WEM Metering, Settlement & Prudential Calculations

Australian Energy Market Operator

Applicable Trading Days: 1 October 2021
Version 4.1
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Version Control

A major version change occurs when the WEM Rules or Market Procedures require changes to the equations from a particular Trading Day onward.
A minor version change may occur for editorial changes, manifest errors or implementation changes that will apply to the same Trading Day period as dictated by the major version.

Version	Changes
1.0	Original publication consistent with WEM Rules effective 1 September 2019
1.1	New functionality added to distinguish between prudentials and settlements. Update of Interest formulae for settlements. Inclusion of Additional Repaid Amounts to be compliant with WEM Rule 9.24.2(b). Correction of SOMS_F_I(f, i) formulae for the Notional Wholesale Meter. Minor changes in formulae or invocation to improve performance.
2.0	Consequential changes due to new WEM Rules effective 22 February 2020
3.0	Consequential changes due to Coordinator fees in new WEM Rules effective 1 July 2021.
4.0	Consequential changes due to new WEM Rules effective 1 October 2021
4.1	Inclusion of Default Levy Adjustment to be compliant with WEM Rule 9.24.9(e).

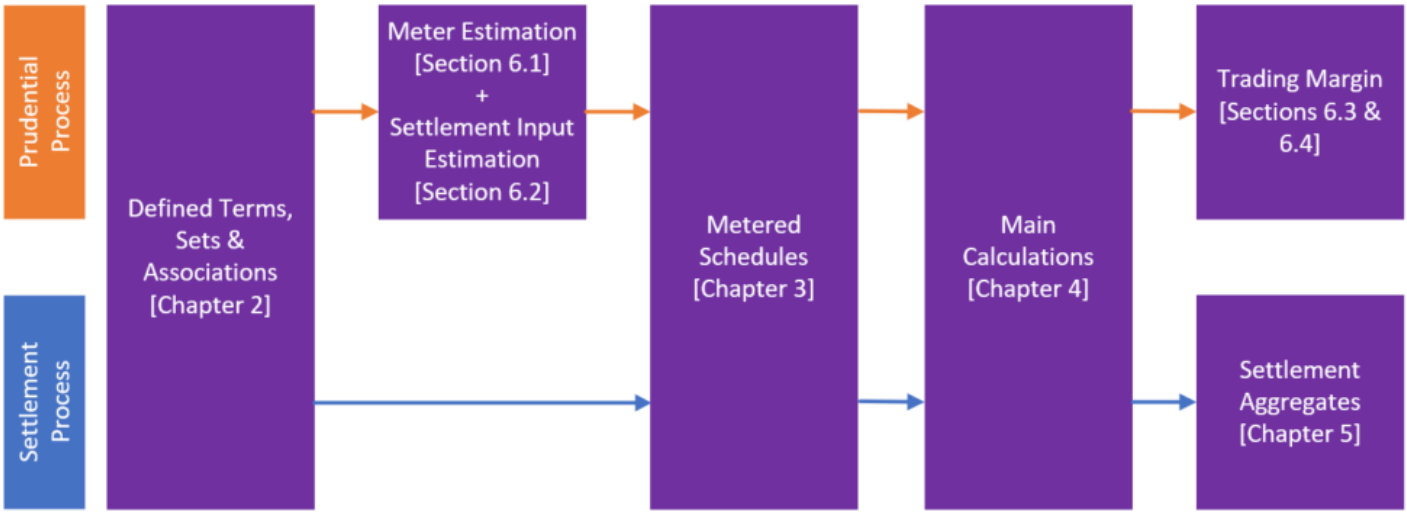
Contents

1 Introduction

The purpose of this document is to:

- outline WEM Metering, Settlement and Prudential calculations as equations
- provide additional context or structure equations in such a way that assists in understanding
- outline the formulation of a system that could be used to perform both settlement and prudential functions

The document is structured in such a way that a system could be designed. The diagram below shows the different sections of the document and how they would work together to facilitate either a settlement (blue) or prudential (orange) process.



This document defines many variables that are used in equations. Each variable will have the following attributes stated to assist in understanding:

Attribute	Explanation	Example
Variable	The name of the variable	$STEMP\_G\_I$
Units	$, {}, MW, MWh, $/MW, $/MWh, Flag, °C, MW/min, min	$/MWh
Scope (SC)	Tranche (T), Channel (CH), NMI (N), Contract(C), Capacity Credit Allocation (A), Participant-Facility (PF), Facility (F), Participant (P), Global (G)	G
Granularity (GR)	Trading Interval (I), Trading Day (D), Trading Week (W), Trading Month (M), Capacity Year (CY), Financial Year (FY)	I
Rule	WEM Rule reference	6.9.7
Description	A description of the variable	STEM Clearing Price for Trading Interval i
Ref	Either the equation number where it is defined in this document, or 'I' to denote an input	I

Granularity has a strict hierarchy - A Capacity Year is comprised of Trading Months, which are comprised of Trading Days which are comprised of Trading Intervals. These hierarchies are represented below:

- $I \in D \in M \in CY$; or
- $I \in D \in M \in FY$.

When defining a variable, it will always be defined for its granularity. For example, The variable $CS\_P\_M(p, m)$ is defined for a particular Trading Month m. It will only be defined by variables with a granularity of Trading Month or coarser. However, when the variable is used to define other equations it may be expressed using a granularity argument more fine

than its defined granularity, for example $CS\_P\_M(p, i)$. When the variable is expressed like this, it is implicit that it refers to the Trading Month m, in which Trading Interval i falls.

2 Defined Terms, Sets and Associations

Defined terms are used throughout the rules. These defined terms often convey specific information, for example the term Scheduled Generator requires the facility to be registered with AEMO as outlined in the definition. Similarly, some specific calculations only apply, or are interpreted based on these defined terms. In the implementation, these defined terms are often represented as a set of Facilities (or Participants) that meet the definition of the defined term. Furthermore, there are often associations between defined terms within the rules, for example Facilities are associated to participants through registration.
This document defines all sets with the following conventions:

- The definition of each set variable is always Global and for a Trading Day and therefore the variable name omits information about scope and granularity. For example the set of Scheduled Generators in Trading Day d is represented as $SG(d)$, rather than being named $SG\_G\_D(d)$.
- Subsets are defined by adding a scope argument. For example $SG(p, d)$ represents the subset of $SG(d)$ associated with participant p.

2.1 Participant Sets

2.1.1 Axiomatic Participant Sets in AEMO systems

Calculations defined in the rules depend on different sets of participants. The participant sets outlined below are considered to be axiomatic, or the base sets, upon which all other sets will be created. These base sets are defined in terms of how AEMO's systems have been created. Sets which are calculated later are often sets of participants which are defined in the rules, and in these instances the rule reference is provided.

Variable	Units	SC	GR	Rule	Description	Ref
WEMS_MG(d)	{}	G	D		Set of participants with MG participant class in WEMS in Trading Day d	I
WEMS_MC(d)	{}	G	D		Set of participants with MC participant class in WEMS in Trading Day d	I
WEMS_ASP(d)	{}	G	D		Set of participants with ASP participant class in WEMS in Trading Day d	I
WEMS_NO(d)	{}	G	D		Set of participants with NO participant class in WEMS in Trading Day d	I
WEMS_SO(d)	{}	G	D		Set of participants with SO participant class (excluding System Management) in WEMS in Trading Day d	I
WEMS_PREG(d)	{}	G	D		Set of participants registered in WEMS in Trading Day d	I

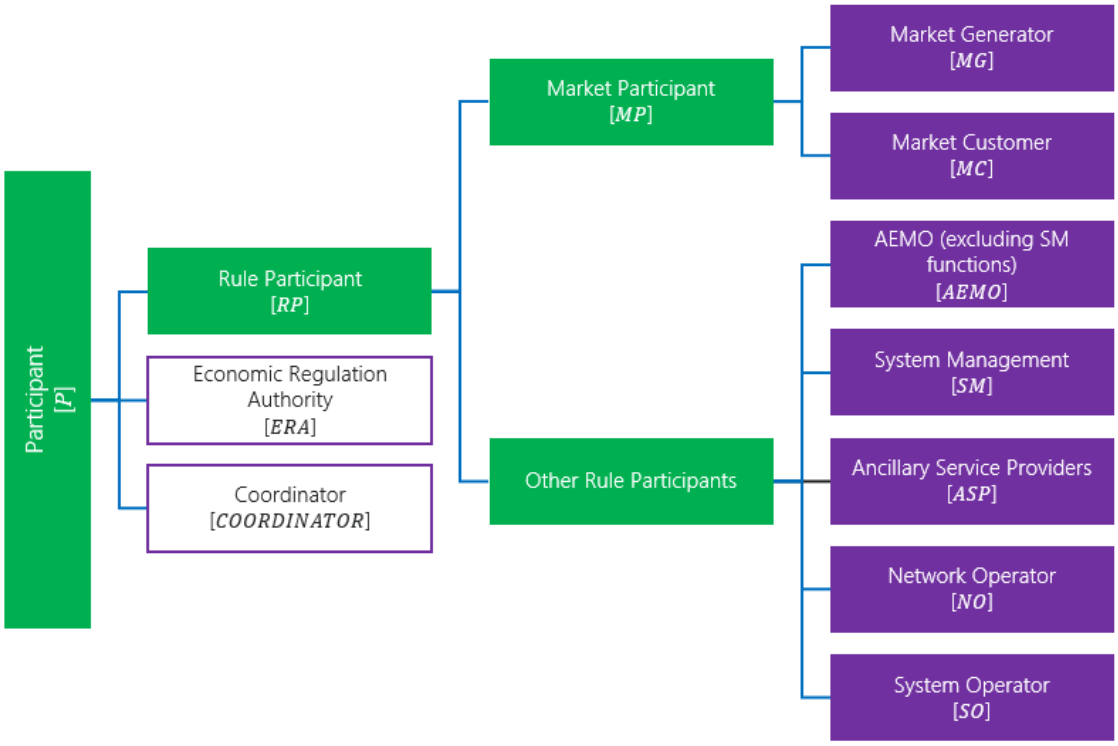
2.1.2 Sets of Rule Participant classes

The following are classes of Rule Participants [MR 2.28.1]:

- Network Operator (NO)
- Market Generator (MG)
- Market Customer (MC)
- Ancillary Service Provider (ASP)
- System Management (SM)
- System Operator (SO)

- AEMO (AEMO)

The diagram below shows the relationship between Rule Participant classes (purple) and other sets of participants (green).



These sets are defined as follows.

$$P\_M(m) = \bigcup_{d \in D(m)} P(d) \tag{1}$$

$$P\_CY(cy) = \bigcup_{d \in D\_CY(cy)} P(d) \tag{2}$$

$$P(d) = COORDINATOR(d) \cup ERA(d) \cup RP(d) \tag{3}$$

$$COORDINATOR(d) = \{COE\} \tag{4}$$

$$ERA(d) = \{ERA\} \tag{5}$$

$$RP(d) = MG(d) \cup MC(d) \cup ASP(d) \cup NO(d) \cup AEMO(d) \cup SM(d) \cup SO(d) \tag{6}$$

$$MP(d) = MG(d) \cup MC(d) \tag{7}$$

$$MG(d) = WEMS\_PREG(d) \cap WEMS\_MG(d) \tag{8}$$

$$MC(d) = WEMS\_PREG(d) \cap WEMS\_MC(d) \tag{9}$$

$$AEMO(d) = \{IMOWA\} \tag{10}$$

$$SM(d) = \{SM\} \tag{11}$$

$$ASP(d) = WEMS\_PREG(d) \cap WEMS\_ASP(d) \tag{12}$$

$$NO(d) = WEMS\_PREG(d) \cap WEMS\_NO(d) \tag{13}$$

$$SO(d) = WEMS\_PREG(d) \cap WEMS\_SO(d) \tag{14}$$

$$Synergy(d) = \{WPGENER\} \tag{15}$$

$$Synergy\_M(m) = \{WPGENER\} \tag{16}$$

Variable	Units	SC	GR	Rule	Description	Ref
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
P_CY(cy)	{}	G	CY		Set of participants (Rule Participants, ERA and the Coordinator) in Capacity Year cy	(2)
P(d)	{}	G	D		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Day d	(3)
COORDINATOR(d)	{}	G	D	11	Set containing the Coordinator	(4)
ERA(d)	{}	G	D	11	Set containing the ERA	(5)
RP(d)	{}	G	D	11	Set of Rule Participants in Trading Day d	(6)
MP(d)	{}	G	D	11	Set of Market Participants in Trading Day d	(7)
MG(d)	{}	G	D	11	Set of Market Generators in Trading Day d	(8)
MC(d)	{}	G	D	11	Set of Market Customers in Trading Day d	(9)
AEMO(d)	{}	G	D	11	Set containing the AEMO	(10)
SM(d)	{}	G	D	11	Set containing System Management	(11)
ASP(d)	{}	G	D	11	Set of Ancillary Service Providers in Trading Day d	(12)
NO(d)	{}	G	D	11	Set containing Network Operators in Trading Day d	(13)
SO(d)	{}	G	D	11	Set System Operators in Trading Day d	(14)
Synergy(d)	{}	G	D	11	Set containing Synergy	(15)
Synergy_M(m)	{}	G	M	11	Set containing Synergy	(16)
WEMS_MG(d)	{}	G	D		Set of participants with MG participant class in WEMS in Trading Day d	I
WEMS_MC(d)	{}	G	D		Set of participants with MC participant class in WEMS in Trading Day d	I
WEMS_ASP(d)	{}	G	D		Set of participants with ASP participant class in WEMS in Trading Day d	I
WEMS_NO(d)	{}	G	D		Set of participants with NO participant class in WEMS in Trading Day d	I
WEMS_SO(d)	{}	G	D		Set of participants with SO participant class (excluding System Management) in WEMS in Trading Day d	I
WEMS_PREG(d)	{}	G	D		Set of participants registered in WEMS in Trading Day d	I
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I
D_CY(cy)	{}	G	CY		Set of Trading Days in Capacity Year cy	I

2.1.3 Other Participant Sets

Additional sets of Participants are required and are defined below.

$$SR(d) = \left\{ p : \left(\sum_{j=0}^{CASoffset\_G\_M(d)\times 30} \sum_{i \in I(d-j)} CASSRQmwh\_P\_I(p,i) \right) > 0 \right\} \tag{17}$$

$$SR\_M(m) = \bigcup_{d \in D(m)} SR(d) \tag{18}$$

Variable	Units	SC	GR	Rule	Description	Ref
SR(d)	{}	G	D		Set of participants to estimate Spinning Reserve Service quantities in Trading Day d	(17)
SR_M(m)	{}	G	M		Set of participants to estimate Spinning Reserve Service quantities in Trading Month m	(18)
CASSRQmwh_P_I(p, i)	MWh	P	I		MWh quantity of Contracted Spinning Reserve Service for Rule Participant p in Trading Interval i	I
CASoffset_G_M(m)		G	M		Parameter set by AEMO, required to implement the estimation of contracted Ancillary Services, applicable in Trading Month m	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

2.2 Facility Sets

2.2.1 Axiomatic Facility Sets in AEMO systems

Calculations defined in the rules depend on different sets of Facilities. The Facility sets outlined below are considered to be axiomatic, or the base sets, upon which all other sets will be created. These base sets are defined in terms of how AEMO's systems have been created. Sets which are calculated later are often sets of Facilities which are defined in the rules, and in these instances the rule reference is provided.

Variable	Units	SC	GR	Rule	Description	Ref
WEMS_DSP(d)	{}	G	D		Set of Facilities with a DSP WEMS Type in Trading Day d	I
WEMS_SG(d)	{}	G	D		Set of Facilities with a SG WEMS Type in Trading Day d	I
WEMS_NSG(d)	{}	G	D		Set of Facilities with a NSG WEMS Type in Trading Day d	I
WEMS_INSG(d)	{}	G	D		Set of Facilities with a INSG WEMS Type in Trading Day d	I
WEMS_IL(d)	{}	G	D		Set of Facilities with a IL WEMS Type in Trading Day d	I
WEMS_N(d)	{}	G	D		Set of Facilities with a N WEMS Type in Trading Day d	I
WEMS_NDL(d)	{}	G	D		Set of Facilities with a NDL WEMS Type in Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
NDL_MTR(d)	{}	G	D		Set of Non-Dispatchable Loads with interval meters that are not in WEMS in Trading Day d	I
WEMS_FREG(d)	{}	G	D		Set of Facilities that are registered in WEMS in Trading Day d	I
WEMS_FCAND(d)	{}	G	D		Set of Facilities that are candidate Facilities WEMS in Trading Day d	I
WEMS_IM(d)	{}	G	D		Set of Facilities that are Intermittent Loads in WEMS in Trading Day d	I
WEMS_RLG(d)	{}	G	D		Set of Facilities in WEMS that serve an Intermittent Load in Trading Day d	I
WEMS_RG(d)	{}	G	D		Set of Facilities in WEMS that remotely serve an Intermittent Load in Trading Day d	I
NOINTMETER(d)	{}	G	D		Set of Facilities in WEMS for which no Interval meter exists in Trading Day d	I
WEMS_SAF(d)	{}	G	D		Set of Facilities in WEMS that are Stand Alone Facilities in Trading Day d	I
MTR_AGG(d)	{}	G	D	2.30	Set of Facilities that are the aggregate of other Facilities in Trading Day d	I
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
WEMS_LFAS(d)	{}	G	D		Set of Facilities in WEMS that are marked as intending to provide LFAS, and have standing data (in an accepted change request) for LFAS enablement limitations on Trading Day d	I

2.2.2 Sets of Facility Types and Facility Classes

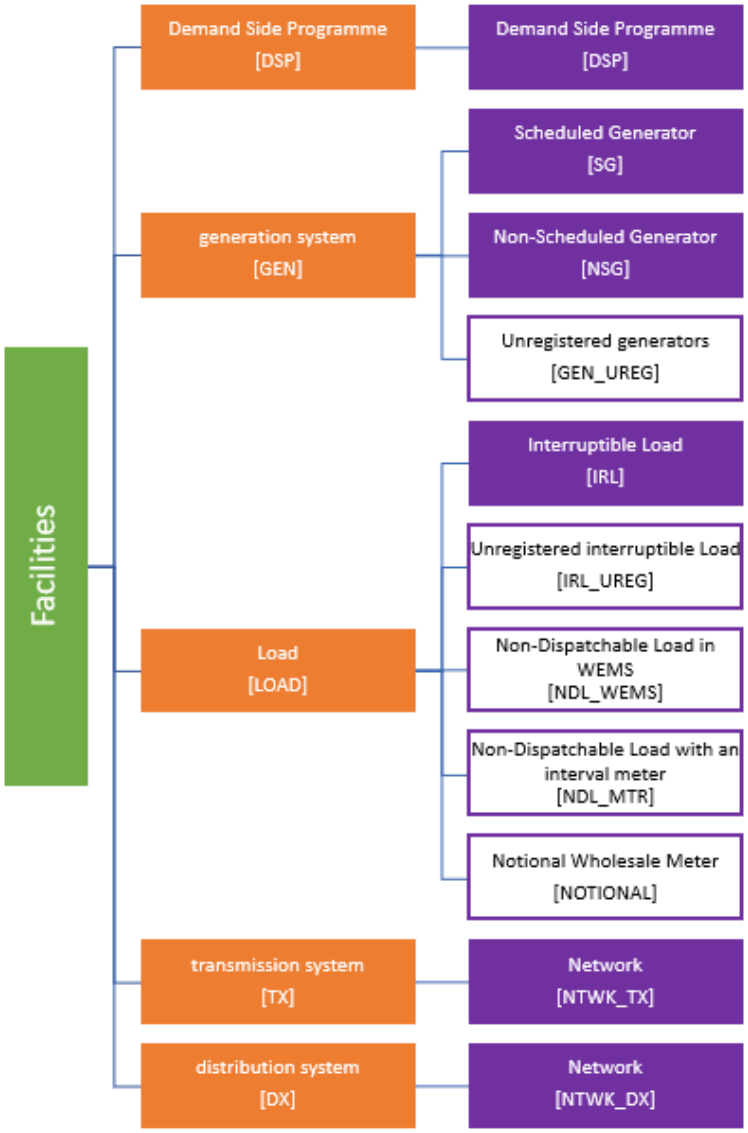
The following are Facilities [MR 2.29.1]:

- distribution system (DX)
- transmission system (TX)
- generation system (GEN)
- Load (LOAD)
- Demand Side Programme (DSP)

The following are Facility Classes [MR 2.29.1A]:

- Network (NTWK)
- Scheduled Generator (SG)
- Non-Scheduled Generator (NSG)
- Interruptible Load (IRL)
- Demand Side Programme (DSP)

The diagram below shows the relationship between Facility types (orange) and Facility Classes (purple).



These sets are defined as follows.

$$DSP(d) = WEMS\_FREG(d) \cap WEMS\_DSP(d) \tag{19}$$

$$GEN(d) = SG(d) \cup NSG(d) \cup GEN\_UREG(d) \tag{20}$$

$$SG(d) = WEMS\_FREG(d) \cap WEMS\_SG(d) \tag{21}$$

$$NSG(d) = WEMS\_FREG(d) \cap (WEMS\_NSG(d) \cup WEMS\_INSG(d)) \tag{22}$$

$$GEN\_UREG(d) = WEMS\_FCAND(d) \cap (WEMS\_SG(d) \cup WEMS\_NSG(d) \cup WEMS\_INSG(d)) \tag{23}$$

$$LOAD(d) = IRL(d) \cup IRL\_UREG(d) \cup NDL\_WEMS(d) \cup NDL\_MTR(d) \cup NOTIONAL(d) \tag{24}$$

$$IRL(d) = WEMS\_FREG(d) \cap WEMS\_IL(d) \tag{25}$$

$$IRL\_UREG(d) = WEMS\_FCAND(d) \cap WEMS\_IL(d) \tag{26}$$

$$NDL\_WEMS(d) = WEMS\_FREG(d) \cap WEMS\_NDL(d) \tag{27}$$

$$NOTIONAL(d) = \{NOTIONAL\} \tag{28}$$

$$NTWK(d) = WEMS\_FREG(d) \cap WEMS\_N(d) \tag{29}$$

$NTWK(d)$ is represented as $NTWK\_TX \cup NTWK\_DX$ in the diagram above showing the relationship between Facility types and Facility Classes.

Variable	Units	SC	GR	Rule	Description	Ref
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
GEN(d)	{}	G	D	2.29.1(c)	Set of generation systems in Trading Day d	(20)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
GEN_UREG(d)	{}	G	D		Set of unregistered generation systems in Trading Day d	(23)
LOAD(d)	{}	G	D	11	Set of Loads in Trading Day d	(24)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
IRL_UREG(d)	{}	G	D		Set of unregistered Loads that can be interrupted upon request in Trading Day d	(26)
NDL_WEMS(d)	{}	G	D		Set of Non-Dispatchable Loads in WEMS registration in Trading Day d	(27)
NDL_MTR(d)	{}	G	D		Set of Non-Dispatchable Loads with interval meters that are not in WEMS in Trading Day d	I
NOTIONAL(d)	{}	G	D	11	Set containing the Notional Wholesale Meter	(28)
NTWK(d)	{}	G	D	11	Set of Networks in Trading Day d.	(29)
WEMS_DSP(d)	{}	G	D		Set of Facilities with a DSP WEMS Type in Trading Day d	I
WEMS_SG(d)	{}	G	D		Set of Facilities with a SG WEMS Type in Trading Day d	I
WEMS_NSG(d)	{}	G	D		Set of Facilities with a NSG WEMS Type in Trading Day d	I
WEMS_INSG(d)	{}	G	D		Set of Facilities with a INSG WEMS Type in Trading Day d	I
WEMS_IL(d)	{}	G	D		Set of Facilities with a IL WEMS Type in Trading Day d	I
WEMS_N(d)	{}	G	D		Set of Facilities with a N WEMS Type in Trading Day d	I
WEMS_NDL(d)	{}	G	D		Set of Facilities with a NDL WEMS Type in Trading Day d	I
WEMS_FREG(d)	{}	G	D		Set of Facilities that are registered in WEMS in Trading Day d	I
WEMS_FCAND(d)	{}	G	D		Set of Facilities that are candidate Facilities WEMS in Trading Day d	I

2.2.3 Other Facility Sets

Additional sets of Facilities are required by the rules and are defined below.

$$F(d) = REG\_F(d) \cup GEN\_UREG(d) \cup IRL\_UREG(d) \tag{30}$$

$$REG\_F(d) = DSP(d) \cup SG(d) \cup NSG(d) \cup IRL(d) \cup NTWK(d) \tag{31}$$

$$NDL(d) = NDL\_WEMS(d) \cup NDL\_MTR(d) \cup NOTIONAL(d) \tag{32}$$

$$IML(d) = (IRL(d) \cup NDL\_WEMS(d)) \cap WEMS\_IM(d) \tag{33}$$

$$IG(d) = WEMS\_FREG(d) \cap WEMS\_INSG(d) \tag{34}$$

$$RG(d) = WEMS\_FREG(d) \cap WEMS\_RG(d) \tag{35}$$

$$EG(d) = WEMS\_FREG(d) \cap WEMS\_RLG(d) \cap \overline{WEMS\_RG(d)} \tag{36}$$

$$BALPF(d) = REG\_F(p,d) \cap \overline{SAF(d) \cup DSP(d) \cup IRL(d)} \text{ where } p \in Synergy(d) \tag{37}$$

$$BALF(d) = SG(p,d) \cup NSG(p,d) \cup SAF(d) \text{ where } p \notin Synergy(d) \tag{38}$$

$$LFASF(d) = (BALF(d) \cap WEMS\_LFAS(d)) \cup PORTFOLIO(d) \tag{39}$$

$$SAF(d) = (SG(d) \cup NSG(d)) \cap WEMS\_SAF(d) \tag{40}$$

$$AF(d) = \left(SG(d) \cap \overline{AGG(d)}\right) \cup SGpreAGG(d) \cup NSG(d) \cup GEN\_UREG\_L(d) \cup EG(d) \tag{41}$$

$$GEN\_UREG\_L(d) = GEN\_UREG(d) \cap WEMS\_RLG(d) \cap \overline{WEMS\_RG(d)} \tag{42}$$

$$AGG(d) = REG\_F(d) \cap MTR\_AGG(d) \tag{43}$$

$$SGpreAGG(d) = \bigcup_{f \in SG(d) \cap AGG(d)} NMI(f,d) \tag{44}$$

$$DSPNMI(d) = \bigcup_{f \in DSP(d)} NMI(f,d) \tag{45}$$

$$PORTFOLIO(d) = \{PORTFOLIO\} \tag{46}$$

$$AF\_M(m) = \bigcup_{d \in D(m)} AF(d) \tag{47}$$

$$IG\_M(m) = \bigcup_{d \in D(m)} IG(d) \tag{48}$$

$$NSG\_M(m) = \bigcup_{d \in D(m)} NSG(d) \tag{49}$$

$$F\_CY(cy) = \bigcup_{d \in D\_CY(cy)} F(d) \tag{50}$$

Variable	Units	SC	GR	Rule	Description	Ref
F(d)	{}	G	D		Set of Registered Facilities, unregistered generation systems and unregistered interruptible loads in Trading Day d	(30)
REG_F(d)	{}	G	D	11	Set of Registered Facilities in Trading Day d	(31)
NDL(d)	{}	G	D	11	Set of Non-Dispatchable Loads in Trading Day d	(32)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
IG(d)	{}	G	D	11	Set of Intermittent Generators in Trading Day d	(34)
RG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load remotely in Trading Day d	(35)
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
BALPF(d)	{}	G	D	11	Set of Facilities in the Balancing Portfolio in Trading Day d	(37)
BALF(d)	{}	G	D	11	Set of Balancing Facilities in Trading Day d	(38)
LFASF(d)	{}	G	D	11	Set of LFAS Facilities in Trading Day d	(39)
SAF(d)	{}	G	D	11	Set of Stand Alone Facilities in Trading Day d	(40)
AF(d)	{}	G	D	Appendix 2	Set of applicable facilities (including any exempt under 2.30A.2) in Trading Day d	(41)
GEN_UREG_L(d)	{}	G	D		Set of unregistered generation system serving an Intermittent Load in Trading Day d	(42)
AGG(d)	{}	G	D	2.30	Set of accepted aggregated Facilities in Trading Day d	(43)
SGpreAGG(d)	{}	G	D	2.30	Set of Facilities which comprise an aggregated Scheduled Generator on Trading Day d	(44)
DSPNMI(d)	{}	G	D		Set of connection points which comprise a Demand Side Programme on Trading Day d	(45)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)

Variable	Units	SC	GR	Rule	Description	Ref
NDL_WEMS(d)	{}	G	D		Set of Non-Dispatchable Loads in WEMS registration in Trading Day d	(27)
NDL_MTR(d)	{}	G	D		Set of Non-Dispatchable Loads with interval meters that are not in WEMS in Trading Day d	I
NOTIONAL(d)	{}	G	D	11	Set containing the Notional Wholesale Meter	(28)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
Synergy(d)	{}	G	D	11	Set containing Synergy	(15)
WEMS_IM(d)	{}	G	D		Set of Facilities that are Intermittent Loads in WEMS in Trading Day d	I
WEMS_FREG(d)	{}	G	D		Set of Facilities that are registered in WEMS in Trading Day d	I
WEMS_INSG(d)	{}	G	D		Set of Facilities with a INSG WEMS Type in Trading Day d	I
WEMS_RG(d)	{}	G	D		Set of Facilities in WEMS that remotely serve an Intermittent Load in Trading Day d	I
WEMS_SAF(d)	{}	G	D		Set of Facilities in WEMS that are Stand Alone Facilities in Trading Day d	I
GEN_UREG(d)	{}	G	D		Set of unregistered generation systems in Trading Day d	(23)
WEMS_RLG(d)	{}	G	D		Set of Facilities in WEMS that serve an Intermittent Load in Trading Day d	I
MTR_AGG(d)	{}	G	D	2.30	Set of Facilities that are the aggregate of other Facilities in Trading Day d	I
WEMS_LFAS(d)	{}	G	D		Set of Facilities in WEMS that are marked as intending to provide LFAS, and have standing data (in an accepted change request) for LFAS enablement limitations on Trading Day d	I
AF_M(m)	{}	G	M	Appendix 2	Set of applicable facilities (including any exempt under 2.30A.2) in Trading Month m	(47)
IG_M(m)	{}	G	M	11	Set of Intermittent Generators in Trading Month m	(48)
NSG_M(m)	{}	G	M	11	Set of Non-Scheduled Generators in Trading Month m	(49)
F_CY(cy)	{}	G	CY		Set of Registered Facilities and unregistered generation systems and unregistered interruptible loads in Capacity Year cy	(50)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
NTWK(d)	{}	G	D	11	Set of Networks in Trading Day d.	(29)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

Variable	Units	SC	GR	Rule	Description	Ref
D_CY(cy)	{}	G	CY		Set of Trading Days in Capacity Year cy	I

2.3 Other Sets

$$CCPF(d) = \{(p, f) : p \in P(d), f \in CCF(p, d)\} \tag{51}$$

$$CCPF\_M(m) = \bigcup_{d \in D(m)} CCPF(d) \tag{52}$$

Variable	Units	SC	GR	Rule	Description	Ref
CCPF(d)	{}	G	D		Set of participant-facility combinations in Trading D d	(51)
CCPF_M(m)	{}	G	M		Set of participant-facility combinations in Trading Month m	(52)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
P(d)	{}	G	D		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Day d	(3)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

Variable	Units	SC	GR	Rule	Description	Ref
B(d)	{}	G	D		Set of all generation metering channels associated with NMIs in Trading Day d	I
E(d)	{}	G	D		Set of all consumption metering channels associated with NMIs in Trading Day d	I
NS(d)	{}	G	D	2.30B.10(a)ii	Set of all separately metered connection points (NMIs) that are also measured by another connection point in Trading Day d	I
BPQP(i)	{}	G	I	11	Set of Balancing Price-Quantity Pairs in Trading Interval i	I
SUP(m)	{}	G	M		Set of Supplementary Capacity contracts in Trading Month m	I
CC(d)	{}	G	D		Set of all price-quantity pairs associated with Capacity Credits (excluding DSM and SPA) for Trading Day d (ordered by ascending price)	I
CCAM(m)	{}	G	M		Set of Capacity Credit Allocations made (by Facility f and Market Participant p) in Trading Month m	I
CCAR(m)	{}	G	M		Set of Capacity Credit Allocations received (by Market Participant p from Facility f) in Trading Month m	I

Variable	Units	SC	GR	Rule	Description	Ref
PGSTSTEM(d)	{}	G	D		Set of all STEM variables which are payments to which GST applies in Trading Day d	I
CGSTSTEM(d)	{}	G	D		Set of all STEM variables which are charges to which GST applies in Trading Day d	I
PGSTNSTEM(d)	{}	G	D		Set of all NSTEM variables which are payments to which GST applies in Trading Day d	I
CGSTNSTEM(d)	{}	G	D		Set of all NSTEM variables which are charges to which GST applies in Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I
I_CY(cy)	{}	G	CY		Set of Trading Intervals in Capacity Year cy	I
PI4320a(i)	{}	G	I		Set of Trading Intervals within the 90th Trading Day prior to Trading Interval i's Trading Day that form part of the 4320 Trading Intervals prior to and including Trading Interval i	I
PI4320b(i)	{}	G	I		Set of Trading Intervals within Trading Interval i's Trading Day that form part of the 4320 Trading Intervals prior to and including Trading Interval i	I
PD89(d)	{}	G	D		Set of 89 Trading Days prior to Trading Day d	I
PI1440(i)	{}	G	I		Set of 1440 Trading Intervals prior to and including Trading Interval i	I
PITD(i)	{}	G	I		Set of Trading Intervals in the same Trading Day as, but prior to, Trading Interval i	I
PD1000(d)	{}	G	D		Set of 1000 Trading Days preceding (and excluding) Trading Day d	I
INTDAYS1(m)	{}	G	M	9.1.3	Set of days from (and including) the settlement day associated with the original NSTEM Settlement Statement up to (but excluding) settlement day for adjustment 1 Non-STEM Settlement Statement for Trading Month m	I
INTDAYS2(m)	{}	G	M	9.1.3	Set of days from (and including) the settlement day associated with the original NSTEM Settlement Statement up to (but excluding) settlement day for adjustment 2 Non-STEM Settlement Statement for Trading Month m	I

Variable	Units	SC	GR	Rule	Description	Ref
INTDAYS3(m)	{}	G	M	9.1.3	Set of days from (and including) the settlement day associated with the original NSTEM Settlement Statement up to (but excluding) settlement day for adjustment 3 Non-STEM Settlement Statement for Trading Month m	I
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I
D_W(w)	{}	G	W		Set of Trading Days in Trading Week w	I
D_CY(cy)	{}	G	CY		Set of Trading Days in Capacity Year cy	I
EXPDAYS(d)	{}	G	D		Set of Trading Days that have not yet had the final Settlement Statement issued, up to and including Trading Day d-1	I

2.4 Associations

Associations are used to link two entities to each other. These associations are used in the document for the following purposes:

- To reference a variable or attribute that applies to the parent of a child by relying on the primary or additional associations listed below. E.g. $UOOM\_F\_I(t,i)$ is referring to the $UOOM\_F\_I$ quantity for the Facility that is associated with tranche t.
- To reference a Facility or NMI associated with an Intermittent Load by relying on the additional associations listed below. E.g. $NMI(IML2RG(f,i),i)$ is referring to the set of NMIs that are associated with the Remote Generator that is associated with Intermittent Load f.

2.4.1 Primary Associations

Association	Child SC	Parent SC	Description
F2P	F	P	Association between Facility f and participant p
N2F	N	F	Association between NMI n and Facility f (excluding DSPs)
CH2N	CH	N	Association between channel ch and NMI n
SUP2P	C	P	Association between Supplementary Capacity contract c and participant p
BPQP2F	T	F	Association between a Balancing Price-Quantity Pair t and Facility f
A2F	A	F	Association between a Capacity Credit Allocation a and Facility f
PF2P	PF	P	Association between a Participant-Facility (p, f) and a Participant p
PF2F	PF	F	Association between a Participant-Facility (p, f) and a Facility f

2.4.2 Additional Associations

Association	Child SC	Parent SC	Description
N2DSP	N	F	Association between NMI n and DSP f

Association	Child SC	Parent SC	Description
IML2EG	F	F	Association between Intermittent Load f and any embedded generator
IML2RG	F	F	Association between Intermittent Load f and any remote generator
IML2NS	N	F	Association between Intermittent Load f and any separately metered NMI that is measured by another connection point
A2PM	A	P	Association between Capacity Credit Allocation a and the Market Participant making the allocation
A2PR	A	P	Association between Capacity Credit Allocation a and the Market Participant receiving the allocation
T2F	T	F	Association between a price-quantity pair and the Facility associated with the price-quantity pair
T2P	T	P	Associations between a price-quantity pair and the participant associated with the price-quantity pair

3 Metered Schedules

Metering calculations are fundamental to settlement and prudential calculations. Due to the large volumes of data, metering calculations are separated from the main calculation engine.

Metered Schedules are calculated for:

- Non-Dispatchable Loads (excluding those represented by the Notional Wholesale Meter)
- Interruptible Loads
- Scheduled Generators
- Non-Scheduled Generators
- Notional Wholesale Meter

In order to determine these Metered Schedules the following information is required:

- Connection point energy quantities
- Facility category
- Facility aggregation requirements

The purpose of this section is to define Sent Out Metered Schedules (Non-loss adjusted energy) and Metered Schedules (loss adjusted energy) for each category of facility defined in the registration chapter. Unregistered NDLs' Metered Schedules and Sent Out Metered Schedules are the same as the connection point's Metered Schedules as defined previously. Intermittent Load facilities Metered Schedules do not use the same variables as all other facilities. These Metered Schedules are detailed in their own section.

The equations in the following sections incorporate the concept of aggregated facilities [MR 2.30], which is a Registered Facility with more than one connection point.

3.1 Invocation

The following table outlines the invocation for the high-level calculations.

Variable	Scope Set
$SOMS\_N\_I(n,i)$	$\forall n \in NMI(i)$
$SOMS\_F\_I(f,i)$	$\forall f \in NDL(i) \cup IRL(i) \cup SG(i) \cup NSG(i)$

Variable	Units	SC	GR	Rule	Description	Ref
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
NDL(d)	{}	G	D	11	Set of Non-Dispatchable Loads in Trading Day d	(32)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)

3.2 Connection point energy quantities

Western Power is a Metering Data Agent and provides AEMO with:

- Energy data (kWh); and
- Standing data (Participant, TLF, DLF).

Each connection point is assigned a NMI (National Meter Identifier).

For any single interval, a NMI may have multiple meter channels that measure and store data. The type of data varies; however, the channels containing data relevant to AEMO are B channels which measure generation, and E channels which measure consumption.

The image below shows a sample of energy data received from Western Power. In this example it shows that NMI 8001000347 had 9.600 kWh of consumption for Trading Interval 03:30 on its E1 channel.

```
<Header>
  <From description="Western Power Networks">WPNTWRKS</From>
  <To description="Independent Market Operator">IMOWAE</To>
  <MessageID>WPNTWRKSMSG-215630979</MessageID>
  <MessageDate>2018-02-28T22:18:54+08:00</MessageDate>
  <TransactionGroup>MTRD</TransactionGroup>
  <Priority>Low</Priority>
  <Market>WAELEC</Market>
</Header>
<Transactions>
  <Transaction transactionID="WPNTWRKS--232925016" transactionDate="20
    <MeterDataNotification version="r17">
      <RecordCount>665</RecordCount>
      <CSVConsumptionData>100,NEM12,201802282218,WPNTWRKS,IMOWAE
200,8001000347,E1Q1T1,01,E1,,0204000021,kWh,30,
300,20170331,496.800,367.200,7.200,4.800,7.200,4.800,4.800,9.600,12.000,
```

The image below shows a sample of standing data received from Western Power. In this example it shows that NMI 8001000266 had a TLF of TSAV, a DLF of QRT6, and a Financially Responsible Market Participant (FRMP) of ERMPOWER.

```
<Header>
  <From description="Western Power Networks">WPNTWRKS</From>
  <To description="ERM Power Retail">ERMPOWER</To>
  <MessageID>WPNTWRKSMSG-264235142</MessageID>
  <MessageDate>2019-05-10T09:01:46+08:00</MessageDate>
  <TransactionGroup>NMID</TransactionGroup>
  <Priority>Medium</Priority>
  <Market>WAELEC</Market>
</Header>
<Transactions>
  <Transaction transactionDate="2019-05-10T09:01:47+08:00" transactionID="WPNTWRKS-0000a-277865442">
    <NMIStandingDataUpdateNotification version="r9">
      <SingleNMIStandingData>
        <NMI checksum="7">8001000266</NMI>
        <WAMasterData>
          <JurisdictionCode>WA</JurisdictionCode>
          <NMIClassificationCode>LARGE</NMIClassificationCode>
          <TransmissionNodeIdentifier effectiveDate="2006-07-20">TSAV</TransmissionNodeIdentifier>
          <DistributionLossFactorCode effectiveDate="2000-11-30">QRT6</DistributionLossFactorCode>
          <ParentEmbeddedNetworkIdentifier xsi:nil="true"/>
          <ChildEmbeddedNetworkIdentifier>Master-Sub</ChildEmbeddedNetworkIdentifier>
          <Address>
          <Status effectiveDate="2000-11-30">A</Status>
          <DistanceFromSubstation effectiveDate="2016-07-01">3.186</DistanceFromSubstation>
          <Voltage>LV</Voltage>
          <PropertyType>Industrial</PropertyType>
          <PoleNumber xsi:nil="true"/>
        </WAMasterData>
        <RoleAssignments>
          <RoleAssignment effectiveDate="2000-11-30">
            <Party description="Synergy Energy">WPRTL</Party>
            <Role>ROLR</Role>
          </RoleAssignment>
          <RoleAssignment effectiveDate="2017-08-01">
            <Party description="ERM Power Retail">ERMPOWER</Party>
            <Role>RP</Role>
          </RoleAssignment>
          <RoleAssignment effectiveDate="2017-08-01">
            <Party description="ERM Power Retail">ERMPOWER</Party>
            <Role>FRMP</Role>
          </RoleAssignment>
```

Some specific items of note:

- Standing Data only provides data at a specific point in time - i.e. no historical data is stored in the file. Therefore AEMO's databases must consider how it will maintain historical information.
- The TLF is sent to AEMO against the TransmissionNodeIdentifier attribute. Market Participants (other than AEMO) receive files with the Transmission Network Identifier (TNI) in this field, and they do not receive TLFs. A TLF can be derived from a TNI and historical metering data.

Each NMI n has a non-loss adjusted energy quantity associated with it for every Trading Interval i.

Facilities without an interval meter (i.e. SCADA-only facilities) have the identical NMI name and Facility name in AEMO's systems (e.g. n = COLLIE˙G1, f = COLLIE˙G1).

Note, that the equation below (53), is as per the rules. AEMO's implementation uses a more generalised equation, (480), to handle prudentials as well as settlement.

$$SettlementSOMS\_N\_I(n,i) = \begin{cases} SCADA\_F\_I(n,i) & \text{for } n \in NOINTMETER(i) \\ \sum_{ch \in B(n,i)} MQ\_CH\_I(ch,i) - \sum_{ch \in E(n,i)} MQ\_CH\_I(ch,i) & \text{for } n \notin NOINTMETER(i) \end{cases} \quad (53)$$

Variable	Units	SC	GR	Rule	Description	Ref
SettlementSOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(53)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
SCADA_F_I(f, i)	MWh	F	I		Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	I
MQ_CH_I(ch, i)	MWh	CH	I		Energy measured by metering channel ch in Trading Interval i, non-loss adjusted	I
B(d)	{}	G	D		Set of all generation metering channels associated with NMIs in Trading Day d	I
E(d)	{}	G	D		Set of all consumption metering channels associated with NMIs in Trading Day d	I
NOINTMETER(d)	{}	G	D		Set of Facilities in WEMS for which no Interval meter exists in Trading Day d	I

3.3 Standard Metered Schedules

Note, that the equation below (54), is as per the rules. AEMO's implementation uses a more generalised equation, (483), to handle prudentials as well as settlement.

$$
\begin{aligned}
&SettlementSOMS\_F\_I(f,i) \\
&= \begin{cases}
\displaystyle\sum_{n \in NMI(f,i)} SOMS\_N\_I(n,i) & \text{for } f \in NDL\_WEMS(i) \cup IRL(i) \cup SG(i) \cup NSG(i) \\
 & \text{and } f \notin IML(i) \cup EG(i) \cup RG(i) \\
SOMS\_N\_I(f,i) & \text{for } f \in NDL\_MTR(i) \\
SOMSIL\_F\_I(f,i) + SOMSEL\_F\_I(f,i) & \text{for } f \in IML(i) \\
SOMSEG\_F\_I(EG2IML(f,i),i) & \text{for } f \in EG(i) \\
0 & \text{for } f \in RG(i) \\
\dfrac{MS\_F\_I(f,i)}{TLF\_F\_D(f,i) \times DLF\_F\_D(f,i)} & \text{for } f \in NOTIONAL(i) \\
0 & \text{otherwise}
\end{cases}
\end{aligned}
\tag{54}
$$

$$
\begin{aligned}
&MS\_F\_I(f,i) \\
&= \begin{cases}
 & \text{for } f \in NDL\_WEMS(i) \cup IRL(i) \cup SG(i) \cup NSG(i) \\
SOMS\_F\_I(f,i) \times TLF\_F\_D(f,i) \times DLF\_F\_D(f,i) & \text{and } f \notin IML(i) \cup EG(i) \cup RG(i) \\
SOMS\_N\_I(f,i) \times TLF\_N\_D(f,i) \times DLF\_N\_D(f,i) & \text{for } f \in NDL\_MTR(i) \\
MSIL\_F\_I(f,i) + MSEL\_F\_I(f,i) & \text{for } f \in IML(i) \\
MSEG\_F\_I(EG2IML(f,i),i) & \text{for } f \in EG(i) \\
0 & \text{for } f \in RG(i) \\
-1 \times \displaystyle\sum_{f \notin NOTIONAL(i)} MS\_F\_I(f,i) & \text{for } f \in NOTIONAL(i) \\
0 & \text{otherwise}
\end{cases}
\end{aligned}
\tag{55}
$$

Variable	Units	SC	GR	Rule	Description	Ref
SettlementSOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(54)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
MS_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c), 2.30B.12	Metered Schedule for Facility f in Trading Interval i	(55)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
MSIL_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c) i.1, ii.1, iii.1, iv.1	Metered Schedule for the intermittent load associated with Facility f in Trading Interval i	(72)
SOMSIL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the intermittent load associated with Facility f in Trading Interval i	(75)
MSEL_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c) i.2, ii.2, iii.2, iv.2	Metered Schedule for the embedded load associated with Facility f in Trading Interval i	(70)
SOMSEL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the embedded load associated with Facility f in Trading Interval i	(73)
MSEG_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c) i.3, ii.3, iii.3, iv.3	Metered Schedule for the embedded generator associated with Intermittent Load Facility f in Trading Interval i	(71)
SOMSEG_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the embedded generator associated with Intermittent Load Facility f in Trading Interval i	(74)
TLF_F_D(f, d)		F	D		Transmission Loss Factor for Facility f for Trading Day d	I
DLF_F_D(f, d)		F	D		Distribution Loss Factor for Facility f for Trading Day d	I
TLF_N_D(n, d)		N	D		Transmission Loss Factor for NMI n for Trading Day d	I
DLF_N_D(n, d)		N	D		Distribution Loss Factor for NMI n for Trading Day d	I
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
NDL_WEMS(d)	{}	G	D		Set of Non-Dispatchable Loads in WEMS registration in Trading Day d	(27)
NDL_MTR(d)	{}	G	D		Set of Non-Dispatchable Loads with interval meters that are not in WEMS in Trading Day d	I
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)

Variable	Units	SC	GR	Rule	Description	Ref
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
RG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load remotely in Trading Day d	(35)
NOTIONAL(d)	{}	G	D	11	Set containing the Notional Wholesale Meter	(28)

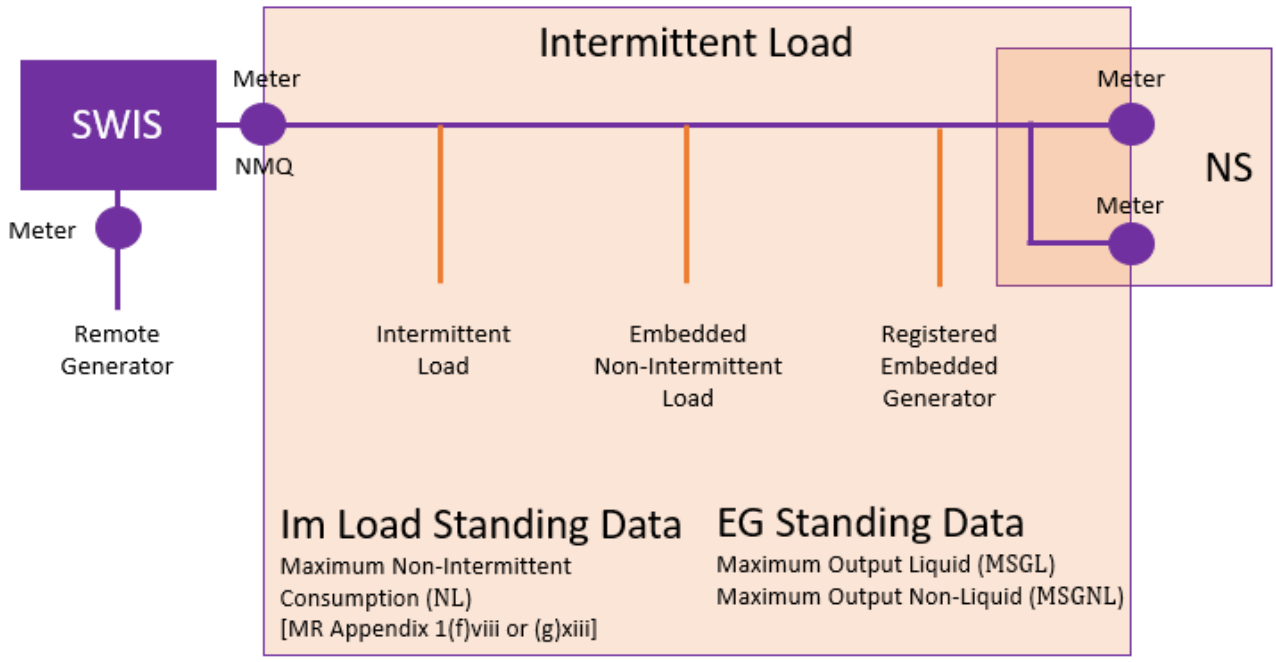
3.4 Intermittent Load Metered Schedules

An Intermittent Load comprises 4 components. The first 3 components are measured by the single connection point associated with the Intermittent Load, the 4th component is located at a different connection point:

- Intermittent load associated with Load f
- Embedded Load (non-Intermittent Load) that is non-Intermittent Load f
- Embedded generation associated with an embedded generator $IML2EG(f,d)$
- Remote generation associated with a remote generator $IML2RG(f,d)$

MR 2.30B.10(c)(i)3 requires the generation to be from a Registered Scheduled Generator at the connection point.

