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Customer Bulletin 2024-12

# ANCILLARY SERVICES

## What are Ancillary Services (AS)?

Ancillary Services (AS) refer to a set of support functions that are essential for maintaining the reliability, stability, and overall operational efficiency of the Grid. These services are necessary to manage the dynamic nature of electricity generation, consumption, and transmission. Ancillary services play a crucial role in ensuring that the power system operates securely and reliably by providing voltage regulation, frequency control, and start-up power after a system blackout.

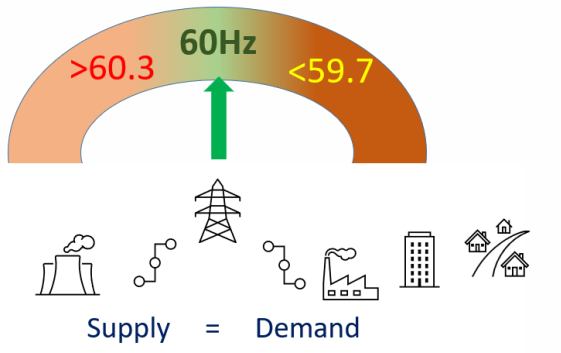
These are provided by a combination of traditional power plants, energy storage systems, demand response programs, and advanced Grid control technologies which are procured and managed by the System Operator. The Ancillary Services provided by traditional power plants and energy storage systems are Ancillary Services in the form of Reserves.

## Why do we need AS?

Energy from power plants are transmitted through the Grid and Distribution Utility (DU) systems in order to reach the End-users (electricity customers). This bulk energy in thousands of Watts are provided by several power plants of different technologies, operating at different levels at the same time. On the other hand, End-users operate their equipment, machineries, and appliances at different levels also. If the Grid is unstable, the bulk energy will not reach the End-users. Thus, it is of utmost priority that the Grid remain stable and secure so the bulk energy from power plants are able to be transmitted and reach the End-users safely, without causing damage to any portion of the system. This is the supply-demand balance that is being maintained through the provision of Ancillary Services by certified power plants.

The supply-demand balance is maintained through frequency control and voltage control. In the extreme case of a system blackout, the re-energization of the Grid is also made possible by Ancillary Services.

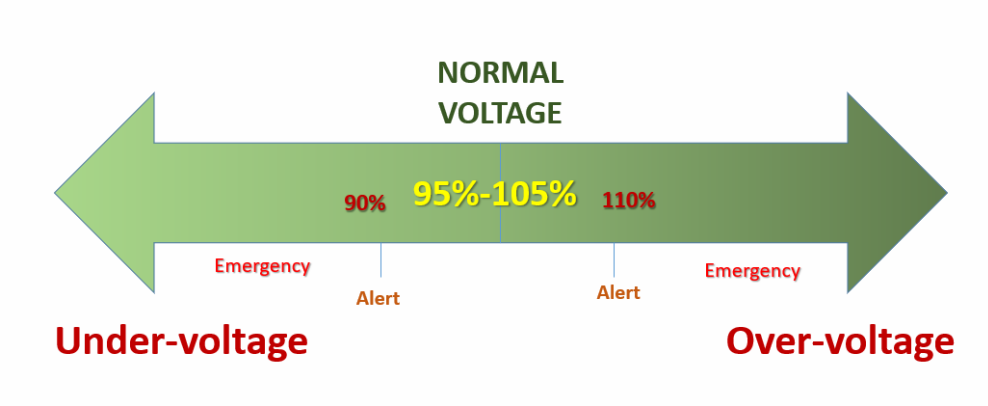
## Why do we need to maintain the system frequency near 60Hz?



The Philippines' Grid frequency should be maintained near or equal to 60Hz, or 60 cycles per second, as this means that all generators within the Grid are synchronized and operate at the same speed. A major event can cause a severe imbalance between supply and demand which can cause a generator, some, or all, of the generators to accelerate (run faster), or decelerate (run slower), depending on the type and severity of the event. Cumulative turbine damage can occur if change in frequency is not properly arrested in time. Cumulative turbine damage means that for every occurrence of frequency imbalance, the damage adds up and its tolerance to such occurrence decreases over time.

