Distribution Network

test continues to dominate the total impositions across the six-month period as identified in Table 7 wherein such resource types received multiple extensions. Similar reasons contributed to the persistent rise of impositions to geothermal plants towards the end of the billing period. Meanwhile, the observed decline in May 2024 for hydro was attributed to the completion of commissioning test and issuance of Final Certificate of Approval to Connect (FCATC) to Lower Labayat HPP. The decrease in the coal-related impositions was also caused by the issuance of FCATC to Mariveles CFTPP Unit 2. One (1) natural gas plant also has started its commissioning period on June 2024 billing period.

As early as 2015, the MSC continuously coordinated with the NGCP-SO as well as the concerned power plants in relation to the observations of the Committee in over-riding constraints impositions particularly due to commissioning tests. During the first half of 2024, the MSC has sent formal letters of inquiry to all generator trading participants that exceeded the 2-month allowable period of commissioning test as well as the 1-month acceptable extensions.

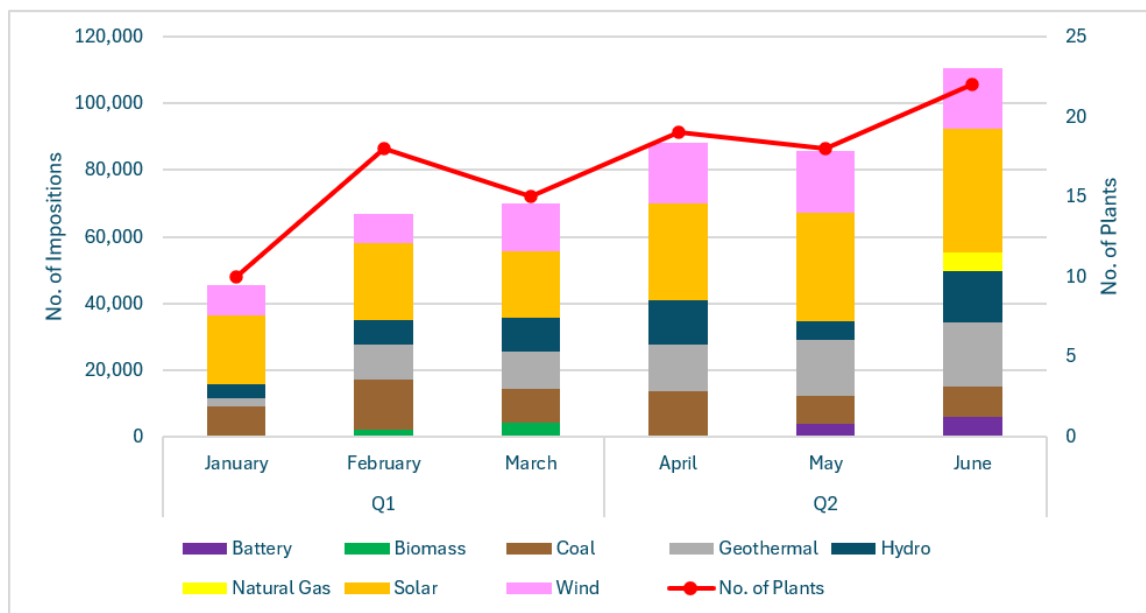


Figure 9. Monthly Comparison of Over-riding Constraints due to Commissioning Test and the Corresponding Number of Power Plants