The figure below is a graphical representation of this configuration.



The purpose of this section is to define the Metered Schedule Quantities for each of the components. To do this, various standing data relating to the Intermittent Load and the embedded generator is used; however, the first step is to perform the following preliminary calculations to derive AMQ_F_I.

If there is a remote generator $IML2RG(f,d)$ associated with Intermittent Load f, its Metered Schedule for the purposes of Appendix 2 is defined below, for all other settlement calculations the Metered Schedule is not to be used. [MR 2.30B.12(b)]

Note, that the equation below (56), is as per the rules. AEMO's implementation uses a more generalised equation, (484), to handle prudentials as well as settlement.

$$SettlementSOMSRG\_F\_I(f,i) = \sum_{n \in NMI(IML2RG(f,i),i)} SOMS\_N\_I(n,i) \tag{56}$$

$$MSRG\_F\_I(f,i) = SOMSRG\_F\_I(f,i) \times TLF\_F\_D(IML2RG(f,i),i) \times DLF\_F\_D(IML2RG(f,i),i) \tag{57}$$

The net metered quantity associated with the Intermittent Load is calculated:

$$NNMQ\_F\_I(f,i) = \sum_{n \in NMI(f,i)} SOMS\_N\_I(n,i) \tag{58}$$

$$NMQ\_F\_I(f,i) = NNMQ\_F\_I(f,i) \times TLF\_F\_D(f,i) \times DLF\_F\_D(f,i) \tag{59}$$

The meter data associated with each individual NMI that is separately metered (and settled) associated with the Intermittent Load is calculated:

$$NS\_F\_I(f,i) = \sum_{n \in NS(f,i)} SOMS\_N\_I(n,i) \times TLF\_N\_D(n,i) \times DLF\_N\_D(n,i) \tag{60}$$

Any separately metered (and settled) quantities associated with the Intermittent Load are removed to determine AMQnoRG. Note, that the equation below (61), is as per the rules. AEMO's implementation uses a more generalised equation, (485), to handle prudentials as well as settlement.

$$SettlementAMQnoRG\_F\_I(f,i) = NMQ\_F\_I(f,i) - NS\_F\_I(f,i) \tag{61}$$

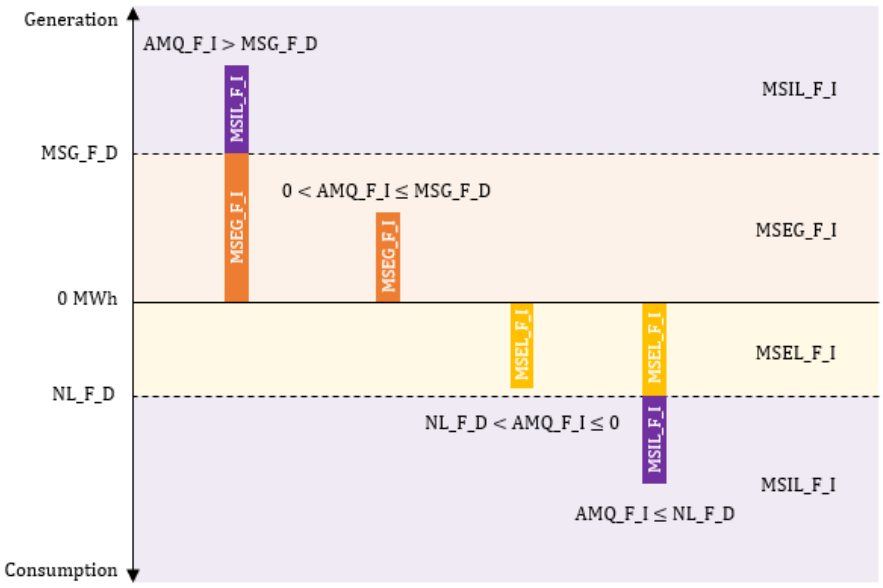
Any remote generator is accounted for to determine AMQ:

$$AMQ\_F\_I(f,i) = AMQnoRG\_F\_I(f,i) + MSRG\_F\_I(f,i) \tag{62}$$

Variable	Units	SC	GR	Rule	Description	Ref
AMQ_F_I(f, i)	MWh	F	I	2.30B.10 (a)vi, 2.30B.12(a)	Adjusted meter quantity (including Remote Generators) for Facility f in Trading Interval i	(62)
SettlementAMQnoRG_F_I(f, i)	MWh	F	I	2.30B.10(a)vi	Adjusted meter quantity (except Remote Generators) for Facility f in Trading Interval i	(61)
AMQnoRG_F_I(f, i)	MWh	F	I	2.30B.10(a)vi	Adjusted meter quantity (except Remote Generators) for Facility f in Trading Interval i	(485)
NMQ_F_I(f, i)	MWh	F	I	2.30B.10 (a)i	Loss adjusted net metered energy measured by the connection point for Facility f in Trading Interval i	(59)
NS_F_I(f, i)	MWh	F	I	2.30B.10(a)ii	Net supply that is separately metered associated with Facility f for Trading Interval i	(60)
NNMQ_F_I(f, i)	MWh	F	I	2.30B.10(a)i	Non-loss adjusted net metered energy measured by the connection point for Facility f in Trading Interval i	(58)
SettlementSOMSRG_F_I(f, i)	MWh	F	I		Non-loss adjusted energy output of remote generators associated with Intermittent Load Facility f in Trading Interval i	(56)
SOMSRG_F_I(f, i)	MWh	F	I		Non-loss adjusted energy output of remote generators associated with Intermittent Load Facility f in Trading Interval i	(484)

Variable	Units	SC	GR	Rule	Description	Ref
MSRG_F_I(f, i)	MWh	F	I		Loss-adjusted energy output of remote generators associated with Intermittent Load Facility f in Trading Interval i	(57)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
TLF_F_D(f, d)		F	D		Transmission Loss Factor for Facility f for Trading Day d	I
DLF_F_D(f, d)		F	D		Distribution Loss Factor for Facility f for Trading Day d	I
TLF_N_D(n, d)		N	D		Transmission Loss Factor for NMI n for Trading Day d	I
DLF_N_D(n, d)		N	D		Distribution Loss Factor for NMI n for Trading Day d	I
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
RG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load remotely in Trading Day d	(35)
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
NS(d)	{}	G	D	2.30B.10(a)ii	Set of all separately metered connection points (NMIs) that are also measured by another connection point in Trading Day d	I

Then the AMQ_F_I value is split into three components based on the standing data of the Intermittent Load or its associated embedded generator. If AMQ_F_I is positive (generating) the generation is attributed to the embedded generator up until its maximum sent out generation, with any excess generation being attributed to the Intermittent Load Metered Schedules. Similarly, if AMQ_F_I is negative (consuming) the consumption is attributed to the embedded load up until its maximum non-intermittent consumption, with any excess consumption being attributed to the Intermittent Load Metered Schedules. The diagram below illustrates this concept.



Mathematically, this is achieved by performing the following calculations:

The maximum non-intermittent Load associated with Intermittent load f is determined as:

$$NL\_F\_D(f,d) = -NLstanding\_F\_D(f,d) \times TLF\_F\_D(f,d) \times DLF\_F\_D(f,d) \tag{63}$$

The maximum Sent Out Generation for an embedded generator, e, associated with Intermittent Load f is determined as:

$$MSGEG\_F\_D(f,d) = MSG\_F\_D(IML2EG(f,d),d) \tag{64}$$

$$MSG\_F\_D(f,d) = 0.5h \times SOC\_F\_D(f,d) \times TLF\_F\_D(f,d) \times DLF\_F\_D(f,d) \tag{65}$$

$$SOC\_F\_D(f,d) = \begin{cases} \sum_{g \in BALPF(d)} SOC\_F\_D(g,d) & \text{for } f \in PORTFOLIO(d) \\ max(0, MSGL\_F\_D(f,d), MSGNL\_F\_D(f,d)) & \text{for } f \notin PORTFOLIO(d) \end{cases} \tag{66}$$

The Metered Schedule for the three components: Embedded Load, Intermittent Load and Embedded Generation of facility f are shown by the four equations below which is the mathematical representation of the image above.

$$MSEL\_F\_I(f,i) = \begin{cases} NL\_F\_D(f,i) & \text{for } AMQ\_F\_I(f,i) \le NL\_F\_D(f,i) \\ AMQ\_F\_I(f,i) & \text{for } NL\_F\_D(f,i) < AMQ\_F\_I(f,i) \le 0 \\ 0 & \text{for } 0 < AMQ\_F\_I(f,i) \le MSGEG\_F\_D(f,i) \\ 0 & \text{for } AMQ\_F\_I(f,i) > MSGEG\_F\_D(f,i) \end{cases} \tag{67}$$

$$MSEG\_F\_I(f,i) = \begin{cases} 0 & \text{for } AMQ\_F\_I(f,i) \le NL\_F\_D(f,i) \\ 0 & \text{for } NL\_F\_D(f,i) < AMQ\_F\_I(f,i) \le 0 \\ AMQ\_F\_I(f,i) & \text{for } 0 < AMQ\_F\_I(f,i) \le MSGEG\_F\_D(f,i) \\ MSGEG\_F\_D(f,i) & \text{for } AMQ\_F\_I(f,i) > MSGEG\_F\_D(f,i) \end{cases} \tag{68}$$

$$MSIL\_F\_I(f,i) = \begin{cases} AMQ\_F\_I(f,i) - NL\_F\_D(f,i) & \text{for } AMQ\_F\_I(f,i) \le NL\_F\_D(f,i) \\ 0 & \text{for } NL\_F\_D(f,i) < AMQ\_F\_I(f,i) \le 0 \\ 0 & \text{for } 0 < AMQ\_F\_I(f,i) \le MSGEG\_F\_D(f,i) \\ AMQ\_F\_I(f,i) - MSGEG\_F\_D(f,i) & \text{for } AMQ\_F\_I(f,i) > MSGEG\_F\_D(f,i) \end{cases} \tag{69}$$

These equations are mathematically equivalent to:

$$MSEL\_F\_I(f,i) = min(0, max(NL\_F\_D(f,i), AMQ\_F\_I(f,i))) \tag{70}$$

$$MSEG\_F\_I(f,i) = max(0, min(MSGEG\_F\_D(f,i), AMQ\_F\_I(f,i))) \tag{71}$$

$$MSIL\_F\_I(f,i) = AMQ\_F\_I(f,i) - MSEL\_F\_I(f,i) - MSEG\_F\_I(f,i) \tag{72}$$

The non-loss adjusted Metered Schedules for Embedded Load and Embedded Generator and Intermittent Load are defined as:

$$SOMSEL\_F\_I(f,i) = \frac{MSEL\_F\_I(f,i)}{TLF\_F\_D(f,i) \times DLF\_F\_D(f,i)} \tag{73}$$

$$SOMSEG\_F\_I(f,i) = \frac{MSEG\_F\_I(f,i)}{TLF\_F\_D(f,i) \times DLF\_F\_D(f,i)} \tag{74}$$

$$SOMSIL\_F\_I(f,i) = \frac{MSIL\_F\_I(f,i)}{TLF\_F\_D(f,i) \times DLF\_F\_D(f,i)} \tag{75}$$

Variable	Units	SC	GR	Rule	Description	Ref
MSIL_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c) i.1, ii.1, iii.1, iv.1	Metered Schedule for the intermittent load associated with Facility f in Trading Interval i	(72)

Variable	Units	SC	GR	Rule	Description	Ref
SOMSIL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the intermittent load associated with Facility f in Trading Interval i	(75)
MSEL_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c) i.2, ii.2, iii.2, iv.2	Metered Schedule for the embedded load associated with Facility f in Trading Interval i	(70)
SOMSEL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the embedded load associated with Facility f in Trading Interval i	(73)
MSEG_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c) i.3, ii.3, iii.3, iv.3	Metered Schedule for the embedded generator associated with Intermittent Load Facility f in Trading Interval i	(71)
SOMSEG_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the embedded generator associated with Intermittent Load Facility f in Trading Interval i	(74)
AMQ_F_I(f, i)	MWh	F	I	2.30B.10 (a)vi, 2.30B.12(a)	Adjusted meter quantity (including Remote Generators) for Facility f in Trading Interval i	(62)
MSGL_F_D(f, d)	MW	F	D	Appendix 1 (b)iii	Maximum sent out capacity (liquid fuel) of Facility f in Trading Day d.	I
MSGNL_F_D(f, d)	MW	F	D	Appendix 1 (b)iii, Appendix 1 (e)iiiA	Maximum sent out capacity (Non-liquid fuel) of Facility f in Trading Day d.	I
MSG_F_D(f, d)	MWh	F	D	2.30B.10(a)v	Maximum sent out generation of Facility f in Trading Day d	(65)
MSGEG_F_D(f, d)	MWh	F	D	2.30B.10(a)v	Maximum sent out generation of the embedded generator serving Intermittent Load Facility f in Trading Day d	(64)
SOC_F_D(f, d)	MW	F	D	11	Sent Out Capacity of Facility f in Trading Day d	(66)
NLstanding_F_D(f, d)	MWh	F	D	Appendix 1 (f)viii or (g)xiii	Maximum possible consumption that is non-intermittent (nominated in standing data) associated with Facility f in Trading Day d. This has a positive value.	I
NL_F_D(f, d)	MWh	F	D	2.30B.10(a)iii	Maximum possible consumption that is non-intermittent associated with Facility f in Trading Day d. This has a negative value.	(63)
TLF_F_D(f, d)		F	D		Transmission Loss Factor for Facility f for Trading Day d	I
DLF_F_D(f, d)		F	D		Distribution Loss Factor for Facility f for Trading Day d	I
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)

Variable	Units	SC	GR	Rule	Description	Ref
BALPF(d)	{}	G	D	11	Set of Facilities in the Balancing Portfolio in Trading Day d	(37)

3.5 Metering Aggregations

3.5.1 Invocation

The following table outlines the preliminary invocation for the high-level calculations.

Variable	Scope Set
$ABSLOAD\_G\_I(i)$	N/A
$ABSGEN\_G\_I(i)$	N/A
$LFCQ\_P\_M(p,m)$	$\forall p \in P\_M(m)$
$DSPL\_F\_I(f,i)$	$\forall f \in DSP(i)$
$SOMSAV\_F\_M(f,m)$	$\forall f \in AF\_M(m) \cap IG\_M(m)$
$SOMS\_G\_I(i)$	N/A

Variable	Units	SC	GR	Rule	Description	Ref
ABSLOAD_G_I(i)	MWh	G	I	9.13.1	Metered Load in Trading Interval i	(76)
ABSGEN_G_I(i)	MWh	G	I	9.13.1	Metered Generation in Trading Interval i	(79)
LFCQ_P_M(p, m)	MWh	P	M	3.14.1(a)	Load following contributing quantity for Market Participant p in Trading Month m	(81)
DSPL_F_I(f, i)	MWh	F	I	6.16.2	Demand Side Programme Load for Facility f in Trading Interval i	(84)
SOMSAV_F_M(f, m)	MWh	F	M		Average Sent Out Metered Schedule for Facility f in Trading Month m	(85)
SOMS_G_I(i)	MWh	G	I	11	Total Sent Out Generation in Trading Interval i	(86)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
AF_M(m)	{}	G	M	Appendix 2	Set of applicable facilities (including any exempt under 2.30A.2) in Trading Month m	(47)
IG_M(m)	{}	G	M	11	Set of Intermittent Generators in Trading Month m	(48)

3.5.2 ABSLOAD_G_I, ABSLOAD_P_I

$$ABSLOAD\_G\_I(i) = \sum_{p \in MP(i)} ABSLOAD\_P\_I(p,i) \tag{76}$$

$$ABSLOAD\_P\_I(p,i) = ABSNDL\_P\_I(p,i) + \sum_{f \in IRL(p,i)} |MS\_F\_I(f,i)| \tag{77}$$

$$ABSNDL\_P\_I(p,i) = \sum_{f \in NDL(p,i)} |MS\_F\_I(f,i)| \tag{78}$$

Variable	Units	SC	GR	Rule	Description	Ref
ABSLOAD_G_I(i)	MWh	G	I	9.13.1	Metered Load in Trading Interval i	(76)
ABSLOAD_P_I(p, i)	MWh	P	I	9.13.1	Metered Load for Market Participant p in Trading Interval i	(77)
ABSNDL_P_I(p, i)	MWh	P	I	9.13.1	Sum of the absolute values of the Non-Dispatchable Load Metered Schedules for Market Participant p in Trading Interval i	(78)
MS_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c), 2.30B.12	Metered Schedule for Facility f in Trading Interval i	(55)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
NDL(d)	{}	G	D	11	Set of Non-Dispatchable Loads in Trading Day d	(32)
MP(d)	{}	G	D	11	Set of Market Participants in Trading Day d	(7)

3.5.3 ABSGEN_G_I, ABSGEN_P_I

$$ABSGEN\_G\_I(i) = \sum_{p \in MP(i)} ABSGEN\_P\_I(p, i) \tag{79}$$

$$ABSGEN\_P\_I(p, i) = \sum_{f \in SG(p,i) \cup NSG(p,i)} |MS\_F\_I(f, i)| \tag{80}$$

Variable	Units	SC	GR	Rule	Description	Ref
ABSGEN_G_I(i)	MWh	G	I	9.13.1	Metered Generation in Trading Interval i	(79)
ABSGEN_P_I(p, i)	MWh	P	I	9.13.1	Metered Generation for Market Participant p in Trading Interval i	(80)
MS_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c), 2.30B.12	Metered Schedule for Facility f in Trading Interval i	(55)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
MP(d)	{}	G	D	11	Set of Market Participants in Trading Day d	(7)

3.5.4 LFCQ_P_M, CQ_P_M

$$LFCQ\_P\_M(p, m) = \sum_{i \in I\_M(m)} \left(\sum_{f \in NSG(p,i)} MS\_F\_I(f, i) \right) + |CQ\_P\_M(p, m)| \tag{81}$$

$$CQ\_P\_M(p, m) = \sum_{i \in I\_M(m)} \left(MSNDL\_P\_I(p, i) + \sum_{f \in IRL(p,i)} MS\_F\_I(f, i) \right) \tag{82}$$

$$MSNDL\_P\_I(p, i) = \sum_{f \in NDL(p,i)} MS\_F\_I(f, i) \tag{83}$$

Variable	Units	SC	GR	Rule	Description	Ref
LFCQ_P_M(p, m)	MWh	P	M	3.14.1(a)	Load following contributing quantity for Market Participant p in Trading Month m	(81)
CQ_P_M(p, m)	MWh	P	M	9.3.7(a)	Contributing quantity for Market Participant p in Trading Month m	(82)
MS_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c), 2.30B.12	Metered Schedule for Facility f in Trading Interval i	(55)
MSNDL_P_I(p, i)	MWh	P	I		Sum of all Non-Dispatchable Load Metered Schedules for Market Participant p in Trading Interval i	(83)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
NDL(d)	{}	G	D		Set of Non-Dispatchable Loads in Trading Day d	(32)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I

3.5.5 DSPL_F_I

$$DSPL\_F\_I(f,i) = \sum_{n \in NMI(f,i)} -SOMS\_N\_I(n,i) \tag{84}$$

Variable	Units	SC	GR	Rule	Description	Ref
DSPL_F_I(f, i)	MWh	F	I	6.16.2	Demand Side Programme Load for Facility f in Trading Interval i	(84)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I

3.5.6 SOMSAV_F_M

$$SOMSAV\_F\_M(f,m) = \begin{cases} 0 & \text{for } REGTITM\_F\_M(f,m) = 0 \\ \dfrac{\sum_{i \in I\_M(m)} SOMS\_F\_I(f,i)}{REGTITM\_F\_M(f,m)} & \text{otherwise} \end{cases} \tag{85}$$

Variable	Units	SC	GR	Rule	Description	Ref
SOMSAV_F_M(f, m)	MWh	F	M		Average Sent Out Metered Schedule for Facility f in Trading Month m	(85)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
REGTITM_F_M(f, m)		F	M		Number of Trading Intervals for which Facility f is registered in Trading Month m	I
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I

3.5.7 SOMS_G_I

$$SOMS\_G\_I(i) = \sum_{f \in SG(i) \cup NSG(i)} max(0, SOMS\_F\_I(f, i)) \tag{86}$$

Variable	Units	SC	GR	Rule	Description	Ref
SOMS_G_I(i)	MWh	G	I	11	Total Sent Out Generation in Trading Interval i	(86)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)

4 Calculation Engine

AEMO uses the same calculation engine for both settlement and prudentials. Settlement calculations are determined for either a Trading Week (STEM) or Trading Month (NSTEM); however, prudential calculations are determined for each Trading Day. Therefore, the common calculation engine has been implemented on a daily basis, and can then be aggregated to achieve the required settlement outputs.
Some calculations are to be calculated prior to those outlined in the main calculation engine. These calculations have been chosen based on implementation considerations. The example below is offered to illustrate an implementation consideration.

AEMO is required to perform a calculation that requires the previous 1000 Trading Days for each Trading Day in April. If AEMO performs the calculation for all 30 days together then it imports 1030 Trading Days of Data. If AEMO performs the calculations for each individual Trading Day it will import 1000 Trading Days of data, 30 times, which is inefficient. These following invocation sections outlines the order in which calculations are invoked in the system.

4.1 Preliminary Calculations

4.1.1 Preliminary Invocation

The following table outlines the preliminary invocation for the high-level calculations.

Variable	Scope Set
$MAX2\_F\_M(f,m)$	$\forall f \in NSG\_M(m)$
$REPOC1000\_F\_D(f,d)$	$\forall f \in SG(d)$
$DISP\_F\_I(f,i)$	$\forall f \in CCF(i) \cap \overline{DSP(i)}$
$DISP1440Flag\_F\_I(f,i)$	$\forall f \in SG(i) \cup DSP(i)$
$SCADASOI\_F\_I(f,i)$	$\forall f \in BALF(i) \cup PORTFOLIO(i)$
$MAXFR\_F\_CY(f,cy)$	$\forall f \in F\_CY(cy)$
$MAXPGR\_P\_CY(p,cy)$	$\forall p \in P\_CY(cy)$
$CC\_PF\_M(p,f,m)$	$\forall (p,f) \in CCPF\_M(m)$

Variable	Units	SC	GR	Rule	Description	Ref
MAX2_F_M(f, m)	MWh	F	M	4.26.1A (a)(ii).3	2nd highest Sent Out Metered Schedule of Facility f up to and including Trading Month m	(87)
REPOC1000_F_D(f, d)		F	D	11	Refund Exempt Planned Outage Count for Facility f over the preceding 1000 Trading Days prior to (and excluding) Trading Day d	(97)
DISP_F_I(f, i)		F	I	4.26.1(f)i	Portion of capacity which is not subject to a Forced Outage for Facility f over the previous 4320 Trading Intervals up to and including Trading Interval i	(98)
DISP1440Flag_F_I(f, i)	Flag	F	I	4.26.6(e)i.1, 4.26.6(e)ii.1	Flag that is 1 when Facility f has been dispatched in the previous 1440 intervals prior to and including Trading Interval i and 0 otherwise	(100)
SCADASOI_F_I(f, i)	MW	F	I		The start of interval output of Facility f for Trading Interval i	(96)
MAXFR_F_CY(f, cy)	$	F	CY	11	Maximum Facility Refund for Facility f in Capacity Year cy	(92)

Variable	Units	SC	GR	Rule	Description	Ref
MAXPGR_P_CY(p, cy)	$	P	CY	11	Maximum Participant Generation Refund for Market Participant p in Capacity Year cy	(90)
CC_PF_M(p, f, m)	MW	PF	M		Capacity Credits associated with Facility f and Market Participant p for Trading Month m	(101)
P_CY(cy)	{}	G	CY		Set of participants (Rule Participants, ERA and the Coordinator) in Capacity Year cy	(2)
F_CY(cy)	{}	G	CY		Set of Registered Facilities and unregistered generation systems and unregistered interruptible loads in Capacity Year cy	(50)
NSG_M(m)	{}	G	M	11	Set of Non-Scheduled Generators in Trading Month m	(49)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
BALF(d)	{}	G	D	11	Set of Balancing Facilities in Trading Day d	(38)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
CCPF_M(m)	{}	G	M		Set of participant-facility combinations in Trading Month m	(52)

4.1.2 MAX2_F_M

$$\begin{aligned} MAX2\_F\_M(f,m) = \text{2nd highest value of} \\ & \{MAX1CM\_F\_M(f,j) : n < j \leq m\} \cup \\ & \{MAX2CM\_F\_M(f,j) : n < j \leq m\} \cup \\ & \{MAX1Start\_F\_M(f,n)\} \cup \\ & \{MAX2Start\_F\_M(f,n)\} \end{aligned} \tag{87}$$

where n is the Trading Month applicable to $MAX1Start\_F\_M$ and $MAX2Start\_F\_M$ and n is represented in two components (year and month) by variables $MAXStartYear\_G\_M$ and $MAXStartMonth\_G\_M$.

$$MAX1CM\_F\_M(f,m) = \text{Highest value of } \{SOMS\_F\_I(f,i) \times COP\_F\_D(f,i) : i \in I\_M(m)\} \tag{88}$$

$$MAX2CM\_F\_M(f,m) = \text{2nd highest value of } \{SOMS\_F\_I(f,i) \times COP\_F\_D(f,i) : i \in I\_M(m)\} \tag{89}$$

Variable	Units	SC	GR	Rule	Description	Ref
MAX2_F_M(f, m)	MWh	F	M	4.26.1A (a)(ii).3	2nd highest Sent Out Metered Schedule of Facility f up to and including Trading Month m	(87)
COP_F_D(f, d)	Flag	F	D	4.13.10B	Flag that is 1 if Facility f is in Commercial Operations in Trading Day d, and 0 otherwise	I

Variable	Units	SC	GR	Rule	Description	Ref
MAX2CM_F_M(f, m)	MWh	F	M		2nd highest Sent Out Metered Schedule (after Commercial Operation) of Facility f in the current month, Trading Month m	(89)
MAX1CM_F_M(f, m)	MWh	F	M		Highest Sent Out Metered Schedule (after Commercial Operation) of Facility f in the current month, Trading Month m	(88)
MAX2Start_F_M(f, m)	MWh	F	M		2nd highest Sent Out Metered Schedule (after Commercial Operation) of Facility f up to and including Trading Month m	I
MAX1Start_F_M(f, m)	MWh	F	M		Highest Sent Out Metered Schedule (after Commercial Operation) of Facility f up to and including Trading Month m	I
MAXStartYear_G_M(f, m)		G	M		A number representing the year associated with the Trading Month applicable to $MAX1Start\_F\_M$ and $MAX2START\_F\_M$	I
MAXStartMonth_G_M(f, m)		G	M		A number representing the month associated with the Trading Month applicable to $MAX1Start\_F\_M$ and $MAX2START\_F\_M$	I
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I

4.1.3 MAXPGR_P_CY and MAXFR_F_CY

The calculations of $MAXFR\_F\_CY$ and $MAXPGR\_P\_CY$ require calculations for all Trading Days in the Capacity Year. This is important to note as very few other calculations require this forward-looking calculation. In order to perform this forward-looking calculation, the following assumptions are made for future Trading Days:

- $CC\_F\_D(f, d+1) = CC\_F\_D(f, d)$
- The Facility remains registered to the current Market Participant for the remainder of the Capacity Year.

$$MAXPGR\_P\_CY(p, cy) = \sum_{d \in D\_CY(cy)} MAXPGR\_P\_D(p, d) \tag{90}$$

$$MAXPGR\_P\_D(p, d) = \sum_{f \in F(p,d) \cap GEN(d)} MAXFR\_F\_D(f, d) \tag{91}$$

$$MAXFR\_F\_CY(f, cy) = \sum_{d \in D\_CY(cy)} MAXFR\_F\_D(f, d) \tag{92}$$

$$MAXFR\_F\_D(f, d) = \begin{cases} CC\_F\_D(f, d) \times RCP\_F\_D(f, d) & \text{for } f \notin DSP(d) \\ CC\_F\_D(f, d) \times RCP\_F\_D(f, d) - VRCC\_F\_D(f, d) \times RCP\_F\_D(f, d) & \text{for } f \in DSP(d) \end{cases} \tag{93}$$

$$RCP\_F\_D(f, d) = \frac{RCP\_F\_M(f, d)}{TDTM\_G\_M(d)} \tag{94}$$

$$TDTM\_G\_M(m) = \begin{cases} 28 & \text{for } m = \text{February in a non-leap year} \\ 29 & \text{for } m = \text{February in a leap year} \\ 30 & \text{for } m \in \{ \text{ April, June, September, November } \} \\ 31 & \text{for } m \in \{ \text{ January, March, May, July, August, October, December } \} \end{cases} \quad (95)$$

Variable	Units	SC	GR	Rule	Description	Ref
MAXPGR_P_CY(p, cy)	$	P	CY	11	Maximum Participant Generation Refund for Market Participant p in Capacity Year cy	(90)
MAXPGR_P_D(p, d)	$	P	D	11	Maximum Participant Generation Refund for Market Participant p contributed by Trading Day d	(91)
MAXFR_F_CY(f, cy)	$	F	CY	11	Maximum Facility Refund for Facility f in Capacity Year cy	(92)
MAXFR_F_D(f, d)	$	F	I	11	Maximum Facility Refund for Facility f contributed by Trading Day d	(93)
VRCC_F_D(f, d)	MW	F	D	4.25.4E	The amount of Capacity Credits voluntarily reduced for Facility f in the Capacity Year in which Trading Day d falls, but prior to the application being approved	I
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
RCP_F_D(f, d)	$/MW	F	D		Daily Reserve Capacity Price for Facility f in Trading Day d	(94)
RCP_F_M(f, m)	$/MW	F	M	11	Facility Monthly Reserve Capacity Price for Facility f in Trading Month m	(376)
TDTM_G_M(m)		G	M		Number of Trading Days in Trading Month m	(95)
GEN(d)	{}	G	D	2.29.1(c)	Set of generation systems in Trading Day d	(20)
F(d)	{}	G	D		Set of Registered Facilities, unregistered generation systems and unregistered interruptible loads in Trading Day d	(30)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
D_CY(cy)	{}	G	CY		Set of Trading Days in Capacity Year cy	I

4.1.4 SCADASOI_F_I

$$SCADASOI\_F\_I(f, i) = SCADAEOI\_F\_I(f, i-1) \quad (96)$$

Variable	Units	SC	GR	Rule	Description	Ref
SCADASOI_F_I(f, i)	MW	F	I		The start of interval output of Facility f for Trading Interval i	(96)
SCADAEOI_F_I(f, i)	MW	F	I		The end of interval output of Facility f for Trading Interval i	I

4.1.5 REPOC1000_F_D

$$REPOC1000\_F\_D(f,d) = \sum_{i \in PD1000(d)} REPOC\_F\_D(f,i) \tag{97}$$

Variable	Units	SC	GR	Rule	Description	Ref
REPOC1000_F_D(f, d)		F	D	11	Refund Exempt Planned Outage Count for Facility f over the preceding 1000 Trading Days prior to (and excluding) Trading Day d	(97)
REPOC_F_D(f, d)		F	D	11	Refund Exempt Planned Outage Count for Facility f on Trading Day d	I
PD1000(d)	{}	G	D		Set of 1000 Trading Days preceding (and excluding) Trading Day d	I

4.1.6 DISP_F_I

$$DISP\_F\_I(f,i) = \begin{cases} 0 & \text{for div by 0} \\ 1 - \dfrac{\sum_{j \in PI4320a(i)} EXPFO\_F\_I(f,j) + \sum_{d \in PD89(i)} EXPFO\_F\_D(f,d) + \sum_{j \in PI4320b(i)} EXPFO\_F\_I(f,i)}{\sum_{j \in PI4320a(i)} CC\_F\_D(f,j) + 48 \times \sum_{d \in PD89(i)} CC\_F\_D(f,d) + \sum_{j \in PI4320b(i)} CC\_F\_D(f,j)} & \text{otherwise} \end{cases} \tag{98}$$

$$EXPFO\_F\_D(f,d) = \sum_{i \in I(d)} EXPFO\_F\_I(f,i) \tag{99}$$

Variable	Units	SC	GR	Rule	Description	Ref
DISP_F_I(f, i)		F	I	4.26.1(f)i	Portion of capacity which is not subject to a Forced Outage for Facility f over the previous 4320 Trading Intervals up to and including Trading Interval i	(98)
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
EXPFO_F_D(f, d)	MW	F	D		Sum of Ex-post Forced Outage for Facility f in Trading Day d	(99)
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
PI4320a(i)	{}	G	I		Set of Trading Intervals within the 90th Trading Day prior to Trading Interval i's Trading Day that form part of the 4320 Trading Intervals prior to and including Trading Interval i	I
PI4320b(i)	{}	G	I		Set of Trading Intervals within Trading Interval i's Trading Day that form part of the 4320 Trading Intervals prior to and including Trading Interval i	I
PD89(d)	{}	G	D		Set of 89 Trading Days prior to Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.1.7 DISP1440Flag_F_I

$$DISP1440Flag\_F\_I(f,i) = \begin{cases} 1 & f \in SG(i) \text{ and } \sum_{j \in PI1440(i)} max(0, SOMS\_F\_I(f,j)) > 0 \\ 1 & f \in DSP(i) \text{ and } \sum_{j \in PI1440(i)} max(0, DI\_F\_I(f,j)) > 0 \\ 0 & \text{otherwise} \end{cases} \quad (100)$$

Variable	Units	SC	GR	Rule	Description	Ref
DISP1440Flag_F_I(f, i)	Flag	F	I	4.26.6(e)i.1, 4.26.6(e)ii.1	Flag that is 1 when Facility f has been dispatched in the previous 1440 intervals prior to and including Trading Interval i and 0 otherwise	(100)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
DI_F_I(f, i)	MWh	F	I	7.13.1(eG)	Dispatch Instruction for Facility f in Trading Interval i	I
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
PI1440(i)	{}	G	I		Set of 1440 Trading Intervals prior to and including Trading Interval i	I

4.1.8 CC_PF_M

The calculation of CC_PF_M requires calculations for all Trading Days in the Trading Month. This is important to note as very few other calculations require this forward-looking calculation. In order to perform this forward-looking calculation, the following assumptions are made for future Trading Days:

- $CC\_F\_D(f, d+1) = CC\_F\_D(f, d)$
- The Facility remains registered to the current Market Participant for the remainder of the Capacity Year.

$$CC\_PF\_M(p,f,m) = \frac{\sum_{d \in D(m)} CC\_PF\_D(p,f,d)}{TDTM\_G\_M(m)} \quad (101)$$

$$CC\_PF\_D(p,f,d) = \begin{cases} CC\_F\_D(f,d) & \text{for } f \in CCF(p,d) \\ 0 & \text{otherwise} \end{cases} \quad (102)$$

Variable	Units	SC	GR	Rule	Description	Ref
CC_PF_M(p, f, m)	MW	PF	M		Capacity Credits associated with Facility f and Market Participant p for Trading Month m	(101)
CC_PF_D(p, f, d)	MW	PF	D		Capacity Credits associated with Facility f and Market Participant p for Trading Day d	(102)
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
TDTM_G_M(m)		G	M		Number of Trading Days in Trading Month m	(95)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

4.2 Invocation

The following table outlines the invocation for the high-level calculations that occur after the preliminary calculations.

Variable	Scope Set
$TOTSTEM\_P\_D(p,d)$	$\forall p \in P(d)$
$TOTNSTEM\_P\_D(p,d)$	$\forall p \in P\_M(d)$
$LFPDNQ\_G\_I(i)$	N/A
$LFBDNQ\_G\_I(i)$	N/A
$UASLR\_G\_I(i)$	N/A
$SOMS\_G\_I(i)$	N/A

Variable	Units	SC	GR	Rule	Description	Ref
TOTNSTEM_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST and interest) for Market Participant p in Trading Day d	(104)
TOTSTEM_P_D(p, d)	$	P	D		Total settlement amount for STEM (including GST and interest) for Market Participant p in Trading Day d	(103)
LFPDNQ_G_I(i)	MW	G	I	11	Sum of any Ex-post Downwards LFAS Enablement quantities in Trading Interval i	(257)
LFBDNQ_G_I(i)	MW	G	I	11	Sum of any Backup Downwards LFAS Enablement quantities in Trading Interval i	(258)
UASLR_G_I(i)	$	G	I	9.9.1	Amount paid for un-contracted Load Rejection and System Restart Services in Trading Interval i	(229)
SOMS_G_I(i)	MWh	G	I	11	Total Sent Out Generation in Trading Interval i	(86)
P(d)	{}	G	D		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Day d	(3)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)

4.3 Daily Aggregations

$$TOTSTEM\_P\_D(p,d) = STEMSA\_P\_D(p,d) + GSTSTEM\_P\_D(p,d) \tag{103}$$

$$TOTNSTEM\_P\_D(p,d) = NOINTNSTEM\_P\_D(p,d) + INTNSTEM\_P\_D(p,d) \tag{104}$$

$$NOINTNSTEM\_P\_D(p,d) = NSTEMSA\_P\_D(p,d) + RRSA\_P\_D(p,d) + GSTNSTEM\_P\_D(p,d) \tag{105}$$

Variable	Units	SC	GR	Rule	Description	Ref
TOTNSTEM_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST and interest) for Market Participant p in Trading Day d	(104)
TOTSTEM_P_D(p, d)	$	P	D		Total settlement amount for STEM (including GST and interest) for Market Participant p in Trading Day d	(103)
NOINTNSTEM_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST, excluding interest) for Market Participant p in Trading Day d	(105)
NSTEMSA_P_D(p, d)	$	P	D	9.14.1	Net NSTEM Settlement amount for Market Participant p in Trading Day d	(106)
STEMSA_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy cleared in STEM for Market Participant p in Trading Day d	(107)
RRSA_P_D(p, d)	$	P	D	9.15.1	Service Fee Settlement Amount paid to Rule Participant p for Trading Day d	(410)
GSTNSTEM_P_D(p, d)	$	P	D		Net GST associated with NSTEM paid to participant p for Trading Day d	(427)
GSTSTEM_P_D(p, d)	$	P	D		Net GST associated with STEM paid to participant p for Trading Day d	(422)
INTNSTEM_P_D(p, d)	$	P	D		Net interest paid to participant p for Trading Day d	(434)

4.3.1 NSTEM

These equations are based on the equations stated in MR 9.14. They have been modified to attribute a monthly calculation to an interval calculation and then aggregate to a Trading Day.

$$NSTEMSA\_P\_D(p,d) = RCSA\_P\_D(p,d) + BSA\_P\_D(p,d) + ASSA\_P\_D(p,d) + COCSA\_P\_D(p,d) + RSA\_P\_D(p,d) + MPFSA\_P\_D(p,d) + DLASA\_P\_D(p,d) \quad (106)$$

Variable	Units	SC	GR	Rule	Description	Ref
- NSTEMSA_P_D(p, d)	$	P	D	9.14.1	Net NSTEM Settlement amount for Market Participant p in Trading Day d	(106)
RCSA_P_D(p, d)	$	P	D	9.7.1	Reserve Capacity settlement amount for Market Participant p in Trading Day d	(293)
BSA_P_D(p, d)	$	P	D	9.8.1	Balancing settlement amount for Market Participant p in Trading Day d	(114)
ASSA_P_D(p, d)	$	P	D	9.9.1	Ancillary Services settlement amount for Market Participant p in Trading Day d	(215)
COCSA_P_D(p, d)	$	P	D	9.10.1	Outage compensation settlement amount for Market Participant p in Trading Day d	(208)
RSA_P_D(p, d)	$	P	D	9.11.1	Reconciliation Settlement amount for Market Participant p in Trading Day d	(196)

Variable	Units	SC	GR	Rule	Description	Ref
MPFSA_P_D(p, d)	$	P	D	9.13.1	Market Participant Fee Settlement Amount charged to Market Participant p for Trading Day d	(401)
DLASA_P_D(p, d)	$	P	D	9.24.9	Default Levy Adjustment settlement amount for Participant p in Trading Day d	(419)

4.4 STEM

$$STEMSA\_P\_D(p,d) = STEMSAS\_P\_D(p,d) - STEMSAD\_P\_D(p,d) \tag{107}$$

Variable	Units	SC	GR	Rule	Description	Ref
STEMSA_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy cleared in STEM for Market Participant p in Trading Day d	(107)
STEMSAS_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy sold in STEM for Market Participant p in Trading Day d	(108)
STEMSAD_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy purchased in STEM for Market Participant p in Trading Day d	(109)

4.4.1 STEM Payments and Charges

These equations are based on the equations stated in 9.6.1. They have been modified to aggregate to a Trading Day and to separate quantities into supply and demand.

$$STEMSAS\_P\_D(p,d) = \sum_{i \in I(d)} STEMSAS\_P\_I(p,i) \tag{108}$$

$$STEMSAD\_P\_D(p,d) = \sum_{i \in I(d)} STEMSAD\_P\_I(p,i) \tag{109}$$

$$STEMSAS\_P\_I(p,i) = \begin{cases} STEMP\_G\_I(i) \times STEMSQ\_P\_I(p,i) & SSF\_G\_D(i) = 1 \\ 0 & SSF\_G\_D(i) = 0 \end{cases} \tag{110}$$

$$STEMSAD\_P\_I(p,i) = \begin{cases} STEMP\_G\_I(i) \times STEMDQ\_P\_I(p,i) & SSF\_G\_D(i) = 1 \\ 0 & SSF\_G\_D(i) = 0 \end{cases} \tag{111}$$

$$STEMSQ\_P\_I(p,i) = max(0, STEMQ\_P\_I(p,i) \times SSF\_G\_D(i)) \tag{112}$$

$$STEMDQ\_P\_I(p,i) = -min(0, STEMQ\_P\_I(p,i) \times SSF\_G\_D(i)) \tag{113}$$

Variable	Units	SC	GR	Rule	Description	Ref
STEMSAS_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy sold in STEM for Market Participant p in Trading Day d	(108)
STEMSAD_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy purchased in STEM for Market Participant p in Trading Day d	(109)
STEMSAS_P_I(p, i)	$	P	I	9.6.1	Settlement amount for energy sold in STEM for Market Participant p in Trading Interval i	(110)

Variable	Units	SC	GR	Rule	Description	Ref
STEMSAD_P_I(p, i)	$	P	I	9.6.1	Settlement amount for energy purchased in STEM for Market Participant p in Trading Interval i	(111)
STEMSQ_P_I(p, i)	MWh	P	I		Energy sold in STEM by Market Participant p in Trading Interval i	(112)
STEMDQ_P_I(p, i)	MWh	P	I		Energy bought in STEM by Market Participant p in Trading Interval i	(113)
STEMQ_P_I(p, i)	MWh	P	I	6.9.13(b), 6.9.13(c), 6.10.2	Energy purchased (sold) in STEM by Market Participant p in Trading Interval i	I
SSF_G_D(d)	Flag	G	D		0 if STEM was suspended in Trading Day d, and 1 otherwise	I
STEMP_G_I(i)	$/MWh	G	I	6.9.7, 6.10.2	STEM Clearing Price declared for Trading Interval i	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.5 Balancing

Balancing is split into four parts:

- Balancing Market - Market Participants are paid and charged for selling and buying energy in the Balancing Market
- Constrained Compensation - Market Participants are paid for being constrained on or off
- DSM Dispatch Payments - Market Participants are paid when Non-Balancing Facilities are Dispatched
- Additional Repaid Amounts - Market Participants are paid when AEMO is required to disgorge funds (in addition to returning Credit Support) in accordance with the Corporations Act

The funding of constrained compensation, non-Balancing Facility Dispatch Instruction Payments and additional Repaid Amounts, is recovered as part of the reconciliation settlement calculations.

$$\begin{aligned} BSA\_P\_D(p,d) = BSAS\_P\_D(p,d) - BSAD\_P\_D(p,d) + CONC\_P\_D(p,d) \\ + COFFC\_P\_D(p,d) + DIP\_P\_D(p,d) + ARA\_P\_D(p,d) \end{aligned} \tag{114}$$

