



**Revised Rules, Terms and
Conditions for the**

**ANCILLARY SERVICES –
COST RECOVERY
MECHANISM**

**Energy Regulatory Commission
ERC Case No. 2018-xxxRM**

**National Grid Corporation of the Philippines
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1.0 Introduction

The Ancillary Services-Cost Recovery Mechanism (AS-CRM) sets out the rules on the cost recovery of Ancillary Services (AS) contracted and procured by the National Grid Corporation of the Philippines (NGCP) under the Ancillary Services Procurement Plan (ASPP). The AS-CRM complements the ASPP and is made consistent with the Open Access Transmission Service (OATS) Rules.

1.1 Overview

NGCP is mandated to ensure and maintain the power quality, reliability and security of the Grid. With the increasing demand for power supply, accompanied by the entry of Variable Renewable Energy (VRE) sources and other technologies that may affect the quality and reliability of the Grid, the necessity to procure AS from various Service Providers becomes more apparent and crucial for NGCP and for the Wholesale Electricity Spot Market (WESM) as well.

1.2 Principles in the Design of AS-CRM

The following principles were used in the design of AS-CRM:

- a. Revenue Neutrality. The formula is revenue neutral to NGCP, i.e., the charges are complete pass-on from the user or beneficiary of the service to the Service Provider. There is no under- or over-recovery and, thus, no profit margin is allowed.
- b. When allocating cost for AS, the timeframe for system averaging is as close as practicable to the time the services are being provided or made available to the system.

1.3 Definition of Terms

Ancillary Service (AS): As defined in the PGC 2016 Edition

Ancillary Service – Billing Determinant Demand (AS-BDD): A determinant for the calculation of Load's AS charges

Ancillary Service – Embedded Generator Billing Determinant (AS-EGBD): A determinant for the calculation of an Embedded Generator's AS charges

Ancillary Service – Generator Billing Determinant (AS-GBD): A determinant for the calculation of a Grid-Connected Generator's AS charges

Ancillary Services Procurement Plan (ASPP): As defined in the OATS Rules

Black Start: As defined in the PGC 2016 Edition

Billing Period: As defined in the OATS Rules

Embedded Generator: As defined in the PGC 2016 Edition and OATS Rules

Frequency: As defined in the PGC 2016 Edition

Grid: As defined in the PGC 2016 Edition

Grid-Connected Generator: An entity authorized by the ERC to operate a generating facility directly connected to the Grid

Load: As defined in the PGC 2016 Edition

National Grid Corporation of the Philippines (NGCP): As defined in the OATS Rules and ASPP

Open Access Transmission Service (OATS) Rules: The set of rules that govern the implementation of Open Access Transmission Service, as approved by the ERC.

Philippine Grid Code (PGC): As defined in the PGC 2016 Edition

Primary Reserve: As defined in the PGC 2016 Edition

Reactive Power: As defined in the PGC 2016 Edition

Reserve Market: As defined in the WESM Rules

Secondary Reserve: As defined in the PGC 2016 Edition

Service Provider: As defined in the ASPP

Synchronized: As defined in the PGC 2016 Edition

Transmission Network: Has the same meaning as Grid defined in the PGC 2016 Edition

WESM Rules: As defined in the PGC 2016 Edition

Wholesale Electricity Spot Market (WESM): As defined in the PGC 2016 Edition

Where terms are not defined in this AS-CRM, reference should be made to the EPIRA¹, its Implementing Rules and Regulations (IRR), ASPP, PGC 2016 Edition, OATS Rules and/or WESM Rules.

¹ Electric Power Industry Reform Act of 2001 (R.A. No. 9136)

2.0 Specification of Ancillary Services

The AS-CRM adopts the following specifications of AS, as defined in the PGC 2016 Edition and the ASPP:

- a. Primary Reserve Ancillary Service (PRAS)
- b. Secondary Reserve Ancillary Service (SRAS)
- c. Tertiary Reserve Ancillary Service (TRAS)
- d. Reactive Power Support Ancillary Service (RPSAS)
- e. Black Start Ancillary Service (BSAS)

3.0 Supply of Ancillary Services

NGCP shall arrange for the adequate AS through the following:

3.1 Ancillary Services Procurement Agreement (ASPA)

AS arranged through ASPA shall be procured in a manner consistent with the ASPP. The AS costs shall be recovered as pass-through charges to the Grid-Connected Generator, Embedded Generator, and Load.

3.2 Reserve Market Arrangements

AS arranged through the Market shall be procured in accordance with the ASPP, and WESM Rules and Manuals.