If a generating unit becomes out-of-synch, imbalance in frequency may even travel through the Grid and cause instability to other generators. Protection and control systems are in place to isolate faulted portions of the Grid, or restore the balance between supply and demand, and prevent cascading tripping of generating units. If only the "unhealthy" portion of the system is successfully isolated in time, the unaffected areas of the Grid can return to normal operations. Off frequency operation can also cause damage to (malfunction in) motors as well as co-generation facilities of other users of the grid.

Why do we need to maintain the Grid voltages at specific values?




The power system (generators, transmission facilities, distribution utility facilities) is just like our gadgets and appliances at home. They have to operate within its specified voltage level in order for it to work properly. If your 110V appliance is plugged to a 220V source, your appliance may explode or overheat, and will need to be replaced. This applies to the power system. In the Philippine Grid Code, the standard for voltages is to maintain it within +/-5% to be considered within normal limits. Typically, overvoltage can damage insulation of an equipment and pose as subsequent health and safety hazard. Undervoltage, on the other hand, may cause some appliances to malfunction and electric motors to overheat. So, if you have a 138kV transmission line, it should operate only from 131.1kV to 144.9kV. When the voltages breach these values, customer equipment may malfunction or suffer permanent damage. More severe voltage excursions can damage major equipment too, such as generators and transmission line equipment, resulting in expensive and prolonged outages.

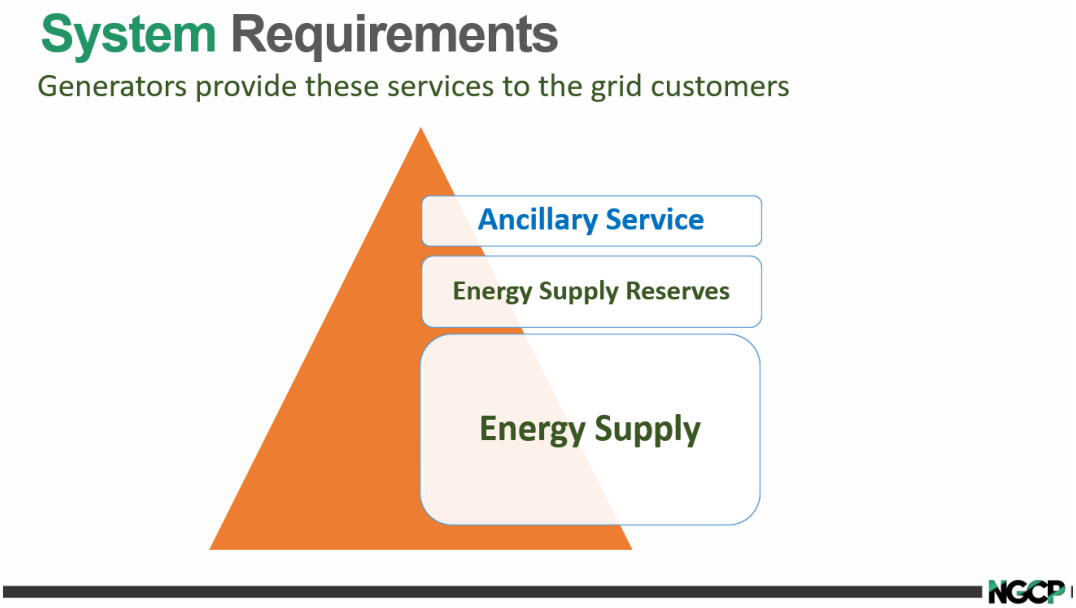
What are the Types of Ancillary Services?

There are 3 major types of Ancillary Services: (1) Frequency Control Ancillary Services composed of Regulating Reserve, Contingency Reserve, Dispatchable Reserve to maintain the system

frequency within an acceptable range; (2) Reactive Power Support for voltage control; and (3) Black Start Service to re-energize the Grid after a system-wide black out.

What are Reserves?

Energy Supply refers to the generation and delivery of energy to meet the overall demand of consumers. The primary goal is to provide a continuous and reliable supply of electricity for various uses, such as lighting, heating, and powering electronic devices.




In case a generator is not available, there are other generator capacities that can fill in the loss, in order to meet the demand. These Energy Supply reserves provide back-up energy supply. When there is not enough back-up energy supply, this is when critical or lack of Energy Supply happens.