Variable	Units	SC	GR	Rule	Description	Ref
BSA_P_D(p, d)	$	P	D	9.8.1	Balancing settlement amount for Market Participant p in Trading Day d	(114)
BSAS_P_D(p, d)	$	P	D	9.8.1	Settlement amount for energy sold in the Balancing Market for Market Participant p in Trading Day d	(115)
BSAD_P_D(p, d)	$	P	D	9.8.1	Settlement amount for energy purchased in the Balancing Market for Market Participant p in Trading Day d	(116)
CONC_P_D(p, d)	$	P	D	9.8.1	Constrained On Compensation for Market Participant p in Trading Day d	(124)
COFFC_P_D(p, d)	$	P	D	9.8.1	Constrained Off Compensation for Market Participant p in Trading Day d	(125)
DIP_P_D(p, d)	$	P	D	6.17.6	DSM Dispatch Payments for Market Participant p in Trading Day d	(187)

Variable	Units	SC	GR	Rule	Description	Ref
ARA_P_D(p, d)	$	P	D	9.24.2(b)	Repaid Amount that AEMO disgorges in addition to returning Credit Support for Market Participant p for Trading Day d	(194)

4.5.1 Balancing Market Payments and Charges

$$BSAS\_P\_D(p,d) = \sum_{i \in I(d)} BSAS\_P\_I(p,i) \tag{115}$$

$$BSAD\_P\_D(p,d) = \sum_{i \in I(d)} BSAD\_P\_I(p,i) \tag{116}$$

$$BSAS\_P\_I(p,i) = BP\_G\_I(i) \times MBSQ\_P\_I(p,i) \tag{117}$$

$$BSAD\_P\_I(p,i) = BP\_G\_I(i) \times MBDQ\_P\_I(p,i) \tag{118}$$

$$MBSQ\_P\_I(p,i) = max(0, MBQ\_P\_I(p,i)) \tag{119}$$

$$MBDQ\_P\_I(p,i) = -min(0, MBQ\_P\_I(p,i)) \tag{120}$$

$$MBQ\_P\_I(p,i) = MS\_P\_I(p,i) - NCP\_P\_I(p,i) \tag{121}$$

$$MS\_P\_I(p,i) = MSNDL\_P\_I(p,i) + \sum_{f \in REG\_F(p,i)} MS\_F\_I(f,i) \tag{122}$$

$$NCP\_P\_I(p,i) = NBP\_P\_I(p,i) + STEMQ\_P\_I(p,i) \times SSF\_G\_D(i) \tag{123}$$

Variable	Units	SC	GR	Rule	Description	Ref
BSAS_P_D(p, d)	$	P	D	9.8.1	Settlement amount for energy sold in the Balancing Market for Market Participant p in Trading Day d	(115)
BSAD_P_D(p, d)	$	P	D	9.8.1	Settlement amount for energy purchased in the Balancing Market for Market Participant p in Trading Day d	(116)
BSAS_P_I(p, i)	$	P	I	9.8.1	Settlement amount for energy sold in the Balancing Market for Market Participant p in Trading Interval i	(117)
BSAD_P_I(p, i)	$	P	I	9.8.1	Settlement amount for energy purchased in the Balancing Market for Market Participant p in Trading Interval i	(118)
BP_G_I(i)	$/MWh	G	I	7A.3.10	Balancing Price for Trading Interval i	I
MBSQ_P_I(p, i)	MWh	P	I		Energy sold in the Balancing Market by Market Participant p in Trading Interval i	(119)
MBDQ_P_I(p, i)	MWh	P	I		Energy purchased in the Balancing Market by Market Participant p in Trading Interval i	(120)
MBQ_P_I(p, i)	MWh	P	I	6.17.2	Metered Balancing Quantity for Market Participant p in Trading Interval i	(121)

Variable	Units	SC	GR	Rule	Description	Ref
MS_P_I(p, i)	MWh	P	I		Sum of all Metered Schedules for Market Participant p in Trading Interval i	(122)
NCP_P_I(p, i)	MWh	P	I	6.9.13	Net Contract Position for Market Participant p in Trading Interval i	(123)
NBP_P_I(p, i)	MWh	P	I	6.9.2	Net Bilateral Position for Market Participant p in Trading Interval i	I
STEMQ_P_I(p, i)	MWh	P	I	6.9.13(b), 6.9.13(c), 6.10.2	Energy purchased (sold) in STEM by Market Participant p in Trading Interval i	I
MSNDL_P_I(p, i)	MWh	P	I		Sum of all Non-Dispatchable Load Metered Schedules for Market Participant p in Trading Interval i	(83)
MS_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c), 2.30B.12	Metered Schedule for Facility f in Trading Interval i	(55)
SSF_G_D(d)	Flag	G	D		0 if STEM was suspended in Trading Day d, and 1 otherwise	I
REG_F(d)	{}	G	D	11	Set of Registered Facilities in Trading Day d	(31)

4.5.2 Constrained Compensation

For implementation purposes the Balancing Portfolio is considered a Facility. Any Facilities that are members of the Balancing Portfolio are not considered individually, but only as a contribution to the Balancing Portfolio.

$$CONC\_P\_D(p,d) = \sum_{i \in I(d)} CONC\_P\_I(p,i) \tag{124}$$

$$COFFC\_P\_D(p,d) = \sum_{i \in I(d)} COFFC\_P\_I(p,i) \tag{125}$$

$$CONC\_P\_I(p,i) = \sum_{f \in BALF(p,i) \cup PORTFOLIO(p,i)} CONC\_F\_I(f,i) \tag{126}$$

$$COFFC\_P\_I(p,i) = \sum_{f \in BALF(p,i) \cup PORTFOLIO(p,i)} COFFC\_F\_I(f,i) \tag{127}$$

$$CONC\_F\_I(f,i) = \sum_{t \in BPQP(f,i)} CONC\_T\_I(t,i) \tag{128}$$

$$COFFC\_F\_I(f,i) = \sum_{t \in BPQP(f,i)} COFFC\_T\_I(t,i) \tag{129}$$

$$CONC\_T\_I(t,i) = CONQLA\_T\_I(t,i) \times CONP\_T\_I(t,i) \tag{130}$$

$$COFFC\_T\_I(t,i) = COFFQLA\_T\_I(t,i) \times COFFP\_T\_I(t,i) \tag{131}$$

$$CONQLA\_T\_I(t,i) = \begin{cases} LF\_F\_D(f,i) \times CONQ\_T\_I(t,i) & \text{for } f \notin PORTFOLIO(i) \\ LFBP\_F\_I(f,i) \times CONQ\_T\_I(t,i) & \text{for } f \in PORTFOLIO(i) \end{cases} \tag{132}$$

$$COFFQLA\_T\_I(t,i) = \begin{cases} LF\_F\_D(f,i) \times COFFQ\_T\_I(t,i) & \text{for } f \notin PORTFOLIO(i) \\ LFBP\_F\_I(f,i) \times COFFQ\_T\_I(t,i) & \text{for } f \in PORTFOLIO(i) \end{cases} \tag{133}$$

$$LFBP\_F\_I(f,i) = \begin{cases} \dfrac{\sum_{g \in BALPF(i)} MS\_F\_I(g,i)}{SOMSBP\_F\_I(f,i)} & \text{for } SOMSBP\_F\_I(f,i) \neq 0 \\ 1 & \text{otherwise} \end{cases} \quad (134)$$

$$SOMSBP\_F\_I(f,i) = \sum_{g \in BALPF(i)} SOMS\_F\_I(g,i) \quad (135)$$

Variable	Units	SC	GR	Rule	Description	Ref
CONC_P_D(p, d)	$	P	D	9.8.1	Constrained On Compensation for Market Participant p in Trading Day d	(124)
COFFC_P_D(p, d)	$	P	D	9.8.1	Constrained Off Compensation for Market Participant p in Trading Day d	(125)
CONC_P_I(p, i)	$	P	I	9.8.1	Constrained On Compensation for Market Participant p in Trading Interval i	(126)
COFFC_P_I(p, i)	$	P	I	9.8.1	Constrained Off Compensation for Market Participant p in Trading Interval i	(127)
CONC_F_I(f, i)	$	F	I	9.8.1	Constrained On Compensation relating to Facility f in Trading Interval i	(128)
COFFC_F_I(f, i)	$	F	I	9.8.1	Constrained Off Compensation relating to Facility f in Trading Interval i	(129)
CONC_T_I(t, i)	$	T	I	9.8.1	Constrained On Compensation relating to tranche t in Trading Interval i	(130)
COFFC_T_I(t, i)	$	T	I	9.8.1	Constrained Off Compensation relating to tranche t in Trading Interval i	(131)
CONP_T_I(t, i)	$/MWh	T	I	6.17.3(b), 6.17.3(c)ii, 6.17.3(d), 6.17.3A(b), 6.17.5(b), 6.17.5(c)ii, 6.17.5(d)	Constrained On Compensation Price for tranche t in Trading Interval i	(183)
COFFP_T_I(t, i)	$/MWh	T	I	6.17.4(b), 6.17.4(c)ii, 6.17.4(d), 6.17.4A(b), 6.17.5A(b), 6.17.5A(c)ii, 6.17.5A(d)	Constrained Off Compensation Price for tranche t in Trading Interval i	(184)
CONQ_T_I(t, i)	MWh	T	I	6.17.3(f), 6.17.3(g), 6.17.3A(a), 6.17.5(f), 6.17.5(g)	Constrained On Quantity for tranche t in Trading Interval i	(136)
COFFQ_T_I(t, i)	MWh	T	I	6.17.4(f), 6.17.4(g), 6.17.4A(a), 6.17.5A(f), 6.17.5A(g)	Constrained Off Quantity for tranche t in Trading Interval i	(137)

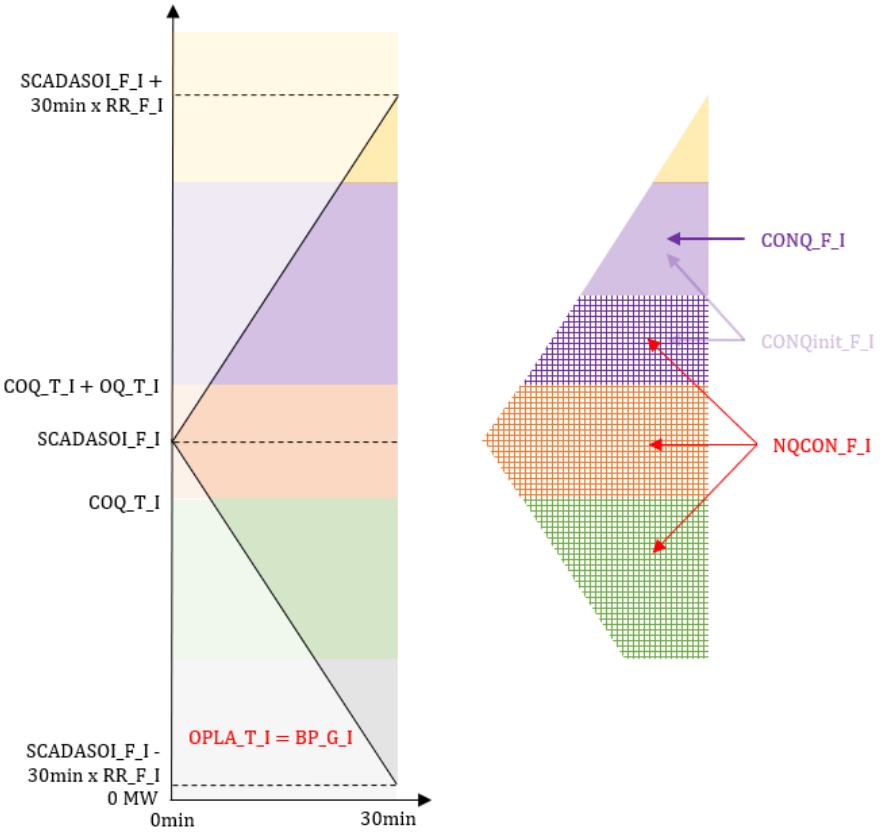
Variable	Units	SC	GR	Rule	Description	Ref
CONQLA_T_I(t, i)	MWh	T	I	6.17.3(h), 6.17.3A(a), 6.17.5(h)	Loss adjusted Constrained On Quantity for tranche t in Trading Interval i	(132)
COFFQLA_T_I(t, i)	MWh	T	I	6.17.4(h), 6.17.4A(a), 6.17.5A(h)	Loss adjusted Constrained Off Quantity for tranche t in Trading Interval i	(133)
MS_F_I(f, i)	MWh	F	I	9.3.4, 2.30B.10(c), 2.30B.12	Metered Schedule for Facility f in Trading Interval i	(55)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
SOMSBP_F_I(f, i)	MWh	F	I	6.16B.1(a)	Sum of Sent Out Metered Schedules for Facilities in the Balancing Portfolio for Facility f in Trading Interval i	(135)
LF_F_D(f, d)		F	D		Loss Factor for Facility f for Trading Day d	(186)
LFBP_F_I(f, i)		F	I	11	Portfolio Loss Factor for Facility f for Trading Interval i	(134)
BPQP(i)	{}	G	I	11	Set of Balancing Price-Quantity Pairs in Trading Interval i	I
BALF(d)	{}	G	D	11	Set of Balancing Facilities in Trading Day d	(38)
BALPF(d)	{}	G	D	11	Set of Facilities in the Balancing Portfolio in Trading Day d	(37)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.5.2.1 Constrained Compensation Quantities

The rules manipulate the constrained compensation quantities for Scheduled Generators and the Balancing Portfolio in two stages as follows:

- Initial calculation which attributes a Facility's Out of Merit generation to each tranche
- Adjustment of this quantity to remove any non-qualifying generation

This is illustrated in the figure below.



$$CONQ\_T\_I(t,i) = \begin{cases} UOOM\_F\_I(t,i) & \text{for } t \in NSG(i) \\ max(0, CONQinit\_T\_I(t,i) - max(0, NQCONMAX\_F\_I(t,i) - CCONQinit\_T\_I(t,i))) & \text{for } t \notin NSG(i) \end{cases} \quad (136)$$

$$COFFQ\_T\_I(t,i) = \begin{cases} DOOM\_F\_I(t,i) & \text{for } t \in NSG(i) \\ max(0, COFFQinit\_T\_I(t,i) - max(0, NQCOFFMAX\_F\_I(t,i) - CCOFFQinit\_T\_I(t,i))) & \text{for } t \notin NSG(i) \end{cases} \quad (137)$$

$$CONQinit\_T\_I(t,i) = \begin{cases} min(TES\_T\_I(t,i), UOOM\_F\_I(t,i) - CCONQinit\_T\_I(t,i)) & \text{for } round(OPLA\_T\_I(t,i),2) > BP\_G\_I(i) \\ 0 & \text{otherwise} \end{cases} \quad (138)$$

$$COFFQinit\_T\_I(t,i) = \begin{cases} min(TESAC\_T\_I(t,i), DOOM\_F\_I(t,i) - CCOFFQinit\_T\_I(t,i)) & \text{for } round(OPLA\_T\_I(t,i),2) < BP\_G\_I(i) \\ & \text{and } OPLA\_T\_I(t,i) \le ACAPP\_F\_I(t,i) \\ 0 & \text{otherwise} \end{cases} \quad (139)$$

$$CCONQinit\_T\_I(t,i) = \sum_{\substack{u \in BPQP(f,i) \\ BMORank\_T\_I(u,i) < BMORank\_T\_I(t,i)}} CONQinit\_T\_I(u,i) \quad (140)$$

$$CCOFFQinit\_T\_I(t,i) = \sum_{\substack{u \in BPQP(f,i) \\ BMORank\_T\_I(u,i) > BMORank\_T\_I(t,i)}} COFFQinit\_T\_I(u,i) \quad (141)$$

$$ACAPP\_F\_I(f,i) = \begin{cases} OPLA\_T\_I(t,i) & \text{if } \exists t \in BPQP(f,i): \\ & COQ\_T\_I(t,i) \leq ACAPQ\_F\_I(f,i) \\ & < COQ\_T\_I(t,i) + OQ\_T\_I(t,i) \\ max(MAXSTEMP\_G\_D(i), AMAXSTEMP\_G\_D(i)) & \text{otherwise} \end{cases} \tag{142}$$

$$ACAPQ\_F\_I(f,i) = \begin{cases} \sum_{g \in BALPF(i)} ACAPQ\_F\_I(g,i) & \text{for } f \in PORTFOLIO(i) \\ SOC\_F\_D(f,i) & \text{for } f \notin PORTFOLIO(i) \\ \quad -EXPPO\_F\_I(f,i) - EXPCO\_F\_I(f,i) - EXPFO\_F\_I(f,i) & \end{cases} \tag{143}$$

$BMORank\_T\_I(t,i) =$ Position of tranche t in $BPQP(i)$ ordered by $OPLA\_T\_I$ ascending and then alphabetically (144)

Variable	Units	SC	GR	Rule	Description	Ref
CONQ_T_I(t, i)	MWh	T	I	6.17.3(f), 6.17.3(g), 6.17.3A(a), 6.17.5(f), 6.17.5(g)	Constrained On Quantity for tranche t in Trading Interval i	(136)
COFFQ_T_I(t, i)	MWh	T	I	6.17.4(f), 6.17.4(g), 6.17.4A(a), 6.17.5A(f), 6.17.5A(g)	Constrained Off Quantity for tranche t in Trading Interval i	(137)
CONQinit_T_I(t, i)	MWh	T	I	6.17.3(a), 6.17.3(c)i, 6.17.3(d), 6.17.3A(a), 6.17.5(a), 6.17.5(c)i, 6.17.5(d)	Constrained On Quantity prior to removing Non-Qualifying Constrained On Generation for tranche t in Trading Interval i	(138)
COFFQinit_T_I(t, i)	MWh	T	I	6.17.4(a), 6.17.4(c)i, 6.17.4(d), 6.17.4A(a), 6.17.5A(a), 6.17.5A(c)i, 6.17.5A(d)	Constrained Off Quantity prior to removing Non-Qualifying Constrained Off Generation for tranche t in Trading Interval i	(139)
CCONQinit_T_I(t, i)	MWh	T	I		Sum of CONQinit quantities for the Facility's tranches with a lower price than tranche t in Trading Interval i	(140)
CCOFFQinit_T_I(t, i)	MWh	T	I		Sum of COFFQinit quantities for the Facility's tranches with a higher price than tranche t in Trading Interval i	(141)

Variable	Units	SC	GR	Rule	Description	Ref
TES_T_I(t, i)	MWh	T	I	6.17.3(a)i, 6.17.3(c)i.1, 6.17.4(a)i, 6.17.4(c)i.1, 6.17.5(a)i, 6.17.5(c)i.1, 6.17.5A(a)i, 6.17.5A(c)i.1	Maximum energy less the minimum energy which could have been dispatched from tranche t in Trading Interval i	(145)
TESAC_T_I(t, i)	MWh	T	I	6.17.4(a)i, 6.17.4(c)i.1, 6.17.5A(a)i, 6.17.5A(c)i.1	Maximum energy less the minimum energy which could have been dispatched (accounting for Available Capacity) from tranche t in Trading Interval i	(157)
UOOM_F_I(f, i)	MWh	F	I	6.16A.1, 6.16B.1	Upwards Out of Merit Generation for Facility f in Trading Interval i	(168)
DOOM_F_I(f, i)	MWh	F	I	6.16A.2, 6.16B.2	Downwards Out of Merit Generation for Facility f in Trading Interval i	(169)
NQCONMAX_F_I(f, i)	MWh	F	I	6.17.3(e), 6.17.5(e)	Maximum Non-Qualifying Constrained On Generation for Facility f in Trading Interval i	(179)
NQCOFFMAX_F_I(f, i)	MWh	F	I	6.17.4(e), 6.17.5A(e)	Maximum Non-Qualifying Constrained Off Generation for Facility f in Trading Interval i	(180)
OPLA_T_I(t, i)	$/MWh	T	I		Loss Factor Adjusted (offer) Price for tranche t in Trading Interval i	(185)
BP_G_I(i)	$/MWh	G	I	7A.3.10	Balancing Price for Trading Interval i	I
ACAPP_F_I(f, i)	$/MWh	F	I	6.17.4(a)i.1, 6.17.5A(a)i.1	Loss-adjusted price associated with the Available Capacity of Facility f in Trading Interval i	(142)
ACAPQ_F_I(f, i)	MW	F	I	11	Available Capacity of Facility f in Trading Interval i	(143)
COQ_T_I(t, i)	MW	T	I		Sum of offer quantities associated with the same facility and with a lower price than tranche t in Trading Interval i	(156)
OQ_T_I(t, i)	MW	T	I	11	Offer quantity of the Balancing Price-Quantity Pair for tranche t in Trading Interval i	I
SOC_F_D(f, d)	MW	F	D	11	Sent Out Capacity of Facility f in Trading Day d	(66)
EXPPO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Planned Outage for Facility f in Trading Interval i	I
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
EXPCO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Consequential Outage for Facility f in Trading Interval i	I
AMAXSTEMP_G_D(d)	$/MWh	G	D	6.20.3	Alternative Maximum STEM Price for Trading Day d	I
MAXSTEMP_G_D(d)	$/MWh	G	D	6.20.2	Maximum STEM Price for Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
BMORank_T_I(t, i)		T	I		Ranking in the Balancing Merit Order (0 is the lowest price) for tranche t in Trading Interval i	(144)
BALPF(d)	{}	G	D	11	Set of Facilities in the Balancing Portfolio in Trading Day d	(37)
BPQP(i)	{}	G	I	11	Set of Balancing Price-Quantity Pairs in Trading Interval i	I
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)

4.5.2.2 Tranche TES

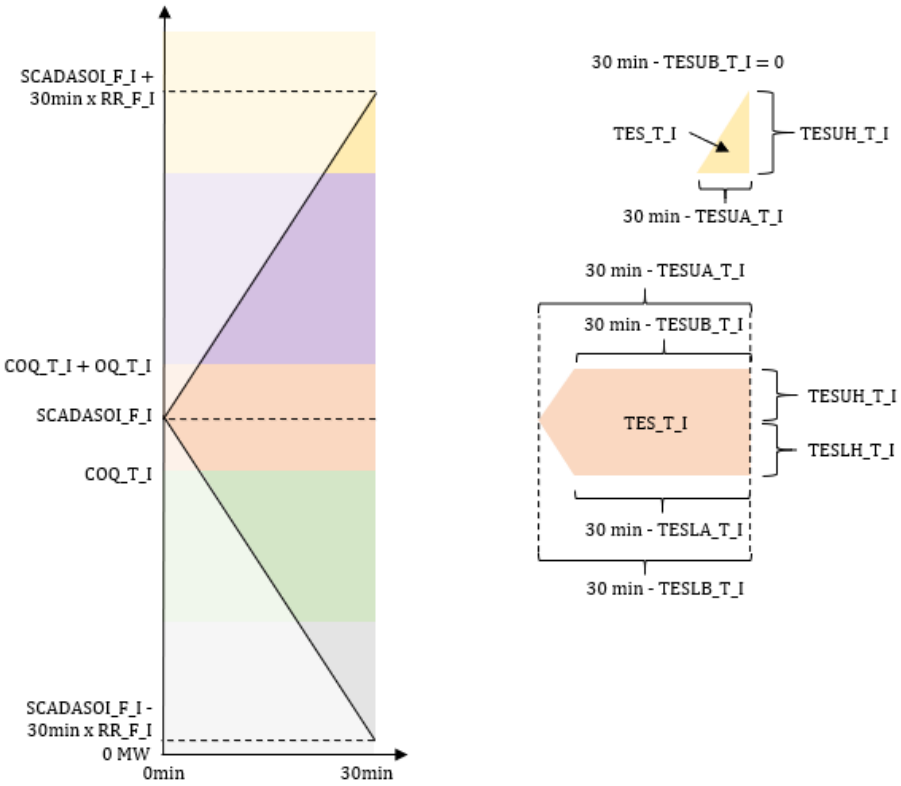
This section calculates:

- the maximum energy that could have been dispatched from each tranche;
- the minimum energy that could have been dispatched from each tranche;
- the maximum energy that could have been dispatched from each tranche (accounting for Available Capacity); and
- the minimum energy that could have been dispatched from each tranche (accounting for Available Capacity)

These values will be referred to as the tranche's theoretical energy schedule (TES).
Only some tranches are considered for constrained on compensation (above the Balancing Price), and others are considered for constrained off compensation (below the Balancing Price); however, this section only calculates each tranche's TES and subsequent calculations will determine which tranches are considered or excluded.

Similarly, only the calculations that account for Available Capacity are used in constrained off compensation; however, this section calculates the theoretical energy schedules for all tranches and subsequent calculations will determine whether to use the calculations accounting for Available Capacity or not.

The picture below illustrates that each tranche's TES is represented by an area, and the corresponding variables which are used to calculate this area. In general, the area is calculated as the sum of an 'upper' trapezium and a 'lower' trapezium. In most instances only one of the trapezia exist, and in some instances the trapezium reduces to a triangle.



$$TES\_T\_I(t,i) = \begin{cases} 0 & \text{for } RR\_F\_I(t,i) = 0 \\ MAXTES\_T\_I(t,i) - MINTES\_T\_I(t,i) & \text{otherwise} \end{cases} \tag{145}$$

$$MAXTES\_T\_I(t,i) = 0.5h \times min(TESTOP\_T\_I(t,i) - TESBTM\_T\_I(t,i), max(0, SCADASOI\_F\_I(t,i) + 30min \times RR\_F\_I(t,i) - TESBTM\_T\_I(t,i))) - TESUH\_T\_I(t,i) \times \frac{TESUA\_T\_I(t,i) + TESUB\_T\_I(t,i)}{2 \times 60min/h} \tag{146}$$

$$MINTES\_T\_I(t,i) = TESLH\_T\_I(t,i) \times \frac{TESLA\_T\_I(t,i) + TESLB\_T\_I(t,i)}{2 \times 60min/h} + max(0, min(TESTOP\_T\_I(t,i) - TESBTM\_T\_I(t,i), SCADASOI\_F\_I(t,i) - 30min \times RR\_F\_I(t,i) - TESBTM\_T\_I(t,i))) \times 0.5h \tag{147}$$

$$TESUH\_T\_I(t,i) = max\left(0, min\left(TESTOP\_T\_I(t,i), SCADASOI\_F\_I(t,i) + 30min \times RR\_F\_I(t,i)\right) - max\left(TESBTM\_T\_I(t,i), SCADASOI\_F\_I(t,i)\right)\right) \tag{148}$$

$$TESLH\_T\_I(t,i) = max\left(0, min\left(TESTOP\_T\_I(t,i), SCADASOI\_F\_I(t,i)\right) - max\left(TESBTM\_T\_I(t,i), SCADASOI\_F\_I(t,i) - 30min \times RR\_F\_I(t,i)\right)\right) \tag{149}$$

$$TESUA\_T\_I(t,i) = max\left(0, min\left(30min, \frac{TESBTM\_T\_I(t,i) - SCADASOI\_F\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{150}$$

$$TESLA\_T\_I(t,i) = max\left(0, min\left(30min, \frac{SCADASOI\_F\_I(t,i) - TESBTM\_T\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{151}$$

$$TESUB\_T\_I(t,i) = max\left(0, min\left(30min, \frac{TESTOP\_T\_I(t,i) - SCADASOI\_F\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{152}$$

$$TESLB\_T\_I(t,i) = max\left(0, min\left(30min, \frac{SCADASOI\_F\_I(t,i) - TESTOP\_T\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \quad (153)$$

$$TESTOP\_T\_I(t,i) = COQ\_T\_I(t,i) + OQ\_T\_I(t,i) \quad (154)$$

$$TESBTM\_T\_I(t,i) = COQ\_T\_I(t,i) \quad (155)$$

$$COQ\_T\_I(t,i) = \sum_{\substack{u \in BPQP(f,i) \\ BMORank\_T\_I(u,i) < BMORank\_T\_I(t,i)}} OQ\_T\_I(u,i) \quad (156)$$

Variable	Units	SC	GR	Rule	Description	Ref
TES_T_I(t, i)	MWh	T	I	6.17.3(a)i, 6.17.3(c)i.1, 6.17.5(a)i, 6.17.5(c)i.1	Maximum energy less the minimum energy which could have been dispatched from tranche t in Trading Interval i	(145)
MAXTES_T_I(t, i)	MWh	T	I		Maximum energy which could have been dispatched from tranche t in Trading Interval i	(146)
MINTES_T_I(t, i)	MWh	T	I		Minimum energy energy which had to be dispatched from tranche t in Trading Interval i	(147)
TESUH_T_I(t, i)	MW	T	I		The height of the upper trapezium for tranche t in Trading Interval i	(148)
TESLH_T_I(t, i)	MW	T	I		The height of the lower trapezium for tranche t in Trading Interval i	(149)
TESUA_T_I(t, i)	min	T	I		Measurement A associated with the upper trapezium for tranche t in Trading Interval i	(150)
TESLA_T_I(t, i)	min	T	I		Measurement A associated with the lower trapezium for tranche t in Trading Interval i	(151)
TESUB_T_I(t, i)	min	T	I		Measurement B associated with the upper trapezium for tranche t in Trading Interval i	(152)
TESLB_T_I(t, i)	min	T	I		Measurement B associated with the lower trapezium for tranche t in Trading Interval i	(153)
TESTOP_T_I(t, i)	MW	T	I		Sum of offer quantities at the top of the tranche for tranche t in Trading Interval i	(154)
TESBTM_T_I(t, i)	MW	T	I		Sum of offer quantities at the bottom of the tranche for tranche t in Trading Interval i	(155)
COQ_T_I(t, i)	MW	T	I		Sum of offer quantities associated with the same facility and with a lower price than tranche t in Trading Interval i	(156)
OQ_T_I(t, i)	MW	T	I	11	Offer quantity of the Balancing Price-Quantity Pair for tranche t in Trading Interval i	I
SCADASOI_F_I(f, i)	MW	F	I		The start of interval output of Facility f for Trading Interval i	(96)

Variable	Units	SC	GR	Rule	Description	Ref
RR_F_I(f, i)	MW/min	F	I	7A.2.4(e)	Ramp Rate Limit or Portfolio Ramp Rate Limit associated with Facility f in Trading Interval i	I
BMORank_T_I(t, i)		T	I		Ranking in the Balancing Merit Order (0 is the lowest price) for tranche t in Trading Interval i	(144)
BPQP(i)	{}	G	I	11	Set of Balancing Price-Quantity Pairs in Trading Interval i	I

The following equations are very similar to those stated previously, but account for Available Capacity.

$$TESAC\_T\_I(t,i) = \begin{cases} 0 & \text{for } RR\_F\_I(t,i) = 0 \\ MAXTESAC\_T\_I(t,i) - MINTESAC\_T\_I(t,i) & \text{otherwise} \end{cases} \tag{157}$$

$$\begin{aligned} MAXTESAC\_T\_I(t,i) = 0.5h \times min(&TESTOPAC\_T\_I(t,i) - TESBTMAC\_T\_I(t,i), max(0, SCADASOI\_F\_I(t,i) \\ &+ 30min \times RR\_F\_I(t,i) - TESBTMAC\_T\_I(t,i))) \\ &- TESUHAC\_T\_I(t,i) \times \frac{TESUAAC\_T\_I(t,i) + TESUBAC\_T\_I(t,i)}{2 \times 60min/h} \end{aligned} \tag{158}$$

$$\begin{aligned} MINTESAC\_T\_I(t,i) = 0.5h \times max(0, min(&TESTOPAC\_T\_I(t,i) - TESBTMAC\_T\_I(t,i), SCADASOI\_F\_I(t,i) \\ &- 30min \times RR\_F\_I(t,i) - TESBTMAC\_T\_I(t,i))) \\ &+ TESLHAC\_T\_I(t,i) \times \frac{TESLAAC\_T\_I(t,i) + TESLBAC\_T\_I(t,i)}{2 \times 60min/h} \end{aligned} \tag{159}$$

$$\begin{aligned} TESUHAC\_T\_I(t,i) = max\,(0, min\,(&TESTOPAC\_T\_I(t,i), SCADASOI\_F\_I(t,i) + 30min \times RR\_F\_I(t,i)) \\ &- max\,(TESBTMAC\_T\_I(t,i), SCADASOI\_F\_I(t,i))) \end{aligned} \tag{160}$$

$$\begin{aligned} TESLHAC\_T\_I(t,i) = max\,(0, min\,(&TESTOPAC\_T\_I(t,i), SCADASOI\_F\_I(t,i)) \\ &- max\,(TESBTMAC\_T\_I(t,i), SCADASOI\_F\_I(t,i) - 30min \times RR\_F\_I(t,i))) \end{aligned} \tag{161}$$

$$TESUAAC\_T\_I(t,i) = max\left(0, min\left(30min, \frac{TESBTMAC\_T\_I(t,i) - SCADASOI\_F\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{162}$$

$$TESLAAC\_T\_I(t,i) = max\left(0, min\left(30min, \frac{SCADASOI\_F\_I(t,i) - TESBTMAC\_T\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{163}$$

$$TESUBAC\_T\_I(t,i) = max\left(0, min\left(30min, \frac{TESTOPAC\_T\_I(t,i) - SCADASOI\_F\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{164}$$

$$TESLBAC\_T\_I(t,i) = max\left(0, min\left(30min, \frac{SCADASOI\_F\_I(t,i) - TESTOPAC\_T\_I(t,i)}{RR\_F\_I(t,i)}\right)\right) \tag{165}$$

$$TESTOPAC\_T\_I(t,i) = min(COQ\_T\_I(t,i) + OQ\_T\_I(t,i), ACAPQ\_F\_I(t,i)) \tag{166}$$

$$TESBTMAC\_T\_I(t,i) = min(COQ\_T\_I(t,i), ACAPQ\_F\_I(t,i)) \tag{167}$$

Variable	Units	SC	GR	Rule	Description	Ref
TESAC_T_I(t, i)	MWh	T	I	6.17.4(a)i, 6.17.4(c)i.1, 6.17.5A(a)i, 6.17.5A(c)i.1	Maximum energy less the minimum energy which could have been dispatched (accounting for Available Capacity) from tranche t in Trading Interval i	(157)
MAXTESAC_T_I(t, i)	MWh	T	I		Maximum energy which could have been dispatched (accounting for Available Capacity) from tranche t in Trading Interval i	(158)
MINTESAC_T_I(t, i)	MWh	T	I		Minimum energy energy which had to be dispatched (accounting for Available Capacity) from tranche t in Trading Interval i	(159)
TESUHAC_T_I(t, i)	MW	T	I		The height of the upper trapezium (accounting for Available Capacity) for tranche t in Trading Interval i	(160)
TESLHAC_T_I(t, i)	MW	T	I		The height of the lower trapezium (accounting for Available Capacity) for tranche t in Trading Interval i	(161)
TESUAAC_T_I(t, i)	min	T	I		Measurement A associated with the upper trapezium (accounting for Available Capacity) for tranche t in Trading Interval i	(162)
TESLAAC_T_I(t, i)	min	T	I		Measurement A associated with the lower trapezium (accounting for Available Capacity) for tranche t in Trading Interval i	(163)
TESUBAC_T_I(t, i)	min	T	I		Measurement B associated with the upper trapezium (accounting for Available Capacity) for tranche t in Trading Interval i	(164)
TESLBAC_T_I(t, i)	min	T	I		Measurement B associated with the lower trapezium (accounting for Available Capacity) for tranche t in Trading Interval i	(165)
TESTOPAC_T_I(t, i)	MW	T	I		Sum of offer quantities at the top of the tranche (accounting for Available Capacity) for tranche t in Trading Interval i	(166)
TESBTMAC_T_I(t, i)	MW	T	I		Sum of offer quantities at the bottom of the tranche (accounting for Available Capacity) for tranche t in Trading Interval i	(167)
ACAPQ_F_I(f, i)	MW	F	I	11	Available Capacity of Facility f in Trading Interval i	(143)
COQ_T_I(t, i)	MW	T	I		Sum of offer quantities associated with the same facility and with a lower price than tranche t in Trading Interval i	(156)
OQ_T_I(t, i)	MW	T	I	11	Offer quantity of the Balancing Price-Quantity Pair for tranche t in Trading Interval i	I
SCADASOI_F_I(f, i)	MW	F	I		The start of interval output of Facility f for Trading Interval i	(96)

Variable	Units	SC	GR	Rule	Description	Ref
RR_F_I(f, i)	MW/min	F	I	7A.2.4(e)	Ramp Rate Limit or Portfolio Ramp Rate Limit associated with Facility f in Trading Interval i	I

4.5.2.3 Facility Out of Merit Generation

$$UOOM\_F\_I(f,i) = ABOVEMAXTES\_F\_I(f,i) \times UOOMEFlag\_F\_I(f,i) \tag{168}$$

$$DOOM\_F\_I(f,i) = BELOWMINTES\_F\_I(f,i) \times DOOMEFlag\_F\_I(f,i) \tag{169}$$

The variables $ABOVEMAXTES\_F\_I$ and $BELOWMINTES\_F\_I$ are not within the rules; however, they have been included here to assist with understanding and analysis. These values are the possible energy that could be considered for out of merit compensation. The variables $UOOM\_F\_I$ and $DOOM\_F\_I$ then filter out any intervals where the generation does not meet the threshold relating to settlement tolerance and non-qualifying generation.

$$ABOVEMAXTES\_F\_I(f,i) = \begin{cases} max(0, SOMSBP\_F\_I(f,i) - MAXTES\_F\_I(f,i)) & \text{for } f \in PORTFOLIO(i) \\ max(0, SOMS\_F\_I(f,i) - MAXTES\_F\_I(f,i)) & \text{for } f \notin PORTFOLIO(i) \end{cases} \tag{170}$$

$$BELOWMINTES\_F\_I(f,i) = \begin{cases} max(0, MINTES\_F\_I(f,i) - SOMSBP\_F\_I(f,i)) & \text{for } f \in PORTFOLIO(i) \\ max(0, MINTES\_F\_I(f,i) - SOMS\_F\_I(f,i)) & \text{for } f \notin PORTFOLIO(i) \end{cases} \tag{171}$$

$$UOOMEFlag\_F\_I(f,i) = \begin{cases} 0 & \text{for } NCDFlag\_F\_I(f,i) = 1 \text{ or } OIFlag\_F\_I(f,i) = 1 \text{ or } TOLUFlag\_F\_I(f,i) = 1 \\ 1 & \text{otherwise} \end{cases} \tag{172}$$

$$DOOMEFlag\_F\_I(f,i) = \begin{cases} 0 & \text{for } NCDFlag\_F\_I(f,i) = 1 \text{ or } OIFlag\_F\_I(f,i) = 1 \text{ or } TOLDFlag\_F\_I(f,i) = 1 \\ & \text{ or } NSGDVFlag\_F\_I(f,i) = 1 \\ 1 & \text{otherwise} \end{cases} \tag{173}$$

$$OIFlag\_F\_I(f,i) = \begin{cases} 1 & \text{for } OINCSFlag\_F\_I(f,i) = 1 \text{ or } OIASCFlag\_F\_I(f,i) = 1 \text{ or } OITFlag\_F\_I(f,i) = 1 \\ & \text{ or } OISCFlag\_F\_I(f,i) = 1 \text{ or } OIASFlag\_F\_I(f,i) = 1 \text{ or } OIRFlag\_F\_I(f,i) = 1 \\ 0 & \text{otherwise} \end{cases} \tag{174}$$

$$OITFlag\_F\_I(f,i) = \begin{cases} 1 & \text{for } OIRCTFlag\_F\_I(f,i) = 1 \text{ or } OICTFlag\_F\_I(f,i) = 1 \\ 0 & \text{otherwise} \end{cases} \tag{175}$$

$$NSGDVFlag\_F\_I(f,i) = \begin{cases} 1 & \text{for } f \in NSG(i) \text{ and } DVEST\_F\_I(f,i) = 0 \\ 0 & \text{otherwise} \end{cases} \tag{176}$$

$$TOLUFlag\_F\_I(f,i) = \begin{cases} 1 & f = PORTFOLIO \text{ and } SOMSBP\_F\_I(f,i) - MAXTES\_F\_I(f,i) < \\ & \quad NQCONMAX\_F\_I(f,i) + STLTOL\_F\_D(f,i) \\ 1 & f \neq PORTFOLIO \text{ and } SOMS\_F\_I(f,i) - MAXTES\_F\_I(f,i) < \\ & \quad NQCONMAX\_F\_I(f,i) + STLTOL\_F\_D(f,i) \\ 0 & \text{otherwise} \end{cases} \tag{177}$$

$$TOLDFlag\_F\_I(f,i) = \begin{cases} 1 & f = PORTFOLIO \text{ and } MINTES\_F\_I(f,i) - SOMSBP\_F\_I(f,i) < \\ & \quad NQCOFFMAX\_F\_I(f,i) + STLTOL\_F\_D(f,i) \\ 1 & f \neq PORTFOLIO \text{ and } MINTES\_F\_I(f,i) - SOMS\_F\_I(f,i) < \\ & \quad NQCOFFMAX\_F\_I(f,i) + STLTOL\_F\_D(f,i) \\ 0 & \text{otherwise} \end{cases} \tag{178}$$

$$NQCONMAX\_F\_I(f,i) = \begin{cases} max(0, DVNCSBP\_F\_I(f,i)) \\ +0.5h \times (LFPUPEQ\_F\_I(f,i) + LFBUPQ\_F\_I(f,i)) + SRRQ\_F\_I(f,i) & \text{for } f \in PORTFOLIO(i) \\ 0.5h \times (LFPUPEQ\_F\_I(f,i) + LFBUPQ\_F\_I(f,i)) & \text{for } f \notin PORTFOLIO(i) \end{cases} \quad (179)$$

$$NQCOFFMAX\_F\_I(f,i) = \begin{cases} max(0, -DVNCSBP\_F\_I(f,i)) \\ +0.5h \times (LFPDNEQ\_F\_I(f,i) + LFBDNQ\_F\_I(f,i)) + LRQ\_F\_I(f,i) & \text{for } f \in PORTFOLIO(i) \\ 0.5h \times (LFPDNEQ\_F\_I(f,i) + LFBDNQ\_F\_I(f,i)) & \text{for } f \notin PORTFOLIO(i) \end{cases} \quad (180)$$

$$DVNCSBP\_F\_I(f,i) = \begin{cases} \sum_{g \in BALPF(i)} DVNCS\_F\_I(g,i) & \text{for } f \in PORTFOLIO(i) \\ 0 & \text{for } f \notin PORTFOLIO(i) \end{cases} \quad (181)$$

$$STLTOL\_F\_D(f,d) = \begin{cases} 0.5h \times TOL\_F\_D(f,d) & f \in SG(d) \text{ and } TOL\_F\_D(f,d) \neq 0 \\ min(3MWh, 3\% \times 0.5h \times SOC\_F\_D(f,d)) & f = PORTFOLIO \\ min(3MWh, max(0.5MWh, 3\% \times 0.5h \times SOC\_F\_D(f,d))) & \text{otherwise} \end{cases} \quad (182)$$

Variable	Units	SC	GR	Rule	Description	Ref
UOOM_F_I(f, i)	MWh	F	I	6.16A.1, 6.16B.1	Upwards Out of Merit Generation for Facility f in Trading Interval i	(168)
DOOM_F_I(f, i)	MWh	F	I	6.16A.2, 6.16B.2	Downwards Out of Merit Generation for Facility f in Trading Interval i	(169)
ABOVEMAXTES_F_I(f, i)	MWh	F	I	6.16A.1, 6.16B.1	Generation in excess of Maximum TES for Facility f in Trading Interval i	(170)
BELOWMINTES_F_I(f, i)	MWh	F	I	6.16A.2, 6.16B.2	Generation less than Minimum TES for Facility f in Trading Interval i	(171)
UOOMEFlag_F_I(f, i)	Flag	F	I	6.16A.1(b), 6.16B.1(b)	Flag that is 0 if Facility f is ineligible for receiving compensation for Upwards Out of Merit Generation in Trading Interval i and 1 otherwise	(172)
DOOMEFlag_F_I(f, i)	Flag	F	I	6.16A.2(b), 6.16B.2(b)	Flag that is 0 if Facility f is ineligible for receiving compensation for Downwards Out of Merit Generation in Trading Interval i and 1 otherwise	(173)
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
SOMSBP_F_I(f, i)	MWh	F	I	6.16B.1(a)	Sum of Sent Out Metered Schedules for Facilities in the Balancing Portfolio for Facility f in Trading Interval i	(135)
MINTES_F_I(f, i)	MWh	F	I		Minimum Theoretical Energy Schedule for Facility f in Trading Interval i	I
MAXTES_F_I(f, i)	MWh	F	I		Maximum Theoretical Energy Schedule for Facility f in Trading Interval i	I

Variable	Units	SC	GR	Rule	Description	Ref
NCDFlag_F_I(f, i)	Flag	F	I	6.16A.1(b)i, 6.16A.2(b)i, 6.16B.1(b)i, 6.16B.2(b)i	Flag that is 1 if the ERA has determined that Facility f is non-compliant with a Dispatch Instruction (or Dispatch Order) in Trading Interval i and 0 otherwise	I
OIFlag_F_I(f, i)	Flag	F	I	6.16A.1(b)ii, 6.16A.2(b)ii	Flag that is 1 if Facility f was complying with an Operating Instruction in Trading Interval i and 0 otherwise	(174)
OITFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to a Test in Trading Interval i and 0 otherwise	(175)
OINCSFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to a Network Control Service Contract in Trading Interval i and 0 otherwise	I
OIASCFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to an Ancillary Service Contract in Trading Interval i and 0 otherwise	I
OISCFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to a Supplementary Capacity Contract in Trading Interval i and 0 otherwise	I
OIASFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to Ancillary Services other than LFAS but including Backup LFAS Enablement (other than Facilities in the Balancing Portfolio) in Trading Interval i and 0 otherwise	I
OIRFlag_F_I(f, i)	Flag	F	I	11, 7.7.11	Flag that is 1 if Facility f was complying with an Operating Instruction applied retrospectively under clause 7.7.11 in Trading Interval i and 0 otherwise	I
OIRCTFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to a Reserve Capacity Test in Trading Interval i and 0 otherwise	I
OICTFlag_F_I(f, i)	Flag	F	I	11	Flag that is 1 if Facility f was complying with an Operating Instruction related to a Commissioning Test in Trading Interval i and 0 otherwise	I
TOLUFlag_F_I(f, i)	Flag	F	I	6.16A.1(b)iii, 6.16B.1(b)ii	Flag that is 1 if Facility f is within a tolerance for Upwards Out of Merit Generation in Trading Interval i and 0 otherwise	(177)
TOLDFlag_F_I(f, i)	Flag	F	I	6.16A.2(b)iii, 6.16B.2(b)ii	Flag that is 1 if Facility f is within a tolerance for Downwards Out of Merit Generation in Trading Interval i and 0 otherwise	(178)

