Stakeholder (Evolugen by Brookfield Renewable) Feedback and IESO Response

During the September 21, 2023 engagement webinar, the IESO presented the updates to the IESO Charge Types and Equations that will be used in the IESO settlement process for IESO-administrated markets and received additional feedback from:

Evolugen by Brookfield Renewable

Related presentation materials and recorded sessions have been posted on the IESO stakeholder engagement webpage. If interested, please visit the webpage to reference the feedback submissions directly as the below uses excerpts and/or a summary of the stakeholder feedback for the purposes of providing an IESO response.
Please contact IESO Engagement at engagement@ieso.ca if you have any questions.

Market Renewal Program: IESO Charge Types and Equations – Stakeholder Feedback Responses September 21, 2023

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.3.5	Day-ahead market balancing credit settlement amount_boundary entity resource (reviewed as of 21st september 2023)	DAM_BCi k,h	RT_LMP (BCOR)	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h' r - class r reserve	DAM - BC - RT_LMPi,t r,h =	Please provide definition for RT_LMPi,t r,h	The variable $RT\_LMP^{i,t}_h$ is defined in MR Ch.9 Appendix 9.2. Please note that the variable provided in your 'Comments/Questions' includes a typo.
3.3.5	Day-ahead market balancing credit settlement amount_boundary entity resource (reviewed as of 21st september 2023)	DAM_BCi k,h	DAM_PROR (BCOR)	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h'	DAM - BC - DAM_PRORi,t h =	Please provide definition for the component DAM_PRORi,t h	The variable $DAM\_PROR^{i}_{r,h}$ is defined in MR Ch.9 Appendix 9.2. Please note that the variable provided in your 'Comments/Questions' includes a typo.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.3.5	Day-ahead market balancing credit settlement amount_boundary entity resource	DAM_BCi k,h	DAM_PROR (BCOR)	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h'	DAM - BC - DAM_PRORi,t h =	Please provide definition for the component DAM_PRORi,t h	The variable $DAM\_PROR^i_{r,h}$ is defined in MR Ch.9 Appendix 9.2. Please note that the variable provided in your 'Comments/Questions' includes a typo.
3.4.10	Day-ahead market make-whole payment_dispatchable loads	DAM_MWPm k,h	DAM_COMP 1	m - delivery points h - each settlement hour in a trading day k - market participant	DAM - MWP - COMP1 = OP=	Can you please provide an example with numbers for calculating Operating profit (OP)	The operating profit function is defined in MR Ch.9 Appendix 9.2 s.10. Please refer to the December 14, 2022 Engagement Webinar presentation for numerical example.
3.4.10	Day-ahead market make-whole payment_dispatchable loads	DAM_MWPm k,h	DAM_HDR_ BL (COMP1)	m - delivery points h - each settlement hour in a trading day k - market participant	DAM - MWP - DAM_HDR_BL m k,h =	Please provide definition fro the component DAM_HDR_BLm k,h	The variable $DAM\_HDR\_BL^m_{k,h}$ is defined in MR Ch.9 Appendix 9.2.
3.4.13.3	Day-ahead market make-whole payment_hydroelectric generation resources	DAM_MWPm k,h	FROPm k,h (COMP1)	m - delivery points h - each settlement hour in a trading day k - market participant	DAM - MWP - FROPm k,h = Formula provided in 3.4.13.2	Please provide definition and meaning of FROP	FROP is the forbidden region operating profit and is defined in MR Ch.11 Definitions.
3.4.15	Day-ahead market make-whole payment_dispatchable generation resources_pseudo-unit	DAM_MWPs k,h	DAM_COMP 1	s - steam turbine delivery point h - each settlement hour in a trading day k - market participant	DAM - MWP - DAM_COMP1 = Formula provided	Steam turbines uses "s" as an variable and also "s" is used as selling market participant, Example 3.1.2 and 3.4.15, Is it possible to change the acronym of one of them as it is confusing	Variables, including subscripts and superscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise specified. In the example provided, they are defined within the applicable settlement amount in MR Ch.9. The IESO will take this away and consider opportunities to clarify.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_ELC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_ELCm,t k,h =	Please provide definition and meaning of RT_ELCm,t k,h	MR Ch.9 s.3.5.1.2 defines ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_OLC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_OLCm,t k,h =	Please provide definition and meaning of RT_OLCm,t k,	MR Ch.9 s.3.5.1.2 defines ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_ELOC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_ELOCm,t k,h =	Please provide definition and meaning of RT_ELOCm,t k,h	MR Ch.9 s.3.5.1.2 defines ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_OLOC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_OLOCm,t k,h =	Please provide definition and meaning of RT_OLOCm,t k,h	MR Ch.9 s.3.5.1.2 defines ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	DAM_QSI (RT_ELC)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - DAM_QSIm,t k,h =	Please provide definition and meaning of DAM_QSIm,t k,h	All variables, superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise specified within the applicable settlement amount in MR Ch.9. Please note that the variable provided in your 'Comments/Questions' includes a typo.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_FROP_LC (RT_ELC)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_FROP_LCm ,t k,h =	Please provide definition and meaning of RT_FROP_LCm,t k,h	MR Ch.9 s.3.5.1.2 defines ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	DAM_QSOR (RT_OLC)	m - delivery points h - each settlement hour in a trading day k - market participant r - class r reserve	RT - MWP - DAM_QSORm,t r,k,h =	Please provide definition and meaning of DAM_QSORm,t r,k,h	All variables, superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise specified within the applicable settlement amount in MR Ch.9. Please note that the variable provided in your 'Comments/Questions' includes a typo.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_OR_EOP (RT_OLC)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h' r - class r reserve	RT - MWP - RT_OR_EOPm, t r,k,h =	Please provide definition and meaning of RT_OR_EOPm,t r,k,h	All variables, superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR Ch.9. Please note that the variable provided in your 'Comments/Questions' includes a typo.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	RT_MWPm k,h	RT_FROP_LOC (RT_ELOC)	m - delivery points h - each settlement hour in a trading day k - market	RT - MWP - RT_ELCm,t k,h =	Please provide definition and meaning of RT_ELCm,t k,h	MR Ch.9 s.3.5.1.2 defines ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
				participant t - each metering interval in settlement hour 'h'			
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	$RT\_MWP_{m\ k,h}$	FR_LL (RT_FROP_L C)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h' f - forbidden region set 'f'	$RT\text{-}MWP\text{-}FR\_LL_{m,t,f\ k,h}=$	Please provide more explanation on $FR\_LL_{m,t,f\ k,h}$	FR_LL is the forbidden region lower limit submitted by the market participant as part of their daily dispatch data. Refer to (1) Market Manual 1.5: Market Registration Procedures and (2) August 25, 2022 Engagement Webinar presentation for more information.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	$RT\_MWP_{m\ k,h}$	FR_UL (RT_FROP_L OC)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h' f - forbidden region set 'f'	$RT\text{-}MWP\text{-}FR\_UL_{m,t,f\ k,h}=$	Please provide more explanation on $FR\_UL_{m,t,f\ k,h}$	FR_UL is the forbidden region upper limit submitted by the market participant as part of their daily dispatch data. Refer to (1) Market Manual 1.5: Market Registration Procedures and (2) August 25, 2022 Engagement Webinar presentation for more information.
3.5.6	Real time make-whole payment_dispatchable generation resources_not associated with pseudo-unit	$RT\_MWP_{m\ k,h}$	RT_QSI (RT_FROP_L OC)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h' f - forbidden region set 'f'	$RT\text{-}MWP\text{-}RT\_QSI_{m,t,f\ k,h}=$	Please provide definition and meaning of $RT\_QSI_{m,t,f\ k,}$	The variable $RT\_QSI^{m,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'f' is defined in the 'Where' clause following the equation.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.7	Real time make-whole settlement amount_dispatchable load	RT_MWPm k,h	RT_ELC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_ELCm,t k,h =	The formula for RT_ELCm,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELCm,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.7	Real time make-whole settlement amount_dispatchable load	RT_MWPm k,h	RT_OLC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_OLCm,t k,h =	The formula for RT_OLCm,t k,h has been provided, however definition of this is missing. What is the definition of RT_OLCm,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.7	Real time make-whole settlement amount_dispatchable load	RT_MWPm k,h	RT_ELOC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_ELOCm,t k,h =	The formula for RT_ELOCm,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELOCm,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.7	Real time make-whole settlement amount_dispatchable load	RT_MWPm k,h	RT_OLOC	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_OLOCm,t k,h =	The formula for RT_OLOCm,t k,h has been provided, however definition of this is missing. What is the definition of RT_OLOCm,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.8.1	Real time make-whole settlement amount_boundary entity resource	RT_MWPi k,h	RT_ELC	i - intertie metering points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_ELCi,t k,h =	The formula for RT_ELCi,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELCi,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.8.1	Real time make-whole settlement amount_boundary entity resource	RT_MWPi k,h	RT_OLC	i - intertie metering points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - MWP - RT_OLCi,t k,h =	The formula for RT_OLCi,t k,h has been provided, however definition of this is missing. What is the definition of RT_OLCi,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.8.2	Real time make-whole settlement amount_boundary entity resource	RT_MWPi k,h (export)	PD_LMP (RT_ELC)	i - intertie metering points h - each settlement hour in a trading day	RT - MWP - PD_LMPi h =	Please provide more explanation on PD_LMPi h	Thank you for identifying this. The variable will be added to MR Ch.9 Appendix 9.2 as part of a future release.
3.5.9	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPc k,h	RT_ELC	c - combustion turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_ELCc,t k,h =	The formula for RT_ELCc,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELCc,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.