Ancillary Services are additional support functions that are crucial for maintaining the reliability, stability, and operational efficiency of the power Grid. They address short-term and real-time challenges that arise due to fluctuations in demand, unexpected outages, or changes in the generation mix that affect the stability of the Grid frequency and voltage. Normally, frequency control Ancillary Services are expected to operate within a WESM trading interval. Thereafter, the WESM is supposed to come up with a new schedule every start of a trading interval. Such schedule should satisfy the prevailing conditions immediately prior to the start of such interval. If the bids for energy supply do not meet the projected demand, the market management system (MMS) software will schedule part of the bids for frequency reserve ancillary services as energy supply – thus leaving the system with inadequate frequency reserves. Generally, Energy Supply is prioritized in the MMS over frequency reserves.

How are Frequency Regulation Ancillary Services sourced?

We now have two (2) methods of sourcing frequency regulation Ancillary Services: (1) contracting by executing an ASPA; and (2) Reserve Market.

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Prior to 2023, the Ancillary Services were sourced via direct negotiations and contracting by NGCP with certified power plants. The Ancillary Services Procurement Agreement (ASPA) executed were then jointly filed by NGCP and the Contracted AS Provider with the Energy Regulatory Commission (ERC) for approval of the arrangement and the rates to be passed on to consumers.

In March 2023, the first Competitive Selection Process (CSP) was conducted in compliance with the DOE Circular No. 2021-10-0031, requiring NGCP to contract Ancillary Services through bidding. This resulted in the execution of ASPAs with 36 power plants nationwide. To date, the ERC has approved 33 of these ASPAs.

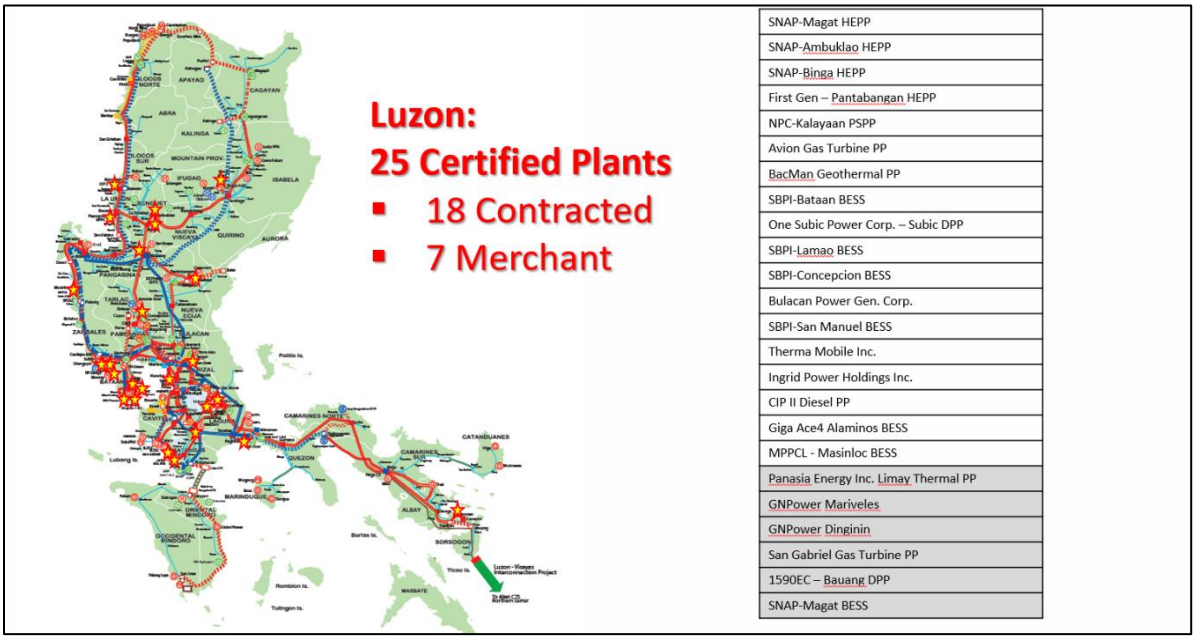
On 26 January 2024, the Reserve Market has started commercial operations. This allows Merchant AS Providers to be scheduled through the Reserve Market and serve as the alternative source of Ancillary Services. The Merchant AS Providers are the generators certified by NGCP as qualified to provide Ancillary Services, and do not have ASPA with NGCP.