Variable	Units	SC	GR	Rule	Description	Ref
SOC_F_D(f, d)	MW	F	D	11	Sent Out Capacity of Facility f in Trading Day d	(66)
NSGDVFlag_F_I(f, i)	Flag	F	I	6.16A.2(b)iv	Flag that is 1 if Facility f is an NSG and System Management has not determined an estimate of its maximum sent out energy in Trading Interval i and 0 otherwise	(176)
DVEST_F_I(f, i)	MWh	F	I	7.13.1(eF)	The maximum sent out energy Facility f would have generated in Trading Interval i, had a Dispatch Instruction not been issued	I
DVNCSBP_F_I(f, i)	MWh	F	I	6.16B.1 (b)ii.1, 6.16B.2 (b)ii.1	Change in the Balancing Portfolio sent out energy due to a Network Control Service Contract for Facility f in Trading Interval i (positive is increase in energy, negative is reduction in energy)	(181)
DVNCS_F_I(f, i)	MWh	F	I	6.16B.1 (b)ii.1, 6.16B.2(b)ii.1	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of a Network Control Service Contract in Trading Interval i	I
NQCONMAX_F_I(f, i)	MWh	F	I	6.17.3(e), 6.17.5(e)	Maximum Non-Qualifying Constrained On Generation for Facility f in Trading Interval i	(179)
NQCOFFMAX_F_I(f, i)	MWh	F	I	6.17.4(e), 6.17.5A(e)	Maximum Non-Qualifying Constrained Off Generation for Facility f in Trading Interval i	(180)
LFPDNEQ_F_I(f, i)	MW	F	I	11	Downwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFBDNQ_F_I(f, i)	MW	F	I	11	Backup Downwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFPUPEQ_F_I(f, i)	MW	F	I	11	Upwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFBUPQ_F_I(f, i)	MW	F	I	11	Backup Upwards LFAS Enablement quantity for Facility f in Trading Interval i	I
SRRQ_F_I(f, i)	MWh	F	I	6.16B.1 (b)ii.3	Spinning Reserve Response Quantity for Facility f in Trading Interval i	I
LRQ_F_I(f, i)	MWh	F	I	6.16B.2(b)ii.3	Load Rejection Reserve Response Quantity for Facility f in Trading Interval i	I
STLTOL_F_D(f, d)	MWh	F	D	6.17.9, 6.17.10	(Portfolio) Settlement Tolerance for Facility f in Trading Day d	(182)
TOL_F_D(f, d)	MW	F	D	6.17.9(a)	Tolerance Range or Facility Tolerance Range as determined by System Management for Facility f in Trading Day d	I
BALPF(d)	{}	G	D	11	Set of Facilities in the Balancing Portfolio in Trading Day d	(37)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)

Variable	Units	SC	GR	Rule	Description	Ref
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)

4.5.2.4 Constrained Compensation Prices

$$CONP\_T\_I(t,i) = \begin{cases} OPLA\_T\_I(t,i) - BP\_G\_I(i) & \text{for } t \notin NSG(t,i) \\ max(0, OPLA\_T\_I(t,i) - BP\_G\_I(i)) & \text{for } t \in NSG(t,i) \end{cases} \tag{183}$$

$$COFFP\_T\_I(t,i) = BP\_G\_I(i) - OPLA\_T\_I(t,i) \tag{184}$$

$$OPLA\_T\_I(t,i) = \begin{cases} max\left(MINSTEMP\_G\_D(i), min\left(MAXSTEMP\_G\_D(i), \frac{OP\_T\_I(t,i)}{LF\_F\_D(f,i)}\right)\right) & \text{for } t \notin PORTFOLIO(i) \\ & \text{and } FUELFlag\_T\_I(t,i) = 1 \\ max\left(MINSTEMP\_G\_D(i), min\left(AMAXSTEMP\_G\_D(i), \frac{OP\_T\_I(t,i)}{LF\_F\_D(f,i)}\right)\right) & \text{for } t \notin PORTFOLIO(i) \\ & \text{and } FUELFlag\_T\_I(t,i) = 0 \\ OP\_T\_I(t,i) & \text{for } t \in PORTFOLIO(i) \end{cases} \tag{185}$$

$$LF\_F\_D(f,d) = TLF\_F\_D(f,d) \times DLF\_F\_D(f,d) \tag{186}$$

Variable	Units	SC	GR	Rule	Description	Ref
CONP_T_I(t, i)	$/MWh	T	I	6.17.3(b), 6.17.3(c)ii, 6.17.3(d), 6.17.3A(b), 6.17.5(b), 6.17.5(c)ii, 6.17.5(d)	Constrained On Compensation Price for tranche t in Trading Interval i	(183)
COFFP_T_I(t, i)	$/MWh	T	I	6.17.4(b), 6.17.4(c)ii, 6.17.4(d), 6.17.4A(b), 6.17.5A(b), 6.17.5A(c)ii, 6.17.5A(d)	Constrained Off Compensation Price for tranche t in Trading Interval i	(184)
OP_T_I(t, i)	$/MWh	T	I		Offer price of the Balancing Price-Quantity Pair for tranche t (before any applicable ramp-rate adjustments) in Trading Interval i	I
OPLA_T_I(t, i)	$/MWh	T	I		Loss Factor Adjusted (offer) Price for tranche t in Trading Interval i	(185)
BP_G_I(i)	$/MWh	G	I	7A.3.10	Balancing Price for Trading Interval i	I
LF_F_D(f, d)		F	D		Loss Factor for Facility f for Trading Day d	(186)
TLF_F_D(f, d)		F	D		Transmission Loss Factor for Facility f for Trading Day d	I
DLF_F_D(f, d)		F	D		Distribution Loss Factor for Facility f for Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
FUELFlag_T_I(t, i)	Flag	T	I		Flag that is 1 if Non-Liquid Fuel applies to tranche t in Trading Interval i and 0 otherwise	I
AMAXSTEMP_G_D(d)	$/MWh	G	D	6.20.3	Alternative Maximum STEM Price for Trading Day d	I
MAXSTEMP_G_D(d)	$/MWh	G	D	6.20.2	Maximum STEM Price for Trading Day d	I
MINSTEMP_G_D(d)	$/MWh	G	D	11	Minimum STEM Price for Trading Day d	I
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)

4.5.3 DSM Dispatch Instruction Payments

$$DIP\_P\_D(p,d) = \sum_{i \in I(d)} DIP\_P\_I(p,i) \tag{187}$$

$$DIP\_P\_I(p,i) = \sum_{f \in DSP(p,i)} DIP\_F\_I(f,i) \tag{188}$$

$$DIP\_F\_I(f,i) = DDSMD\_F\_I(f,i) \times CDP\_F\_I(f,i) \tag{189}$$

$$CDP\_F\_I(f,i) = \begin{cases} CDPPK\_F\_D(f,i) & \text{for } PKTI\_G\_I(i) = 1 \\ CDPOP\_F\_D(f,i) & \text{otherwise} \end{cases} \tag{190}$$

$$DDSMD\_F\_I(f,i) = min\left(0.5h \times CC\_F\_D(f,i), DI\_F\_I(f,i), max\left(0, 0.5h \times RD\_F\_D(f,i) - \left(DSPL\_F\_I(f,i) + FDSMCD\_F\_I(f,i)\right)\right)\right) \tag{191}$$

$$FDSMCD\_F\_I(f,i) = DVNCS\_F\_I(f,i) + DVASC\_F\_I(f,i) + DVT\_F\_I(f,i) + DVSC\_F\_I(f,i) \tag{192}$$

$$DVT\_F\_I(f,i) = DVRCT\_F\_I(f,i) + DVCT\_F\_I(f,i) \tag{193}$$

Variable	Units	SC	GR	Rule	Description	Ref
DIP_P_D(p, d)	$	P	D	6.17.6	DSM Dispatch Instruction Payments for Market Participant p in Trading Day d	(187)
DIP_P_I(p, i)	$	P	I	6.17.6	DSM Dispatch Instruction Payments for Market Participant p in Trading Interval i	(188)
DIP_F_I(f, i)	$	F	I	6.17.6	DSM Dispatch Instruction Payments for Facility f in Trading Interval i	(189)
DDSMD_F_I(f, i)	MWh	F	I	6.17.6(a)iii	Deemed DSM Dispatch for Facility f in Trading Interval i	(191)
CDP_F_I(f, i)	$/MWh	F	I	11	Consumption Decrease Price for Facility f in Trading Interval i	(190)
CDPPK_F_D(f, d)	$/MWh	F	D	Appendix 1 (h)vi.1	Consumption Decrease Price for Peak Trading Intervals for Facility f for Trading Day d	I
CDPOP_F_D(f, d)	$/MWh	F	D	Appendix 1 (h)vi.2	Consumption Decrease Price for Off-Peak Trading Intervals for Facility f for Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
DSPL_F_I(f, i)	MWh	F	I	6.16.2	Demand Side Programme Load for Facility f in Trading Interval i	(84)
RD_F_D(f, d)	MW	F	D	4.26.2CA	Relevant Demand of Facility f in Trading Day d	I
DI_F_I(f, i)	MWh	F	I	7.13.1(eG)	Dispatch Instruction for Facility f in Trading Interval i	I
DVNCS_F_I(f, i)	MWh	F	I	6.16B.1 (b)ii.1, 6.16B.2(b)ii.1	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of a Network Control Service Contract in Trading Interval i	I
DVASC_F_I(f, i)	MWh	F	I	11	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of an Ancillary Service Contract in Trading Interval i	I
DVT_F_I(f, i)	MWh	F	I	11	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of a Test under the Market Rules in Trading Interval i	(193)
DVRCT_F_I(f, i)	MWh	F	I	11	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of a Reserve Capacity Test under the Market Rules in Trading Interval i	I
DVCT_F_I(f, i)	MWh	F	I	11	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of a Commissioning Test under the Market Rules in Trading Interval i	I
DVSC_F_I(f, i)	MWh	F	I	11	Dispatch volume associated with an Operating Instruction for Facility f to meet the requirements of a Supplementary Capacity Contract in Trading Interval i	I
FDSMCD_F_I(f, i)	MWh	F	I	6.17.6D(d)	Further DSM Consumption Decrease for Facility f in Trading Interval i	(192)
PKTI_G_I(i)	Flag	G	I	11	Flag which is 1 if Trading Interval i is a Peak Trading Interval and 0 otherwise	(225)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.5.4 Additional Repaid Amounts

$$ARA\_P\_D(p,d) = \sum_{i \in I(d)} ARA\_P\_I(p,i) \tag{194}$$

$$ARA\_P\_I(p,i) = \frac{ARAincGST\_P\_D(p,i)}{(1 + GST\_G\_D(i)) \times 48} \tag{195}$$

Variable	Units	SC	GR	Rule	Description	Ref
ARA_P_D(p, d)	$	P	D	9.24.2(b)	Repaid Amount that AEMO disgorges in addition to returning Credit Support for Market Participant p for Trading Day d	(194)
ARA_P_I(p, i)	$	P	I		Repaid Amount that AEMO disgorges in addition to returning Credit Support for Market Participant p for Trading Interval i	(195)
ARAincGST_P_D(p, d)	$	P	D	9.24.2(b)	Repaid Amount (inc GST) that AEMO disgorges in addition to returning Credit Support for Market Participant p for Trading Day d	I
GST_G_D(d)		G	D		GST rate for Trading Day d	I

4.6 Reconciliation

Reconciliation is split into two parts:

- Constrained Compensation & DSM Dispatch Instruction Costs - Which is paid to Market Participants in Balancing settlement calculations. This part also includes the cost recovery when AEMO must disgorge funds to a Market Participant in addition to returning its Credit Support.
- Cost_LR Shortfall Costs - A charge to Market Participants for Load Rejection Services and System Restart Services which have been paid in excess of the amount specified by AEMO (when contracts exceed the value determined by the ERA).

These equations are based on the equations stated in MR 9.11. They have been modified to separate the two parts listed above and to attribute a monthly calculation to an interval calculation and then aggregate to a Trading Day. If the calculations were aggregated to a Trading Month they would be mathematically equivalent to the equations detailed in the rules.

$$RSA\_P\_D(p,d) = -(LRSF\_P\_D(p,d) + CCDSMT3C\_P\_D(p,d)) \tag{196}$$

Variable	Units	SC	GR	Rule	Description	Ref
RSA_P_D(p, d)	$	P	D	9.11.1	Reconciliation Settlement amount for Market Participant p in Trading Day d	(196)
LRSF_P_D(p, d)	$	P	D		Charges to cover any shortfall in Load Rejection and System Restart costs for Market Participant p in Trading Day d	(197)
CCDSMT3C_P_D(p, d)	$	P	D		Charges to cover the cost of constrained compensation and DSM Dispatch for Market Participant p in Trading Day d	(204)

4.6.1 Load Rejection and System Restart Shortfall Costs

$$LRSF\_P\_D(p,d) = \sum_{i \in I(d)} LRSF\_P\_I(p,i) \tag{197}$$

$$LRSF\_P\_I(p,i) = CS\_P\_M(p,i) \times \frac{LRSF\_G\_M(i)}{TITM\_G\_M(i)} \tag{198}$$

$$LRSF\_G\_M(m) = max\left(0, CASL\_G\_M(m) + CASR\_G\_M(m) - COSTLR\_G\_M(m)\right) \tag{199}$$

$$CASL\_G\_M(m) = \sum_{p \in P\_M(m)} CASL\_P\_M(p, m) \tag{200}$$

$$CASR\_G\_M(m) = \sum_{p \in P\_M(m)} CASR\_P\_M(p, m) \tag{201}$$

$$COSTLR\_G\_M(m) = \frac{COSTLR\_G\_FY(m)}{12} \tag{202}$$

$$TITM\_G\_M(m) = \begin{cases} 28 \times 48 & \text{for } m = \text{February in a non-leap year} \\ 29 \times 48 & \text{for } m = \text{February in a leap year} \\ 30 \times 48 & \text{for } m \in \{ \text{ April, June, September, November } \} \\ 31 \times 48 & \text{for } m \in \{ \text{ January, March, May, July, August, October, December } \} \end{cases} \tag{203}$$

Variable	Units	SC	GR	Rule	Description	Ref
LRSF_P_D(p, d)	$	P	D		Charges to cover any shortfall in Load Rejection and System Restart costs for Market Participant p in Trading Day d	(197)
LRSF_P_I(p, i)	$	P	I		Charges to cover any shortfall in Load Rejection and System Restart costs for Market Participant p in Trading Interval i	(198)
CS_P_M(p, m)		P	M	9.3.7	Consumption share for Market Participant p in Trading Month m	(288)
LRSF_G_M(m)	$	G	M	9.9.3B	The value of the contracts to provide Load Rejection and System Restart Services in excess of the value determined by the ERA for Trading Month m	(199)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
CASL_G_M(m)	$	G	M		Sum of amounts paid for the provision of contracted Load Rejection Services for Trading Month m	(200)
CASR_G_M(m)	$	G	M		Sum of amounts paid for the provision of contracted System Restart Services for Trading Month m	(201)
CASL_P_M(p, m)	$	P	M	9.9.3(c)	Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Month m	I
CASR_P_M(p, m)	$	P	M	9.9.3(d)	Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Month m	I
COSTLR_G_FY(fy)	$	G	FY	3.22.1(g)i	The annual amount determined by the ERA to cover the costs of Load Rejection and System Restart Services, and un-contracted Dispatch Support Services for Financial Year fy	I

Variable	Units	SC	GR	Rule	Description	Ref
COSTLR_G_M(m)	$	G	M	3.22.1(g)i	The monthly equivalent of the amount determined by the ERA to cover the costs of Load Rejection and System Restart Services, and un-contracted Dispatch Support Services for Trading Month m	(202)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)

4.6.2 Constrained Compensation and DSM Dispatch Costs

$$CCDSMT3C\_P\_D(p,d) = \sum_{i \in I(d)} CCDSMT3C\_P\_I(p,i) \tag{204}$$

$$CCDSMT3C\_P\_I(p,i) = CS\_P\_M(p,i) \times BSA\_G\_I(i) \tag{205}$$

$$BSA\_G\_I(i) = \sum_{p \in P\_M(i)} BSA\_P\_I(p,i) \tag{206}$$

$$\begin{aligned} BSA\_P\_I(p,i) = {} & BSAS\_P\_I(p,i) - BSAD\_P\_I(p,i) + CONC\_P\_I(p,i) \\ & + COFFC\_P\_I(p,i) + DIP\_P\_I(p,i) + ARA\_P\_I(p,i) \end{aligned} \tag{207}$$

Variable	Units	SC	GR	Rule	Description	Ref
CCDSMT3C_P_D(p, d)	$	P	D		Charges to cover the cost of constrained compensation and DSM Dispatch for Market Participant p in Trading Day d	(204)
CCDSMT3C_P_I(p, i)	$	P	I		Charges to cover the cost of constrained compensation and DSM Dispatch for Market Participant p in Trading Interval i	(205)
CS_P_M(p, m)		P	M	9.3.7	Consumption share for Market Participant p in Trading Month m	(288)
BSA_G_I(i)	$	G	I		Sum of all Market Participant's Balancing settlement amount for Trading Interval i	(206)
BSA_P_I(p, i)	$	P	I	9.8.1	Balancing settlement amount for Market Participant p in Trading Interval i	(207)
BSAS_P_I(p, i)	$	P	I	9.8.1	Settlement amount for energy sold in the Balancing Market for Market Participant p in Trading Interval i	(117)
BSAD_P_I(p, i)	$	P	I	9.8.1	Settlement amount for energy purchased in the Balancing Market for Market Participant p in Trading Interval i	(118)
CONC_P_I(p, i)	$	P	I	9.8.1	Constrained On Compensation for Market Participant p in Trading Interval i	(126)

Variable	Units	SC	GR	Rule	Description	Ref
COFFC_P_I(p, i)	$	P	I	9.8.1	Constrained Off Compensation for Market Participant p in Trading Interval i	(127)
DIP_P_I(p, i)	$	P	I	6.17.6C(c)	DSM Dispatch Instruction Payments for Market Participant p in Trading Interval i	(188)
ARA_P_I(p, i)	$	P	I		Repaid Amount that AEMO disgorges in addition to returning Credit Support for Market Participant p for Trading Interval i	(195)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)

4.7 Changed Outage Compensation

Changed Outage Compensation is split into two parts:

- Compensation paid to a Market Participant to cover the costs of a changed outage.
- Charge to Market Participants to recover the cost of outage compensation.

These equations are based on the equations stated in MR 9.10. They have been modified to attribute a monthly calculation to an interval calculation and then aggregate to a Trading Day. If the calculations were aggregated to a Trading Month they would be mathematically equivalent to the equations detailed in the rules.

$$COCSA\_P\_D(p,d) = COCP\_P\_D(p,d) - COCC\_P\_D(p,d) \tag{208}$$

Variable	Units	SC	GR	Rule	Description	Ref
COCSA_P_D(p, d)	$	P	D	9.10.1	Outage compensation settlement amount for Market Participant p in Trading Day d	(208)
COCP_P_D(p, d)	$	P	D	9.10.1	Outage compensation payment for Market Participant p in Trading Day d	(209)
COCC_P_D(p, d)	$	P	D	9.10.1	Charge to fund outage compensation, for Market Participant p in Trading Day d	(211)

4.7.1 Changed Outage Compensation

$$COCP\_P\_D(p,d) = \sum_{i \in I(d)} COCP\_P\_I(p,i) \tag{209}$$

$$COCP\_P\_I(p,i) = \frac{COCP\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{210}$$

Variable	Units	SC	GR	Rule	Description	Ref
COCP_P_I(p, i)	$	P	I	9.10.1	Outage compensation payment for Market Participant p in Trading Interval i	(210)
COCP_P_D(p, d)	$	P	D	9.10.1	Outage compensation payment for Market Participant p in Trading Day d	(209)

Variable	Units	SC	GR	Rule	Description	Ref
COCP_P_M(p, m)	$	P	M	9.10.1, 3.22.1(h)	Outage compensation payment for Market Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.7.2 Changed Outage Compensation Charges

$$COCC\_P\_D(p,d) = \sum_{i \in I(d)} COCC\_P\_I(p,i) \tag{211}$$

$$COCC\_P\_I(p,i) = CS\_P\_M(p,i) \times \frac{COCC\_G\_M(i)}{TITM\_G\_M(i)} \tag{212}$$

$$COCC\_G\_M(m) = COCP\_G\_M(m) \tag{213}$$

$$COCP\_G\_M(m) = \sum_{p \in P\_M(m)} COCP\_P\_M(p,m) \tag{214}$$

Variable	Units	SC	GR	Rule	Description	Ref
COCP_P_M(p, m)	$	P	M	9.10.1, 3.22.1(h)	Outage compensation payment for Market Participant p for Trading Month m	I
COCP_G_M(m)	$	G	M		Sum of all outage compensation payments for Trading Month m	(214)
COCC_G_M(m)	$	G	M	9.10.1	Sum of all outage compensation charges for Trading Month m	(213)
COCC_P_I(p, i)	$	P	I	9.10.1	Charge to fund outage compensation, for Market Participant p in Trading Interval i	(212)
COCC_P_D(p, d)	$	P	D	9.10.1	Charge to fund outage compensation, for Market Participant p in Trading Day d	(211)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
CS_P_M(p, m)		P	M	9.3.7	Consumption share for Market Participant p in Trading Month m	(288)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)

4.8 Ancillary Services

Ancillary Services is split into 12 parts:

- Un-contracted Spinning Reserve Services Provider Payment - Synergy is paid for its provision of un-contracted Spinning Reserve Services (acting as the default Ancillary Services provider)
- Un-contracted Load Rejection, System Restart and Dispatch Support Services Provider Payment - Synergy is paid for its provision of un-contracted Load Rejection, System Restart and Dispatch Support Services (acting as the default Ancillary Services provider)

- Contracted Spinning Reserve Services Provider Payment - Market Participants are paid for their provision of Spinning Reserve Services provided under contract
- Contracted Load Rejection Services Provider Payment - Market Participants are paid for their provision of Load Rejection Services provided under contract
- Contracted System Restart Services Provider Payment - Market Participants are paid for their provision of System Restart Services provided under contract
- Contracted Dispatch Support Services Provider Payment - Market Participants are paid for their provision of Dispatch Support Services provided under contract
- Load Following Market Payment - Market Participants are paid for their provision of Load Following services (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS).
- Load Following Capacity Cost - Market Participants are charged to cover the cost of capacity of plant that provide Load Following Services.
- Load Following Market Cost - Market Participants are charged to cover the cost of plant that clears in the Load Following Markets.
- Spinning Reserve availability cost - Market Participants are charged to cover Spinning Reserve costs.
- Load Rejection System Restart and Un-contracted Dispatch Support Costs - Market Participants are charged to cover the costs of Load Rejection Service and System Restart Services.
- Contracted Dispatch Support Services Costs - Market Participants are charged to cover the costs of contracted Dispatch Support Services.

$$\begin{aligned} ASSA\_P\_D(p,d) = {} & SynergyASPP\_P\_D(p,d) + ASPP\_P\_D(p,d) + LFSA\_P\_D(p,d) \\ & - LFCC\_P\_D(p,d) - LFMC\_P\_D(p,d) - SRAC\_P\_D(p,d) - COSTLRD\_P\_D(p,d) \end{aligned} \tag{215}$$

$$ASPP\_P\_D(p,d) = CASSR\_P\_D(p,d) + CASL\_P\_D(p,d) + CASR\_P\_D(p,d) + CASD\_P\_D(p,d) \tag{216}$$

$$SynergyASPP\_P\_D(p,d) = UASSR\_P\_D(p,d) + UASLR\_P\_D(p,d) \tag{217}$$

$$COSTLRD\_P\_D(p,d) = COSTLR\_P\_D(p,d) + COSTD\_P\_D(p,d) \tag{218}$$

Variable	Units	SC	GR	Rule	Description	Ref
ASSA_P_D(p, d)	$	P	D	9.9.1	Ancillary Services settlement amount for Market Participant p in Trading Day d	(215)
SynergyASPP_P_D(p, d)	$	P	D	9.9.3	Payment to Synergy for un-contracted Ancillary Services for Market Participant p in Trading Day d	(217)
ASPP_P_D(p, d)	$	P	D	9.9.3	Payment for Contracted Ancillary Services for Market Participant p in Trading Day d	(216)
UASSR_P_D(p, d)	$	P	D	9.9.1	Amount paid for Synergy's provision of un-contracted Spinning Reserve Services for Market Participant p in Trading Day d	(219)
UASLR_P_D(p, d)	$	P	D	9.9.1	Amount paid for Synergy's provision of un-contracted Load Rejection and System Restart Services for Market Participant p in Trading Day d	(226)

Variable	Units	SC	GR	Rule	Description	Ref
CASSR_P_D(p, d)	$	P	D		Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Day d	(230)
CASL_P_D(p, d)	$	P	D		Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Day d	(232)
CASR_P_D(p, d)	$	P	D		Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Day d	(234)
CASD_P_D(p, d)	$	P	D		Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Day d	(236)
LFSA_P_D(p, d)	$	P	D	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in Trading Day d	(238)
LFCC_P_D(p, d)	$	P	D	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following for Market Participant p in Trading Day d	(250)
LFMC_P_D(p, d)	$	P	D	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Market Participant p in Trading Day d	(259)
SRAC_P_D(p, d)	$	P	D	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Market Participant p in Trading Day d	(269)
COSTLRD_P_D(p, d)	$	P	D	9.9.1	Amount charged to recover the cost of Load Rejection Service, System Restart Service and Dispatch Support Services for Market Participant p in Trading Day d	(218)
COSTLR_P_D(p, d)	$	P	D	9.9.1	Amount charged to recover the cost of Load Rejection Service and System Restart Service for Market Participant p in Trading Day d	(286)
COSTD_P_D(p, d)	$	P	D	9.9.1	Amount charged to recover the cost of Dispatch Support Services for Market Participant p in Trading Day d	(290)

4.8.1 Un-contracted Spinning Reserve Services Provider Payment

These equations have been modified to tease out un-contracted Spinning Reserve from un-contracted Load Rejection, System Restart and Dispatch Support Services. In doing so, some of the equations simplify.

$$UASSR\_P\_D(p,d) = \sum_{i \in I(d)} UASSR\_P\_I(p,i) \tag{219}$$

$$UASSR\_P\_I(p,i) = \begin{cases} 0.5h \times MV\_G\_I(i) \times max(0, BP\_G\_I(i)) \times max(0, SRQ\_G\_I(i) & \\ -(LFPUPQ\_G\_I(i) + LFBUPQ\_G\_I(i)) - CASSRQ\_G\_I(i)) & \text{for } p \in Synergy(i) \\ 0 & \text{for } p \notin Synergy(i) \end{cases} \tag{220}$$

$$CASSRQ\_G\_I(i) = \sum_{p \in P(i)} CASSRQ\_P\_I(p,i) \tag{221}$$

$$CASSRQ\_P\_I(p,i) = \frac{CASSRQmwh\_P\_I(p,i)}{0.5h} \tag{222}$$

$$MV\_G\_I(i) = \begin{cases} MVPK\_G\_FY(i) & \text{for } PKTI\_G\_I(i) = 1 \\ MVOP\_G\_FY(i) & \text{otherwise} \end{cases} \tag{223}$$

$$SRQ\_G\_I(i) = \begin{cases} SRQPK\_G\_FY(i) & \text{for } PKTI\_G\_I(i) = 1 \\ SRQOP\_G\_FY(i) & \text{otherwise} \end{cases} \tag{224}$$

$$PKTI\_G\_I(i) = \begin{cases} 1 & \text{for } PKSTART\_G\_D(i) \leq hour(i) < PKEND\_G\_D(i) \\ 0 & \text{otherwise} \end{cases} \tag{225}$$

Variable	Units	SC	GR	Rule	Description	Ref
UASSR_P_D(p, d)	$	P	D	9.9.1	Amount paid for Synergy's provision of un-contracted Spinning Reserve Services for Market Participant p in Trading Day d	(219)
UASSR_P_I(p, i)	$	P	I	9.9.1	Amount paid for Synergy's provision of un-contracted Spinning Reserve Services for Market Participant p in Trading Interval i	(220)
BP_G_I(i)	$/MWh	G	I	7A.3.10	Balancing Price for Trading Interval i	I
MV_G_I(i)		G	I		Margin value applicable to Trading Interval i	(223)
MVPK_G_FY(fy)		G	FY	3.22.1(c)	Reserve availability payment margin applying to Peak Trading Intervals in Financial Year fy	I
MVOP_G_FY(fy)		G	FY	3.22.1(d)	Reserve availability payment margin applying to Off-Peak Trading Intervals in Financial Year fy	I
SRQ_G_I(i)	MW	G	I	9.9.2(f)	Ancillary Services Requirement for Spinning Reserve in Trading Interval i	(224)
SRQPK_G_FY(fy)	MW	G	FY	3.22.1(e)	Ancillary Services Requirement for Spinning Reserve in Peak Trading Intervals in Financial Year fy	I
SRQOP_G_FY(fy)	MW	G	FY	3.22.1(f)	Ancillary Services Requirement for Spinning Reserve in Off-Peak Trading Intervals in Financial Year fy	I
CASSRQ_G_I(i)	MW	G	I	9.9.2(f)	Sum of all quantities of Contracted Spinning Reserve Services in Trading Interval i	(221)
CASSRQ_P_I(p, i)	MW	P	I	9.9.2(f)	Quantity of Contracted Spinning Reserve Service for Rule Participant p in Trading Interval i	(222)
CASSRQmwh_P_I(p, i)	MWh	P	I		MWh quantity of Contracted Spinning Reserve Service for Rule Participant p in Trading Interval i	I
LFPUPQ_G_I(i)	MW	G	I	11	Sum of any Ex-post Upwards LFAS Enablement quantities in Trading Interval i	(255)

Variable	Units	SC	GR	Rule	Description	Ref
LFBUPQ_G_I(i)	MW	G	I	11	Sum of any Backup Upwards LFAS Enablement quantities in Trading Interval i	(256)
PKTI_G_I(i)	Flag	G	I	11	Flag which is 1 if Trading Interval i is a Peak Trading Interval and 0 otherwise	(225)
PKSTART_G_D(d)		G	D		Start time of Peak Trading Intervals in Trading Day d (represented as the hour in the day)	I
PKEND_G_D(d)		G	D		End time of Peak Trading Intervals in Trading Day d (represented as the hour in the day)	I
P(d)	{}	G	D		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Day d	(3)
Synergy(d)	{}	G	D	11	Set containing Synergy	(15)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.2 Un-contracted Load Rejection, System Restart and Dispatch Support Services Provider Payment

These equations have been modified to tease out un-contracted Load Rejection, System Restart and Dispatch Support Services from un-contracted Spinning Reserve. In doing so, some of the equations simplify.

$$UASLR\_P\_D(p,d) = \sum_{i \in I(d)} UASLR\_P\_I(p,i) \tag{226}$$

$$UASLR\_P\_I(p,i) = \frac{UASLR\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{227}$$

$$UASLR\_P\_M(p,m) = \begin{cases} COSTLR\_G\_M(m) - min(COSTLR\_G\_M(m), CASR\_G\_M(m) + CASL\_G\_M(m)) & \text{for } p \in Synergy\_M(m) \\ 0 & \text{for } p \notin Synergy\_M(m) \end{cases} \tag{228}$$

This equation is not required for the settlement amounts, but should be calculated for completeness.

$$UASLR\_G\_I(i) = \sum_{p \in P\_M(i)} UASLR\_P\_I(p,i) \tag{229}$$

Variable	Units	SC	GR	Rule	Description	Ref
UASLR_P_D(p, d)	$	P	D	9.9.1	Amount paid for Synergy's provision of un-contracted Load Rejection and System Restart Services for Market Participant p in Trading Day d	(226)
UASLR_P_I(p, i)	$	P	I	9.9.1	Amount paid for Synergy's provision of un-contracted Load Rejection and System Restart Services for Market Participant p in Trading Interval i	(227)
UASLR_G_I(i)	$	G	I	9.9.1	Amount paid for un-contracted Load Rejection and System Restart Services in Trading Interval i	(229)

Variable	Units	SC	GR	Rule	Description	Ref
UASLR_P_M(p, m)	$	P	M	9.9.1	Amount paid for Synergy's provision of un-contracted Load Rejection and System Restart Services for Market Participant p in Trading Month m	(228)
CASL_G_M(m)	$	G	M		Sum of amounts paid for the provision of contracted Load Rejection Services for Trading Month m	(200)
CASR_G_M(m)	$	G	M		Sum of amounts paid for the provision of contracted System Restart Services for Trading Month m	(201)
COSTLR_G_M(m)	$	G	M	3.22.1(g)i	The monthly equivalent of the amount determined by the ERA to cover the costs of Load Rejection and System Restart Services, and un-contracted Dispatch Support Services for Trading Month m	(202)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
Synergy_M(m)	{}	G	M	11	Set containing Synergy	(16)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.3 Contracted Spinning Reserve Services Provider Payment

$$CASSR\_P\_D(p,d) = \sum_{i \in I(d)} CASSR\_P\_I(p,i) \tag{230}$$

$$CASSR\_P\_I(p,i) = \frac{CASSR\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{231}$$

Variable	Units	SC	GR	Rule	Description	Ref
CASSR_P_D(p, d)	$	P	D		Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Day d	(230)
CASSR_P_I(p, i)	$	P	I		Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Interval i	(231)
CASSR_P_M(p, m)	$	P	M	9.9.3(a)	Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.4 Contracted Load Rejection Services Provider Payment

$$CASL\_P\_D(p,d) = \sum_{i \in I(d)} CASL\_P\_I(p,i) \tag{232}$$

$$CASL\_P\_I(p,i) = \frac{CASL\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{233}$$

Variable	Units	SC	GR	Rule	Description	Ref
CASL_P_D(p, d)	$	P	D		Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Day d	(232)
CASL_P_I(p, i)	$	P	I		Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Interval i	(233)
CASL_P_M(p, m)	$	P	M	9.9.3(c)	Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.5 Contracted System Restart Services Provider Payment

$$CASR\_P\_D(p,d) = \sum_{i \in I(d)} CASR\_P\_I(p,i) \tag{234}$$

$$CASR\_P\_I(p,i) = \frac{CASR\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{235}$$

Variable	Units	SC	GR	Rule	Description	Ref
CASR_P_D(p, d)	$	P	D		Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Day d	(234)
CASR_P_I(p, i)	$	P	I		Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Interval i	(235)
CASR_P_M(p, m)	$	P	M	9.9.3(d)	Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.6 Contracted Dispatch Support Services Provider Payment

$$CASD\_P\_D(p,d) = \sum_{i \in I(d)} CASD\_P\_I(p,i) \tag{236}$$

$$CASD\_P\_I(p,i) = \frac{CASD\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{237}$$

Variable	Units	SC	GR	Rule	Description	Ref
CASD_P_D(p, d)	$	P	D		Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Day d	(236)
CASD_P_I(p, i)	$	P	I		Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Interval i	(237)
CASD_P_M(p, m)	$	P	M	9.9.3(e)	Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.7 Load Following Market Payment

$$LFSA\_P\_D(p,d) = \sum_{i \in I(d)} LFSA\_P\_I(p,i) \tag{238}$$

$$LFSA\_P\_I(p,i) = LFDSA\_P\_I(p,i) + LFUSA\_P\_I(p,i) \tag{239}$$

$$LFDSA\_P\_I(p,i) = LFPDNSA\_P\_I(p,i) + LFBDNSA\_P\_I(p,i) \tag{240}$$

$$LFUSA\_P\_I(p,i) = LFPUPSA\_P\_I(p,i) + LFBUPSA\_P\_I(p,i) \tag{241}$$

$$LFPDNSA\_P\_I(p,i) = LFPDNQ\_P\_I(p,i) \times LFPDNP\_G\_I(i) \tag{242}$$

$$LFBDNSA\_P\_I(p,i) = LFBDNQ\_P\_I(p,i) \times LFBDNP\_G\_I(i) \tag{243}$$

$$LFPUPSA\_P\_I(p,i) = LFPUPQ\_P\_I(p,i) \times LFPUPP\_G\_I(i) \tag{244}$$

$$LFBUPSA\_P\_I(p,i) = LFBUPQ\_P\_I(p,i) \times LFBUPP\_G\_I(i) \tag{245}$$

$$LFPDNQ\_P\_I(p,i) = \sum_{f \in LFASF(p,i)} LFPDNQ\_F\_I(f,i) \tag{246}$$

$$LFBDNQ\_P\_I(p,i) = \sum_{f \in LFASF(p,i)} LFBDNQ\_F\_I(f,i) \tag{247}$$

$$LFPUPQ\_P\_I(p,i) = \sum_{f \in LFASF(p,i)} LFPUPQ\_F\_I(f,i) \tag{248}$$

$$LFBUPQ\_P\_I(p,i) = \sum_{f \in LFASF(p,i)} LFBUPQ\_F\_I(f,i) \tag{249}$$

Variable	Units	SC	GR	Rule	Description	Ref
LFSA_P_D(p, d)	$	P	D	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in Trading Day d	(238)
LFSA_P_I(p, i)	$	P	I	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in Trading Interval i	(239)
LFDSA_P_I(p, i)	$	P	I	9.9.2(b)	Payment to Market Participant p for providing Downwards LFAS and Backup Downwards LFAS in Trading Interval i	(240)
LFUSA_P_I(p, i)	$	P	I	9.9.2(a)	Payment to Market Participant p for providing Upwards LFAS and Backup Upwards LFAS in Trading Interval i	(241)
LFPDNSA_P_I(p, i)	$	P	I	9.9.2(b)	Payment to Market Participant p for providing Downwards LFAS in Trading Interval i	(242)
LFBDNSA_P_I(p, i)	$	P	I	9.9.2(b)	Payment to Market Participant p for providing Backup Downwards LFAS in Trading Interval i	(243)
LFPUPSA_P_I(p, i)	$	P	I	9.9.2(a)	Payment to Market Participant p for providing Upwards LFAS in Trading Interval i	(244)
LFBUPSA_P_I(p, i)	$	P	I	9.9.2(a)	Payment to Market Participant p for providing Backup Upwards LFAS in Trading Interval i	(245)
LFPDNQ_P_I(p, i)	MW	P	I	11	Sum of any Ex-post Downwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(246)
LFPDNP_G_I(i)	$/MW	G	I	7B.3.4(b)	Downwards LFAS Price for Trading Interval i	I
LFBDNQ_P_I(p, i)	MW	P	I	11	Sum of any Backup Downwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(247)
LFBDNP_G_I(i)	$/MW	G	I	7B.2.6	Backup Downwards LFAS Price for Trading Interval i	I
LFPUPQ_P_I(p, i)	MW	P	I	11	Sum of any Ex-post Upwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(248)
LFPUPP_G_I(i)	$/MW	G	I	11	Upwards LFAS Price for Trading Interval i	I
LFBUPQ_P_I(p, i)	MW	P	I	11	Sum of any Backup Upwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(249)
LFBUPP_G_I(i)	$/MW	G	I	7B.2.6	Backup Upwards LFAS Price for Trading Interval i	I
LFPDNQ_F_I(f, i)	MW	F	I	11	Ex-post Downwards LFAS Enablement quantity for Facility f in Trading Interval i	I

Variable	Units	SC	GR	Rule	Description	Ref
LFBDNQ_F_I(f, i)	MW	F	I	11	Backup Downwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFPUPQ_F_I(f, i)	MW	F	I	11	Ex-post Upwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFBUPQ_F_I(f, i)	MW	F	I	11	Backup Upwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFASF(d)	{}	G	D	11	Set of LFAS Facilities in Trading Day d	(39)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.8 Load Following Capacity Cost

$$LFCC\_P\_D(p,d) = \sum_{i \in I(d)} LFCC\_P\_I(p,i) \tag{250}$$

$$LFCC\_P\_I(p,i) = LFS\_P\_M(p,i) \times LFCC\_G\_I(i) \tag{251}$$

$$LFCC\_G\_I(i) = RCP\_G\_I(i) \times (LFPUPQ\_G\_I(i) + LFBUPQ\_G\_I(i)) \tag{252}$$

$$RCP\_G\_I(i) = \frac{RCP\_G\_M(i)}{TITM\_G\_M(i)} \tag{253}$$

$$RCP\_G\_M(m) = \frac{RCP\_G\_CY(m)}{12} \tag{254}$$

$$LFPUPQ\_G\_I(i) = \sum_{p \in MP(i)} LFPUPQ\_P\_I(p,i) \tag{255}$$

$$LFBUPQ\_G\_I(i) = \sum_{p \in MP(i)} LFBUPQ\_P\_I(p,i) \tag{256}$$

These equations are not required for the settlement amounts, but should be calculated for completeness.

$$LFPDNQ\_G\_I(i) = \sum_{p \in MP(i)} LFPDNQ\_P\_I(p,i) \tag{257}$$

$$LFBDNQ\_G\_I(i) = \sum_{p \in MP(i)} LFBDNQ\_P\_I(p,i) \tag{258}$$

Variable	Units	SC	GR	Rule	Description	Ref
LFCC_P_D(p, d)	$	P	D	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following for Market Participant p in Trading Day d	(250)
LFCC_P_I(p, i)	$	P	I	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following for Market Participant p in Trading Interval i	(251)
LFCC_G_I(i)	$	G	I	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following in Trading Interval i	(252)

Variable	Units	SC	GR	Rule	Description	Ref
LFS_P_M(p, m)		P	M	3.14.1	Load Following share for Market Participant p in Trading Month m	(267)
RCP_G_I(i)	$/MW	G	I		Interval Reserve Capacity Price for Trading Interval i	(253)
RCP_G_M(m)	$/MW	G	M	11	Monthly Reserve Capacity Price for Trading Month m	(254)
RCP_G_CY(cy)	$/MW	G	CY	11	Reserve Capacity Price for Capacity Year cy	I
LFPDNQ_G_I(i)	MW	G	I	11	Sum of any Ex-post Downwards LFAS Enablement quantities in Trading Interval i	(257)
LFBDNQ_G_I(i)	MW	G	I	11	Sum of any Backup Downwards LFAS Enablement quantities in Trading Interval i	(258)
LFPUPQ_G_I(i)	MW	G	I	11	Sum of any Ex-post Upwards LFAS Enablement quantities in Trading Interval i	(255)
LFBUPQ_G_I(i)	MW	G	I	11	Sum of any Backup Upwards LFAS Enablement quantities in Trading Interval i	(256)
LFPDNQ_P_I(p, i)	MW	P	I	11	Sum of any Ex-post Downwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(246)
LFBDNQ_P_I(p, i)	MW	P	I	11	Sum of any Backup Downwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(247)
LFPUPQ_P_I(p, i)	MW	P	I	11	Sum of any Ex-post Upwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(248)
LFBUPQ_P_I(p, i)	MW	P	I	11	Sum of any Backup Upwards LFAS Enablement quantities for Market Participant p in Trading Interval i	(249)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
MP(d)	{}	G	D	11	Set of Market Participants in Trading Day d	(7)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.9 Load Following Market Cost

$$LFMC\_P\_D(p,d) = \sum_{i \in I(d)} LFMC\_P\_I(p,i) \tag{259}$$

$$LFMC\_P\_I(p,i) = LFS\_P\_M(p,i) \times LFMC\_G\_I(i) \tag{260}$$

$$LFMC\_G\_I(i) = LFSA\_G\_I(i) - ASSF\_G\_I(i) \times ASCS\_G\_I(i) \tag{261}$$

$$LFSA\_G\_I(i) = \sum_{p \in P\_M(i)} LFSA\_P\_I(p,i) \tag{262}$$

$$ASSF\_G\_I(i) = \begin{cases} \dfrac{LFSA\_G\_I(i)}{LFSA\_G\_I(i) + SRNoLF\_G\_I(i)} & \text{for } LFSA\_G\_I(i) + SRNoLF\_G\_I(i) \neq 0 \\ 0 & \text{for } LFSA\_G\_I(i) + SRNoLF\_G\_I(i) = 0 \end{cases} \tag{263}$$

$$ASCS\_G\_I(i) = 0.5h \times MV\_G\_I(i) \times max(0, BP\_G\_I(i)) \times min(LFPUPQ\_G\_I(i) + LFBUPQ\_G\_I(i), SRQ\_G\_I(i) - CASSRQ\_G\_I(i)) \quad (264)$$

$$SRNoLF\_G\_I(i) = 0.5h \times MV\_G\_I(i) \times max(0, BP\_G\_I(i)) \times max(0, SRQ\_G\_I(i) - CASSRQ\_G\_I(i)) + \frac{CASSR\_G\_M(i)}{TITM\_G\_M(i)} \quad (265)$$

$$CASSR\_G\_M(m) = \sum_{p \in P\_M(p,m)} CASSR\_P\_M(p,m) \quad (266)$$

$$LFS\_P\_M(p,m) = \frac{LFCQ\_P\_M(p,m)}{LFCQ\_G\_M(m)} \quad (267)$$

$$LFCQ\_G\_M(m) = \sum_{p \in P\_M(m)} LFCQ\_P\_M(p,m) \quad (268)$$

Variable	Units	SC	GR	Rule	Description	Ref
LFMC_P_D(p, d)	$	P	D	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Market Participant p in Trading Day d	(259)
LFMC_P_I(p, i)	$	P	I	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Market Participant p in Trading Interval i	(260)
LFMC_G_I(i)	$	G	I	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Trading Interval i	(261)
LFS_P_M(p, m)		P	M	3.14.1	Load Following share for Market Participant p in Trading Month m	(267)
LFCQ_P_M(p, m)	MWh	P	M	3.14.1(a)	Load following contributing quantity for Market Participant p in Trading Month m	(81)
LFCQ_G_M(m)	MWh	G	M	3.14.1(b)	Sum of all load following contributing quantities in Trading Month m	(268)
LFSA_G_I(i)	$	G	I	9.9.2(e)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) in Trading Interval i	(262)
LFSA_P_I(p, i)	$	P	I	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in Trading Interval i	(239)
ASSF_G_I(i)		G	I	9.9.2(j)	Ancillary Services saving factor for Trading Interval i	(263)

Variable	Units	SC	GR	Rule	Description	Ref
ASCS_G_I(i)	$	G	I	9.9.2(i)	Ancillary Services cost saving achieved from the dual use of plant to provide Spinning Reserve Service and Load Following Service for Trading Interval i	(264)
BP_G_I(i)	$/MWh	G	I	7A.3.10	Balancing Price for Trading Interval i	I
MV_G_I(i)		G	I		Margin value applicable to Trading Interval i	(223)
SRQ_G_I(i)	MW	G	I	9.9.2(f)	Ancillary Services Requirement for Spinning Reserve in Trading Interval i	(224)
CASSRQ_G_I(i)	MW	G	I	9.9.2(f)	Sum of all quantities of Contracted Spinning Reserve Services in Trading Interval i	(221)
LFPUPQ_G_I(i)	MW	G	I	11	Sum of any Ex-post Upwards LFAS Enablement quantities in Trading Interval i	(255)
LFBUPQ_G_I(i)	MW	G	I	11	Sum of any Backup Upwards LFAS Enablement quantities in Trading Interval i	(256)
SRNoLF_G_I(i)	$	G	I	9.9.2(h)	Assumed total cost of Spinning Reserve if no Spinning Reserve was provided by Load Following Plant in Trading Interval i	(265)
CASSR_G_M(m)	$	G	M	9.9.3(a)	Payment for the provision of contracted Spinning Reserve Services for Trading Month m	(266)
CASSR_P_M(p, m)	$	P	M	9.9.3(a)	Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.10 Spinning Reserve Availability Cost

$$SRAC\_P\_D(p,d) = \sum_{i \in I(d)} SRAC\_P\_I(p,i) \tag{269}$$

$$SRAC\_P\_I(p,i) = SRS\_P\_I(p,i) \times SRAC\_G\_I(i) \tag{270}$$

$$SRAC\_G\_I(i) = UASSR\_G\_I(i) + \frac{CASSR\_G\_M(i)}{TITM\_G\_M(i)} + ASSF\_G\_I(i) \times ASCS\_G\_I(i) \tag{271}$$

$$UASSR\_G\_I(i) = \sum_{p \in P\_M(i)} UASSR\_P\_I(p,i) \tag{272}$$

Variable	Units	SC	GR	Rule	Description	Ref
SRAC_P_D(p, d)	$	P	D	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Market Participant p in Trading Day d	(269)
SRAC_P_I(p, i)	$	P	I	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Market Participant p in Trading Interval i	(270)
SRAC_G_I(i)	$	G	I	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Trading Interval i	(271)
SRS_P_I(p, i)		P	I	Appendix 2 Step 4	The share of Spinning Reserve costs for Market Participant p in Trading Interval i	(285)
UASSR_G_I(i)	$	G	I	9.9.1	Amount paid for un-contracted Spinning Reserve Services for Market Participant p in Trading Interval i	(272)
UASSR_P_I(p, i)	$	P	I	9.9.1	Amount paid for Synergy's provision of un-contracted Spinning Reserve Services for Market Participant p in Trading Interval i	(220)
CASSR_G_M(m)	$	G	M	9.9.3(a)	Payment for the provision of contracted Spinning Reserve Services for Trading Month m	(266)
ASSF_G_I(i)		G	I	9.9.2(j)	Ancillary Services saving factor for Trading Interval i	(263)
ASCS_G_I(i)	$	G	I	9.9.2(i)	Ancillary Services cost saving achieved from the dual use of plant to provide Spinning Reserve Service and Load Following Service for Trading Interval i	(264)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)