4.0 Cost Recovery Mechanism of Ancillary Services

4.1 Matrix of Cost Recovery

	Grid- Connected Generator	Embedded Generator	Load
PRAS	✓	✓	
SRAS	✓	✓	✓
TRAS	✓	✓	✓
RPSAS			✓
BSAS	✓	✓	✓

Note: If the PRAS and SRAS will be redesigned to "raise" and "lower", the same shall be charged to Grid-Connected and Embedded Generator; and Load, respectively.

For those periods of time when the Grid-Connected Generator draw power from the Grid for their own use the charges relevant to Load shall apply.

4.2 Ancillary Service Billing Determinant

The following billing determinant shall be used in the computation of AS Charges for the Grid-Connected Generator, Embedded Generator, and Load:

Ancillary Service Billing Determinant	
Grid-Connected	Ancillary Service - Generator Billing Determinant

Ancillary Service Billing Determinant	
Generator	(AS-GBD) <ul style="list-style-type: none"> The AS-GBD for a Billing Period shall be the summation of the daily coincident [to the system of the Grid-Connected Generator] peak injection to the Grid.
Embedded Generator	Ancillary Service - Embedded Generator Billing Determinant (AS-EGBD) <ul style="list-style-type: none"> The AS-EGBD for a Billing Period shall be the summation of the daily coincident [to the system of both Embedded Generator and the host Load] peak injection to the Load's system.
Load	Ancillary Service - Billing Determinant Demand (AS-BDD) <ul style="list-style-type: none"> The AS-BDD for a Billing Period shall be the summation of the daily coincident [to the system of Load] peak demand.

4.3 Ancillary Service Charge

a. Primary Reserve Ancillary Service Charge

$$PRAS\ Charge_{G,EG} = \frac{\sum_{i=1}^m PRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k} \times BD_{G,EG}$$

Where:

$\sum_{i=1}^m PRAS\ Cost_i$ = the sum of the daily actual cost, in PhP, for the provision of PRAS in a Grid from day "i" to "m" for the current Billing Period, plus any adjustments from the previous billings

$\sum_{j=1}^n AS - GBD_j$ = the sum of AS-GBD, in kW-day, of Grid-Connected Generator "j" to "n" in a Grid for the current Billing Period

$\sum_{k=1}^o AS - EGBD_k$ = the sum of AS-EGBD, in kW-day, of Embedded Generator "k" to "o" in a Grid for the current Billing Period

$BD_{G,EG}$ = the applicable billing determinant, in kW-day, which shall be either AS-GBD or AS-EGBD

$$\frac{\sum_{i=1}^m PRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k} = \text{the } PRAS\ Rate, \text{ in PhP/kW-day}$$

$\left[\frac{\sum_{i=1}^m PRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k} \times BD_{G,EG} \right]$ = the $PRAS\ Charge_{G,EG}$, in PhP, of the Grid-Connected Generator or the Embedded Generator for the current Billing Period

b. Secondary Reserve Ancillary Service Charge

$$SRAS\ Charge_{G,EG,L} = \frac{\sum_{i=1}^m SRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k + \sum_{l=1}^p AS - BDD_l} \times BD_{G,EG,L}$$

Where:

$\sum_{i=1}^m SRAS\ Cost_i$ = the sum of the daily actual cost, in PhP, for the provision of SRAS in a Grid from day “i” to “m” for the current Billing Period, plus any adjustments from the previous billings

$\sum_{j=1}^n AS - GBD_j$ = the sum of AS-GBD, in kW-day, of Grid-Connected Generator “j” to “n” in a Grid for the current Billing Period

$\sum_{k=1}^o AS - EGBD_k$ = the sum of AS-EGBD, in kW-day, of Embedded Generator “k” to “o” in a Grid for the current Billing Period

$\sum_{l=1}^p AS - BDD_l$ = the sum of AS-BDD, in kW-day, of Load “l” to “p” in a Grid for the current Billing Period

$BD_{G,EG,L}$ = the applicable billing determinant, in kW-day, which shall be either AS-GBD or AS-EGBD or AS-BDD

$\frac{\sum_{i=1}^m SRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k + \sum_{l=1}^p AS - BDD_l}$ = the *SRAS Rate*, in PhP/kW-day

$\left[\frac{\sum_{i=1}^m SRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k + \sum_{l=1}^p AS - BDD_l} \times BD_{G,EG,L} \right]$ = the *SRAS Charge*_{G,EG,L}, in PhP, of the Grid-Connected Generator or the Embedded Generator or the Load for the current Billing Period

c. Tertiary Reserve Ancillary Service Charge

$$TRAS\ Charge_{G,EG,L} = \frac{\sum_{i=1}^m TRAS\ Cost_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k + \sum_{l=1}^p AS - BDD_l} \times BD_{G,EG,L}$$

Where:

$\sum_{i=1}^m TRAS\ Cost_i$ = the sum of the daily actual cost, in PhP, for the provision of TRAS in a Grid from day “i” to “m” for the current Billing Period, plus any adjustments from the previous billings