Please note that for Contracted AS Providers, their ASPA have to be approved by ERC before they can be scheduled to provide Ancillary Services. For Merchant AS Providers, the Price Determination Methodology for the Reserve Market serves as their basis for payment, which is also approved by the ERC.

Further, only those Contracted and/or Merchant AS Providers that were are actually scheduled and utilized can be paid for the Ancillary Services costs – Ancillary Services that are not able to be fully responsive are likewise not fully paid. These Ancillary Services costs are then passed on to the Grid customers. NGCP is merely a collecting agent for the AS Providers, and consequently not allowed by the ERC to earn any profit on Ancillary Services at all.

Who are the AS Providers?

The figures below shows all the power plants that were certified as capable of providing Ancillary Services. The ones with ASPA are the Contracted AS Providers, and the uncontracted ones are Merchant AS Providers.

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| SNAP-Magat HEPP |
| SNAP-Ambuklao HEPP |
| SNAP-Binga HEPP |
| First Gen – Pantabangan HEPP |
| NPC-Kalayaan PSPP |
| Avion Gas Turbine PP |
| BacMan Geothermal PP |
| SBPI-Bataan BESS |
| One Subic Power Corp. – Subic DPP |
| SBPI-Lamao BESS |
| SBPI-Concepcion BESS |
| Bulacan Power Gen. Corp. |
| SBPI-San Manuel BESS |
| Therma Mobile Inc. |
| Ingrid Power Holdings Inc. |
| CIP II Diesel PP |
| Giga Ace4 Alaminos BESS |
| MPPCL - Masinloc BESS |
| Panasia Energy Inc. Limay Thermal PP |
| GNPower Mariveles |
| GNPower Dinginin |
| San Gabriel Gas Turbine PP |
| 1590EC – Bauang DPP |
| SNAP-Magat BESS |

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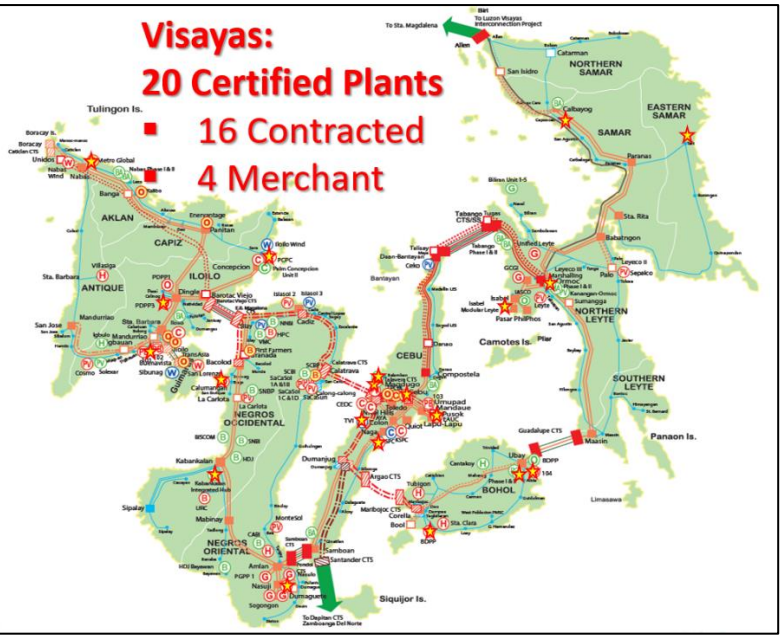
| Panay Power Corp. – Nabas DPP |
| SIPC Power Corp.-Panay DPP |
| MORE Power Barge, Inc. |
| Central Negros Power Reliability Inc. |
| SKPCL-Kabankalan BESS |
| Isabel Ancillary Service Co. Ltd. Green Core |
| Therma Visayas, Inc |
| Therma Power Visayas, Inc. |
| Toledo Power Corp. |
| SBPI-Toledo BESS |
| Meridian Power Inc. |
| East Asia Utilities Corp. |
| SPC Power Corp.-PB104 |
| SIPC Power Corp.-Bohol DPP |
| SBPI-Ubay BESS |
| SBPI-Ormoc BESS |
| Palm Concepcion Power Corp. |
| Geothermal Inc.-Palinpinon |
| Taft Hydroenergy Corp. |
| GT-Energy Corp. |