4.8.10.1 Spinning Reserve Share

Step 1 - Determine applicable capacity for each applicable facility. Note that this implementation includes those facilities which are exempt from Spinning Reserve costs and then sets their applicable capacity to 0.

$$AC\_F\_I(f,i) = SRSFlag\_F\_I(f,i) \times \frac{SRSOMS\_F\_I(f,i)}{0.5h} \tag{273}$$

$$SRSFlag\_F\_I(f,i) = SRsynchFlag\_F\_I(f,i) \times SR10Flag\_F\_I(f,i) \times SRpayableFlag\_F\_I(f,i) \tag{274}$$

$$SRpayableFlag\_F\_I(f,i) = \begin{cases} 0 & \text{for } SRexemptFlag\_F\_D(f,i) = 1 \\ 1 & \text{otherwise} \end{cases} \tag{275}$$

$$SR10Flag\_F\_I(f,i) = \begin{cases} 1 & \frac{SRSOMS\_F\_I(f,i)}{0.5h} > 10MW \\ 0 & \frac{SRSOMS\_F\_I(f,i)}{0.5h} \leq 10MW \end{cases} \tag{276}$$

$$SRSOMS\_F\_I(f,i) = \begin{cases} SOMS\_N\_I(f,i) & \text{where } f \in SGpreAGG(i) \cup \left(SG(i) \cap \overline{AGG(i)} \cap \overline{EG(i)}\right) \\ SOMSAV\_F\_M(f,i) & \text{where } f \in IG(i) \\ SCADA\_F\_I(f,i) & \text{where } f \in EG(i) \cup GEN\_UREG\_L(i) \\ 0 & \text{otherwise} \end{cases} \tag{277}$$

Step 2 - Order applicable facilities by ascending applicable capacity

$$AF\_G\_I(i) = AF(i) \text{ ordered by ascending } AC\_F\_I(f,i) \text{ and then alphabetically} \tag{278}$$

$$SRrank\_F\_I(f,i) = \text{Position of applicable facility } f \text{ in } AF\_G\_I(i) \tag{279}$$

The expression $AF[r]$ returns the r-th element of the set $AF\_G\_I(i)$ and the following equation shows the interaction between $AF\_G\_I(i)$, $SRrank\_F\_I(f,i)$ and $AF[r]$:

$$AF[SRrank\_F\_I(f,i)] = f \tag{280}$$

Step 3 - Determine Facility Spinning Reserve Share

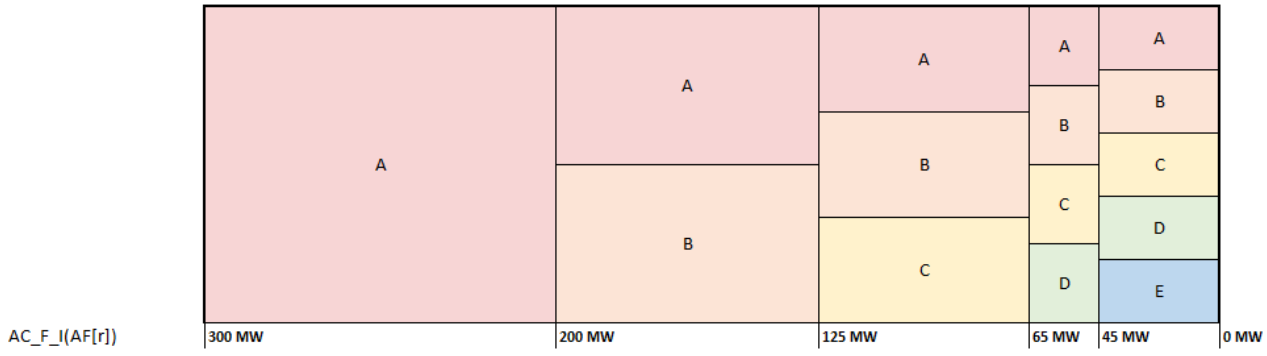
$$FSRS\_F\_I(f,i) = \sum_{r=1}^{SRrank\_F\_I(f,i)} \frac{\left(\frac{AC\_F\_I(AF[r],i) - AC\_F\_I(AF[r-1],i)}{MAXAC\_G\_I(i)}\right)}{MAXr\_G\_I(i) - r + 1} \tag{281}$$

$$AC\_F\_I(AF[0],i) = 0 \tag{282}$$

$$MAXr\_G\_I(i) = |AF\_G\_I(i)| \tag{283}$$

$$MAXAC\_G\_I(i) = AC\_F\_I(AF[MAXr\_G\_I(i)],i) \tag{284}$$

The image below is to assist in visualising the calculation of FSRS_F_I(f, i). Each applicable facility is represented by a letter, and the facility share is visually represented as the area of the 'runway'.



r	5	4	3	2	1
AC_F_I(AF[r]) - AC_F_I(AF[r-1])	100 MW	75 MW	60 MW	20 MW	45 MW
MAXAC_G_I	300 MW	300 MW	300 MW	300 MW	300 MW
	33%	25%	20%	7%	15%
MAXr_G_I	5	5	5	5	5
MAXr_G_I - r + 1	1	2	3	4	5
	33%	13%	7%	2%	3%
FSRS_F_I(f)	57%	24%	11%	5%	3%

Step 4 - Determine participant Spinning Reserve share

$$SRS\_P\_I(p,i) = \sum_{f \in AF(p,i)} FSRS\_F\_I(f,i) \tag{285}$$

Variable	Units	SC	GR	Rule	Description	Ref
SRS_P_I(p, i)		P	I	Appendix 2 Step 4	The share of Spinning Reserve costs for Market Participant p in Trading Interval i	(285)
FSRS_F_I(f, i)		F	I	Appendix 2 Step 3	The share of Spinning Reserve costs for Facility f in Trading Interval i	(281)
MAXr_G_I(i)		G	I		The number of applicable facilities in Trading Interval i	(283)
MAXAC_G_I(i)	MW	G	I		The largest applicable capacity in Trading Interval i	(284)
AF_G_I(i)	{}	G	I	Appendix 2 Step 2	Ordered set of applicable facilities in Trading Interval i (ordered by ascending applicable capacity)	(278)
AF[r]		G	I		The r-th element of the set $AF\_G\_I(i)$	(280)
AF(d)	{}	G	D	Appendix 2	Set of applicable facilities (including any exempt under 2.30A.2) in Trading Day d	(41)
AC_F_I(f, i)	MW	F	I	Appendix 2 Step 1	Applicable capacity for applicable facility f in Trading Interval i	(273) & (282)
SRrank_F_I(f, i)		F	I		The element number of applicable facility f in AF_G_I(i), where 1 is the applicable facility with the lowest applicable capacity.	(279)
SRSFlag_F_I(f, i)	Flag	F	I		Flag used to set the applicable capacity for applicable facility f in Trading Interval i to 0, when required	(274)
SRsynchFlag_F_I(f, i)	Flag	F	I	Appendix 2 Step 1 1.	Flag that is 1 when applicable facility f is synchronised to the SWIS in Trading Interval i	I
SR10Flag_F_I(f, i)	Flag	F	I	Appendix 2 Step 1 2.	Flag that is 1 when applicable facility f sent power out at an average rate greater than 10MW over Trading Interval i	(276)
SRpayableFlag_F_I(f, i)	Flag	F	I		Flag that is 1 when the Facility associated with applicable facility f is required to fund Spinning Reserve in Trading Interval i	(275)
SRexemptFlag_F_D(f, d)	Flag	F	D	2.30A.2	Flag that is 1 when the Facility associated with applicable facility f is exempt from funding Spinning Reserve in Trading Day d	I
SRSOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Scheduled used when determining applicable capacity for connection point n in Trading Interval i	(277)
SOMS_N_I(f, i)	MWh	F	I		Sent Out Metered Schedule for applicable facility f in Trading Interval i	(480)
SCADA_F_I(f, i)	MWh	F	I		Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	I
SOMSAV_F_M(f, m)	MWh	F	M		Average Sent Out Metered Schedule for Facility f in Trading Month m	(85)

Variable	Units	SC	GR	Rule	Description	Ref
SGpreAGG(d)	{}	G	D	2.30	Set of Facilities which comprise an aggregated Scheduled Generator on Trading Day d	(44)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
IG(d)	{}	G	D	11	Set of Intermittent Generators in Trading Day d	(34)
AGG(d)	{}	G	D	2.30	Set of accepted aggregated Facilities in Trading Day d	(43)
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
GEN_UREG_L(d)	{}	G	D		Set of unregistered generation system serving an Intermittent Load in Trading Day d	(42)

4.8.11 Load Rejection, System Restart and un-contracted Dispatch Support Services Costs

$$COSTLR\_P\_D(p,d) = \sum_{i \in I(d)} COSTLR\_P\_I(p,i) \tag{286}$$

$$COSTLR\_P\_I(p,i) = CS\_P\_M(p,i) \times \frac{COSTLR\_G\_M(i)}{TITM\_G\_M(i)} \tag{287}$$

$$CS\_P\_M(p,m) = \frac{CQ\_P\_M(p,m)}{CQ\_G\_M(m)} \tag{288}$$

$$CQ\_G\_M(m) = \sum_{p \in P\_M(m)} CQ\_P\_M(p,m) \tag{289}$$

Variable	Units	SC	GR	Rule	Description	Ref
COSTLR_P_D(p, d)	$	P	D	9.9.1	Amount charged to recover the cost of Load Rejection Service and System Restart Service for Market Participant p in Trading Day d	(286)
COSTLR_P_I(p, i)	$	P	I	9.9.1	Amount charged to recover the cost of Load Rejection Service and System Restart Service for Market Participant p in Trading Interval i	(287)
CS_P_M(p, m)		P	M	9.3.7	Consumption share for Market Participant p in Trading Month m	(288)
CQ_P_M(p, m)	MWh	P	M	9.3.7(a)	Contributing quantity for Market Participant p in Trading Month m	(82)
CQ_G_M(m)	MWh	G	M	9.3.7(b)	Sum of all contributing quantities in Trading Month m	(289)
COSTLR_G_M(m)	$	G	M	3.22.1(g)i	The monthly equivalent of the amount determined by the ERA to cover the costs of Load Rejection and System Restart Services, and un-contracted Dispatch Support Services for Trading Month m	(202)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)

Variable	Units	SC	GR	Rule	Description	Ref
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.8.12 Contracted Dispatch Support Costs

$$COSTD\_P\_D(p,d) = \sum_{i \in I(d)} COSTD\_P\_I(p,i) \tag{290}$$

$$COSTD\_P\_I(p,i) = CS\_P\_M(p,i) \times \frac{CASD\_G\_M(i)}{TITM\_G\_M(i)} \tag{291}$$

$$CASD\_G\_M(m) = \sum_{p \in P\_M(m)} CASD\_P\_M(p,m) \tag{292}$$

Variable	Units	SC	GR	Rule	Description	Ref
COSTD_P_D(p, d)	$	P	D	9.9.1	Amount charged to recover the cost of Dispatch Support Services for Market Participant p in Trading Day d	(290)
COSTD_P_I(p, i)	$	P	I	9.9.1	Amount charged to recover the cost of Dispatch Support Services for Market Participant p in Trading Interval i	(291)
CS_P_M(p, m)		P	M	9.3.7	Consumption share for Market Participant p in Trading Month m	(288)
CASD_G_M(m)	$	G	M	3.22.1(g)ii	The monthly amount for Dispatch Support Services for Trading Month m	(292)
CASD_P_M(p, m)	$	P	M	9.9.3(e)	Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Month m	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9 Reserve Capacity

Reserve Capacity is split into the following parts:

- Capacity Payments - Payment to Market Participants for unallocated Capacity Credits.
- Capacity Credit Over-allocations Payment - Payment to Market Participants for receiving more Capacity Credit Allocations than its IRCR.
- Supplementary Capacity Payments - Payment to Market Participants associated with a Supplementary Capacity Contract.
- TRCC Charges - Charge to Market Participants to fund the cost of Capacity up to the Reserve Capacity Requirement.
- SRCC Charges - Charge to Market Participants to fund the payment of Capacity in excess of the Reserve Capacity Requirement.

- Capacity Cost Refund - Charge to Market Participants resulting from failure to meet obligations relating to Capacity Credits.
- Intermittent Load Refunds - Charge to Market Participants for Intermittent Load Refunds.
- Capacity Rebate - Payment to Market Participants redistributing the Capacity Refunds.
- Load Following Capacity Rebate - Payment to Market Participants to return Capacity charges relating to the Load Following Requirement (as these are paid through another equation).

These equations are based on the equations stated in MR 9.7. They have been modified to attribute a monthly calculation to an interval calculation and then aggregate to a Trading Day. They have also been altered so that payments are represented as positive values and charges negative values. If the calculations were aggregated to a Trading Month they would be mathematically equivalent to the equations detailed in the rules.

$$RCSA\_P\_D(p,d) = CPP\_P\_D(p,d) - CPC\_P\_D(p,d) \tag{293}$$

$$\begin{aligned} CPP\_P\_D(p,d) = {} & CAPREBSA\_P\_D(p,d) + CCSA\_P\_D(p,d) - IMLR\_P\_D(p,d) \\ & + SUPCAPSA\_P\_D(p,d) - CCR\_P\_D(p,d) + CCAOASA\_P\_D(p,d) \end{aligned} \tag{294}$$

$$CPC\_P\_D(p,d) = TRCC\_P\_D(p,d) + SRCC\_P\_D(p,d) - LFREBATE\_P\_D(p,d) \tag{295}$$

Variable	Units	SC	GR	Rule	Description	Ref
RCSA_P_D(p, d)	$	P	D	9.7.1	Reserve Capacity settlement amount for Market Participant p in Trading Day d	(293)
CPP_P_D(p, d)	$	P	D	9.7.1A	Capacity Provider Payment for Market Participant p in Trading Day d	(294)
CPC_P_D(p, d)	$	P	D	9.7.1B	Capacity Purchaser Charge for Market Participant p in Trading Day d	(295)
CAPREBSA_P_D(p, d)	$	P	D	4.26.4	Participant Capacity Rebate (whereby Capacity Cost Refunds are redistributed) for Market Participant p in Trading Day d	(385)
CCSA_P_D(p, d)	$	P	D	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in Trading Day d	(296)
IMLR_P_D(p, d)	$	P	D	4.28A.1	Intermittent Load Refunds for Market Participant p in Trading Day d	(383)
SUPCAPSA_P_D(p, d)	$	P	D	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in Trading Day d	(306)
CCR_P_D(p, d)	$	P	D	4.26.2E	Capacity Cost Refund charged to Market Participant p in Trading Day d	(336)
CCAOASA_P_D(p, d)	$	P	D	9.7.1A	Capacity Credit Allocation over-allocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in Trading Day d	(301)
TRCC_P_D(p, d)	$	P	D	9.7.1B	Charge to cover the Targeted Reserve Capacity Cost for Market Participant p in Trading Day d	(309)
SRCC_P_D(p, d)	$	P	D	9.7.1B	Charge to cover the Shared Reserve Capacity Cost for Market Participant p in Trading Day d	(326)

Variable	Units	SC	GR	Rule	Description	Ref
LFREBATE_P_D(p, d)	$	P	D	9.7.1B	Payment returning cost of Capacity associated with Load Following, for Market Participant p in Trading Day d	(397)

4.9.1 Capacity Payments

This implementation appears slightly inconsistent with the rule stated in 9.7.1A as it includes the term $DSPVRR\_F\_I$. This term relates to a refund outlined in clause 4.25.4E. The rules do not state where this refund should be included in 9.7.1A, and therefore AEMO has included it within this term. The rules are explicit in defining a Demand Side Programme Capacity Cost Refund, which does not include the refund outlined in 4.25.4E. Similarly, the rules are explicit in defining what refunds are distributed as a Participant Capacity Rebate which again do not include the $DSPVRR\_F\_I$ refund. Implementing this refund here, allows AEMO to maintain the zero-sum nature of the settlement equations by returning the refund in the calculation of the Shared Reserve Capacity Cost.

$$CCSA\_P\_D(p,d) = \sum_{i \in I(d)} CCSA\_P\_I(p,i) \tag{296}$$

$$CCSA\_P\_I(p,i) = \sum_{(pp,f) \in CCPF\_M(p,i)} CCSA\_PF\_I(pp,f,i) \tag{297}$$

$$CCSA\_PF\_I(p,f,i) = \begin{cases} NetCC\_PF\_M(p,f,i) \times RCP\_F\_I(f,i) & \text{for } f \notin DSP(i) \\ NetCC\_PF\_M(p,f,i) \times RCP\_F\_I(f,i) - DSPVRR\_F\_I(f,i) & \text{for } f \in DSP(i) \end{cases} \tag{298}$$

$$NetCC\_PF\_M(p,f,m) = CC\_PF\_M(p,f,m) - CCAM\_PF\_M(p,f,m) \tag{299}$$

$$CCAM\_PF\_M(p,f,m) = \sum_{a \in CCAM(p,f,m)} CCAQ\_A\_M(a) \tag{300}$$

Variable	Units	SC	GR	Rule	Description	Ref
CCSA_P_D(p, d)	$	P	D	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in Trading Day d	(296)
CCSA_P_I(p, i)	$	P	I	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in Trading Interval i	(297)
CCSA_PF_I(p, f, i)	$	PF	I	9.7.1A	Payment for non-allocated Capacity Credits for Facility f and Market Participant p in Trading Interval i	(298)
NetCC_PF_M(p, f, m)	MW	PF	M		Net Capacity Credits (net of any Capacity Credit Allocations) for Facility f and Market Participant p for Trading Month m	(299)
CC_PF_M(p, f, m)	MW	PF	M		Capacity Credits associated with Facility f and Market Participant p for Trading Month m	(101)
CCAM_PF_M(pf, m)	MW	PF	M		Number of Capacity Credits allocated to another Market Participant by Market Participant p in relation to Facility f in Trading Month m	(300)
CCAQ_A_M(a)	MW	A	M		Number of Capacity Credits associated with Capacity Credit Allocation a	I
RCP_F_I(f, i)	$/MW	F	I		Interval Reserve Capacity Price for Facility f in Trading Interval i	(375)

Variable	Units	SC	GR	Rule	Description	Ref
DSPVRR_F_I(f, i)	$	F	I	4.25.4E	Refund payable related to the voluntary reduction of Capacity Credits for Facility f in Trading Interval i	(371)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
CCAM(m)	{}	G	M		Set of Capacity Credit Allocations made (by Facility f and Market Participant p) in Trading Month m	I
CCPF_M(m)	{}	G	M		Set of participant-facility combinations in Trading Month m	(52)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.2 Capacity Credit Over-Allocations Payment

$$CCAOASA\_P\_D(p,d) = \sum_{i \in I(d)} CCAOASA\_P\_I(p,i) \tag{301}$$

$$CCAOASA\_P\_I(p,i) = CCAOA\_P\_M(p,i) \times \frac{EAP\_P\_M(p,i)}{TITM\_G\_M(i)} \tag{302}$$

$$CCAOA\_P\_M(p,m) = max(0, CCAR\_P\_M(p,m) - IRCR\_P\_M(p,m)) \tag{303}$$

$$EAP\_P\_M(p,m) = \begin{cases} \dfrac{\sum_{a \in CCAR(p,m)} CCAQ\_A\_M(a) \times RCP\_F\_M(A2F(a),m)}{CCAR\_P\_M(p,m)} & \text{for } CCAR\_P\_M(p,m) \neq 0 \\ 0 & \text{for } CCAR\_P\_M(p,m) = 0 \end{cases} \tag{304}$$

$$CCAR\_P\_M(p,m) = \sum_{a \in CCAR(p,m)} CCAQ\_A\_M(a) \tag{305}$$

Variable	Units	SC	GR	Rule	Description	Ref
CCAOASA_P_D(p, d)	$	P	D	9.7.1A	Capacity Credit Allocation over-allocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in Trading Day d	(301)
CCAOASA_P_I(p, i)	$	P	I	9.7.1A	Capacity Credit Allocation over-allocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in Trading Interval i	(302)
CCAOA_P_M(p, m)	MW	P	M		Number of Capacity Credit Allocations received by Market Participant p in excess of its IRCR for Trading Month m	(303)
IRCR_P_M(p, m)	MW	P	M	4.28.7, 4.28.11A	Individual Reserve Capacity Requirement for Market Participant p for Trading Month m	(314)
CCAR_P_M(p, m)	MW	P	M		Number of Capacity Credits received by Market Participant p through Capacity Credit Allocations in Trading Month m	(305)

Variable	Units	SC	GR	Rule	Description	Ref
EAP_P_M(m)	$/MW	P	M	9.7.1A	Excess allocation price for Participant p in Trading Month m	(304)
RCP_F_M(f, m)	$/MW	F	M	11	Facility Monthly Reserve Capacity Price for Facility f in Trading Month m	(376)
CCAQ_A_M(a)	MW	A	M		Number of Capacity Credits associated with Capacity Credit Allocation a	I
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
CCAR(m)	{}	G	M		Set of Capacity Credit Allocations received (by Market Participant p from Facility f) in Trading Month m	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.3 Supplementary Capacity Payments

$$SUPCAPSA\_P\_D(p,d) = \sum_{i \in I(d)} SUPCAPSA\_P\_I(p,i) \tag{306}$$

$$SUPCAPSA\_P\_I(p,i) = \sum_{c \in SUP(p,i)} SUPCAPSA\_C\_I(c,i) \tag{307}$$

$$SUPCAPSA\_C\_I(c,i) = \frac{SUPCAPSA\_C\_M(c,i)}{TITM\_G\_M(i)} \tag{308}$$

Variable	Units	SC	GR	Rule	Description	Ref
SUPCAPSA_P_D(p, d)	$	P	D	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in Trading Day d	(306)
SUPCAPSA_P_I(p, i)	$	P	I	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in Trading Interval i	(307)
SUPCAPSA_C_M(c, m)	$	C	M	4.29.3(e)i	Payment to be made under Supplementary Capacity Contract c in Trading Month m	I
SUPCAPSA_C_I(c, i)	$	C	I		Payment to be made under Supplementary Capacity Contract c in Trading Interval i	(308)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
SUP(m)	{}	G	M		Set of Supplementary Capacity contracts in Trading Month m	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.4 TRCC Charges

$$TRCC\_P\_D(p,d) = \sum_{i \in I(d)} TRCC\_P\_I(p,i) \tag{309}$$

$$TRCC\_P\_I(p,i) = \begin{cases} SS\_P\_M(p,i) \times TRCC\_G\_I(i) & \text{for } TRCC\_G\_I(i) \neq 0 \\ 0 & \text{otherwise} \end{cases} \tag{310}$$

$$SS\_P\_M(p,m) = \frac{CCASF\_P\_M(p,m)}{CCASF\_G\_M(m)} \tag{311}$$

$$CCASF\_G\_M(m) = \sum_{p \in P\_M(m)} CCASF\_P\_M(p,m) \tag{312}$$

$$CCASF\_P\_M(p,m) = max(0, IRCR\_P\_M(p,m) - CCAR\_P\_M(p,m)) \tag{313}$$

$$IRCR\_P\_M(p,m) = \begin{cases} IRCR3\_P\_M(p,m) & \text{if } IRCR3NULLFlag\_G\_M(m) = 0 \\ IRCR2\_P\_M(p,m) & \text{if } IRCR2NULLFlag\_G\_M(m) = 0 \text{ and } IRCR3NULLFlag\_G\_M(m) = 1 \\ IRCR1\_P\_M(p,m) & \text{if } IRCR1NULLFlag\_G\_M(m) = 0 \text{ and } IRCR3NULLFlag\_G\_M(m) = 1 \\ & \text{and } IRCR2NULLFlag\_G\_M(m) = 1 \\ IRCR0\_P\_M(p,m) & \text{otherwise} \end{cases} \tag{314}$$

$$TRCC\_G\_I(i) = \frac{TRCC\_G\_M(i)}{TITM\_G\_M(i)} \tag{315}$$

Variable	Units	SC	GR	Rule	Description	Ref
TRCC_P_D(p, d)	$	P	D	9.7.1B	Charge to cover the Targeted Reserve Capacity Cost for Market Participant p in Trading Day d	(309)
TRCC_P_I(p, i)	$	P	I	9.7.1B	Charge to cover the Targeted Reserve Capacity Cost for Market Participant p in Trading Interval i	(310)
TRCC_G_I(i)	$	G	I	4.28.3	Targeted Reserve Capacity Cost in Trading Interval i	(315)
SS_P_M(p, m)		P	M	9.7.1B	Shortfall share for Market Participant p in Trading Month m	(311)
CCASF_G_M(m)	MW	G	M	9.7.1B	The sum of the amount IRCR exceeds Capacity Credit Allocations received by Market Participants in Trading Month m	(312)
CCASF_P_M(p, m)	MW	P	M	9.7.1B	The amount IRCR exceeds Capacity Credit Allocations received by Market Participant p in Trading Month m	(313)
IRCR_P_M(p, m)	MW	P	M	4.28.7, 4.28.11A	Latest published Individual Reserve Capacity Requirement for Market Participant p for Trading Month m	(314)
IRCR3_P_M(p, m)	MW	P	M	4.28.11A	Third adjustment of the Individual Reserve Capacity Requirement for Market Participant p for Trading Month m	I
IRCR2_P_M(p, m)	MW	P	M	4.28.11A	Second adjustment of the Individual Reserve Capacity Requirement for Market Participant p for Trading Month m	I
IRCR1_P_M(p, m)	MW	P	M	4.28.11A	First adjustment of the Individual Reserve Capacity Requirement for Market Participant p for Trading Month m	I

Variable	Units	SC	GR	Rule	Description	Ref
IRCR0_P_M(p, m)	MW	P	M	4.28.7	Individual Reserve Capacity Requirement (prior to any adjustments) for Market Participant p for Trading Month m	I
IRCR3NULLFlag_G_M(m)	MW	G	M		Flag that is 0 if the third adjustment of the Individual Reserve Capacity Requirements have been published for Trading Month m, and 0 otherwise	I
IRCR2NULLFlag_G_M(m)	MW	G	M		Flag that is 0 if the second adjustment of the Individual Reserve Capacity Requirements have been published for Trading Month m, and 0 otherwise	I
IRCR1NULLFlag_G_M(m)	MW	G	M		Flag that is 0 if the first adjustment of the Individual Reserve Capacity Requirements have been published for Trading Month m, and 0 otherwise	I
CCAR_P_M(p, m)	MW	P	M		Number of Capacity Credits received by Market Participant p through Capacity Credit Allocations in Trading Month m	(305)
TRCC_G_M(m)	$	G	M	4.28.3	Targeted Reserve Capacity Cost in Trading Interval i	(324)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.4.1 Targeted Reserve Capacity Cost

MR 4.28.1(a) outlines the Targeted Reserve Capacity Cost as the cost of Capacity Credits acquired by AEMO (not traded bilaterally through a Capacity Credit Allocation) to just meet the Reserve Capacity Requirement. To implement this the following steps are followed.

Step 1: Determine how many Capacity Credits need to be acquired by AEMO to just meet the Reserve Capacity Requirement

$$TRCCQ\_G\_M(m) = min(RCR\_G\_CY(m), CC\_G\_M(m)) - (CCAR\_G\_M(m) - CCAOA\_G\_M(m)) \tag{316}$$

$$CC\_G\_M(m) = \sum_{(p,f)\in CCPF\_M(m)} CC\_PF\_M(p, f, m) \tag{317}$$

$$CCAR\_G\_M(m) = \sum_{p\in P\_M(m)} CCAR\_P\_M(p, m) \tag{318}$$

$$CCAOA\_G\_M(m) = \sum_{p\in P\_M(m)} CCAOA\_P\_M(p, m) \tag{319}$$

Step 2: Identify the set of all Capacity Credits acquired by AEMO and order them by descending price.

$$CCTRCC\_G\_M(m) = \{t : T2P(t) \in P\_M(m) \text{ or } (T2P(t), T2F(t)) \in CCPF\_M(m)\}$$
ordered by descending $CCP\_T\_M(t, m)$ and then alphabetically, where $t \in CCTRCC\_G\_M(m)$ (320)

$$CCP\_T\_M(t,m) = \begin{cases} EAP\_P\_M(t,m) & \text{for } t \in P\_M(m) \\ RCP\_F\_M(T2F(t),m) & \text{for } t \in CCPF\_M(m) \end{cases} \tag{321}$$

$$CCQ\_T\_M(t,m) = \begin{cases} CCAOA\_P\_M(t,m) & \text{for } t \in P\_M(m) \\ NetCC\_PF\_M(t,m) & \text{for } t \in CCPF\_M(m) \end{cases} \tag{322}$$

$$TRCCrank\_T\_M(t,m) = \text{Position of price-quantity pair } t \text{ in } CCTRCC\_G\_M(m) \tag{323}$$

Step 3: Determine the cost of Capacity Credits acquired by AEMO to just meet the Reserve Capacity Target.

$$\begin{aligned} TRCC\_G\_M(m) = & \sum_{t \in CCTRCC\_G\_M} CCP\_T\_M(t,m) \\ & \times min\left(CCQ\_T\_M(t,m), max(0, TRCCQ\_G\_M(m) - CCCQ\_T\_M(t,m))\right) \end{aligned} \tag{324}$$

$$CCCQ\_T\_M(t,m) = \sum_{\substack{u \in CCTRCC\_G\_M(m) \\ TRCCrank\_T\_M(u,m) < TRCCrank\_T\_M(t,m)}} CCQ\_T\_M(u,m) \tag{325}$$

Variable	Units	SC	GR	Rule	Description	Ref
TRCCQ_G_M(m)	MW	G	M	4.28.1(a)	The number of Capacity Credits acquired by AEMO to meet the Reserve Capacity Requirement after allowing for Capacity Credits traded bilaterally for Trading Month m	(316)
RCR_G_CY(cy)	MW	G	CY	4.6.1	Reserve Capacity Requirement for Capacity Year cy	I
CC_G_M(m)	MW	G	M		Bilaterally tradeable Capacity Credits for Trading Month m	(317)
CC_PF_M(p, f, m)	MW	PF	M		Capacity Credits associated with Facility f and Market Participant p for Trading Month m	(101)
CCAR_G_M(m)	MW	G	M		Number of Capacity Credits received through Capacity Credit Allocations in Trading Month m	(318)
CCAR_P_M(p, m)	MW	P	M		Number of Capacity Credits received by Market Participant p through Capacity Credit Allocations in Trading Month m	(305)
CCAOA_G_M(m)	MW	G	M		Sum of Capacity Credit Allocations received in excess of a Market Participant's IRCR for Trading Month m	(319)
CCAOA_P_M(p, m)	MW	P	M		Number of Capacity Credit Allocations received by Market Participant p in excess of its IRCR for Trading Month m	(303)
CCTRCC_G_M(m)	{}	G	M		Ordered set of all price-quantity pairs associated with Capacity Credits used in the calculation of the Targeted Reserve Capacity Cost for Trading Month m (ordered by descending $TRCCrank\_T\_M(t,m)$)	(320)
CCP_T_M(t, m)	$/MW	T	M		Daily capacity price for tranche t in Trading Month m	(321)

Variable	Units	SC	GR	Rule	Description	Ref
CCQ_T_M(t, m)	MW	T	M		Capacity Credits associated with tranche t on Trading Month m	(322)
CCCQ_T_M(t, m)	MW	T	M		Sum of Capacity Credits with a lower $TRCCrank\_T\_M(t,m)$ than tranche t on Trading Month m	(325)
NetCC_PF_M(p, f, m)	MW	PF	M		Net Capacity Credits (net of any Capacity Credit Allocations) for Facility f and Market Participant p for Trading Month m	(299)
RCP_F_M(f, m)	$/MW	F	M	11	Facility Monthly Reserve Capacity Price for Facility f in Trading Month m	(376)
EAP_P_M(m)	$/MW	P	M	9.7.1A	Excess allocation price for Participant p in Trading Month m	(304)
TRCCrank_T_M(t, m)		T	M		The element number of price-quantity pair t in $CCTRCC\_G\_M(m)$ where 1 is the price-quantity pair with the highest price.	(323)
TRCC_G_M(m)	$	G	M	4.28.3	Targeted Reserve Capacity Cost in Trading Interval i	(324)
CCPF_M(m)	{}	G	M		Set of participant-facility combinations in Trading Month m	(52)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)

4.9.5 SRCC Charges

$$SRCC\_P\_D(p,d) = \sum_{i \in I(d)} SRCC\_P\_I(p,i) \tag{326}$$

$$SRCC\_P\_I(p,i) = IRCRS\_P\_M(p,i) \times SRCC\_G\_I(i) \tag{327}$$

$$SRCC\_G\_I(i) = ECCSA\_G\_I(i) + SUPCAPSA\_G\_I(i) - IMLR\_G\_I(i) - RCSD\_G\_I(i) - DSMRCSD\_G\_I(i) \tag{328}$$

$$ECCSA\_G\_I(i) = CCSA\_G\_I(i) + CCAOASA\_G\_I(i) - TRCC\_G\_I(i) \tag{329}$$

$$SUPCAPSA\_G\_I(i) = \sum_{p \in P\_M(i)} SUPCAPSA\_P\_I(p,i) \tag{330}$$

$$IMLR\_G\_I(i) = \sum_{p \in P\_M(i)} IMLR\_P\_I(p,i) \tag{331}$$

$$CCSA\_G\_I(i) = \sum_{p \in P\_M(i)} CCSA\_P\_I(p,i) \tag{332}$$

$$CCAOASA\_G\_I(i) = \sum_{p \in P\_M(i)} CCAOASA\_P\_I(p,i) \tag{333}$$

$$RCSD\_G\_I(i) = \frac{RCSD\_G\_M(i)}{TITM\_G\_M(i)} \tag{334}$$

$$DSMRCSD\_G\_I(i) = \frac{DSMRCSD\_G\_M(i)}{TITM\_G\_M(i)} \tag{335}$$

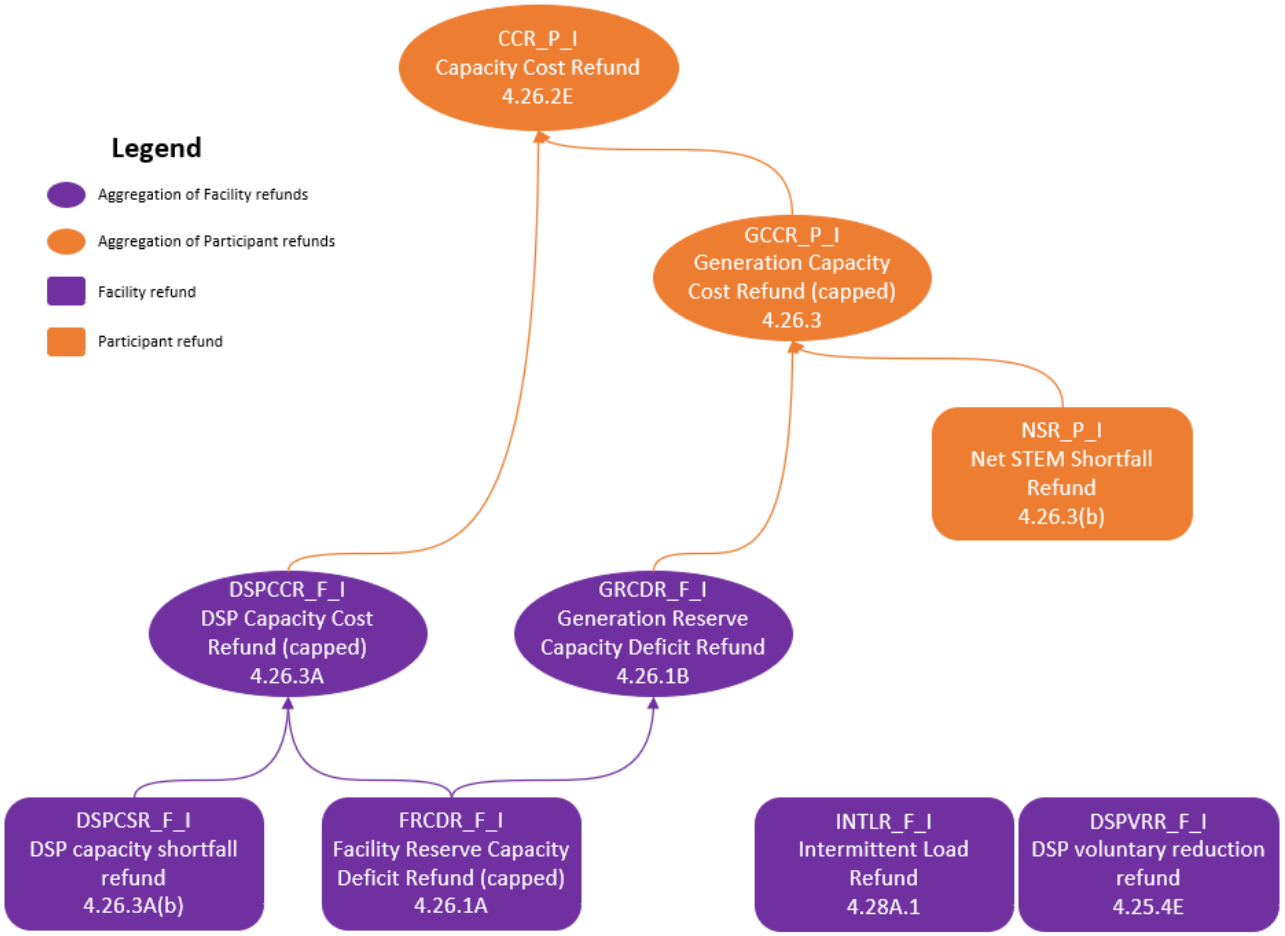
Variable	Units	SC	GR	Rule	Description	Ref
SRCC_P_D(p, d)	$	P	D	9.7.1B	Charge to cover the Shared Reserve Capacity Cost for Market Participant p in Trading Day d	(326)
SRCC_P_I(p, i)	$	P	I	9.7.1B	Charge to cover the Shared Reserve Capacity Cost for Market Participant p in Trading Interval i	(327)
SRCC_G_I(i)	$	G	I	4.28.4	Shared Reserve Capacity Cost for Trading Interval i	(328)
ECCSA_G_I(i)	$	G	I	4.28.4(a)	Payments made for Capacity Credits in excess of the Reserve Capacity Requirement for Trading Interval i	(329)
IRCRS_P_M(p, m)		P	M	9.7.1B	Capacity share for Market Participant p for Trading Month m	(399)
CCSA_P_I(p, i)	$	P	I	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in Trading Interval i	(297)
CCSA_G_I(i)	$	G	I		Payment for non-allocated Capacity Credits in Trading Interval i	(332)
TRCC_G_I(i)	$	G	I	4.28.3	Targeted Reserve Capacity Cost in Trading Interval i	(315)
SUPCAPSA_P_I(p, i)	$	P	I	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in Trading Interval i	(307)
SUPCAPSA_G_I(i)	$	G	I	4.28.4(b)	Payment to be made under Supplementary Capacity Contracts in Trading Interval i	(330)
IMLR_P_I(p, i)	$	P	I	4.28A.1	Intermittent Load Refunds for Market Participant p in Trading Interval i	(384)
IMLR_G_I(i)	$	G	I	4.28.4(c)	Intermittent Load Refunds for Trading Interval i	(331)
RCSD_G_I(i)	$	G	I	4.28.4(b), 4.28.4(d)	Total amount drawn under a Reserve Capacity Security by AEMO for Trading Interval i	(334)
RCSD_G_M(m)	$	G	M	4.28.4(b), 4.28.4(d)	Total amount drawn under a Reserve Capacity Security by AEMO for Trading Month m	I
DSMRCSD_G_I(i)	$	G	I	4.28.4(b), 4.28.4(d)	Total amount drawn under a DSM Reserve Capacity Security by AEMO for Trading Interval i	(335)
DSMRCSD_G_M(m)	$	G	M	4.28.4(b), 4.28.4(d)	Total amount drawn under a DSM Reserve Capacity Security by AEMO for Trading Month m	I
CCAOASA_P_I(p, i)	$	P	I	9.7.1A	Capacity Credit Allocation overallocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in Trading Interval i	(302)
CCAOASA_G_I(i)	$	G	I	9.7.1A	Capacity Credit Allocation overallocation Payment (when Capacity Credit Allocations exceed IRCR) in Trading Interval i	(333)

Variable	Units	SC	GR	Rule	Description	Ref
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.6 Capacity Cost Refunds

The rules have many defined terms relating to refunds. The drawing below outlines some of these terms/variables and how they relate to each other. The important points to note are:

- Whether the variable relates to the 'lowest-level' refund (shown as rectangles) or whether it is an aggregation of other lower-level refunds (shown as ellipses)
- Whether the variable is capped
- Whether the variable relates to a Facility (shown in purple) or Market Participant (shown in orange)



To assist in understanding this document has grouped most of the refund types into this section; however, the Intermittent Load Refunds and DSP voluntary reduction refunds are aggregated and handled in separate sections as they are returned to a different set of Market Participants than Capacity Cost Refunds.