$\sum_{j=1}^n AS - GBD_j$ = the sum of AS-GBD, in kW-day, of Grid-Connected Generator “j” to “n” in a Grid for the current Billing Period

$\sum_{k=1}^o AS - EGBD_k$ = the sum of AS-EGBD, in kW-day, of Embedded Generator “k” to “o” in a Grid for the current Billing Period

$\sum_{l=1}^p AS - BDD_l$ = the sum of AS-BDD, in kW-day, of Load “l” to “p” in a Grid for the current Billing Period

$BD_{G,EG,L}$ = the applicable billing determinant, in kW-day, which shall be either AS-GBD or AS-EGBD or AS-BDD

$$\frac{\sum_{i=1}^m TRASCost_i}{\sum_{j=1}^n AS-GBD_j + \sum_{k=1}^o AS-EGBD_k + \sum_{l=1}^p AS-BDD_l} = \text{the } TRAS \text{ Rate, in PhP/kW-day}$$

$$\left[\frac{\sum_{i=1}^m TRASCost_i}{\sum_{j=1}^n AS-GBD_j + \sum_{k=1}^o AS-EGBD_k + \sum_{l=1}^p AS-BDD_l} \times BD_{G,EG,L} \right] = \text{the } TRAS \text{ Charge}_{G,EG,L},$$

in PhP, of the Grid-Connected Generator or the Embedded Generator or the Load for the current Billing Period

d. Reactive Power Support Ancillary Service Charge

$$RPSAS \text{ Charge}_L = \frac{\sum_{i=1}^m RPSAS \text{ Cost}_i}{\sum_{l=1}^p AS - BDD_l} \times BD_L$$

Where:

$\sum_{i=1}^m RPSAS \text{ Cost}_i$ = the sum of the daily actual cost, in PhP, for the provision of RPSAS in a Grid from day “i” to “m” for the current Billing Period, plus any adjustments from the previous billings

$\sum_{l=1}^p AS - BDD_l$ = the sum of AS-BDD, in kW-day, of Load “l” to “p” in a Grid for the current Billing Period

BD_L = the applicable billing determinant, in kW-day, which shall be AS-BDD

$$\frac{\sum_{i=1}^m RPSAS \text{ Cost}_i}{\sum_{l=1}^p AS - BDD_l} = \text{the } RPSAS \text{ Rate, in PhP/kW-day}$$

$$\left[\frac{\sum_{i=1}^m RPSAS \text{ Cost}_i}{\sum_{l=1}^p AS - BDD_l} \times BD_L \right] = \text{the } RPSAS \text{ Charge}_L, \text{ in PhP, of the Load for the current Billing Period}$$

e. Black Start Ancillary Service Charge

$$BSAS \text{ Charge}_{G,EG,L} = \frac{\sum_{i=1}^m BSAS \text{ Cost}_i}{\sum_{j=1}^n AS - GBD_j + \sum_{k=1}^o AS - EGBD_k + \sum_{l=1}^p AS - BDD_l} \times BD_{G,EG,L}$$

Where:

$\sum_{i=1}^m BSAS \text{ Cost}_i$ = the sum of the daily actual cost, in PhP, for the provision of BSAS in a Grid from day “i” to “m” for the current Billing Period, plus any adjustments from the previous billings

$\sum_{j=1}^n AS - GBD_j$ = the sum of AS-GBD, in kW-day, of Grid-Connected Generator “j” to “n” in a Grid for the current Billing Period

$\sum_{k=1}^o AS - EGBD_k$ = the sum of AS-EGBD, in kW-day, of Embedded Generator “k” to “o” in a Grid for the current Billing Period

$\sum_{l=1}^p AS - BDD_l$ = the sum of AS-BDD, in kW-day, of Load “l” to “p” in a Grid for the current Billing Period

$BD_{G,EG,L}$ = the applicable billing determinant, in kW-day, which shall be

either AS-GBD or AS-EGBD or AS-BDD

$$\frac{\sum_{i=1}^m BSAS\ Cost_i}{\sum_{j=1}^n AS-GBD_j + \sum_{k=1}^o AS-EGBD_k + \sum_{l=1}^p AS-BDD_l} = \text{the } BSAS\ Rate, \text{ in PhP/kW-day}$$

$$\left[\frac{\sum_{i=1}^m BSAS\ Cost_i}{\sum_{j=1}^n AS-GBD_j + \sum_{k=1}^o AS-EGBD_k + \sum_{l=1}^p AS-BDD_l} \times BD_{G,EG,L} \right] = \text{the } BSAS\ Charge_{G,EG,L},$$

in PhP, of the Grid-Connected Generator or the Embedded Generator or the Load for the current Billing Period