## Visayas:
## 20 Certified Plants
- 16 Contracted
- 4 Merchant

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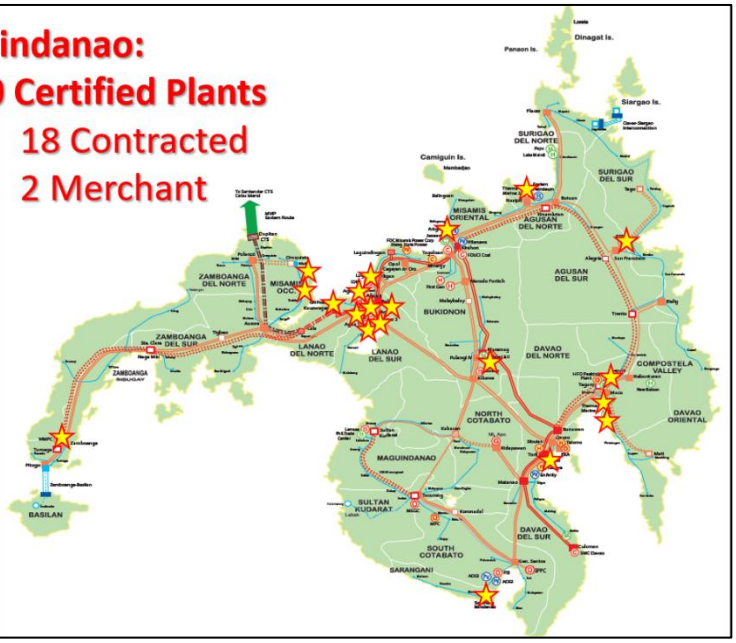
| Therma Marine Inc.-Mobile2 (Butuan) |
| King Energy Generation Inc.-Tandag DPP |
| Mapalad Power Corp.-Iligan DPP |
| GNPower Kauswagan Co. Ltd.-Coal PP |
| Agus 1 HEPP |
| Agus 2 HEPP |
| Agus 4 HEPP |
| Agus 5 HEPP |
| Agus 6 HEPP |
| Agus 7 HEPP |
| Pulangi IV HEPP |
| King Energy Generation Inc.-Jimenez DPP |
| King Energy Generation Inc.-Pana-on DPP |
| Western Mindanao Power Corp. DPP |
| Therma Marine Inc.-Mobile 1 |
| SBPI-Maco BESS |
| SBPI-Malita BESS |
| SBPI-Jasaan BESS |
| Sarangani Energy Corp. |
| Therma South, Inc.-Davao Coal PP |

## Mindanao:
## 20 Certified Plants
- 18 Contracted
- 2 Merchant



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How do we source more Reserves?

While majority of the existing power plants have already been tested, NGCP will continue to work with the generation companies that are interested to offer Ancillary Services, so their generating units can be tested and certified.




Beyond the certification, NGCP relies on the regulators and policy makers to attract the generation companies to offer their capacities for Ancillary Services.

Generation companies are more willing to offer Ancillary Services when they are provided with a reasonable cost recovery and room for profit. Both are in the control of the Energy Regulatory Commission (ERC) as all of the fees to be charged to consumers undergo ERC evaluation and approval. No prior ERC approval is needed for bids in the reserve market is required, however.

Further, more investments in the generation sector are needed, particularly for reliable and stable generation technology. They can help provide additional Energy Supply, as well as minimize the need for additional Ancillary Services even as the share of REs in the generation mix is increased with minimal degradation in reliability. As the government promote programs for green and renewable energy, most of these technologies are variable and intermittent in nature – introducing a significant reduction of reliability level to the grid. The prevailing as well as required overall reliability (such as Loss of Load Probability, LoLP) of the Grid should also be included in the planning priorities of the Department of Energy (DOE), and ensure that projects in the pipeline also include reliable plants that can balance out the influx of intermittent RE generators. Moreover, reliability requirement guidelines for intermittent RE generators need to be promulgated in order to maintain the stability and reliability of the Grid. These include provision of synthetic inertia, energy storage requirements, as well as adequate voltage and frequency response capabilities.

In conclusion, more focus on grid reliability considerations in generation planning is needed to maintain the stability and reliability of the Grid.

This Customer Bulletin was prepared by the Customer Affairs Department of Revenue and Regulatory Affairs. For any questions/inquiries, you may e-mail us at lgbacani@ngcp.ph or rcereno@ngcp.ph.