4.9.6.1 Refund Aggregations

$$CCR\_P\_D(p,d) = \sum_{i \in I(d)} CCR\_P\_I(p,i) \tag{336}$$

$$CCR\_P\_I(p,i) = GCCR\_P\_I(p,i) + DSPCCR\_P\_I(p,i) \tag{337}$$

$$GCCR\_P\_I(p,i) = min(MAXPGR\_P\_CY(p,i) - CGCCR\_P\_I(p,i), GRCDR\_P\_I(p,i) + NSR\_P\_I(p,i)) \tag{338}$$

$$CGCCR\_P\_I(p,i) = CGCCRstart\_P\_D(p,d) + \sum_{j \in PITD(i)} GCCR\_P\_I(p,j) \tag{339}$$

$$GRCDR\_P\_I(p,i) = \sum_{f \in F(p,i) \cap \overline{DSP(i)}} GRCDR\_F\_I(f,i) \tag{340}$$

$$GRCDR\_F\_I(f,i) = \begin{cases} FRCDR\_F\_I(f,i) & \text{for } f \notin DSP(i) \\ 0 & \text{for } f \in DSP(i) \end{cases} \tag{341}$$

$$DSPCCR\_P\_I(p,i) = \sum_{f \in DSP(p,i)} DSPCCR\_F\_I(f,i) \tag{342}$$

$$DSPCCR\_F\_I(f,i) = \begin{cases} min(MAXFR\_F\_CY(f,i) - CDSPCCR\_F\_I(f,i), DSPCSR\_F\_I(f,i) + FRCDR\_F\_I(f,i)) & \text{for } f \in DSP(i) \\ 0 & \text{for } f \notin DSP(i) \end{cases} \tag{343}$$

$$CDSPCCR\_F\_I(f,i) = CDSPCCRstart\_F\_D(f,i) + \sum_{j \in PITD(i)} DSPCCR\_F\_I(f,j) \tag{344}$$

Variable	Units	SC	GR	Rule	Description	Ref
CCR_P_D(p, d)	$	P	D	4.26.2E	Capacity Cost Refund charged to Market Participant p in Trading Day d	(336)
CCR_P_I(p, i)	$	P	I	4.26.2E	Capacity Cost Refund charged to Market Participant p in Trading Interval i	(337)
GCCR_P_I(p, i)	$	P	I	4.26.3	Generation Capacity Cost Refund for Market Participant p in Trading Interval i	(338)
DSPCCR_P_I(p, i)	$	P	I	4.26.2F(b)	Sum of DSP Capacity Cost Refunds for Market Participant p in Trading Interval i	(342)
DSPCCR_F_I(f, i)	$	F	I	4.26.3A	DSP Capacity Cost Refund for Facility f in Trading Interval i	(343)
CDSPCCR_F_I(f, i)	$	F	I	4.26.3A	Sum of DSP Capacity Cost Refund for Facility f in Trading Intervals in the same Capacity Year as, but prior to, Trading Interval i	(344)
CDSPCCRstart_F_D(f, d)	$	F	D	4.26.3A	Sum of DSP Capacity Cost Refund for Facility f in the same Capacity Year as, but prior to, Trading Day d	I
CGCCR_P_I(p, i)	$	P	I	4.26.3	Sum of Generation Capacity Cost Refund for Market Participant p in Trading Intervals in the same Capacity Year as, but prior to, Trading Day d	(339)

Variable	Units	SC	GR	Rule	Description	Ref
CGCCRstart_P_D(p, d)	$	P	D	4.26.3	Sum of Generation Capacity Cost Refund for Market Participant p in the same Capacity Year as, but prior to, Trading Day d	I
MAXPGR_P_CY(p, cy)	$	P	CY	11	Maximum Participant Generation Refund for Market Participant p in Capacity Year cy	(90)
GRCDR_P_I(p, i)	$	P	I	4.26.1B	Generation Reserve Capacity Deficit Refund for Market Participant p in Trading Interval i	(340)
GRCDR_F_I(f, i)	$	F	I		Generation Reserve Capacity Deficit Refund contribution by Facility f in Trading Interval i	(341)
FRCDR_F_I(f, i)	$	F	I	4.26.1A	Facility Reserve Capacity Deficit Refund for Facility f in Trading Interval i	(364)
DSPCSR_F_I(f, i)	$	F	I	4.26.3A(b)	DSP capacity shortfall refund for Facility f in Trading Interval i	(362)
NSR_P_I(p, i)	$	P	I	4.26.3(b)	Net STEM Refund for Market Participant p in Trading Interval i	(345)
MAXFR_F_CY(f, cy)	$	F	CY	11	Maximum Facility Refund for Facility f in Capacity Year cy	(92)
F(d)	{}	G	D		Set of Registered Facilities, unregistered generation systems and unregistered interruptible loads in Trading Day d	(30)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
PITD(i)	{}	G	I		Set of Trading Intervals in the same Trading Day as, but prior to, Trading Interval i	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.6.2 Net STEM Refund

$$NSR\_P\_I(p,i) = TIRRW\_P\_I(p,i) \times NSSF\_P\_I(p,i) \tag{345}$$

In the WEM Rules $NSSF\_P\_I(p,i)$ is expressed as shown in (346) and (347).

$$NSSF\_P\_I(p,i) = max(RCDF\_P\_I(p,i), RCOQ\_P\_I(p,i) - A\_P\_I(p,i)) - RCDF\_P\_I(p,i) \tag{346}$$

$$A\_P\_I(p,i) = min(RCOQ\_P\_I(p,i), CAPA\_P\_I(p,i)) \tag{347}$$

Because $RCDF\_P\_I(p,i)$ is non-negative, (346) and (347) are equivalent to (348), which makes it simpler to understand what the shortfall represents conceptually. The Net STEM Shortfall is the difference between a Market Participant's obligation ($RCOQ\_P\_I$) and the capacity it makes available ($CAPA\_P\_I$), net of any deficits it will pay refunds for by another mechanism ($RCDF\_P\_I$).

$$NSSF\_P\_I(p,i) = max(0, RCOQ\_P\_I(p,i) - CAPA\_P\_I(p,i) - RCDF\_P\_I(p,i)) \tag{348}$$

$$CAPA\_P\_I(p,i) = \begin{cases} RCOQ\_P\_I(p,i) & \text{if } SSF\_G\_D(i) = 0 \\ RCOQIL\_P\_I(p,i) + \dfrac{NCP\_P\_I(p,i)}{0.5h \times LF\_P\_D(p,i)} + \dfrac{STEMNSOQ\_P\_I(p,i) + STEMDQ\_P\_I(p,i)}{0.5h \times LF\_P\_D(p,i)} & \text{if } SSF\_G\_D(i) = 1 \\ + \dfrac{BSASQ\_P\_I(p,i)}{0.5h \times LF\_P\_D(p,i)} + max(0, BSFO\_P\_I(p,i) - RTFO\_P\_I(p,i)) \end{cases} \tag{349}$$

$$RCOQIL\_P\_I(p,i) = \sum_{f \in IRL(p,i)} RCOQ\_F\_I(f,i) \tag{350}$$

$$LF\_P\_D(p,d) = 1 \tag{351}$$

$$LFCAPPED\_F\_D(f,d) = min(1, TLF\_F\_D(f,d) \times DLF\_F\_D(f,d)) \tag{352}$$

$$BSFO\_P\_I(p,i) = \sum_{f \in REG\_F(p,i)} min(RCOQ\_F\_I(f,i), BSFO\_F\_I(f,i)) \tag{353}$$

$$RCOQ\_P\_I(p,i) = RCOQU\_P\_I(p,i) + \sum_{f \in REG\_F(p,i) \cap \overline{DSP(i)}} LFCAPPED\_F\_D(f,i) \times RCOQ\_F\_I(f,i) \tag{354}$$

$$RCOQU\_P\_I(p,i) = \sum_{f \in CCF(p,i) \cap \overline{REG\_F(i)} \cap \overline{IRL\_UREG(i)}} RCOQ\_F\_I(f,i) \tag{355}$$

$$RCDF\_P\_I(p,i) = RTFO\_P\_I(p,i) + RTRPPO\_P\_I(p,i) \tag{356}$$

$$RTFO\_P\_I(p,i) = \sum_{f \in REG\_F(p,i)} RTFO\_F\_I(f,i) \tag{357}$$

$$RTRPPO\_P\_I(p,i) = \sum_{f \in SG(p,i)} RTRPPO\_F\_I(f,i) \tag{358}$$

$$RTFO\_F\_I(f,i) = min(RCOQ\_F\_I(f,i), EXPFO\_F\_I(f,i)) \tag{359}$$

$$RTRPPO\_F\_I(f,i) = max(0, RPPO\_F\_I(f,i) - BSPO\_F\_I(f,i)) \tag{360}$$

$$STEMNSOQ\_P\_I(p,i) = STEMOQ\_P\_I(p,i) - STEMSQ\_P\_I(p,i) \tag{361}$$

Variable	Units	SC	GR	Rule	Description	Ref
NSR_P_I(p, i)	$	P	I	4.26.3(b)	Net STEM Refund for Market Participant p in Trading Interval i	(345)
TIRRW_P_I(p, i)	$/MW	P	I	4.26.3(b)ii	Weighted average Trading Interval refund rate for Market Participant p in Trading Interval i	(372)
NSSF_P_I(p, i)	MW	P	I	4.26.2	Net STEM Shortfall for Market Participant p in Trading Interval i	(346) & (348)

Variable	Units	SC	GR	Rule	Description	Ref
RCDF_P_I(p, i)	MW	P	I	4.26.2	Reserve capacity deficit caused by Forced Outages and Refund Payable Planned Outages for Market Participant p in Trading Interval i	(356)
RCOQ_P_I(p, i)	MW	P	I	4.26.2	Reserve Capacity Obligation Quantity for Market Participant p in Trading Interval i	(354)
RCOQ_F_I(f, i)	MW	F	I	11	Reserve Capacity Obligation Quantity of Facility f in Trading Interval i	I
RCOQU_P_I(p, i)	MW	P	I	4.26.2(a)	Reserve Capacity Obligation Quantity associated with unregistered Facilities (excluding interruptible loads) for Market Participant p in Trading Interval i	(355)
RCOQIL_P_I(p, i)	MW	P	I	4.26.2(d)i	Sum of Interruptible Load Reserve Capacity Obligation Quantities for Market Participant p in Trading Interval i	(350)
CAPA_P_I(p, i)	MW	P	I	4.26.2	Capacity made available by Market Participant p in Trading Interval i	(349)
NCP_P_I(p, i)	MWh	P	I	6.9.13	Net Contract Position for Market Participant p in Trading Interval i	(123)
LF_P_D(p, d)		P	D	4.26.2A	Loss Factor for Market Participant p for Trading Day d	(351)
LFCAPPED_F_D(f, d)		F	D	4.26.2B	Loss Factor (capped at 1) for Facility f for Trading Day d	(352)
TLF_F_D(f, d)		F	D		Transmission Loss Factor for Facility f for Trading Day d	I
DLF_F_D(f, d)		F	D		Distribution Loss Factor for Facility f for Trading Day d	I
RTFO_P_I(p, i)	MW	P	I	4.26.2	Real time Forced Outages for Market Participant p in Trading Interval i	(357)
RTFO_F_I(f, i)	MW	F	I	4.26.2	Real time Forced Outage for Facility f in Trading Interval i	(359)
RTRPPO_P_I(p, i)	MW	P	I	4.26.2	Real time Refund Payable Planned Outages for Market Participant p in Trading Interval i	(358)
RTRPPO_F_I(f, i)	MW	F	I	4.26.2	Real time Refund Payable Planned Outage for Facility f in Trading Interval i	(360)
RPPO_F_I(f, i)	MW	F	I	4.26.1C(b)	Refund Payable Planned Outage for Facility f in Trading Interval i	(367)
BSFO_P_I(p, i)	MW	P	I	4.26.2	Before STEM Forced Outage for Market Participant p in Trading Interval i	(353)
BSFO_F_I(f, i)	MW	F	I	7.3.4	Before STEM Forced Outage for Facility f in Trading Interval i	I
BSPO_F_I(f, i)	MW	F	I	7.3.4	Before STEM Planned Outage for Facility f in Trading Interval i	I
BSASQ_P_I(p, i)	MWh	P	I	6.3A.2(e)(i)	Before STEM Ancillary Services quantity for Market Participant p in Trading Interval i	I

Variable	Units	SC	GR	Rule	Description	Ref
STEMSQ_P_I(p, i)	MWh	P	I		Energy sold in STEM by Market Participant p in Trading Interval i	(112)
STEMDQ_P_I(p, i)	MWh	P	I		Energy bought in STEM by Market Participant p in Trading Interval i	(113)
STEMNSOQ_P_I(p, i)	MWh	P	I		Energy offered (but not scheduled) in STEM by Market Participant p in Trading Interval i	(361)
STEMOQ_P_I(p, i)	MWh	P	I	Appendix 6 (e)	Energy offered in STEM by Market Participant p in Trading Interval i	I
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
SSF_G_D(d)	Flag	G	D		0 if STEM was suspended in Trading Day d, and 1 otherwise	I
A_P_I(p, i)	MW	P	I	4.26.2	Capped capacity made available by Market Participant p in Trading Interval i	(347)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
REG_F(d)	{}	G	D	11	Set of Registered Facilities in Trading Day d	(31)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
IRL_UREG(d)	{}	G	D		Set of unregistered Loads that can be interrupted upon request in Trading Day d	(26)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)

4.9.6.3 DSP Capacity Shortfall Refund

$$DSPCSR\_F\_I(f,i) = \begin{cases} TIRR\_F\_I(f,i) \times DSPSF\_F\_I(f,i) & \text{for } f \in DSP(i) \\ 0 & \text{for } f \notin DSP(i) \end{cases} \tag{362}$$

$$DSPSF\_F\_I(f,i) = max\left(0, min\left(RCOQ\_F\_I(f,i), \frac{DI\_F\_I(f,i)}{0.5h}\right) - max\left(0, RD\_F\_D(f,i) - \frac{DSPL\_F\_I(f,i)}{0.5h}\right)\right) \tag{363}$$

Variable	Units	SC	GR	Rule	Description	Ref
DSPCSR_F_I(f, i)	$	F	I	4.26.3A(b)	DSP capacity shortfall refund for Facility f in Trading Interval i	(362)
TIRR_F_I(f, i)	$/MW	F	I	4.26.1(a)	Trading Interval Refund Rate for Facility f in Trading Interval i	(373)
DSPSF_F_I(f, i)	MW	F	I	4.26.2D	DSP Capacity Shortfall for Facility f for Trading Interval i	(363)
RCOQ_F_I(f, i)	MW	F	I	11	Reserve Capacity Obligation Quantity of Facility f in Trading Interval i	I
RD_F_D(f, d)	MW	F	D	4.26.2CA	Relevant Demand of Facility f in Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
DSPL_F_I(f, i)	MWh	F	I	6.16.2	Demand Side Programme Load for Facility f in Trading Interval i	(84)
DI_F_I(f, i)	MWh	F	I	7.13.1(eG)	Dispatch Instruction for Facility f in Trading Interval i	I
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)

4.9.6.4 Facility Reserve Capacity Deficit Refund

$$FRCDR\_F\_I(f,i) = \begin{cases} 0 & \text{for } f \in IML(i) \\ min(RCD\_F\_I(f,i) \times TIRR\_F\_I(f,i), MAXFR\_F\_CY(f,i) - CFRCDR\_F\_I(f,i)) & \text{for } f \notin IML(i) \end{cases} \quad (364)$$

$$CFRCDR\_F\_I(f,i) = CFRCDRstart\_F\_D(f,i) + \sum_{j \in PITD(i)} FRCDR\_F\_I(f,j) \quad (365)$$

$$RCD\_F\_I(f,i) \quad (366)$$
$$= \begin{cases} EXPFO\_F\_I(f,i) + RPPO\_F\_I(f,i) & \text{for } f \in SG(i) \cup IRL(i) \cup \left(NSG(i) \cap \overline{IG(i)}\right) \text{ and } COP\_F\_D(f,i) = 1 \\ CC\_F\_D(f,i) & \text{for } f \in IG(i) \text{ and } COP\_F\_D(f,i) = 0 \\ REQLA\_F\_D(f,i) - max\left(\frac{MAX2\_F\_M(f,i)}{0.5h}, EST SOC\_F\_D(f,i)\right) & \text{for } f \in IG(i) \text{ and } COP\_F\_D(f,i) = 1 \text{ and } Y\_F\_I(f,i) \neq 0 \\ CC\_F\_D(f,i) & \text{for } f \in F(i) \cap \overline{REG\_F(i)} \text{ or } \left(f \in \overline{DSP(i) \cup IG(i)} \text{ and } COP\_F\_D(f,i) = 0\right) \\ max(0, RCOQ\_F\_I(f,i) - max(0, RD\_F\_D(f,i) - MINL\_F\_D(f,i))) & \text{for } f \in DSP(i) \\ 0 & \text{otherwise} \end{cases}$$

$$RPPO\_F\_I(f,i) = \begin{cases} 0 & \text{for } f \in SG(i) \text{ and } REPOC1000\_F\_D(f,i) < 8400 \\ EXPPO\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (367)$$

$$MINL\_F\_D(f,d) = \sum_{n \in DSPNMI(f,d)} MINL\_N\_D(n,d) \quad (368)$$

Variable	Units	SC	GR	Rule	Description	Ref
FRCDR_F_I(f, i)	$	F	I	4.26.1A	Facility Reserve Capacity Deficit Refund for Facility f in Trading Interval i	(364)
CFRCDR_F_I(f, i)	$	F	I	4.26.1A(b)	Sum of Facility Reserve Capacity Deficit Refunds for Facility f in Trading Intervals in the same Capacity Year as, but prior to, Trading Interval i	(365)
CFRCDRstart_F_D(f, d)	$	F	D	4.26.1A(b)	Sum of Facility Reserve Capacity Deficit Refunds for Facility f in the same Capacity Year as, but prior to, Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
MAXFR_F_CY(f, cy)	$	F	CY	11	Maximum Facility Refund for Facility f in Capacity Year cy	(92)
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
RCD_F_I(f, i)	MW	F	I	4.26.1A	Reserve Capacity Deficit for Facility f for Trading Interval i	(366)
COP_F_D(f, d)	Flag	F	D	4.13.10B	Flag that is 1 if Facility f is in Commercial Operations in Trading Day d, and 0 otherwise	I
MAX2_F_M(f, m)	MWh	F	M	4.26.1A (a)(ii).3	2nd highest Sent Out Metered Schedule of Facility f up to and including Trading Month m	(87)
ESTSOC_F_D(f, d)	MW	F	D	4.13.10C	Independent expert's estimate of the sent out capacity of Facility f applicable for Trading Day d	I
REQLA_F_D(f, d)	MW	F	D		Required Level adjusted to current level of Capacity Credits for Facility f for Trading Day d	I
EXPPO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Planned Outage for Facility f in Trading Interval i	I
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
RPPO_F_I(f, i)	MW	F	I	4.26.1C(b)	Refund Payable Planned Outage for Facility f in Trading Interval i	(367)
REPOC1000_F_D(f, d)		F	D	11	Refund Exempt Planned Outage Count for Facility f over the preceding 1000 Trading Days prior to (and excluding) Trading Day d	(97)
RCOQ_F_I(f, i)	MW	F	I	11	Reserve Capacity Obligation Quantity of Facility f in Trading Interval i	I
RD_F_D(f, d)	MW	F	D	4.26.2CA	Relevant Demand of Facility f in Trading Day d	I
MINL_F_D(f, d)	MW	F	D	4.26.1(e)iii.4	Minimum load of Facility f for Trading Day d	(368)
MINL_N_D(n, d)	MW	N	D	2.29.5B(c)	Minimum load of NMI n for Trading Day d	I
TIRR_F_I(f, i)	$/MW	F	I	4.26.1(a)	Trading Interval Refund Rate for Facility f in Trading Interval i	(373)
Y_F_I(f, i)	$/MW	F	I	4.26.1(b)	Per Interval Reserve Capacity Price for Facility f in Trading Interval i	(374)
DSPNMI(d)	{}	G	D		Set of connection points which comprise a Demand Side Programme on Trading Day d	(45)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
IG(d)	{}	G	D	11	Set of Intermittent Generators in Trading Day d	(34)

Variable	Units	SC	GR	Rule	Description	Ref
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
F(d)	{}	G	D		Set of Registered Facilities, unregistered generation systems and unregistered interruptible loads in Trading Day d	(30)
REG_F(d)	{}	G	D	11	Set of Registered Facilities in Trading Day d	(31)
PD1000(d)	{}	G	D		Set of 1000 Trading Days preceding (and excluding) Trading Day d	I
PITD(i)	{}	G	I		Set of Trading Intervals in the same Trading Day as, but prior to, Trading Interval i	I

4.9.6.5 Intermittent Load Refunds

$$IMLR\_F\_I(f,i) = \begin{cases} IMLSF\_F\_I(f,i) \times Y\_F\_I(f,i) & \text{for } f \in IML(i) \\ 0 & \text{otherwise} \end{cases} \tag{369}$$

$$IMLSF\_F\_I(f,i) = \begin{cases} max\left(0, \frac{-SOMSIL\_F\_I(f,i)}{0.5h} - 1.03 \times NC\_F\_D(f,i)\right) & \text{for } IMLPOFlag\_F\_I(f,i) \\ & +IMLCOFlag\_F\_I(f,i) > 0 \\ max\left(0, \frac{-SOMSIL\_F\_I(f,i)}{0.5h} - 0.03 \times NC\_F\_D(f,i) - ACR\_F\_D(f,i)\right) & \text{for } IMLPOFlag\_F\_I(f,i) \\ & +IMLCOFlag\_F\_I(f,i) \\ & +IMLFOFlag\_F\_I(f,i) = 0 \\ & \text{and } MAXTEMP\_F\_D(f,i) > 41°C \\ max\left(0, \frac{-SOMSIL\_F\_I(f,i)}{0.5h} - 0.03 \times NC\_F\_D(f,i)\right) & \text{otherwise} \end{cases} \tag{370}$$

Variable	Units	SC	GR	Rule	Description	Ref
IMLR_F_I(f, i)	$	F	I	4.28A.1	Intermittent Load Refunds for Facility f in Trading Interval i	(369)
IMLSF_F_I(f, i)	MW	F	I	4.28A.1(c)	Intermittent Load Capacity Shortfall for Facility f for Trading Interval i	(370)
Y_F_I(f, i)	$/MW	F	I	4.26.1(b)	Per Interval Reserve Capacity Price for Facility f in Trading Interval i	(374)
SOMSIL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the intermittent load associated with Facility f in Trading Interval i	(75)
IMLPOFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Planned Outage in Trading Interval i	I
IMLFOFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Forced Outage in Trading Interval i	I

Variable	Units	SC	GR	Rule	Description	Ref
IMLCOFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Consequential Outage in Trading Interval i	I
MAXTEMP_F_D(f, d)	°C	F	D	2.30B.3(b)ii	Daily maximum temperature associated with Facility f for Trading Day d	I
NC_F_D(f, d)	MW	F	D	4.28.8(c)	Nominated capacity for Facility f for Trading Day d	I
ACR_F_D(f, d)	MW	F	D	2.30B.3(b)i	Anticipated capacity reduction at 45°C associated with Facility f for Trading Day d	I
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)

4.9.6.6 DSP Voluntary Reduction Refunds

$$DSPVRR\_F\_I(f,i) = \begin{cases} (VRCC\_F\_D(f,i)) \times RCP\_F\_I(f,i) - \frac{VRCC\_F\_D(f,i)}{CC\_F\_D(f,i)} \times DSPCCR\_F\_I(f,i) & \text{for } CC\_F\_D(f,i) \neq 0 \\ 0 & \text{otherwise} \end{cases} \quad (371)$$

Variable	Units	SC	GR	Rule	Description	Ref
DSPVRR_F_I(f, i)	$	F	I	4.25.4E	Refund payable related to the voluntary reduction of Capacity Credits for Facility f in Trading Interval i	(371)
VRCC_F_D(f, d)	MW	F	D	4.25.4E	The amount of Capacity Credits voluntarily reduced for Facility f in the Capacity Year in which Trading Day d falls, but prior to the application being approved	I
DSPCCR_F_I(f, i)	$	F	I	4.26.3A	DSP Capacity Cost Refund for Facility f in Trading Interval i	(343)
RCP_F_I(f, i)	$/MW	F	I		Interval Reserve Capacity Price for Facility f in Trading Interval i	(375)
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I

4.9.6.7 Refund Rates

$$TIRRW\_P\_I(p,i) = \begin{cases} 0 & \text{for } \sum_{f \in SG(p,i)} CC\_F\_D(f,i) = 0 \\ \dfrac{\sum_{f \in SG(p,i)} TIRR\_F\_I(f,i) \times CC\_F\_D(f,i)}{\sum_{f \in SG(p,i)} CC\_F\_D(f,i)} & \text{otherwise} \end{cases} \quad (372)$$

$$TIRR\_F\_I(f,i) = RF\_F\_I(f,i) \times Y\_F\_I(f,i) \quad (373)$$

$$Y\_F\_I(f,i) = \begin{cases} \dfrac{RCP\_F\_M(f,i) \times 12}{400} & \text{for } f \in DSP(i) \\ 0 & \text{for } f \in NSG(i) \text{ and } REQLAFlag\_F\_I(f,i) = 1 \\ RCP\_G\_I(i) & f \in IML(i) \\ RCP\_F\_I(f,i) & \text{otherwise} \end{cases} \tag{374}$$

$$RCP\_F\_I(f,i) = \frac{RCP\_F\_M(f,m)}{TITM\_G\_M(i)} \tag{375}$$

$$RCP\_F\_M(f,m) = \frac{RCP\_F\_CY(f,m)}{12} \tag{376}$$

$$REQLAFlag\_F\_I(f,i) = \begin{cases} 1 & \text{for } COP\_F\_D(f,i) = 1 \text{ and } max\left(\dfrac{MAX2\_F\_M(f,i)}{0.5h}, ESTSOC\_F\_D(f,i)\right) \geq REQLA\_F\_D(f,i) \\ 0 & \text{otherwise} \end{cases} \tag{377}$$

$$RF\_F\_I(f,i) = min(6, max(RFdyn\_G\_I(i), RFfloor\_F\_I(f,i))) \tag{378}$$

$$RFdyn\_G\_I(i) = 11.75 - \frac{5.75}{750MW} \times SPARE\_G\_I(i) \tag{379}$$

$$SPARE\_G\_I(i) = \sum_{f \in CCF(i)} SPARE\_F\_I(f,i) \tag{380}$$

$$SPARE\_F\_I(f,i) \tag{381}$$
$$= \begin{cases} max\left(0, CC\_F\_D(f,i) - EXPPO\_F\_I(f,i) - EXPFO\_F\_I(f,i) - EXPCO\_F\_I(f,i) - \dfrac{SOMS\_F\_I(f,i)}{0.5h}\right) & \text{for } f \in SG(i) \\ max\left(0, min\left(RCOQ\_F\_I(f,i), \dfrac{DSPL\_F\_I(f,i)}{0.5h} - MINL\_F\_D(f,i)\right)\right) & \text{for } f \in DSP(i) \\ 0 & \text{otherwise} \end{cases}$$

$$RFfloor\_F\_I(f,i) = \begin{cases} 1 & \text{for } f \in DSP(i) \\ 1 & \text{for } f \in F(i) \cap \overline{REG\_F(i)} \text{ or } \left(f \in \overline{DSP(i) \cup IG(i)} \text{ and } COP\_F\_D(f,i) = 0\right) \\ 1 & \text{for } f \in IG(i) \text{ and } (COP\_F\_D(f,i) = 0 \text{ or } Y\_F\_I(f,i) \neq 0)) \\ 1 - 0.75 \times DISP\_F\_I(f,i) & \text{otherwise} \end{cases} \tag{382}$$

Variable	Units	SC	GR	Rule	Description	Ref
TIRRW_P_I(p, i)	$/MW	P	I	4.26.3(b)ii	Weighted average Trading Interval refund rate for Market Participant p in Trading Interval i	(372)
TIRR_F_I(f, i)	$/MW	F	I	4.26.1(a)	Trading Interval Refund Rate for Facility f in Trading Interval i	(373)
Y_F_I(f, i)	$/MW	F	I	4.26.1(b)	Per Interval Reserve Capacity Price for Facility f in Trading Interval i	(374)
REQLAFlag_F_I(f, i)	Flag	F	I	4.26.1(b)i	Flag that is 1 if Facility f has met its Required Level as at Trading Interval i and 0 otherwise	(377)
RCP_G_I(i)	$/MW	G	I		Interval Reserve Capacity Price for Trading Interval i	(253)

Variable	Units	SC	GR	Rule	Description	Ref
RCP_F_I(f, i)	$/MW	F	I		Interval Reserve Capacity Price for Facility f in Trading Interval i	(375)
RCP_F_M(f, m)	$/MW	F	M	11	Facility Monthly Reserve Capacity Price for Facility f in Trading Month m	(376)
RCP_F_CY(f, cy)	$/MW	F	CY	11	Annual Reserve Capacity Price for Facility f in Capacity Year cy	I
COP_F_D(f, d)	Flag	F	D	4.13.10B	Flag that is 1 if Facility f is in Commercial Operations in Trading Day d, and 0 otherwise	I
MAX2_F_M(f, m)	MWh	F	M	4.26.1A (a)(ii).3	2nd highest Sent Out Metered Schedule of Facility f up to and including Trading Month m	(87)
ESTSOC_F_D(f, d)	MW	F	D	4.13.10C	Independent expert's estimate of the sent out capacity of Facility f applicable for Trading Day d	I
REQLA_F_D(f, d)	MW	F	D		Required Level adjusted to current level of Capacity Credits for Facility f for Trading Day d	I
RF_F_I(f, i)		F	I	4.26.1(c), 4.28A.1(a)	Refund factor for Facility f in Trading Interval i	(378)
RFdyn_G_I(i)		G	I	4.26.1(d)	Dynamic refund factor for in Trading Interval i	(379)
RFfloor_F_I(f, i)		F	I	4.26.1(f), 4.26.1(g)	Minimum refund factor for Facility f in Trading Interval i	(382)
SPARE_G_I(i)	MW	G	I	4.26.1(d)	Available capacity (related to Capacity Credits) which is not dispatched in Trading Interval i	(380)
SPARE_F_I(f, i)	MW	F	I	4.26.1(e)	Available capacity (related to Capacity Credits) which is not dispatched for Facility f in Trading Interval i	(381)
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
EXPPO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Planned Outage for Facility f in Trading Interval i	I
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
EXPCO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Consequential Outage for Facility f in Trading Interval i	I
RCOQ_F_I(f, i)	MW	F	I	11	Reserve Capacity Obligation Quantity of Facility f in Trading Interval i	I
DSPL_F_I(f, i)	MWh	F	I	6.16.2	Demand Side Programme Load for Facility f in Trading Interval i	(84)
MINL_F_D(f, d)	MW	F	D	4.26.1(e)iii.4	Minimum load of Facility f for Trading Day d	(368)

Variable	Units	SC	GR	Rule	Description	Ref
DISP_F_I(f, i)		F	I	4.26.1(f)i	Portion of capacity which is not subject to a Forced Outage for Facility f over the previous 4320 Trading Intervals up to and including Trading Interval i	(98)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
IG(d)	{}	G	D	11	Set of Intermittent Generators in Trading Day d	(34)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I

4.9.7 Intermittent Load Refunds

$$IMLR\_P\_D(p,d) = \sum_{i \in I(d)} IMLR\_P\_I(p,i) \tag{383}$$

$$IMLR\_P\_I(p,i) = \sum_{f \in IML(p,i)} IMLR\_F\_I(f,i) \tag{384}$$

Variable	Units	SC	GR	Rule	Description	Ref
IMLR_P_D(p, d)	$	P	D	4.28A.1	Intermittent Load Refunds for Market Participant p in Trading Day d	(383)
IMLR_P_I(p, i)	$	P	I	4.28A.1	Intermittent Load Refunds for Market Participant p in Trading Interval i	(384)
IMLR_F_I(f, i)	$	F	I	4.28A.1	Intermittent Load Refunds for Facility f in Trading Interval i	(369)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.8 Capacity Rebate

$$CAPREBSA\_P\_D(p,d) = \sum_{i \in I(d)} CAPREBSA\_P\_I(p,i) \tag{385}$$

$$CAPREBSA\_P\_I(p,i) = \sum_{f \in SG(p,i) \cup DSP(p,i)} CAPREBSA\_F\_I(f,i) \tag{386}$$

$$CAPREBSA\_F\_I(f,i) = CAPREBS\_F\_I(f,i) \times CCR\_G\_I(i) \tag{387}$$

$$CAPREBS\_F\_I(f,i) = \frac{CAPREBCQ\_F\_I(f,i)}{CAPREBCQ\_G\_I(i)} \tag{388}$$

$$CAPREBCQ\_F\_I(f,i) = CCNSO\_F\_I(f,i) \times E\_F\_I(f,i) \tag{389}$$

$$CAPREBCQ\_G\_I(i) = \sum_{f \in SG(i) \cup DSP(i)} CAPREBCQ\_F\_I(f,i) \tag{390}$$

$$CCR\_G\_I(i) = \sum_{p \in P\_M(i)} CCR\_P\_I(p,i) \tag{391}$$

$$E\_F\_I(f,i) = \begin{cases} 1 & f \in SG(i) \text{ and } DISP1440Flag\_F\_I(f,i) = 1 \text{ and } MAXREFFlag\_F\_I(f,i) = 0 \\ & \text{and } MAXREFFlag\_P\_I(p,i) = 0 \\ 1 & f \in DSP(i) \text{ and } DISP1440Flag\_F\_I(f,i) = 1 \text{ and } RCOQ\_F\_I(f,i) \neq 0 \\ & \text{and } MAXREFFlag\_F\_I(f,i) = 0 \\ 0 & \text{otherwise} \end{cases} \tag{392}$$

$$MAXREFFlag\_F\_I(f,i) = \begin{cases} 1 & f \in DSP(i) \text{ and } CDSPCCR\_F\_I(f,i) + DSPCCR\_F\_I(f,i) = MAXFR\_F\_CY(f,i) \\ 1 & f \notin DSP(i) \text{ and } CFRCDR\_F\_I(f,i) + FRCDR\_F\_I(f,i) = MAXFR\_F\_CY(f,i) \\ 0 & \text{otherwise} \end{cases} \tag{393}$$

$$MAXREFFlag\_P\_I(p,i) = \begin{cases} 1 & \text{for } CGRCDR\_P\_I(p,i) + GRCDR\_P\_I(p,i) = MAXPGR\_P\_CY(p,i) \\ 0 & \text{otherwise} \end{cases} \tag{394}$$

$$CGRCDR\_P\_I(p,i) = CGRCDRstart\_P\_D(p,i) + \sum_{j \in PITD(i)} GRCDR\_P\_I(p,j) \tag{395}$$

$$CCNSO\_F\_I(f,i) = \begin{cases} min\left(RCOQ\_F\_I(f,i), \dfrac{DSPL\_F\_I(f,i)}{0.5h} - MINL\_F\_D(f,i)\right) & \text{for } f \in DSP(i) \\ CC\_F\_D(f,i) - (EXPPO\_F\_I(f,i) + EXPFO\_F\_I(f,i) + EXPCO\_F\_I(f,i)) & \text{for } f \in SG(i) \\ 0 & \text{otherwise} \end{cases} \tag{396}$$

Variable	Units	SC	GR	Rule	Description	Ref
CAPREBSA_P_D(p, d)	$	P	D	4.26.4	Participant Capacity Rebate (whereby Capacity Cost Refunds are redistributed) for Market Participant p in Trading Day d	(385)
CAPREBSA_P_I(p, i)	$	P	I	4.26.4	Participant Capacity Rebate (whereby Capacity Cost Refunds are redistributed) for Market Participant p in Trading Interval i	(386)
CAPREBSA_F_I(f, i)	$	F	I	4.26.6	Facility Capacity Rebate for Facility f in Trading Interval i	(387)
CAPREBS_F_I(f, i)		F	I		Share of Capacity Rebates for Facility f in Trading Interval i	(388)
CAPREBCQ_F_I(f, i)		F	I		Capacity Rebate contributing quantity for Facility f in Trading Interval i	(389)
CAPREBCQ_G_I(i)		G	I		Total Capacity Rebate contributing quantity in Trading Interval i	(390)
CCR_G_I(i)	$	G	I	4.26.6(b)	Capacity Cost Refunds charged in Trading Interval i	(391)

Variable	Units	SC	GR	Rule	Description	Ref
CCR_P_I(p, i)	$	P	I	4.26.2E	Capacity Cost Refund charged to Market Participant p in Trading Interval i	(337)
CCNSO_F_I(f, i)	MW	F	I	4.26.6(d)	Capacity Credits not subject to an Outage for Facility f in Trading Interval i	(396)
DSPL_F_I(f, i)	MWh	F	I	6.16.2	Demand Side Programme Load for Facility f in Trading Interval i	(84)
MINL_F_D(f, d)	MW	F	D	4.26.1(e)iii.4	Minimum load of Facility f for Trading Day d	(368)
RCOQ_F_I(f, i)	MW	F	I	11	Reserve Capacity Obligation Quantity of Facility f in Trading Interval i	I
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
EXPPO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Planned Outage for Facility f in Trading Interval i	I
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
EXPCO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Consequential Outage for Facility f in Trading Interval i	I
E_F_I(f, i)	Flag	F	I	4.26.6(e)	Flag representing whether Facility f is eligible to receive a Facility Capacity Rebate in Trading Interval i	(392)
FRCDR_F_I(f, i)	$	F	I	4.26.1A	Facility Reserve Capacity Deficit Refund for Facility f in Trading Interval i	(364)
CFRCDR_F_I(f, i)	$	F	I	4.26.1A(b)	Sum of Facility Reserve Capacity Deficit Refunds for Facility f in Trading Intervals in the same Capacity Year as, but prior to, Trading Interval i	(365)
MAXFR_F_CY(f, cy)	$	F	CY	11	Maximum Facility Refund for Facility f in Capacity Year cy	(92)
MAXPGR_P_CY(p, cy)	$	P	CY	11	Maximum Participant Generation Refund for Market Participant p in Capacity Year cy	(90)
DISP1440Flag_F_I(f, i)	Flag	F	I	4.26.6(e)i.1, 4.26.6(e)ii.1	Flag that is 1 when Facility f has been dispatched in the previous 1440 intervals prior to and including Trading Interval i and 0 otherwise	(100)
MAXREFFlag_F_I(f, i)	Flag	F	I	4.26.6(e)i.2, 4.26.6(e)ii.3	Flag that is 1 when Facility f has accrued the maximum Facility Reserve Capacity Deficit Refunds as at Trading Interval i and 0 otherwise	(393)
MAXREFFlag_P_I(p, i)	Flag	P	I	4.26.6(e)i.3	Flag that is 1 when Market Participant p has accrued the maximum Generation Reserve Capacity Deficit Refunds as at Trading Interval i and 0 otherwise	(394)

Variable	Units	SC	GR	Rule	Description	Ref
CGRCDR_P_I(p, i)	$	P	I	4.26.1B	Sum of Generation Reserve Capacity Deficit Refund for Market Participant p in Trading Intervals in the same Capacity Year as, but prior to, Trading Interval i	(395)
CGRCDRstart_P_D(p, d)	$	P	D	4.26.1B	Sum of Generation Reserve Capacity Deficit Refund for Market Participant p in the same Capacity Year as, but prior to, Trading Day d	I
GRCDR_P_I(p, i)	$	P	I	4.26.1B	Generation Reserve Capacity Deficit Refund for Market Participant p in Trading Interval i	(340)
RCOQ_F_I(f, i)	MW	F	I	11	Reserve Capacity Obligation Quantity of Facility f in Trading Interval i	I
DSPCCR_F_I(f, i)	$	F	I	4.26.3A	DSP Capacity Cost Refund for Facility f in Trading Interval i	(343)
CDSPCCR_F_I(f, i)	$	F	I	4.26.3A	Sum of DSP Capacity Cost Refund for Facility f in Trading Intervals in the same Capacity Year as, but prior to, Trading Interval i	(344)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
PITD(i)	{}	G	I		Set of Trading Intervals in the same Trading Day as, but prior to, Trading Interval i	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.9.9 Load Following Capacity Rebate

$$LFREBATE\_P\_D(p,d) = \sum_{i \in I(d)} LFREBATE\_P\_I(p,i) \tag{397}$$

$$LFREBATE\_P\_I(p,i) = IRCRS\_P\_M(p,i) \times LFCC\_G\_I(i) \tag{398}$$

$$IRCRS\_P\_M(p,m) = \frac{IRCR\_P\_M(p,m)}{IRCR\_G\_M(m)} \tag{399}$$

$$IRCR\_G\_M(m) = \sum_{p \in P\_M(m)} IRCR\_P\_M(p,m) \tag{400}$$

Variable	Units	SC	GR	Rule	Description	Ref
LFREBATE_P_D(p, d)	$	P	D	9.7.1B	Payment returning cost of Capacity associated with Load Following, for Market Participant p in Trading Day d	(397)

Variable	Units	SC	GR	Rule	Description	Ref
LFREBATE_P_I(p, i)	$	P	I	9.7.1B	Payment returning cost of Capacity associated with Load Following, for Market Participant p in Trading Interval i	(398)
IRCRS_P_M(p, m)		P	M	9.7.1B	Capacity share for Market Participant p for Trading Month m	(399)
IRCR_P_M(p, m)	MW	P	M	4.28.7, 4.28.11A	Individual Reserve Capacity Requirement for Market Participant p for Trading Month m	(314)
IRCR_G_M(m)	MW	G	M		Sum of the all Individual Reserve Capacity Requirement for Trading Month m	(400)
LFCC_G_I(i)	$	G	I	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following in Trading Interval i	(252)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.10 Market Participant Fees

Fees are split into the following parts:

- Market Fees
- System Management Fees
- Regulator Fees
- Coordinator Fees

The corresponding payment made to AEMO, AEMO (acting as System Management), ERA and the Coordinator are included in a separate chapter titled Service Fees.

These equations are based on the equations stated in MR 9.13. They have been modified to aggregate to a Trading Day and separate out the components of the fees.

$$MPFSA\_P\_D(p,d) = -(MFSAD\_P\_D(p,d) + SFSAD\_P\_D(p,d) + RFSAD\_P\_D(p,d) + CFSAD\_P\_D(p,d)) \quad (401)$$

Variable	Units	SC	GR	Rule	Description	Ref
MPFSA_P_D(p, d)	$	P	D	9.13.1	Market Participant Fee Settlement Amount charged to Market Participant p for Trading Day d	(401)
MFSAD_P_D(p, d)	$	P	D		Market Fee settlement amount charged to Market Participant p for Trading Day d	(402)
SFSAD_P_D(p, d)	$	P	D		System Management Fee settlement amount charged to Market Participant p for Trading Day d	(404)
RFSAD_P_D(p, d)	$	P	D		Regulator Fee settlement amount charged to Market Participant p for Trading Day d	(406)

Variable	Units	SC	GR	Rule	Description	Ref
CFSAD_p_d(p,d)	$	P	D		Coordinator Fee settlement amount charged to Market Participant p for Trading Day d	(408)

4.10.1 Market Fees

$$MFSAD\_P\_D(p,d) = \sum_{i \in I(d)} MFSAD\_P\_I(p,i) \tag{402}$$

$$MFSAD\_P\_I(p,i) = MFRATE\_G\_FY(i) \times (ABSGEN\_P\_I(p,i) + ABSLOAD\_P\_I(p,i)) \tag{403}$$

Variable	Units	SC	GR	Rule	Description	Ref
MFSAD_P_D(p, d)	$	P	D		Market Fee settlement amount charged to Market Participant p for Trading Day d	(402)
MFSAD_P_I(p, i)	$	P	I		Market Fee settlement amount charged to Market Participant p for Trading Interval i	(403)
MFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	Market Fee rate applicable in Financial Year fy	I
ABSGEN_P_I(p, i)	MWh	P	I	9.13.1	Metered Generation for Market Participant p in Trading Interval i	(80)
ABSLOAD_P_I(p, i)	MWh	P	I	9.13.1	Metered Load for Market Participant p in Trading Interval i	(77)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.10.2 System Management Fees

$$SFSAD\_P\_D(p,d) = \sum_{i \in I(d)} SFSAD\_P\_I(p,i) \tag{404}$$

$$SFSAD\_P\_I(p,i) = SFRATE\_G\_FY(i) \times (ABSGEN\_P\_I(p,i) + ABSLOAD\_P\_I(p,i)) \tag{405}$$

Variable	Units	SC	GR	Rule	Description	Ref
SFSAD_P_D(p, d)	$	P	D		System Management Fee settlement amount charged to Market Participant p for Trading Day d	(404)
SFSAD_P_I(p, i)	$	P	I		System Management Fee settlement amount charged to Market Participant p for Trading Interval i	(405)
SFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	System Management Fee rate applicable in Financial Year fy	I
ABSGEN_P_I(p, i)	MWh	P	I	9.13.1	Metered Generation for Market Participant p in Trading Interval i	(80)
ABSLOAD_P_I(p, i)	MWh	P	I	9.13.1	Metered Load for Market Participant p in Trading Interval i	(77)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.10.3 Regulator Fees

$$RFSAD\_P\_D(p,d) = \sum_{i \in I(d)} RFSAD\_P\_I(p,i) \tag{406}$$

$$RFSAD\_P\_I(p,i) = RFRATE\_G\_FY(i) \times (ABSGEN\_P\_I(p,i) + ABSLOAD\_P\_I(p,i)) \tag{407}$$

Variable	Units	SC	GR	Rule	Description	Ref
RFSAD_P_D(p, d)	$	P	D		Regulator Fee settlement amount charged to Market Participant p for Trading Day d	(406)
RFSAD_P_I(p, i)	$	P	I		Regulator Fee settlement amount charged to Market Participant p for Trading Interval i	(407)
RFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	Regulator Fee rate applicable in Financial Year fy	I
ABSGEN_P_I(p, i)	MWh	P	I	9.13.1	Metered Generation for Market Participant p in Trading Interval i	(80)
ABSLOAD_P_I(p, i)	MWh	P	I	9.13.1	Metered Load for Market Participant p in Trading Interval i	(77)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.10.4 Coordinator Fees

$$CFSAD\_P\_D(p,d) = \sum_{i \in I(d)} CFSAD\_P\_I(p,i) \tag{408}$$

$$CFSAD\_P\_I(p,i) = CFRATE\_G\_FY(i) \times (ABSGEN\_P\_I(p,i) + ABSLOAD\_P\_I(p,i)) \tag{409}$$

Variable	Units	SC	GR	Rule	Description	Ref
CFSAD_P_D(p, d)	$	P	D		Coordinator Fee settlement amount charged to Market Participant p for Trading Day d	(408)
CFSAD_P_I(p, i)	$	P	I		Coordinator Fee settlement amount charged to Market Participant p for Trading Interval i	(409)
CFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	Coordinator Fee rate applicable in Financial Year fy	I
ABSGEN_P_I(p, i)	MWh	P	I	9.13.1	Metered Generation for Market Participant p in Trading Interval i	(80)
ABSLOAD_P_I(p, i)	MWh	P	I	9.13.1	Metered Load for Market Participant p in Trading Interval i	(77)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.11 Service Fees

Fees are split into the following parts:

- Market Fees
- System Management Fees
- Regulator Fees

- Coordinator Fees

The corresponding charges to Market Participants are included in a separate section titled Market Participant Fees.

These equations are based on the equations stated in MR 9.15. They have been modified to aggregate to a Trading Day, and avoid the concept of a proportionality factor.

$$RRSA\_P\_D(p,d) = MFSAS\_P\_D(p,d) + SFSAS\_P\_D(p,d) + RFSAS\_P\_D(p,d) + CFSAS\_P\_D(p,d) \tag{410}$$

Variable	Units	SC	GR	Rule	Description	Ref
RRSA_P_D(p, d)	$	P	D	9.15.1	Service Fee Settlement Amount paid to Rule Participant p for Trading Day d	(410)
MFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of market operations to Rule Participant p for Trading Day d	(411)
SFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of System Management functions to Rule Participant p for Trading Day d	(413)
RFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of regulation functions to Rule Participant p for Trading Day d	(415)
CFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of coordinator functions to Rule Participant p for Trading Day d	(417)

4.11.1 Market Fee Payments

$$MFSAS\_P\_D(p,d) = \sum_{i \in I(d)} MFSAS\_P\_I(p,i) \tag{411}$$

$$MFSAS\_P\_I(p,i) = \begin{cases} MFRATE\_G\_FY(i) \times (ABSGEN\_G\_I(i) + ABSLOAD\_G\_I(i)) & \text{for } p \in AEMO(i) \\ 0 & \text{for } p \notin AEMO(i) \end{cases} \tag{412}$$

Variable	Units	SC	GR	Rule	Description	Ref
MFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of market operations to Rule Participant p for Trading Day d	(411)
MFSAS_P_I(p, i)	$	P	I		Service Fee Settlement Amount paid for the provision of market operations to Rule Participant p for Trading Interval i	(412)
MFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	Market Fee rate applicable in Financial Year fy	I
ABSGEN_G_I(i)	MWh	G	I	9.13.1	Metered Generation in Trading Interval i	(79)
ABSLOAD_G_I(i)	MWh	G	I	9.13.1	Metered Load in Trading Interval i	(76)
AEMO(d)	{}	G	D	11	Set containing the AEMO	(10)

Variable	Units	SC	GR	Rule	Description	Ref
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.11.2 System Management Fee Payments

$$SFSAS\_P\_D(p,d) = \sum_{i \in I(d)} SFSAS\_P\_I(p,i) \tag{413}$$

$$SFSAS\_P\_I(p,i) = \begin{cases} SFRATE\_G\_FY(i) \times (ABSGEN\_G\_I(i) + ABSLOAD\_G\_I(i)) & \text{for } p \in SM(i) \\ 0 & \text{for } p \notin SM(i) \end{cases} \tag{414}$$

Variable	Units	SC	GR	Rule	Description	Ref
SFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of System Management functions to Rule Participant p for Trading Day d	(413)
SFSAS_P_I(p, i)	$	P	I		Service Fee Settlement Amount paid for the provision of System Management functions to Rule Participant p for Trading Interval i	(414)
SFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	System Management Fee rate applicable in Financial Year fy	I
ABSGEN_G_I(i)	MWh	G	I	9.13.1	Metered Generation in Trading Interval i	(79)
ABSLOAD_G_I(i)	MWh	G	I	9.13.1	Metered Load in Trading Interval i	(76)
SM(d)	{}	G	D	11	Set containing System Management	(11)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.11.3 Regulator Fee Payments

$$RFSAS\_P\_D(p,d) = \sum_{i \in I(d)} RFSAS\_P\_I(p,i) \tag{415}$$

$$RFSAS\_P\_I(p,i) = \begin{cases} RFRATE\_G\_FY(i) \times (ABSGEN\_G\_I(i) + ABSLOAD\_G\_I(i)) & \text{for } p \in ERA(i) \\ 0 & \text{for } p \notin ERA(i) \end{cases} \tag{416}$$

Variable	Units	SC	GR	Rule	Description	Ref
RFSAS_P_D(p, d)	$	P	D		Service Fee Settlement Amount paid for the provision of regulation functions to Rule Participant p for Trading Day d	(415)
RFSAS_P_I(p, i)	$	P	I		Service Fee Settlement Amount paid for the provision of regulation functions to Rule Participant p for Trading Interval i	(416)
RFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	Regulator Fee rate applicable in Financial Year fy	I
ABSGEN_G_I(i)	MWh	G	I	9.13.1	Metered Generation in Trading Interval i	(79)
ABSLOAD_G_I(i)	MWh	G	I	9.13.1	Metered Load in Trading Interval i	(76)

Variable	Units	SC	GR	Rule	Description	Ref
ERA(d)	{}	G	D	11	Set containing the ERA	(5)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.11.4 Coordinator Fee Payments

$$CFSAS\_P\_D(p,d) = \sum_{i \in I(d)} CFSAS\_P\_I(p,i) \tag{417}$$

$$CFSAS\_P\_I(p,i) = \begin{cases} CFRATE\_G\_FY(i) \times (ABSGEN\_G\_I(i) + ABSLOAD\_G\_I(i)) & \text{for } p \in COORDINATOR(i) \\ 0 & \text{for } p \notin COORDINATOR(i) \end{cases} \tag{418}$$

Variable	Units	SC	GR	Rule	Description	Ref
CFSAS_P_D(p, d)	$	P	D		Coordinator Fee Settlement Amount paid for the provision of coordinator functions to Rule Participant p for Trading Day d	(417)
CFSAS_P_I(p, i)	$	P	I		Coordinator Fee Settlement Amount paid for the provision of coordinator functions to Rule Participant p for Trading Interval i	(418)
CFRATE_G_FY(fy)	$/MWh	G	FY	2.24.2	Coordinator Fee rate applicable in Financial Year fy	I
ABSGEN_G_I(i)	MWh	G	I	9.13.1	Metered Generation in Trading Interval i	(79)
ABSLOAD_G_I(i)	MWh	G	I	9.13.1	Metered Load in Trading Interval i	(76)
COORDINATOR(d)	{}	G	D	11	Set containing the Coordinator	(4)
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.12 Default Levy Adjustment

By the end of the second month following the end of a Financial Year, AEMO must re-allocate any Default Levies raised during that Financial Year.

Default Levy Adjustment is split into two parts:

- Payment to a Participant for re-allocation of Default Levies raised during the most recently ended Financial Year.
- Charge to a Participant for re-allocation of Default Levies raised during the most recently ended Financial Year.

$$DLASA\_P\_D(p,d) = DLAP\_P\_D(p,d) - DLAC\_P\_D(p,d) \tag{419}$$

$$DLAP\_P\_D(p,d) = \frac{max(0, DLA\_P\_M(p,m))}{TDTM\_G\_M(m)} \tag{420}$$

$$DLAC\_P\_D(p,d) = \frac{-min(0, DLA\_P\_M(p,m))}{TDTM\_G\_M(m)} \tag{421}$$

Variable	Units	SC	GR	Rule	Description	Ref
DLASA_P_D(p, d)	$	P	D	9.24.9(e)	Default Levy Adjustment settlement amount for Participant p in Trading Day d	(419)
DLAP_P_D(p, d)	$	P	D	9.24.9(e)	The amount Participant p is paid in Trading Day d for re-allocation of Default Levies raised during the most recently ended Financial Year	(420)
DLAC_P_D(p, d)	$	P	D	9.24.9(e)	The amount Participant p is charged in Trading Day d for re-allocation of Default Levies raised during the most recently ended Financial Year	(421)
DLA_P_M(p, m)	$	P	M	9.24.9(d)	The Default Levy adjustment (including GST) to put Participant p in the position it would have been in had it paid the amount determined under clause 9.24.9(b) instead of the amounts actually paid under clause 9.24.7	I
TDTM_G_M(m)		G	M		Number of Trading Days in Trading Month m	(95)

4.13 GST

GST is charged for the provision of eligible goods and services. The Variable Categorisation section outlines which statement summary variables (of day granularity) have GST applied and which are exempt. The interval-equivalent variables are identified in the sets used in the equations below.

4.13.1 STEM GST

$$GSTSTEM\_P\_D(p,d) = GSTSTEMP\_P\_D(p,d) - GSTSTEMC\_P\_D(p,d) \tag{422}$$

$$GSTSTEMP\_P\_D(p,d) = \sum_{i \in I(d)} GSTSTEMP\_P\_I(p,i) \tag{423}$$

$$GSTSTEMP\_P\_I(p,i) = GST\_G\_D(i) \times \sum_{py \in PGSTSTEM(p,i)} py \tag{424}$$

$$GSTSTEMC\_P\_D(p,d) = \sum_{i \in I(d)} GSTSTEMC\_P\_I(p,i) \tag{425}$$

$$GSTSTEMC\_P\_I(p,i) = GST\_G\_D(i) \times \sum_{cg \in CGSTSTEM(p,i)} cg \tag{426}$$

Variable	Units	SC	GR	Rule	Description	Ref
GSTSTEM_P_D(p, d)	$	P	D		Net GST associated with STEM paid to participant p for Trading Day d	(422)
GSTSTEMP_P_D(p, d)	$	P	D	9.1.2	GST associated with STEM paid to participant p in Trading Day d	(423)
GSTSTEMC_P_D(p, d)	$	P	D	9.1.2	GST associated with STEM charged to Market Participant p in Trading Day d	(425)
GSTSTEMP_P_I(p, i)	$	P	I	9.1.2	GST associated with STEM paid to Market Participant p in Trading Interval i	(424)

Variable	Units	SC	GR	Rule	Description	Ref
GSTSTEMC_P_I(p, i)	$	P	I	9.1.2	GST associated with STEM charged to Market Participant p in Trading Interval i	(426)
GST_G_D(d)		G	D		GST rate for Trading Day d	I
PGSTSTEM(d)	{}	G	D		Set of all STEM variables which are payments to which GST applies in Trading Day d	I
CGSTSTEM(d)	{}	G	D		Set of all STEM variables which are charges to which GST applies in Trading Day d	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.13.2 NSTEM GST

$$GSTNSTEM\_P\_D(p,d) = GSTNSTEMP\_P\_D(p,d) - GSTNSTEMC\_P\_D(p,d) \tag{427}$$

$$GSTNSTEMP\_P\_D(p,d) = \sum_{i \in I(d)} GSTNSTEMP\_P\_I(p,i) \tag{428}$$

$$GSTNSTEMP\_P\_I(p,i) = GST\_G\_D(i) \times \sum_{py \in PGSTNSTEM(p,i)} py \tag{429}$$

$$GSTNSTEMC\_P\_D(p,d) = \sum_{i \in I(d)} GSTNSTEMC\_P\_I(p,i) \tag{430}$$

$$GSTNSTEMC\_P\_I(p,i) = GST\_G\_D(i) \times \sum_{cg \in CGSTNSTEM(p,i)} cg \tag{431}$$

Variable	Units	SC	GR	Rule	Description	Ref
GSTNSTEM_P_D(p, d)	$	P	D		Net GST associated with NSTEM paid to participant p for Trading Day d	(427)
GSTNSTEMP_P_D(p, d)	$	P	D	9.1.2	GST associated with NSTEM paid to participant p in Trading Day d	(428)
GSTNSTEMC_P_D(p, d)	$	P	D	9.1.2	GST associated with NSTEM charged to Market Participant p in Trading Day d	(430)
GSTNSTEMP_P_I(p, i)	$	P	I	9.1.2	GST associated with NSTEM paid to Market Participant p in Trading Interval i	(429)
GSTNSTEMC_P_I(p, i)	$	P	I	9.1.2	GST associated with NSTEM charged to Market Participant p in Trading Interval i	(431)
GST_G_D(d)		G	D		GST rate for Trading Day d	I
PGSTNSTEM(d)	{}	G	D		Set of all NSTEM variables which are payments to which GST applies in Trading Day d	I
CGSTNSTEM(d)	{}	G	D		Set of all NSTEM variables which are charges to which GST applies in Trading Day d	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

4.13.3 Variable Categorisation

The table below outlines the variables that are payments from AEMO to the Market Participant or charges to be paid by the Market Participant to AEMO and whether GST is applicable. The use of the character 'X' is to denote any granularity. The daily granularity variables are presented in the statement summary.

Variable	Market	P or C	GST	Rule	Description
STEMSAS_P_X(p, x)	STEM	P	Y	9.6.1	Settlement amount for energy sold in STEM for Market Participant p in trading period x
STEMSAD_P_X(p, x)	STEM	C	Y	9.6.1	Settlement amount for energy purchased in STEM for Market Participant p in trading period x
GSTSTEMP_P_X(p, x)	STEM	P	N		GST associated with STEM paid to Market Participant p in trading period x
GSTSTEMC_P_X(p, x)	STEM	C	N		GST associated with STEM charged to Market Participant p in trading period x
MFSAD_P_X(p, x)	NSTEM	C	N		Market Fee settlement amount charged to Market Participant p for trading period x
SFSAD_P_X(p, x)	NSTEM	C	N		System Management Fee settlement amount charged to Market Participant p for trading period x
RFSAD_P_X(p, x)	NSTEM	C	N		Regulator Fee settlement amount charged to Market Participant p for trading period x
CFSAD_P_X(p, x)	NSTEM	C	N		Coordinator Fee settlement amount charged to Market Participant p for trading period x
BSAS_P_X(p, x)	NSTEM	P	Y	9.8.1	Settlement amount for energy sold in the Balancing Market for Market Participant p in trading period x
BSAD_P_X(p, x)	NSTEM	C	Y	9.8.1	Settlement amount for energy purchased in the Balancing Market for Market Participant p in trading period x
CONC_P_X(p, x)	NSTEM	P	Y	9.8.1	Constrained On Compensation for Market Participant p in trading period x
COFFC_P_X(p, x)	NSTEM	P	Y	9.8.1	Constrained Off Compensation for Market Participant p in trading period x
DIP_P_X(p, x)	NSTEM	P	Y	6.17.6C(c)	DSM Dispatch Instruction Payments for Market Participant p in trading period x
ARA_P_X(p, x)	NSTEM	P	Y	9.24.2(b)	Repaid Amount that AEMO disgorges in addition to returning Credit Support for Market Participant p for Trading period x
LRSF_P_X(p, x)	NSTEM	C	Y		Charges to cover any shortfall in Load Rejection and System Restart costs for Market Participant p in trading period x
CCDSMT3C_P_X(p, x)	NSTEM	C	Y		Charges to cover the cost of constrained compensation and DSM Dispatch for Market Participant p in trading period x
COCP_P_X(p, x)	NSTEM	P	Y	9.10.1	Outage compensation payment for Market Participant p in trading period x
COCC_P_X(p, x)	NSTEM	C	Y	9.10.1	Charge to fund outage compensation, for Market Participant p in trading period x

Variable	Market	P or C	GST	Rule	Description
UASSR_P_X(p, x)	NSTEM	P	Y	9.9.1	Amount paid for Synergy's provision of un-contracted Spinning Reserve Services for Market Participant p in trading period x
UASLR_P_X(p, x)	NSTEM	P	Y	9.9.1	Amount paid for Synergy's provision of un-contracted Load Rejection and System Restart Services for Market Participant p in trading period x
CASSR_P_X(p, x)	NSTEM	P	Y		Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for trading period x
CASL_P_X(p, x)	NSTEM	P	Y		Payment for the provision of contracted Load Rejection Services for Rule Participant p for trading period x
CASR_P_X(p, x)	NSTEM	P	Y		Payment for the provision of contracted System Restart Services for Rule Participant p for trading period x
CASD_P_X(p, x)	NSTEM	P	Y		Payment for the provision of contracted Dispatch Support Services for Rule Participant p for trading period x
LFSA_P_X(p, x)	NSTEM	P	Y	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in trading period x
LFCC_P_X(p, x)	NSTEM	C	Y	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following for Market Participant p in trading period x
LFMC_P_X(p, x)	NSTEM	C	Y	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Market Participant p in trading period x
SRAC_P_X(p, x)	NSTEM	C	Y	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Market Participant p in trading period x
COSTLR_P_X(p, x)	NSTEM	C	Y	9.9.1	Amount charged to recover the cost of Load Rejection Service and System Restart Service for Market Participant p in trading period x
COSTD_P_X(p, x)	NSTEM	C	Y	9.9.1	Amount charged to recover the cost of Dispatch Support Services for Market Participant p in trading period x
CCSA_P_X(p, x)	NSTEM	P	Y	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in trading period x
CCAOASA_P_X(p, x)	NSTEM	P	Y	9.7.1A	Capacity Credit Allocation over-allocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in trading period x
SUPCAPSA_P_X(p, x)	NSTEM	P	Y	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in trading period x

Variable	Market	P or C	GST	Rule	Description
TRCC_P_X(p, x)	NSTEM	C	Y	9.7.1B	Charge to cover the Targeted Reserve Capacity Cost for Market Participant p in trading period x
SRCC_P_X(p, x)	NSTEM	C	Y	9.7.1B	Charge to cover the Shared Reserve Capacity Cost for Market Participant p in trading period x
CCR_P_X(p, x)	NSTEM	C	Y	4.26.2E	Capacity Cost Refund charged to Market Participant p in trading period x
IMLR_P_X(p, x)	NSTEM	C	Y	4.28A.1	Intermittent Load Refunds for Market Participant p in trading period x
CAPREBSA_P_X(p, x)	NSTEM	P	Y	4.26.4	Participant Capacity Rebate (whereby Capacity Cost Refunds are redistributed) for Market Participant p in trading period x
LFREBATE_P_X(p, x)	NSTEM	P	Y	9.7.1B	Payment returning cost of Capacity associated with Load Following, for Market Participant p in trading period x
MFSAS_P_X(p, x)	NSTEM	P	N		Service Fee Settlement Amount paid to AEMO for trading period x
SFSAS_P_X(p, x)	NSTEM	P	N		Service Fee Settlement Amount paid to AEMO (in its capacity as System Management) for trading period x
RFSAS_P_X(p, x)	NSTEM	P	N		Service Fee Settlement Amount paid to the Economic Regulation Authority in trading period x
CFSAS_P_X(p, x)	NSTEM	P	N		Service Fee Settlement Amount paid to the Coordinator in trading period x
DLAC_P_X(p, x)	NSTEM	C	N	9.24.9	Amount charged to Participant p for reallocation of Default Levies raised during the most recently ended Financial Year
DLAP_P_X(p, x)	NSTEM	P	N	9.24.9	Amount paid to Participant p for reallocation of Default Levies raised during the most recently ended Financial Year
GSTNSTEMP_P_X(p, x)	NSTEM	P	N		GST associated with NSTEM paid to Market Participant p in trading period x
GSTNSTEMC_P_X(p, x)	NSTEM	C	N		GST associated with NSTEM charged to Market Participant p in trading period x
INTNSTEMP_P_X(p, x)	NSTEM	P	N		Interest associated with NSTEM paid to Market Participant p in trading period x
INTNSTEMC_P_X(p, x)	NSTEM	C	N		Interest associated with NSTEM charged to Market Participant p in trading period x

The table below assists in understanding how the payments and charges are related. The only non-zero sum component within the settlement summary variables is when AEMO is required to draw down on Reserve Capacity security or DSM Reserve Capacity Security, which is represented by $RCSD\_G\_X(x)$ and $DSMRCSD\_G\_X(x)$, respectively.

Category	Payments	=	Charges
STEM	STEMSAS_G_X(x)	=	STEMSAD_G_X(x)
Market Fees	MFSAS_G_X(x)	=	MFSAD_G_X(x)
System Management Fees	SFSAS_G_X(x)	=	SFSAD_G_X(x)
Regulation Fees	RFSAS_G_X(x)	=	RFSAD_G_X(x)

Category	Payments	=	Charges
Coordinator Fees	CFSAS_G_X(x)	=	CFSAD_G_X(x)
Balancing Market	BSAS_G_X(x)	=	BSAD_G_X(x)
Constrained Compensation and DSP Dispatch	CONC_G_X(x) + COFFC_G_X(x) + DIP_G_X(x) + ARA_G_X(x)	=	CCDSMT3C_G_X(x)
Changed Outage Compensation	COCP_G_X(x)	=	COCC_G_X(x)
Spinning Reserve and Load Following (ex. Capacity)	UASSR_G_X(x) + CASSR_G_X(x) + LFSA_G_X(x)	=	SRAC_G_X(x) + LFMC_G_X(x)
Load Rejection and System Restart	UASLR_G_X(x) + CASL_G_X(x) + CASR_G_X(x)	=	COSTLR_G_X(x) + LRSF_G_X(x)
Dispatch Support Services	CASD_G_X(x)	=	COSTD_G_X(x)
Capacity	CCSA_G_X(x) + CCAOASA_G_X(x) + SUPCAPSA_G_X(x)	=	TRCC_G_X(x) + SRCC_G_X(x) + IMLR_G_X(x) + RCSD_G_X(x) + DSMRCSD_G_X(x)
Capacity Cost Refunds	CAPREBSA_G_X(x)	=	CCR_G_X(x)
Load Following Capacity adjustment	LFREBATE_G_X(x)	=	LFCC_G_X(x)
Default Levy Adjustment	DLAP_G_X(x)	=	DLAC_G_X(x)
GST STEM	GSTSTEMP_G_X(x)	=	GSTSTEMC_G_X(x)
GST NSTEM	GSTNSTEMP_G_X(x)	=	GSTNSTEMC_G_X(x)
Interest	INTNSTEMP_G_X(x)	=	INTNSTEMC_G_X(x)

4.14 Interest

Interest is paid/charged in the WEM for two reasons:

- Interest paid/charged as part of the Adjustment Process [MR 9.1.3]
- Interest paid on security deposits [MR 2.38.5, 4.13.6, 4.13.14, 4.13A.13, and 4.13A.19]

The payment of interest on security deposits is handled separate to that outlined in this formulation.

$$INTNSTEMP\_P\_D(p,d) = max(0, INTNSTEM\_P\_D(p,d)) \tag{432}$$

$$INTNSTEMC\_P\_D(p,d) = -min(0, INTNSTEM\_P\_D(p,d)) \tag{433}$$

$$INTNSTEM\_P\_D(p,d) = INTNSTEM1\_P\_D(p,d) + INTNSTEM2\_P\_D(p,d) + INTNSTEM3\_P\_D(p,d) \tag{434}$$

$$INTNSTEM1\_P\_D(p,d) = \begin{cases} (NOINTNSTEM\_P\_D(p,d) - NOINTNSTEM0\_P\_D(p,d)) & \text{for } NSTEM1NULLFlag\_G\_M(d) = 1 \\ & \text{and } NSTEM0NULLFlag\_G\_M(d) = 0 \\ \times \sum_{j \in INTDAYS1(d)} \frac{BBR\_G\_D(j)}{365} & \\ (NOINTNSTEM1\_P\_D(p,d) - NOINTNSTEM0\_P\_D(p,d)) & \text{otherwise} \\ \times \sum_{j \in INTDAYS1(d)} \frac{BBR\_G\_D(j)}{365} & \end{cases} \tag{435}$$

$$INTNSTEM2\_P\_D(p,d)$$
$$= \begin{cases} (NOINTNSTEM\_P\_D(p,d) - NOINTNSTEM1\_P\_D(p,d)) & \text{for } NSTEM2NULLFlag\_G\_M(d) = 1 \\ & \text{and } NSTEM1NULLFlag\_G\_M(d) = 0 \\ \times \sum_{j \in INTDAYS2(d)} \frac{BBR\_G\_D(j)}{365} & \\ (NOINTNSTEM2\_P\_D(p,d) - NOINTNSTEM1\_P\_D(p,d)) & \text{otherwise} \\ \times \sum_{j \in INTDAYS2(d)} \frac{BBR\_G\_D(j)}{365} & \end{cases} \quad (436)$$

$$INTNSTEM3\_P\_D(p,d)$$
$$= \begin{cases} (NOINTNSTEM\_P\_D(p,d) - NOINTNSTEM2\_P\_D(p,d)) & \text{for } NSTEM3NULLFlag\_G\_M(d) = 1 \\ & \text{and } NSTEM2NULLFlag\_G\_M(d) = 0 \\ \times \sum_{j \in INTDAYS3(d)} \frac{BBR\_G\_D(j)}{365} & \\ (NOINTNSTEM3\_P\_D(p,d) - NOINTNSTEM2\_P\_D(p,d)) & \text{otherwise} \\ \times \sum_{j \in INTDAYS3(d)} \frac{BBR\_G\_D(j)}{365} & \end{cases} \quad (437)$$

Variable	Units	SC	GR	Rule	Description	Ref
INTNSTEMP_P_D(p, d)	$	P	D		Net interest paid to participant p for Trading Day d	(432)
INTNSTEMC_P_D(p, d)	$	P	D		Net interest charged to participant p for Trading Day d	(433)
INTNSTEM_P_D(p, d)	$	P	D		Net interest paid/charged to participant p for Trading Day d	(434)
INTNSTEM1_P_D(p, d)	$	P	D		Interest accrued due to variations between the adjustment 1 Non-STEM Settlement Statement and the initial Non-STEM Settlement Statement for participant p for Trading Day d	(435)
INTNSTEM2_P_D(p, d)	$	P	D		Interest accrued due to variations between the adjustment 2 Non-STEM Settlement Statement and the adjustment 1 Non-STEM Settlement Statement for participant p for Trading Day d	(436)
INTNSTEM3_P_D(p, d)	$	P	D		Interest accrued due to variations between the adjustment 3 Non-STEM Settlement Statement and the adjustment 2 Non-STEM Settlement Statement for participant p for Trading Day d	(437)
BBR_G_D(d)		G	D		Annual Bank Bill Rate applicable to Trading Day d	I

Variable	Units	SC	GR	Rule	Description	Ref
NOINTNSTEM_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST, excluding interest) for Market Participant p in Trading Day d	(105)
NOINTNSTEM0_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST, excluding interest) for Market Participant p in Trading Day d as published in initial Non-STEM Settlement Statement	I
NOINTNSTEM1_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST, excluding interest) for Market Participant p in Trading Day d as published in adjustment 1 Non-STEM Settlement Statement	I
NOINTNSTEM2_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST, excluding interest) for Market Participant p in Trading Day d as published in adjustment 2 Non-STEM Settlement Statement	I
NOINTNSTEM3_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST, excluding interest) for Market Participant p in Trading Day d as published in adjustment 3 Non-STEM Settlement Statement	I
INTDAYS1(m)	{}	G	M	9.1.3	Set of days from (and including) the settlement day associated with the original NSTEM Settlement Statement up to (but excluding) settlement day for adjustment 1 Non-STEM Settlement Statement for Trading Month m	I
INTDAYS2(m)	{}	G	M	9.1.3	Set of days from (and including) the settlement day associated with the original NSTEM Settlement Statement up to (but excluding) settlement day for adjustment 2 Non-STEM Settlement Statement for Trading Month m	I
INTDAYS3(m)	{}	G	M	9.1.3	Set of days from (and including) the settlement day associated with the original NSTEM Settlement Statement up to (but excluding) settlement day for adjustment 3 Non-STEM Settlement Statement for Trading Month m	I
NSTEM0NULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Non-STEM settlement amounts (as published in the initial Non-STEM Settlement Statements) are unavailable for Trading Month m, and 0 otherwise	I
NSTEM1NULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Non-STEM settlement amounts (as published in adjustment 1 Non-STEM Settlement Statements) are unavailable for Trading Month m, and 0 otherwise	I

Variable	Units	SC	GR	Rule	Description	Ref
NSTEM2NULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Non-STEM settlement amounts (as published in adjustment 2 Non-STEM Settlement Statements) are unavailable for Trading Month m, and 0 otherwise	I
NSTEM3NULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Non-STEM settlement amounts (as published in adjustment 3 Non-STEM Settlement Statements) are unavailable for Trading Month m, and 0 otherwise	I

5 Settlements

Daily outputs from the common calculation engine are aggregated to achieve the required settlement outputs.

5.1 High-Level Settlement Variables

For the purposes of certification, the following three equations make use of the common calculation engine to determine the high-level settlement variables defined in the rules.

$$STEMSA\_P\_W(p,w) = \sum_{d \in D\_W(w)} STEMSA\_P\_D(p,d) \tag{438}$$

$$NSTEMSA\_P\_M(p,m) = \sum_{d \in D(m)} NSTEMSA\_P\_D(p,d) \tag{439}$$

$$RRSA\_P\_M(p,m) = \sum_{d \in D(m)} RRSA\_P\_D(p,d) \tag{440}$$

Variable	Units	SC	GR	Rule	Description	Ref
STEMSA_P_W(p, w)	$	P	W	9.6.1	Settlement amount for energy cleared in STEM for Market Participant p in Trading Week w	(438)
STEMSA_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy cleared in STEM for Market Participant p in Trading Day d	(107)
NSTEMSA_P_M(p, m)	$	P	M	9.14.1	Net NSTEM Settlement amount for Market Participant p in Trading Month m	(439)
NSTEMSA_P_D(p, d)	$	P	D	9.14.1	Net NSTEM Settlement amount for Market Participant p in Trading Day d	(106)
RRSA_P_M(p, m)	$	P	M	9.15.1	Service Fee Settlement Amount paid to Rule Participant p for Trading Month m	(440)
RRSA_P_D(p, d)	$	P	D	9.15.1	Service Fee Settlement Amount paid to Rule Participant p for Trading Day d	(410)
D_W(w)	{}	G	W		Set of Trading Days in Trading Week w	I
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

5.2 Other Settlement Variables

There are other settlement variables (of Trading Month granularity) that participants can determine from the variables used in the common calculation engine.

5.2.1 Reconciliation

$$RSA\_P\_M(p,m) = \sum_{d \in D(m)} RSA\_P\_D(p,d) \tag{441}$$

Variable	Units	SC	GR	Rule	Description	Ref
RSA_P_M(p, m)	$	P	M	9.11.1	Reconciliation Settlement amount for Market Participant p in Trading Month m	(441)

Variable	Units	SC	GR	Rule	Description	Ref
RSA_P_D(p, d)	$	P	D	9.11.1	Reconciliation Settlement amount for Market Participant p in Trading Day d	(196)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

5.2.2 Changed Outage Compensation

$$COCSA\_P\_M(p,m) = \sum_{d \in D(m)} COCSA\_P\_D(p,d) \tag{442}$$

Variable	Units	SC	GR	Rule	Description	Ref
COCSA_P_M(p, m)	$	P	M	9.10.1	Outage compensation settlement amount for Market Participant p in Trading Month m	(442)
COCSA_P_D(p, d)	$	P	D	9.10.1	Outage compensation settlement amount for Market Participant p in Trading Day d	(208)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

5.2.3 Ancillary Services

$$ASSA\_P\_M(p,m) = \sum_{d \in D(m)} ASSA\_P\_D(p,d) \tag{443}$$

$$SynergyASPP\_P\_M(p,m) = \sum_{d \in D(m)} SynergyASPP\_P\_D(p,d) \tag{444}$$

$$ASPP\_P\_M(p,m) = \sum_{d \in D(m)} ASPP\_P\_D(p,d) \tag{445}$$

$$LFSA\_P\_M(p,m) = \sum_{d \in D(m)} LFSA\_P\_D(p,d) \tag{446}$$

$$LFCC\_P\_M(p,m) = \sum_{d \in D(m)} LFCC\_P\_D(p,d) \tag{447}$$

$$LFMC\_P\_M(p,m) = \sum_{d \in D(m)} LFMC\_P\_D(p,d) \tag{448}$$

$$SRAC\_P\_M(p,m) = \sum_{d \in D(m)} SRAC\_P\_D(p,d) \tag{449}$$

$$COSTLRD\_G\_M(m) = COSTLR\_G\_M(m) + CASD\_G\_M(m) \tag{450}$$

$$SRAC\_G\_M(m) = \sum_{i \in I\_M(m)} SRAC\_G\_I(i) \tag{451}$$

$$\begin{aligned} &ASPBP\_G\_M(m) \\ &= CASSR\_G\_M(m) + min\left(COSTLR\_G\_M(m), CASL\_G\_M(m) + CASR\_G\_M(m)\right) + CASD\_G\_M(m) \end{aligned} \tag{452}$$

Variable	Units	SC	GR	Rule	Description	Ref
ASSA_P_M(p, m)	$	P	M	9.9.1	Ancillary Services settlement amount for Market Participant p in Trading Month m	(443)
ASSA_P_D(p, d)	$	P	D	9.9.1	Ancillary Services settlement amount for Market Participant p in Trading Day d	(215)
SynergyASPP_P_M(p, m)	$	P	M	9.9.3	Payment to Synergy for un-contracted Ancillary Services for Market Participant p in Trading Month m	(444)
SynergyASPP_P_D(p, d)	$	P	D	9.9.3	Payment to Synergy for un-contracted Ancillary Services for Market Participant p in Trading Day d	(217)
ASPP_P_M(p, m)	$	P	M	9.9.3	Payment for Contracted Ancillary Services for Market Participant p in Trading Month m	(445)
ASPP_P_D(p, d)	$	P	D	9.9.3	Payment for Contracted Ancillary Services for Market Participant p in Trading Day d	(216)
LFSA_P_M(p, m)	$	P	M	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in Trading Month m	(446)
LFSA_P_D(p, d)	$	P	D	9.9.2(c)	Amount paid for the provision of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) to Market Participant p in Trading Day d	(238)
LFCC_P_M(p, m)	$	P	M	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following for Market Participant p in Trading Month m	(447)
LFCC_P_D(p, d)	$	P	D	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following for Market Participant p in Trading Day d	(250)
LFMC_P_M(p, m)	$	P	M	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Market Participant p in Trading Month m	(448)
LFMC_P_D(p, d)	$	P	D	9.9.2(n)	Amount charged to recover the cost of Load Following (Upwards LFAS, Downwards LFAS, Backup Upwards LFAS and Backup Downwards LFAS) for Market Participant p in Trading Day d	(259)
SRAC_P_M(p, m)	$	P	M	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Market Participant p in Trading Month m	(449)

Variable	Units	SC	GR	Rule	Description	Ref
SRAC_P_D(p, d)	$	P	D	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Market Participant p in Trading Day d	(269)
COSTLRD_G_M(m)	$	G	M	3.22.1(g)	The total Load Rejection, System Restart and Dispatch Support Services payment cost for Trading Month m	(450)
COSTLR_G_M(m)	$	G	M	3.22.1(g)i	The monthly equivalent of the amount determined by the ERA to cover the costs of Load Rejection and System Restart Services, and un-contracted Dispatch Support Services for Trading Month m	(202)
CASD_G_M(m)	$	G	M	3.22.1(g)ii	The monthly amount for Dispatch Support Services for Trading Month m	(292)
SRAC_G_M(m)	$	G	M	9.9.2(l)	Total Spinning Reserve availability cost for Trading Month m	(451)
SRAC_G_I(i)	$	G	I	9.9.2(l)	Amount charged to recover the cost of Spinning Reserve Services for Trading Interval i	(271)
ASPBP_G_M(m)	$	G	M	9.9.3A	Ancillary Service Provider balance payment for Trading Month m	(452)
CASSR_G_M(m)	$	G	M	9.9.3(a)	Payment for the provision of contracted Spinning Reserve Services for Trading Month m	(266)
CASL_G_M(m)	$	G	M		Sum of amounts paid for the provision of contracted Load Rejection Services for Trading Month m	(200)
CASR_G_M(m)	$	G	M		Sum of amounts paid for the provision of contracted System Restart Services for Trading Month m	(201)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I

5.2.4 Reserve Capacity

$$RCSA\_P\_M(p,m) = \sum_{d \in D(m)} RCSA\_P\_D(p,d) \tag{453}$$

$$CPP\_P\_M(p,m) = \sum_{d \in D(m)} CPP\_P\_D(p,d) \tag{454}$$

$$CPC\_P\_M(p,m) = \sum_{d \in D(m)} CPC\_P\_D(p,d) \tag{455}$$

$$CAPREBSA\_P\_M(p,m) = \sum_{d \in D(m)} CAPREBSA\_P\_D(p,d) \tag{456}$$

$$CCSA\_P\_M(p,m) = \sum_{d \in D(m)} CCSA\_P\_D(p,d) \tag{457}$$

$$IMLR\_P\_M(p,m) = \sum_{d \in D(m)} IMLR\_P\_D(p,d) \tag{458}$$

$$SUPCAPSA\_P\_M(p,m) = \sum_{d \in D(m)} SUPCAPSA\_P\_D(p,d) \quad (459)$$

$$CCR\_P\_M(p,m) = \sum_{d \in D(m)} CCR\_P\_D(p,d) \quad (460)$$

$$CCAOASA\_P\_M(p,m) = \sum_{d \in D(m)} CCAOASA\_P\_D(p,d) \quad (461)$$

$$TRCC\_P\_M(p,m) = \sum_{d \in D(m)} TRCC\_P\_D(p,d) \quad (462)$$

$$SRCC\_P\_M(p,m) = \sum_{d \in D(m)} SRCC\_P\_D(p,d) \quad (463)$$

$$SRCC\_G\_M(m) = \sum_{i \in I\_M(m)} SRCC\_G\_I(i) \quad (464)$$

$$LFREBATE\_P\_M(p,m) = \sum_{d \in D(m)} LFREBATE\_P\_D(p,d) \quad (465)$$

$$LFCC\_G\_M(m) = \sum_{i \in I\_M(m)} LFCC\_G\_I(i) \quad (466)$$

$$SUPCAPSA\_G\_M(m) = \sum_{i \in I\_M(m)} SUPCAPSA\_G\_I(i) \quad (467)$$

$$IMLR\_G\_M(m) = \sum_{i \in I\_M(m)} IMLR\_G\_I(i) \quad (468)$$

$$CCSA\_G\_M(m) = \sum_{i \in I\_M(m)} CCSA\_G\_I(i) \quad (469)$$

Variable	Units	SC	GR	Rule	Description	Ref
RCSA_P_M(p, m)	$	P	M	9.7.1	Reserve Capacity settlement amount for Market Participant p in Trading Month m	(453)
RCSA_P_D(p, d)	$	P	D	9.7.1	Reserve Capacity settlement amount for Market Participant p in Trading Day d	(293)
CPP_P_M(p, m)	$	P	M	9.7.1A	Capacity Provider Payment for Market Participant p in Trading Month m	(454)
CPP_P_D(p, d)	$	P	D	9.7.1A	Capacity Provider Payment for Market Participant p in Trading Day d	(294)
CPC_P_M(p, m)	$	P	M	9.7.1B	Capacity Purchaser Charge for Market Participant p in Trading Month m	(455)
CPC_P_D(p, d)	$	P	D	9.7.1B	Capacity Purchaser Charge for Market Participant p in Trading Day d	(295)
CAPREBSA_P_M(p, m)	$	P	M	4.26.4	Participant Capacity Rebate (whereby Capacity Cost Refunds are redistributed) for Market Participant p in Trading Month m	(456)
CAPREBSA_P_D(p, d)	$	P	D	4.26.4	Participant Capacity Rebate (whereby Capacity Cost Refunds are redistributed) for Market Participant p in Trading Day d	(385)

Variable	Units	SC	GR	Rule	Description	Ref
CCSA_P_M(p, m)	$	P	M	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in Trading Month m	(457)
CCSA_P_D(p, d)	$	P	D	9.7.1A	Payment for non-allocated Capacity Credits for Market Participant p in Trading Day d	(296)
IMLR_P_M(p, m)	$	P	M	4.28A.1	Intermittent Load Refunds for Market Participant p in Trading Month m	(458)
IMLR_P_D(p, d)	$	P	D	4.28A.1	Intermittent Load Refunds for Market Participant p in Trading Day d	(383)
SUPCAPSA_P_M(p, m)	$	P	M	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in Trading Month m	(459)
SUPCAPSA_P_D(p, d)	$	P	D	9.7.1	Payment to be made under Supplementary Capacity Contracts to Market Participant p in Trading Day d	(306)
CCR_P_M(p, m)	$	P	M	4.26.2E	Capacity Cost Refund charged to Market Participant p in Trading Month m	(460)
CCR_P_D(p, d)	$	P	D	4.26.2E	Capacity Cost Refund charged to Market Participant p in Trading Day d	(336)
CCAOASA_P_M(p, m)	$	P	M	9.7.1A	Capacity Credit Allocation over-allocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in Trading Month m	(461)
CCAOASA_P_D(p, d)	$	P	D	9.7.1A	Capacity Credit Allocation over-allocation Payment (when Capacity Credit Allocations exceed IRCR) for Market Participant p in Trading Day d	(301)
TRCC_P_M(p, m)	$	P	M	9.7.1B	Charge to cover the Targeted Reserve Capacity Cost for Market Participant p in Trading Month m	(462)
TRCC_P_D(p, d)	$	P	D	9.7.1B	Charge to cover the Targeted Reserve Capacity Cost for Market Participant p in Trading Day d	(309)
SRCC_P_M(p, m)	$	P	M	9.7.1B	Charge to cover the Shared Reserve Capacity Cost for Market Participant p in Trading Month m	(463)
SRCC_P_D(p, d)	$	P	D	9.7.1B	Charge to cover the Shared Reserve Capacity Cost for Market Participant p in Trading Day d	(326)
SRCC_G_M(m)	$	G	M	4.28.4	Shared Reserve Capacity Cost for Trading Month m	(464)
SRCC_G_I(i)	$	G	I	4.28.4	Shared Reserve Capacity Cost for Trading Interval i	(328)
LFREBATE_P_M(p, m)	$	P	M	9.7.1B	Payment returning cost of Capacity associated with Load Following, for Market Participant p in Trading Month m	(465)

Variable	Units	SC	GR	Rule	Description	Ref
LFREBATE_P_D(p, d)	$	P	D	9.7.1B	Payment returning cost of Capacity associated with Load Following, for Market Participant p in Trading Day d	(397)
LFCC_G_M(m)	$	G	M	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following in Trading Month m	(466)
LFCC_G_I(i)	$	G	I	9.9.2(p)	Amount charged to recover the cost of capacity associated with Load Following in Trading Interval i	(252)
CC_F_D(f, d)	MW	F	D	11	Capacity Credits associated with Facility f on Trading Day d	I
SUPCAPSA_G_M(m)	$	G	M	4.28.4(b)	Payment to be made under Supplementary Capacity Contracts in Trading Month m	(467)
SUPCAPSA_G_I(i)	$	G	I	4.28.4(b)	Payment to be made under Supplementary Capacity Contracts in Trading Interval i	(330)
IMLR_G_M(m)	$	G	M	4.28.4(c)	Intermittent Load Refunds for Trading Month m	(468)
IMLR_G_I(i)	$	G	I	4.28.4(c)	Intermittent Load Refunds for Trading Interval i	(331)
CCSA_G_M(m)	$	G	M		Payment for non-allocated Capacity Credits in Trading Month m	(469)
TDTM_G_M(m)		G	M		Number of Trading Days in Trading Month m	(95)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I

5.2.5 Market Participant Fees

$$MPFSA\_P\_M(p,m) = \sum_{d \in D(m)} MPFSA\_P\_D(p,d) \tag{470}$$

Variable	Units	SC	GR	Rule	Description	Ref
MPFSA_P_M(p, m)	$	P	M	9.13.1	Market Participant Fee Settlement Amount charged to Market Participant p for Trading Month m	(470)
MPFSA_P_D(p, d)	$	P	D	9.13.1	Market Participant Fee Settlement Amount charged to Market Participant p for Trading Day d	(401)
D(m)	{}	G	M		Set of Trading Days in Trading Month m	I

6 Prudentials

Prudential calculations require the estimation of exposure before all inputs are known. This section is separated into the estimation of metering inputs and settlement inputs, as a different approach is taken.
When estimating meter data, AEMO uses more general metering equations to incorporate estimation methodology. When actual data is available, the equations simplify to the previously outlined metering equations. The more general metering equations are detailed in the subsequent subsections.
When estimating settlement data, AEMO does not modify settlement equations, but instead estimates inputs which are not known at the time of calculation. The methodology for estimating settlement inputs when they are unknown is detailed in the subsequent subsections.

6.1 Estimating Metering Variables

Metered Schedules are required to be estimated for the purposes of determining a Market Participant's Outstanding Amount.
When a Metered Schedule does not exist because data is yet to be provided by the Meter Data Agent, an estimation methodology is used to scale data from a similar period, depending on what data is available. The following sections outline:

- how data statuses are used to indicate if data exists;
- how a similar interval is determined using a 'Like Day, Like Period' methodology;
- how scaling factors are used; and
- the estimation methodology consistent with the requirements in Market Procedure: Prudential Requirements.

6.1.1 Data Statuses

Statuses are set up to distinguish between NULL values and 0 values in AEMO's generic settlement calculation engine. Although these statuses are defined as equations in this section, they are treated as inputs in the metering calculations.

$$DataStatus\_F\_I(f,i) = \begin{cases} 1 & \text{for } f \in NOINTMETER(i) \text{ and } ScadaStatus\_F\_I(f,i) > 0 \\ FacilityDataStatus\_F\_I(f,i) & \text{for } f \notin NOINTMETER(i) \\ 0 & \text{otherwise} \end{cases} \tag{471}$$

$$FacilityDataStatus\_F\_I(f,i) = \begin{cases} 1 & \text{if } \exists n \in NMI(f,i) : NMIStatus\_N\_I(n,i) = 1 \\ 0 & \text{otherwise} \end{cases} \tag{472}$$

$$NMIStatus\_N\_I(n,i) = \begin{cases} ScadaStatus\_F\_I(n,i) & \text{for } n \in NOINTMETER(i) \\ 1 & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{ or (for } n \notin NOINTMETER(i) \\ & \text{ and } \exists ch \in B(n,i) \cup E(n,i) : MQ\_CH\_I(ch,i) \neq NULL) \\ 0 & \text{otherwise} \end{cases} \tag{473}$$

$$ScadaStatus\_F\_I(f,i) = \begin{cases} 1 & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{ or } SCADA\_F\_I(f,i) \neq NULL \\ 2 & \text{elseif } SCADAEOI\_F\_I(f,i) \neq NULL \\ 3 & \text{elseif } SCADAEOIprov\_F\_I(f,i) \neq NULL \\ 0 & \text{otherwise} \end{cases} \tag{474}$$

Variable	Units	SC	GR	Rule	Description	Ref
DataStatus_F_I(f, i)		F	I		Status that indicates if a Facility has energy data and 0 otherwise	(471)
ESTIMATIONFlag_G_M(m)	Flag	G	M		Flag that is 1 when estimation is permitted for Trading Month m, and 0 otherwise	I
FacilityDataStatus_F_I(f, i)		F	I		Status that indicates if a Facility has energy data	(472)
NMIStatus_N_I(n, i)		N	I		Status that indicates if a connection point has energy data	(473)
ScadaStatus_F_I(f, i)		F	I		Status that indicates the most accurate SCADA data available for a Facility	(474)
SCADAEOI_F_I(f, i)	MW	F	I		EOI Quantity of Facility f for Trading Interval i	I
SCADAEOIprov_F_I(f, i)	MW	F	I		Provisional EOI Quantity of Facility f for Trading Interval i	I
SCADA_F_I(f, i)	MWh	F	I		Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	I
MQ_CH_I(ch, i)	MWh	CH	I		Energy measured by metering channel ch in Trading Interval i, non-loss adjusted	I
B(d)	{}	G	D		Set of all generation metering channels associated with NMIs in Trading Day d	I
E(d)	{}	G	D		Set of all consumption metering channels associated with NMIs in Trading Day d	I
NOINTMETER(d)	{}	G	D		Set of Facilities in WEMS for which no Interval meter exists in Trading Day d	I
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I

6.1.2 Like Day, Like Period (LDLP)

A 'Like Day' of Trading Interval i is defined as follows:

- If i falls on a Trading Day d that is a Public Holiday, then a 'Like Day' is any Trading Day that is a Sunday.
- If i falls on a Trading Day d that is not a public holiday, then a 'Like Day' is any Trading Day that is not a Public Holiday and is the same day of the week as d.

The set of Trading Days that are a 'Like Day' of Trading Interval i is infinitely large. For the purposes of estimation, the set of Like Days we will use will be defined as the union of:

- the set of Like Days that occur after the last Trading Day for which the relevant Interval Meter Deadline has passed; and
- the set containing the most recent Like Day for which the relevant Interval Meter Deadline has passed.

A 'Like Period' of Trading Interval i is defined as any Trading Interval that is the same time of day as i.

A 'Like Day, Like Period' of i, is defined as a Trading Interval that both falls on a 'Like Day' of i and is a 'Like Period' of i.

The set of 'Like Day, Like Periods' of i is represented as LDLP(i). This set is ordered from most recent interval to least recent interval. LDLP(i)[1] refers to the most recent interval in the set and LDLP(i)[j] refers to the least recent interval in the set.

Refer to the table below for examples illustrating LDLP(i) for estimating Trading Interval i when the calculation is performed at time j.

#	i @ j	LDLP(i) @ j	Purpose of example
1	20:30 Fri 03 May 2019 calculated @ 23:59 01 May 2019	{20:30 Fri 26 Apr 2019, ~~20:30 Fri 19 Apr 2019~~, 20:30 Fri 12 Apr 2019, 20:30 Fri 05 Apr 2019, 20:30 Fri 29 Mar 2019, 20:30 Fri 22 Mar 2019, 20:30 Fri 15 Mar 2019, 20:30 Fri 08 Mar 2019, 20:30 Fri 01 Mar 2019, 20:30 Fri 22 Feb 2019}	Shows omission of Public Holidays (Good Friday) when i is not a Public Holiday.
2	20:30 Fri 03 May 2019 calculated @ 00:00 02 May 2019	{20:30 Fri 26 Apr 2019, ~~20:30 Fri 19 Apr 2019~~, 20:30 Fri 12 Apr 2019, 20:30 Fri 05 Apr 2019, 20:30 Fri 29 Mar 2019}	Compare with example 1 to show effect of calculating after the Interval Meter Deadline for Trading Month March 2019 on 8 May 2019.
3	08:00 Thu 25 Apr 2019 calculated @ 13:00 27 Apr 2019	{08:00 Sun 21 Apr 2019, 08:00 Sun 14 Apr 2019, 08:00 Sun 07 Apr 2019, 08:00 Sun 31 Mar 2019, 08:00 Sun 24 Mar 2019, 08:00 Sun 17 Mar 2019, 08:00 Sun 10 Mar 2019, 08:00 Sun 03 Mar 2019, 08:00 Sun 24 Feb 2019}	Shows example when i falls on a Trading Day that is a Public Holiday (ANZAC Day).
4	07:30 Thu 25 Apr 2019 calculated @ 13:00 27 Apr 2019	{07:30 Thu 18 Apr 2019, 07:30 Thu 11 Apr 2019, 07:30 Thu 04 Apr 2019, 07:30 Thu 28 Mar 2019, 07:30 Thu 21 Mar 2019, 07:30 Thu 14 Mar 2019, 07:30 Thu 07 Mar 2019, 07:30 Thu 28 Feb 2019}	Compare with example 3 to show distinction between a Trading Day that is a Public Holiday and a calendar day that is a Public Holiday.

In subsequent sections, $LDLP\_N\_I(n,i)$ and $LDLP\_F\_I(f,i)$ will be used as the inputs to functions that expect a single Trading Interval (and not a set of Trading Intervals). The purpose of this variable is to return the interval itself, if data is available, otherwise to return the most recent interval in the set LDLP(i), for which data exists. This is defined mathematically in the equations below.

$$LDLP\_N\_I(n,i) = \begin{cases} i & \text{if } NMIstatus\_N\_I(n,i) \neq 0 \\ LDLP(i)[1] & \text{elseif } NMIstatus\_N\_I(n, LDLP(i)[1]) \neq 0 \\ LDLP(i)[2] & \text{elseif } NMIstatus\_N\_I(n, LDLP(i)[2]) \neq 0 \\ \quad\vdots & \quad\vdots \\ LDLP(i)[j-1] & \text{elseif } NMIstatus\_N\_I(n, LDLP(i)[j-1]) \neq 0 \\ LDLP(i)[j] & \text{otherwise} \end{cases} \tag{475}$$

$$LDLP\_F\_I(f,i) = \begin{cases} i & \text{if } ScadaStatus\_F\_I(f,i) \neq 0 \\ LDLP(i)[1] & \text{elseif } ScadaStatus\_F\_I(f, LDLP(i)[1]) \neq 0 \\ LDLP(i)[2] & \text{elseif } ScadaStatus\_F\_I(f, LDLP(i)[2]) \neq 0 \\ \quad\vdots & \quad\vdots \\ LDLP(i)[j-1] & \text{elseif } ScadaStatus\_F\_I(f, LDLP(i)[j-1]) \neq 0 \\ LDLP(i)[j] & \text{otherwise} \end{cases} \tag{476}$$

Variable	Units	SC	GR	Rule	Description	Ref
LDLP_N_I(n, i)		N	I		The interval used to determine scaled meter data for connection point n in Trading Interval i	(475)
LDLP_F_I(f, i)		F	I		The interval used to determine scaled SCADA data for Facility f in Trading Interval i	(476)

Variable	Units	SC	GR	Rule	Description	Ref
NMIStatus_N_I(n, i)		N	I		Status that indicates if a connection point has energy data	(473)
ScadaStatus_F_I(f, i)		F	I		Status that indicates the most accurate SCADA data available for a Facility	(474)
LDLP(i)	{}	G	I		A set of Like Day, Like Periods of Trading Interval i. $LDLP(i)[1]$ represents the most recent Like Day, Like Period of Trading Interval i and $LDLP(i)[j]$ represents the least recent Like Day, Like Period of Trading Interval i.	I

6.1.3 Scaling Factors

The previous section introduces the concept of identifying LDLP for a Trading Interval i. This concept is now used to estimate data for Trading Interval i by scaling data from the most recent LDLP of Trading Interval i for which data is available. To scale the data a scaling factor (SF) is used. Scaling Factors apply to a facility (or NMI) for a specific Trading Interval.

$$SF\_N\_I(n,i) = \begin{cases} ACTIVE\_N\_D(n,i) \times \dfrac{RDQ\_G\_I(i)}{RDQ\_G\_I(LDLP\_N\_I(n,i))} & \text{if } RDQ\_G\_I(i) \neq NULL \\ & \text{and } RDQ\_G\_I(LDLP\_N\_I(n,i)) \neq NULL \\ ACTIVE\_N\_D(n,i) \times \dfrac{LOADFCST\_G\_I(i)}{LOADFCST\_G\_I(LDLP\_N\_I(n,i))} & \text{elseif } LOADFCST\_G\_I(LDLP\_N\_I(n,i)) \neq 0 \\ ACTIVE\_N\_D(n,i) & \text{otherwise} \end{cases} \quad (477)$$

$$SF\_F\_I(f,i) = \begin{cases} ACTIVE\_F\_D(f,i) \times \dfrac{RDQ\_G\_I(i)}{RDQ\_G\_I(LDLP\_F\_I(f,i))} & \text{if } RDQ\_G\_I(i) \neq NULL \\ & \text{and } RDQ\_G\_I(LDLP\_F\_I(f,i)) \neq NULL \\ ACTIVE\_F\_D(f,i) \times \dfrac{LOADFCST\_G\_I(i)}{LOADFCST\_G\_I(LDLP\_F\_I(f,i))} & \text{elseif } LOADFCST\_G\_I(LDLP\_F\_I(f,i)) \neq 0 \\ ACTIVE\_F\_D(f,i) & \text{otherwise} \end{cases} \quad (478)$$

Variable	Units	SC	GR	Rule	Description	Ref
SF_N_I(n, i)		N	I		Scaling Factor for NMI n in Trading Interval i	(477)
SF_F_I(f, i)		F	I		Scaling Factor for Facility f in Trading Interval i	(478)
ACTIVE_F_D(f, d)	Flag	F	D		1 if the Facility f is registered to a Market Participant in Trading Day d and 0 otherwise	I
ACTIVE_N_D(n, d)	Flag	N	D		1 if the NMI n is active and associated with a Market Participant in Trading Day d and 0 otherwise	I
RDQ_G_I(i)	MW	G	I		Relevant Dispatch Quantity in Trading Interval i	I
LOADFCST_G_I(i)	MW	G	I		Load Forecast in Trading Interval i	I

Variable	Units	SC	GR	Rule	Description	Ref
LDLP_F_I(f, i)		F	I		The interval used to determine scaled SCADA data for Facility f in Trading Interval i	(476)
LDLP_N_I(n, i)		N	I		The interval used to determine scaled meter data for connection point n in Trading Interval i	(475)

6.1.4 Estimation

Meter Schedules are determined or estimated based on what data is available. The general philosophy for what data to use is based on the following heirarchy as dictated by the Market Procedure: Prudential Requirements:

1. Use $SOMS\_N\_I$ data for the entire Facility, if $SOMS\_N\_I$ data exists for any NMI associated with Facility f, for Trading Interval i
2. Use SCADA energy data if it exists for Facility f, for Trading Interval i
3. Use EOI Quantity if it exists for Facility f, for Trading Interval i
4. Scale $SOMS\_N\_I$ data for Facility f in the most recent similar interval of Trading Interval i

The general equations below (480) to (485) are used in the calculation engine. When metering data is available (i.e. $NMIStatus\_N\_I = 1$ for Facilities with interval meters and $ScadaStatus\_F\_I = 1$ for Facilities without interval meters) the generic equations simplify to those previously stated in the document (equations (53), (483), (484), (485)).

$$SOMSinit\_N\_I(n,i) = \begin{cases} mtrSCADA\_F\_I(n,i) & \text{for } n \in NOINTMETER(i) \\ \sum_{ch \in B(n,i)} MQ\_CH\_I(ch,i) - \sum_{ch \in E(n,i)} MQ\_CH\_I(ch,i) & \text{for } n \notin NOINTMETER(i) \end{cases} \quad (479)$$

$$SOMS\_N\_I(n,i) = SOMSinit\_N\_I(n, LDLP\_N\_I(n,i)) \times SF\_N\_I(n,i) \quad (480)$$

$$NOINTmtrSCADA\_F\_I(f,i) = mtrSCADA\_F\_I(f, LDLP\_F\_I(f,i)) \times SF\_F\_I(f,i) \quad (481)$$

$$mtrSCADA\_F\_I(f,i) = \begin{cases} SCADA\_F\_I(f,i) & \text{for } ScadaStatus\_F\_I(f,i) = 1 \\ 0.5h \times SCADAEOI\_F\_I(f,i) & \text{for } ScadaStatus\_F\_I(f,i) = 2 \\ 0.5h \times SCADAEOIprov\_F\_I(f,i) & \text{for } ScadaStatus\_F\_I(f,i) = 3 \\ 0 & \text{otherwise} \end{cases} \quad (482)$$

Variable	Units	SC	GR	Rule	Description	Ref
SOMSinit_N_I(n, i)	MWh	N	I		Initial calculation of Sent Out Metered Schedule for NMI n in Trading Interval i	(479)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
MQ_CH_I(ch, i)	MWh	CH	I		Energy measured by metering channel ch in Trading Interval i, non-loss adjusted	I
NMIStatus_N_I(n, i)		N	I		Status that indicates if a connection point has energy data	(473)
mtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	(482)

Variable	Units	SC	GR	Rule	Description	Ref
NOINTmtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by a Facility f which has no interval meters in Trading Interval i, non-loss adjusted	(481)
SCADA_F_I(f, i)	MWh	F	I		Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	I
SCADAEOI_F_I(f, i)	MW	F	I		EOI Quantity of Facility f for Trading Interval i	I
SCADAEOIprov_F_I(f, i)	MW	F	I		Provisional EOI Quantity of Facility f for Trading Interval i	I
SF_F_I(f, i)		F	I		Scaling Factor for Facility f in Trading Interval i	(478)
SF_N_I(n, i)		N	I		Scaling Factor for NMI n in Trading Interval i	(477)
LDLP_F_I(f, i)		F	I		The interval used to determine scaled SCADA data for Facility f in Trading Interval i	(476)
LDLP_N_I(n, i)		N	I		The interval used to determine scaled meter data for connection point n in Trading Interval i	(475)
ScadaStatus_F_I(f, i)		F	I		Status that indicates the most accurate SCADA data available for a Facility	(474)
B(d)	{}	G	D		Set of all generation metering channels associated with NMIs in Trading Day d	I
E(d)	{}	G	D		Set of all consumption metering channels associated with NMIs in Trading Day d	I
NOINTMETER(d)	{}	G	D		Set of Facilities in WEMS for which no Interval meter exists in Trading Day d	I

$$SOMS\_F\_I(f,i)$$

$$= \begin{cases} NOINTmtrSCADA\_F\_I(f,i) & \text{for } f \in NDL\_WEMS(i) \cup IRL(i) \cup SG(i) \cup NSG(i) \\ & \text{and } f \notin IML(i) \cup EG(i) \cup RG(i) \\ & \text{and } f \in NOINTMETER(i) \\ & \text{and } DataStatus\_F\_I(f,i) = 0 \\ mtrSCADA\_F\_I(f,i) & \text{for } f \in NDL\_WEMS(i) \cup IRL(i) \cup SG(i) \cup NSG(i) \\ & \text{and } f \notin IML(i) \cup EG(i) \cup RG(i) \\ & \text{and } f \notin NOINTMETER(i) \\ & \text{and } DataStatus\_F\_I(f,i) = 0 \text{ and } ScadaStatus\_F\_I \neq 0 \\ \sum_{n \in NMI(f,i)} SOMS\_N\_I(n,i) & \text{for } f \in NDL\_WEMS(i) \cup IRL(i) \cup SG(i) \cup NSG(i) \\ & \text{and } f \notin IML(i) \cup EG(i) \cup RG(i) \\ & \text{and } (f \in NOINTMETER(i) \text{ and } DataStatus\_F\_I(f,i) \neq 0 \\ & \quad \text{or } (f \notin NOINTMETER(i) \\ & \quad \text{and not } (DataStatus\_F\_I(f,i) = 0 \text{ and } ScadaStatus\_F\_I \neq 0))) \\ SOMS\_N\_I(f,i) & \text{for } f \in NDL\_MTR(i) \\ SOMSIL\_F\_I(f,i) + SOMSEL\_F\_I(f,i) & \text{for } f \in IML(i) \\ SOMSEG\_F\_I(EG2IML(f,i),i) & \text{for } f \in EG(i) \\ 0 & \text{for } f \in RG(i) \\ \dfrac{MS\_F\_I(f,i)}{TLF\_F\_D(f,i) \times DLF\_F\_D(f,i)} & \text{for } f \in NOTIONAL(i) \\ 0 & \text{otherwise} \end{cases} \tag{483}$$

Variable	Units	SC	GR	Rule	Description	Ref
SOMS_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
SOMSIL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the intermittent load associated with Facility f in Trading Interval i	(75)
SOMSEL_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the embedded load associated with Facility f in Trading Interval i	(73)
SOMSEG_F_I(f, i)	MWh	F	I		Sent Out Metered Schedule for the embedded generator associated with Intermittent Load Facility f in Trading Interval i	(74)
mtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	(482)
NOINTmtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by a Facility f which has no interval meters in Trading Interval i, non-loss adjusted	(481)

Variable	Units	SC	GR	Rule	Description	Ref
DataStatus_F_I(f, i)		F	I		Status that indicates if a Facility has energy data and 0 otherwise	(471)
ScadaStatus_F_I(f, i)		F	I		Status that indicates the most accurate SCADA data available for a Facility	(474)
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
NDL_WEMS(d)	{}	G	D		Set of Non-Dispatchable Loads in WEMS registration in Trading Day d	(27)
NDL_MTR(d)	{}	G	D		Set of Non-Dispatchable Loads with interval meters that are not in WEMS in Trading Day d	I
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
EG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load locally in Trading Day d	(36)
RG(d)	{}	G	D	2.30B.2(a)	Set of Scheduled Generators that serve an Intermittent Load remotely in Trading Day d	(35)
NOTIONAL(d)	{}	G	D	11	Set containing the Notional Wholesale Meter	(28)

$$SOMSRG\_F\_I(f,i) = \begin{cases} NOINTmtrSCADA\_F\_I(IML2RG(f,i),i) & \text{for } IML2RG(f,i) \in NOINTMETER(i) \\ & \text{and } DataStatus\_F\_I(IML2RG(f,i),i) = 0 \\ mtrSCADA\_F\_I(IML2RG(f,i),i) & \text{for } IML2RG(f,i) \notin NOINTMETER(i) \\ & \text{and } DataStatus\_F\_I(IML2RG(f,i),i) = 0 \\ & \text{and } ScadaStatus\_F\_I(IML2RG(f,i),i) \neq 0 \\ \sum_{n \in NMI(IML2RG(f,i),i)} SOMS\_N\_I(n,i) & \text{otherwise} \end{cases} \tag{484}$$

Variable	Units	SC	GR	Rule	Description	Ref
SOMSRG_F_I(f, i)	MWh	F	I		Non-loss adjusted energy output of remote generators associated with Intermittent Load Facility f in Trading Interval i	(484)
SOMS_N_I(n, i)	MWh	N	I		Sent Out Metered Schedule for NMI n in Trading Interval i	(480)
mtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	(482)

Variable	Units	SC	GR	Rule	Description	Ref
NOINTmtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by a Facility f which has no interval meters in Trading Interval i, non-loss adjusted	(481)
DataStatus_F_I(f, i)		F	I		Status that indicates if a Facility has energy data and 0 otherwise	(471)
ScadaStatus_F_I(f, i)		F	I		Status that indicates the most accurate SCADA data available for a Facility	(474)
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I

$$AMQnoRG\_F\_I(f,i) = \begin{cases} NOINTmtrSCADA\_F\_I(f,i) \times TLF\_F\_D(f,i) \times DLF\_F\_D(f,i) & \text{for } f \in NOINTMETER(i) \text{ and } DataStatus\_F\_I(f,i) = 0 \\ mtrSCADA\_F\_I(f,i) \times TLF\_F\_D(f,i) \times DLF\_F\_D(f,i) & \text{for } f \notin NOINTMETER(i) \text{ and } DataStatus\_F\_I(f,i) = 0 \text{ and } ScadaStatus\_F\_I(f,i) \neq 0 \\ NMQ\_F\_I(f,i) - NS\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (485)$$

Variable	Units	SC	GR	Rule	Description	Ref
AMQnoRG_F_I(f, i)	MWh	F	I	2.30B.10(a)vi	Adjusted meter quantity (except Remote Generators) for Facility f in Trading Interval i	(485)
NMQ_F_I(f, i)	MWh	F	I	2.30B.10 (a)i	Loss adjusted net metered energy measured by the connection point for Facility f in Trading Interval i	(59)
NS_F_I(f, i)	MWh	F	I	2.30B.10(a)ii	Net supply that is separately metered associated with Facility f for Trading Interval i	(60)
mtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	(482)
NOINTmtrSCADA_F_I(f, i)	MWh	F	I		(Metering) estimate of Net generation measured by a Facility f which has no interval meters in Trading Interval i, non-loss adjusted	(481)
DataStatus_F_I(f, i)		F	I		Status that indicates if a Facility has energy data and 0 otherwise	(471)
ScadaStatus_F_I(f, i)		F	I		Status that indicates the most accurate SCADA data available for a Facility	(474)
TLF_F_D(f, d)		F	D		Transmission Loss Factor for Facility f for Trading Day d	I
DLF_F_D(f, d)		F	D		Distribution Loss Factor for Facility f for Trading Day d	I

6.2 Estimating Settlement Inputs

Settlement inputs will be required to be estimated for the purposes of determining a Market Participant's Outstanding Amount.

6.2.1 Invocation

The following table outlines the invocation for estimating settlement inputs.

Variable	Scope Set
$\widehat{I\_M}(m)$	N/A
$LFP\widehat{DNQ}\_F\_I(f,i)$	$\forall f \in LFASF(i)$
$LFP\widehat{UPQ}\_F\_I(f,i)$	$\forall f \in LFASF(i)$
$CA\widehat{SD\_P}\_M(p,m)$	$\forall p \in P\_M(m)$
$CA\widehat{SL\_P}\_M(p,m)$	$\forall p \in P\_M(m)$
$CA\widehat{SR\_P}\_M(p,m)$	$\forall p \in P\_M(m)$
$CASS\widehat{RQmwh}\_P\_I(p,i)$	$\forall p \in SR(i)$
$CA\widehat{SSR\_P}\_M(p,m)$	$\forall p \in P\_M(m)$
$EX\widehat{PCO}\_F\_I(f,i)$	$\forall f \in CCF(i) \cap \overline{DSP(i)}$
$EX\widehat{PFO}\_F\_I(f,i)$	$\forall f \in CCF(i) \cap \overline{DSP(i)}$
$EX\widehat{PPO}\_F\_I(f,i)$	$\forall f \in CCF(i) \cap \overline{DSP(i)}$
$IMLPO\widehat{Flag}\_F\_I(f,i)$	$\forall f \in IML(d)$
$IMLFO\widehat{Flag}\_F\_I(f,i)$	$\forall f \in IML(d)$
$IMLCO\widehat{Flag}\_F\_I(f,i)$	$\forall f \in IML(d)$
$NOINT\widehat{NSTEM0}\_P\_D(p,d)$	$\forall p \in P\_M(d)$
$NOINT\widehat{NSTEM1}\_P\_D(p,d)$	$\forall p \in P\_M(d)$
$NOINT\widehat{NSTEM2}\_P\_D(p,d)$	$\forall p \in P\_M(d)$
$NOINT\widehat{NSTEM3}\_P\_D(p,d)$	$\forall p \in P\_M(d)$
$MAX\widehat{TEMP}\_F\_D(f,d)$	$\forall f \in IML(d)$
$\widehat{BP\_G}\_I(i)$	N/A
$IR\widehat{CR0}\_P\_M(p,m)$	$\forall p \in P\_M(m)$
$\widehat{MAXTES}\_F\_I(f,i)$	$\forall f \in BALF(i) \cup PORTFOLIO(i)$
$\widehat{MINTES}\_F\_I(f,i)$	$\forall f \in BALF(i) \cup PORTFOLIO(i)$
$SC\widehat{ADAEOI}\_F\_I(f,i)$	$\forall f \in BALF(i) \cup PORTFOLIO(i)$
$SC\widehat{ADA}\_F\_I(f,i)$	$\forall f \in EG(i) \cup GEN\_UREG\_L(i)$
$REGT\widehat{ITM}\_F\_M(f,m)$	$\forall f \in IG\_M(m)$

Variable	Units	SC	GR	Rule	Description	Ref
$\widehat{I\_M}(m)$	{}	G	M		Estimate of Set of Trading Intervals in Trading Month m	(486)

Variable	Units	SC	GR	Rule	Description	Ref
$\widehat{LFPDNQ}\_F\_I(f,i)$	MW	F	I	11	Estimate of Ex-post Downwards LFAS Enablement quantity for Facility f in Trading Interval i	(487)
$\widehat{LFPUPQ}\_F\_I(f,i)$	MW	F	I	11	Estimate of Ex-post Upwards LFAS Enablement quantity for Facility f in Trading Interval i	(488)
$\widehat{CASD\_P}\_M(p,m)$	$	P	M	9.9.3(e)	Estimate of Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Month m	(489)
$\widehat{CASL\_P}\_M(p,m)$	$	P	M	9.9.3(c)	Estimate of Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Month m	(490)
$\widehat{CASR\_P}\_M(p,m)$	$	P	M	9.9.3(d)	Estimate of Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Month m	(491)
$\widehat{CASSRQmwh}\_P\_I(p,i)$	MWh	P	I		Estimate of MWh quantity of Contracted Spinning Reserve Service for Rule Participant p in Trading Interval i	(492)
$\widehat{CASSR\_P}\_M(p,m)$	$	P	M	9.9.3(a)	Estimate of Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Month m	(493)
$\widehat{EXPCO}\_F\_I(f,i)$	MW	F	I	7.13.1A(b)	Estimate of Ex-post Consequential Outage for Facility f in Trading Interval i	(495)
$\widehat{EXPFO}\_F\_I(f,i)$	MW	F	I	7.13.1A(b)	Estimate of Ex-post Forced Outage for Facility f in Trading Interval i	(496)
$\widehat{EXPPO}\_F\_I(f,i)$	MW	F	I	7.13.1A(b)	Estimate of Ex-post Planned Outage for Facility f in Trading Interval i	(497)
$IMLPO\widehat{Flag}\_F\_I(f,i)$	Flag	F	I	7.13.1A(b)	Estimate of Flag indicating if the embedded generator associated with Facility f is on a Planned Outage in Trading Interval i	(500)
$IMLFO\widehat{Flag}\_F\_I(f,i)$	Flag	F	I	7.13.1A(b)	Estimate of Flag indicating if the embedded generator associated with Facility f is on a Forced Outage in Trading Interval i	(499)
$IMLCO\widehat{Flag}\_F\_I(f,i)$	Flag	F	I	7.13.1A(b)	Estimate of Flag indicating if the embedded generator associated with Facility f is on a Consequential Outage in Trading Interval i	(498)
$MAXT\widehat{EMP}\_F\_D(f,d)$	°C	F	D	2.30B.3(b)ii	Estimate of Daily maximum temperature associated with Facility f for Trading Day d	(501)
$\widehat{BP\_G}\_I(i)$	$/MWh	G	I	7A.3.10	Estimate of Balancing Price for Trading Interval i	(502)

Variable	Units	SC	GR	Rule	Description	Ref
$\widehat{IRCR0\_P\_M}(p,m)$	MW	P	M		Estimate of Individual Reserve Capacity Requirement (prior to any adjustments) for Market Participant p for Trading Month m	(503)
$\widehat{MAXTES\_F\_I}(f,i)$	MWh	F	I		Estimate of Maximum Theoretical Energy Schedule for Facility f in Trading Interval i	(504)
$\widehat{MINTES\_F\_I}(f,i)$	MWh	F	I		Estimate of Minimum Theoretical Energy Schedule for Facility f in Trading Interval i	(505)
$\widehat{SCADAEOI\_F\_I}(f,i)$	MW	F	I		Estimate of The end of interval output of Facility f for Trading Interval i	(506)
$\widehat{SCADA\_F\_I}(f,i)$	MWh	F	I		Estimate of Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	(507)
$\widehat{REGTITM\_F\_M}(f,m)$		F	M		Estimate of number of Trading Intervals for which Facility f is registered in Trading Month m	I
F(d)	{}	G	D		Set of Registered Facilities, unregistered generation systems and unregistered interruptible loads in Trading Day d	(30)
REG_F(d)	{}	G	D	11	Set of Registered Facilities in Trading Day d	(31)
NDL(d)	{}	G	D	11	Set of Non-Dispatchable Loads in Trading Day d	(32)
IML(d)	{}	G	D	2.30B.1	Set of Loads which have an Intermittent Load component in Trading Day d	(33)
LFASF(d)	{}	G	D	11	Set of LFAS Facilities in Trading Day d	(39)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)
NMI(d)	{}	G	D		Set of all connection points in Trading Day d	I
SG(d)	{}	G	D	11	Set of Scheduled Generators in Trading Day d	(21)
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
IRL(d)	{}	G	D	11	Set of Interruptible Loads in Trading Day d	(25)
IG_M(m)	{}	G	M	11	Set of Intermittent Generators in Trading Month m	(48)
CCF(d)	{}	G	D		Set of Facilities with Capacity Credits on Trading Day d	I
DSP(d)	{}	G	D	11	Set of Demand Side Programmes in Trading Day d	(19)
P_M(m)	{}	G	M		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Month m	(1)
P(d)	{}	G	D		Set of participants (Rule Participants, ERA and the Coordinator) in Trading Day d	(3)

Variable	Units	SC	GR	Rule	Description	Ref
SR(d)	{}	G	D		Set of participants to estimate Spinning Reserve Service quantities in Trading Day d	(17)

6.2.2 Estimation

Settlement inputs are estimated based on what data is available. The table below specifies the different methodologies for estimating various settlement inputs. If an input is not defined in the table below a zero value is used when the actual data is unavailable.

6.2.2.1 Sets

$$\widehat{I\_M}(m) = \bigcup_{i \in I\_M(m)} \{i : i \leq \text{Trading Day on which the calculation is performed}\} \tag{486}$$

Variable	Units	SC	GR	Rule	Description	Ref
$\widehat{I\_M}(m)$	{}	G	M		Estimate of Set of Trading Intervals in Trading Month m	I
I_M(m)	{}	G	M		Set of Trading Intervals in Trading Month m	I

6.2.2.2 Load Following Ancillary Services

$$\widehat{LFPDNQ}\_F\_I(f,i) = \begin{cases} LFPDNQ\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } LFPQNULLFlag\_G\_D(i) = 0 \\ LFPDNEQ\_F\_I(f,i) & \text{otherwise} \end{cases} \tag{487}$$

$$\widehat{LFPUPQ}\_F\_I(f,i) = \begin{cases} LFPUPQ\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } LFPQNULLFlag\_G\_D(i) = 0 \\ LFPUPEQ\_F\_I(f,i) & \text{otherwise} \end{cases} \tag{488}$$

Variable	Units	SC	GR	Rule	Description	Ref
ESTIMATIONFlag_G_M(m)	Flag	G	M		Flag that is 1 when estimation is permitted for Trading Month m, and 0 otherwise	I
$\widehat{LFPDNQ}\_F\_I(f,i)$	MW	F	I	11	Estimate of Ex-post Downwards LFAS Enablement quantity for Facility f in Trading Interval i	(487)
$\widehat{LFPUPQ}\_F\_I(f,i)$	MW	F	I	11	Estimate of Ex-post Upwards LFAS Enablement quantity for Facility f in Trading Interval i	(488)
LFPDNQ_F_I(f, i)	MW	F	I	11	Ex-post Downwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFPUPQ_F_I(f, i)	MW	F	I	11	Ex-post Upwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFPDNEQ_F_I(f, i)	MW	F	I	11	Downwards LFAS Enablement quantity for Facility f in Trading Interval i	I

Variable	Units	SC	GR	Rule	Description	Ref
LFPUPEQ_F_I(f, i)	MW	F	I	11	Upwards LFAS Enablement quantity for Facility f in Trading Interval i	I
LFPQNULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when Ex-post Upwards LFAS Enablement quantities and Ex-post Downwards LFAS Enablement quantities are unavailable for Trading Day d, and 0 otherwise	I

6.2.2.3 Contracted Ancillary Services

$$\widehat{CASD\_P\_M}(p,m) = \begin{cases} CASD\_P\_M(p,m) & \text{if } ESTIMATIONFlag\_G\_M(m) = 0 \\ & \text{or } CASPNULLFlag\_G\_M(m) = 0 \\ CASD\_P\_M(p,m-1) & \text{elseif } CASPNULLFlag\_G\_M(m-1) = 0 \\ CASD\_P\_M(p,m-2) & \text{elseif } CASPNULLFlag\_G\_M(m-2) = 0 \\ \quad\vdots & \quad\vdots \\ CASD\_P\_M(p,m-CASoffset\_G\_M(m)) & \text{elseif } CASPNULLFlag\_G\_M(m-CASoffset\_G\_M(m)) = 0 \\ 0 & \text{otherwise} \end{cases} \tag{489}$$

$$\widehat{CASL\_P\_M}(p,m) = \begin{cases} CASL\_P\_M(p,m) & \text{if } ESTIMATIONFlag\_G\_M(m) = 0 \\ & \text{or } CASPNULLFlag\_G\_M(m) = 0 \\ CASL\_P\_M(p,m-1) & \text{elseif } CASPNULLFlag\_G\_M(m-1) = 0 \\ CASL\_P\_M(p,m-2) & \text{elseif } CASPNULLFlag\_G\_M(m-2) = 0 \\ \quad\vdots & \quad\vdots \\ CASL\_P\_M(p,m-CASoffset\_G\_M(m)) & \text{elseif } CASPNULLFlag\_G\_M(m-CASoffset\_G\_M(m)) = 0 \\ 0 & \text{otherwise} \end{cases} \tag{490}$$

$$\widehat{CASR\_P\_M}(p,m) = \begin{cases} CASR\_P\_M(p,m) & \text{if } ESTIMATIONFlag\_G\_M(m) = 0 \\ & \text{or } CASPNULLFlag\_G\_M(m) = 0 \\ CASR\_P\_M(p,m-1) & \text{elseif } CASPNULLFlag\_G\_M(m-1) = 0 \\ CASR\_P\_M(p,m-2) & \text{elseif } CASPNULLFlag\_G\_M(m-2) = 0 \\ \quad\vdots & \quad\vdots \\ CASR\_P\_M(p,m-CASoffset\_G\_M(m)) & \text{elseif } CASPNULLFlag\_G\_M(m-CASoffset\_G\_M(m)) = 0 \\ 0 & \text{otherwise} \end{cases} \tag{491}$$

$$\widehat{CASSRQmwh\_P\_I}(p,i) \tag{492}$$
$$= \begin{cases} CASSRQmwh\_P\_I(p,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } CASQNULLFlag\_G\_M(i) = 0 \\ CASSRQmwh\_P\_I(p,i-1\times 48) & \text{elseif } CASQNULLFlag\_G\_M(i-1\times 48) = 0 \\ CASSRQmwh\_P\_I(p,i-2\times 48) & \text{elseif } CASQNULLFlag\_G\_M(i-2\times 48) = 0 \\ \quad\vdots & \quad\vdots \\ CASSRQmwh\_P\_I(p,i-CASoffset\_G\_M(m)\times 30\times 48) & \text{elseif } 0 = \\ & CASQNULLFlag\_G\_M(i-CASoffset\_G\_M(m)\times 30\times 48) \\ 0 & \text{otherwise} \end{cases}$$

$$\widehat{CASSR\_P\_M}(p,m) \tag{493}$$
$$= \begin{cases} CASSR\_P\_M(p,m) & \text{if } ESTIMATIONFlag\_G\_M(m) = 0 \\ & \text{or } CASPNULLFlag\_G\_M(m) = 0 \\ & \text{or } p \notin SR\_M(m) \\ \dfrac{TITM\_G\_M(m)}{estTITM\_G\_M(m)}\times & \text{otherwise} \\ \displaystyle\sum_{i\in\widehat{I\_M}(m)} 0.5h\times MV\_G\_I(i)\times max(0,\widehat{BP\_G\_I}(i))\times \frac{\widehat{CASSRQmwh\_P\_I}(p,i)}{0.5h} & \end{cases}$$

$$estTITM\_G\_M(m) = \left|\widehat{I\_M}(m)\right| \tag{494}$$

Variable	Units	SC	GR	Rule	Description	Ref
ESTIMATIONFlag_G_M(m)	Flag	G	M		Flag that is 1 when estimation is permitted for Trading Month m, and 0 otherwise	I
$\widehat{CASD\_P\_M}(p,m)$	$	P	M	9.9.3(e)	Estimate of Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Month m	(489)
CASD_P_M(p, m)	$	P	M	9.9.3(e)	Payment for the provision of contracted Dispatch Support Services for Rule Participant p for Trading Month m	I
CASPNULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Ancillary Service Contract settlement amounts are unavailable for Trading Month m, and 0 otherwise	I
$\widehat{CASL\_P\_M}(p,m)$	$	P	M	9.9.3(c)	Estimate of Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Month m	(490)
CASL_P_M(p, m)	$	P	M	9.9.3(c)	Payment for the provision of contracted Load Rejection Services for Rule Participant p for Trading Month m	I
$\widehat{CASR\_P\_M}(p,m)$	$	P	M	9.9.3(d)	Estimate of Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Month m	(491)

Variable	Units	SC	GR	Rule	Description	Ref
CASR_P_M(p, m)	$	P	M	9.9.3(d)	Payment for the provision of contracted System Restart Services for Rule Participant p for Trading Month m	I
$\widehat{CASSRQmwh\_P\_I}(p,i)$	MWh	P	I		Estimate of MWh quantity of Contracted Spinning Reserve Service for Rule Participant p in Trading Interval i	(492)
CASSRQmwh_P_I(p, i)	MWh	P	I		MWh quantity of Contracted Spinning Reserve Service for Rule Participant p in Trading Interval i	I
CASQNULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Ancillary Service Contract quantities are unavailable for Trading Month m, and 0 otherwise	I
$\widehat{CASSR\_P\_M}(p,m)$	$	P	M	9.9.3(a)	Estimate of Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Month m	(493)
CASSR_P_M(p, m)	$	P	M	9.9.3(a)	Payment for the provision of contracted Spinning Reserve Services for Rule Participant p for Trading Month m	I
$\widehat{BP\_G\_I}(i)$	$/MWh	G	I	7A.3.10	Estimate of Balancing Price for Trading Interval i	(502)
TITM_G_M(m)		G	M		Number of Trading Intervals in Trading Month m	(203)
estTITM_G_M(m)		G	M		Number of Trading Intervals in the set $\widehat{I\_M}(m)$ for Trading Month m	(494)
MV_G_I(i)		G	I		Margin value applicable to Trading Interval i	(223)
CASoffset_G_M(m)		G	M		Parameter set by AEMO, required to implement the estimation of contracted Ancillary Services, applicable in Trading Month m	I
SR_M(m)	{}	G	M		Set of participants to estimate Spinning Reserve Service quantities in Trading Month m	(18)
$\widehat{I\_M}(m)$	{}	G	M		Estimate of Set of Trading Intervals in Trading Month m	(486)

6.2.2.4 Ex-post Outages

$$\widehat{EXPCO\_F\_I}(f,i) = \begin{cases} EXPCO\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EXPONULLFlag\_G\_D(i) = 0 \\ EXACO\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (495)$$

$$\widehat{EXPFO\_F\_I}(f,i) = \begin{cases} EXPFO\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EXPONULLFlag\_G\_D(i) = 0 \\ EXAFO\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (496)$$

$$\widehat{EXPPO\_F\_I}(f,i) = \begin{cases} EXPPO\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EXPONULLFlag\_G\_D(i) = 0 \\ EXAPO\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (497)$$

$$\widehat{IMLCOFlag\_F\_I}(f,i) = \begin{cases} IMLCOFlag\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EXPONULLFlag\_G\_D(i) = 0 \\ IMLCOEXAFlag\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (498)$$

$$\widehat{IMLFOFlag\_F\_I}(f,i) = \begin{cases} IMLFOFlag\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EXPONULLFlag\_G\_D(i) = 0 \\ IMLFOEXAFlag\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (499)$$

$$\widehat{IMLPOFlag\_F\_I}(f,i) = \begin{cases} IMLPOFlag\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EXPONULLFlag\_G\_D(i) = 0 \\ IMLPOEXAFlag\_F\_I(f,i) & \text{otherwise} \end{cases} \quad (500)$$

Variable	Units	SC	GR	Rule	Description	Ref
ESTIMATIONFlag_G_M(m)	Flag	G	M		Flag that is 1 when estimation is permitted, and 0 otherwise	I
$\widehat{EXPCO\_F\_I}(f,i)$	MW	F	I	7.13.1A(b)	Estimate of Ex-post Consequential Outage for Facility f in Trading Interval i	(495)
EXPCO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Consequential Outage for Facility f in Trading Interval i	I
EXACO_F_I(f, i)	MW	F	I		Ex-ante Consequential Outage for Facility f in Trading Interval i	I
EXPONULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when ex-post Outages are unavailable for Trading Day d, and 0 otherwise	I
$\widehat{EXPFO\_F\_I}(f,i)$	MW	F	I	7.13.1A(b)	Estimate of Ex-post Forced Outage for Facility f in Trading Interval i	(496)
EXPFO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Forced Outage for Facility f in Trading Interval i	I
EXAFO_F_I(f, i)	MW	F	I		Ex-ante Forced Outage for Facility f in Trading Interval i	I
$\widehat{EXPPO\_F\_I}(f,i)$	MW	F	I	7.13.1A(b)	Estimate of Ex-post Planned Outage for Facility f in Trading Interval i	(497)
EXPPO_F_I(f, i)	MW	F	I	7.13.1A(b)	Ex-post Planned Outage for Facility f in Trading Interval i	I
EXAPO_F_I(f, i)	MW	F	I		Ex-ante Planned Outage for Facility f in Trading Interval i	I
$\widehat{IMLPOFlag\_F\_I}(f,i)$	Flag	F	I	7.13.1A(b)	Estimate of Flag indicating if the embedded generator associated with Facility f is on a Planned Outage in Trading Interval i	(500)
$\widehat{IMLFOFlag\_F\_I}(f,i)$	Flag	F	I	7.13.1A(b)	Estimate of Flag indicating if the embedded generator associated with Facility f is on a Forced Outage in Trading Interval i	(499)
$\widehat{IMLCOFlag\_F\_I}(f,i)$	Flag	F	I	7.13.1A(b)	Estimate of Flag indicating if the embedded generator associated with Facility f is on a Consequential Outage in Trading Interval i	(498)

Variable	Units	SC	GR	Rule	Description	Ref
IMLPOFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Planned Outage in Trading Interval i	I
IMLFOFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Forced Outage in Trading Interval i	I
IMLCOFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Consequential Outage in Trading Interval i	I
IMLPOEXAFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Planned Outage (based on ex-ante Outages) in Trading Interval i	I
IMLFOEXAFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Forced Outage (based on ex-ante Outages) in Trading Interval i	I
IMLCOEXAFlag_F_I(f, i)	Flag	F	I	7.13.1A(b)	Flag indicating if the embedded generator associated with Facility f is on a Consequential Outage (based on ex-ante Outages) in Trading Interval i	I

6.2.2.5 Other Inputs

$$\widehat{MAXTEMP\_F\_D}(f,d) = \begin{cases} MAXTEMP\_F\_D(f,d) & \text{if } ESTIMATIONFlag\_G\_M(d) = 0 \\ & \text{or } TEMPNULLFlag\_F\_D(f,d) = 0 \\ 25°C & \text{otherwise} \end{cases} \quad (501)$$

$$\widehat{BP\_G\_I}(i) = \begin{cases} BP\_G\_I(i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } BPNULLFlag\_G\_D(i) = 0 \\ BPprov\_G\_I(i) & \text{else if } BPprovNULLFlag\_G\_D(i) = 0 \\ BPfcst\_G\_I(i) & \text{otherwise} \end{cases} \quad (502)$$

$$\widehat{IRCR0\_P\_M}(p,m) = \begin{cases} IRCR0\_P\_M(p,m) & \text{if } ESTIMATIONFlag\_G\_M(m) = 0 \\ & \text{or } IRCR0NULLFlag\_G\_M(m) = 0 \\ IRCRindicative\_P\_M(p,m) & \text{otherwise} \end{cases} \quad (503)$$

$$\widehat{MAXTES\_F\_I}(f,i) = \begin{cases} MAXTES\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } TESNULLFlag\_G\_D(d) = 0 \\ MAXTESprov\_F\_I(f,i) & \text{else if } TESprovNULLFlag\_G\_D(d) = 0 \\ 999999 & \text{otherwise} \end{cases} \quad (504)$$

$$\widehat{MINTES\_F\_I}(f,i) = \begin{cases} MINTES\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } TESNULLFlag\_G\_D(d) = 0 \\ MINTESprov\_F\_I(f,i) & \text{else if } TESprovNULLFlag\_G\_D(d) = 0 \\ 0 & \text{otherwise} \end{cases} \quad (505)$$

$$\widehat{SCADAEOI\_F\_I}(f,i) = \begin{cases} SCADAEOI\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } EOINULLFlag\_G\_D(i) = 0 \\ SCADAEOIprov\_F\_I(f,i) & \text{else if } EOIprovNULLFlag\_G\_I(i) = 0 \\ \sum_{g \in BALPF(i)} \dfrac{\widehat{SOMS\_F\_I}(g,i)}{0.5h} & \text{else if } EOIprovNULLFlag\_G\_I(i) = 1 \\ & \text{and } f \in PORTFOLIO(i) \\ \dfrac{\widehat{SOMS\_F\_I}(f,i)}{0.5h} & \text{otherwise} \end{cases} \quad (506)$$

$$\widehat{SCADA\_F\_I}(f,i) = \begin{cases} SCADA\_F\_I(f,i) & \text{if } ESTIMATIONFlag\_G\_M(i) = 0 \\ & \text{or } SCADANULLFlag\_G\_D(i) = 0 \\ 0.5h \times \widehat{SCADAEOI\_F\_I}(f,i) & \text{otherwise} \end{cases} \quad (507)$$

$\widehat{REGTITM\_F\_M}(f,m)$ calculated @ d

$$= \begin{cases} REGTITM\_F\_M(f,m) & \text{if } d \text{ is after Trading Month } m \\ \text{Number of Trading Intervals for which Facility f is registered in Trading Month } m \text{ that are on or before } d & \text{otherwise} \end{cases} \quad (508)$$

Variable	Units	SC	GR	Rule	Description	Ref
ESTIMATIONFlag_G_M	Flag	G	M		Flag that is 1 when estimation is permitted, and 0 otherwise	I
$\widehat{MAXTEMP\_F\_D}(f,d)$	°C	F	D	2.30B.3(b)ii	Estimate of Daily maximum temperature associated with Facility f for Trading Day d	(501)
MAXTEMP_F_D(f, d)	°C	F	D	2.30B.3(b)ii	Daily maximum temperature associated with Facility f for Trading Day d	I
TEMPNULLFlag_F_D(f, d)	Flag	F	D		Flag that is 1 when daily maximum temperatures are unavailable for Facility f for Trading Day d, and 0 otherwise	I
$\widehat{BP\_G\_I}(i)$	$/MWh	G	I	7A.3.10	Estimate of Balancing Price for Trading Interval i	(502)
BP_G_I(i)	$/MWh	G	I	7A.3.10	Balancing Price for Trading Interval i	I
BPprov_G_I(i)	$/MWh	G	I		Provisional Balancing Price for Trading Interval i	I
BPfcst_G_I(i)	$/MWh	G	I		Forecast Balancing Price (determined by using the Forecast BMO and Relevant Dispatch Quantity) in Trading Interval i	I
BPNULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when Balancing Prices are unavailable for Trading Day d, and 0 otherwise	I
BPprovNULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when Provisional Balancing Prices are unavailable for Trading Day d, and 0 otherwise	I
$\widehat{IRCR0\_P\_M}(p,m)$	MW	P	M		Estimate of Individual Reserve Capacity Requirement (prior to any adjustments) for Market Participant p for Trading Month m	(503)

Variable	Units	SC	GR	Rule	Description	Ref
IRCR0_P_M(p, m)	MW	P	M	4.28.7	Individual Reserve Capacity Requirement (prior to any adjustments) for Market Participant p for Trading Month m	I
IRCRindicative_P_M(p, m)	MW	P	M		Indicative Individual Reserve Capacity Requirement for Market Participant p in Trading Month m	I
IRCR0NULLFlag_G_M(m)	Flag	G	M		Flag that is 1 when Individual Reserve Capacity Requirements are unavailable for Trading Month m, and 0 otherwise	I
$\widehat{MAXTES\_F\_I}(f,i)$	MWh	F	I		Estimate of Maximum Theoretical Energy Schedule for Facility f in Trading Interval i	(504)
MAXTES_F_I(f, i)	MWh	F	I		Maximum Theoretical Energy Schedule for Facility f in Trading Interval i	I
MAXTESprov_F_I(f, i)	MWh	F	I		Provisional Maximum Theoretical Energy Schedule for Facility f in Trading Interval i	I
TESNULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when Maximum Theoretical Energy Schedules and Minimum Theoretical Schedules are unavailable for Trading Day d, and 0 otherwise	I
TESprovNULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when provisional Maximum Theoretical Energy Schedules and provisional Minimum Theoretical Energy Schedules are unavailable for Trading Day d, and 0 otherwise	I
$\widehat{MINTES\_F\_I}(f,i)$	MWh	F	I		Estimate of Minimum Theoretical Energy Schedule for Facility f in Trading Interval i	(505)
MINTES_F_I(f, i)	MWh	F	I		Minimum Theoretical Energy Schedule for Facility f in Trading Interval i	I
MINTESprov_F_I(f, i)	MWh	F	I		Provisional Minimum Theoretical Energy Schedule for Facility f in Trading Interval i	I
MAXTES_T_I(t, i)	MWh	T	I		Maximum energy which could have been dispatched from tranche t in Trading Interval i	(146)
MINTES_T_I(t, i)	MWh	T	I		Minimum energy energy which had to be dispatched from tranche t in Trading Interval i	(147)
MAXTESAC_T_I(t, i)	MWh	T	I		Maximum energy which could have been dispatched (accounting for Available Capacity) from tranche t in Trading Interval i	(158)
MINTESAC_T_I(t, i)	MWh	T	I		Minimum energy energy which had to be dispatched (accounting for Available Capacity) from tranche t in Trading Interval i	(159)

Variable	Units	SC	GR	Rule	Description	Ref
OPLA_T_I(t, i)	$/MWh	T	I		Loss Factor Adjusted (offer) Price for tranche t in Trading Interval i	(185)
DVEST_F_I(f, i)	MWh	F	I	7.13.1(eF)	The maximum sent out energy Facility f would have generated in Trading Interval i, had a Dispatch Instruction not been issued	I
$\widehat{SCADAEOI}\_F\_I(f,i)$	MW	F	I		Estimate of The end of interval output of Facility f for Trading Interval i	(506)
SCADAEOI_F_I(f, i)	MW	F	I		EOI Quantity of Facility f for Trading Interval i	I
SCADAEOIprov_F_I(f, i)	MW	F	I		Provisional EOI Quantity of Facility f for Trading Interval i	I
$\widehat{SOMS}\_F\_I(f,i)$	MWh	F	I		Estimate of Sent Out Metered Schedule for Facility f in Trading Interval i	(483)
EOINULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when EOI Quantities are unavailable for Trading Day d, and 0 otherwise	I
EOIprovNULLFlag_G_I(i)	Flag	G	I		Flag that is 1 when provisional EOI Quantities are unavailable for Trading Day d, and 0 otherwise	I
$\widehat{SCADA}\_F\_I(f,i)$	MWh	F	I		Estimate of Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	(507)
SCADA_F_I(f, i)	MWh	F	I		Net generation measured by SCADA for Facility f in Trading Interval i, non-loss adjusted	I
SCADANULLFlag_G_D(d)	Flag	G	D		Flag that is 1 when net generation quantities measured by SCADA are unavailable for Trading Day d, and 0 otherwise	I
$\widehat{REGTITM}\_F\_M(f,m)$		F	M		Estimate of number of Trading Intervals for which Facility f is registered in Trading Month m	I
REGTITM_F_M(f, m)		F	M		Number of Trading Intervals for which Facility f is registered in Trading Month m	I
BALPF(d)	{}	G	D	11	Set of Facilities in the Balancing Portfolio in Trading Day d	(37)
PORTFOLIO(d)	{}	G	D	11	Set containing the Balancing Portfolio	(46)
BPQP(i)	{}	G	I	11	Set of Balancing Price-Quantity Pairs in Trading Interval i	I
NSG(d)	{}	G	D	11	Set of Non-Scheduled Generators in Trading Day d	(22)
BALF(d)	{}	G	D	11	Set of Balancing Facilities in Trading Day d	(38)

6.3 Trading Margin

$$TM\_P\_D(p,d) = TL\_P\_D(p,d) - OA\_P\_D(p,d) \tag{509}$$

$$TL\_P\_D(p,d) = PF\_G\_D(d) \times CREDSUP\_P\_D(p,d) \tag{510}$$

$$PF\_G\_D(d) = 0.87 \tag{511}$$

$$OA\_P\_D(p,d) = CEE\_P\_D(p,d) + INP\_P\_D(p,d) - PP\_P\_D(p,d) \tag{512}$$

$$CEE\_P\_D(p,d) = \sum_{j \in EXPDAYSNSTEM(d)} EENSTEM\_P\_D(p,j) + \sum_{j \in EXPDAYSSTEM(d)} EESTEM\_P\_D(p,j) \tag{513}$$

$$EENSTEM\_P\_D(p,d) = -(TOTNSTEM\_P\_D(p,d) - TOTNSTEMprev\_P\_D(p,d)) \tag{514}$$

$$EESTEM\_P\_D(p,d) = -(TOTSTEM\_P\_D(p,d) - TOTSTEMprev\_P\_D(p,d)) \tag{515}$$

Variable	Units	SC	GR	Rule	Description	Ref
TM_P_D(p, d)	$	P	D	2.41.1	Trading Margin for Market Participant p for Trading Day d	(509)
TL_P_D(p, d)	$	P	D	2.39.1	Trading Limit for Market Participant p for Trading Day d	(510)
CREDSUP_P_D(p, d)	$	P	D	2.38	Credit Support held by AEMO on behalf of Market Participant p on Trading Day d	I
PF_G_D(d)		G	D	2.39.2	Prudential factor on Trading Day d	(511)
OA_P_D(p, d)	$	P	D	2.40.1	Outstanding Amount for Market Participant p on Trading Day d	(512)
INP_P_D(p, d)	$	P	D		Amount of money a Rule Participant p owes for which a Settlement Statement has been issued, but payment has not been made, as calculated on Trading Day d	I
PP_P_D(p, d)	$	P	D	2.40.1(c)	Prepayments held by AEMO on behalf of Market Participant p on Trading Day d	I
CEE_P_D(p, d)	$	P	D		Cumulative Estimated exposure for Market Participant p as calculated on Trading Day d	(513)
EENSTEM_P_D(p, d)	$	P	D		Estimated Non-STEM exposure for Market Participant p relating to Trading Day d	(514)
EESTEM_P_D(p, d)	$	P	D		Estimated STEM exposure for Market Participant p relating to Trading Day d	(515)
TOTNSTEMprev_P_D(p, d)	$	P	D		Total Non-STEM Settlement Statement amount (including GST and interest) for Market Participant p in Trading Day d from most recently published Non-STEM Settlement Statement for Trading Day d	I
TOTNSTEM_P_D(p, d)	$	P	D		Total settlement amount for NSTEM (including GST and interest) for Market Participant p in Trading Day d	(104)

Variable	Units	SC	GR	Rule	Description	Ref
TOTSTEMprev_P_D(p, d)	$	P	D		Total STEM Settlement Statement amount (including GST and interest) for Market Participant p in Trading Day d from most recently published STEM Settlement Statement for Trading Day d	I
TOTSTEM_P_D(p, d)	$	P	D		Total settlement amount for STEM (including GST and interest) for Market Participant p in Trading Day d	(103)
EXPDAYSNSTEM(d)	{}	G	D		Set of Trading Days that have not yet had a Non-STEM Settlement Statement issued, up to and including Trading Day d-1	I
EXPDAYSSTEM(d)	{}	G	D		Set of Trading Days that have not yet had a STEM Settlement Statement issued, up to and including Trading Day d-1	I