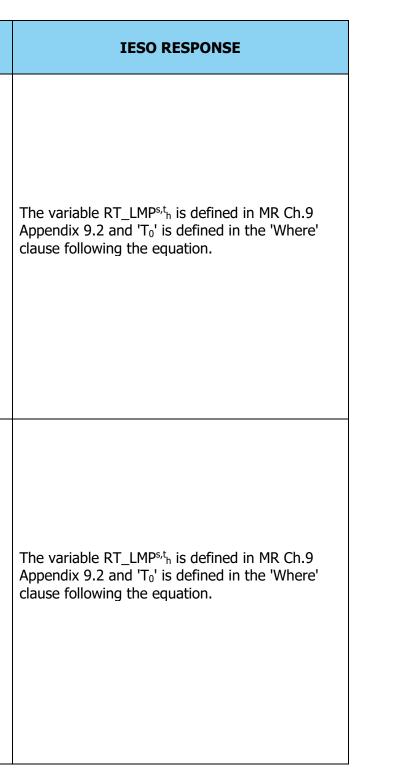| MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.9	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPc k,h	RT_OLC	c - combustion turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_OLCc,t k,h =	The formula for RT_OLCc,t k,h has been provided, however definition of this is missing. What is the definition of RT_OLCc,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.9	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPc k,h	RT_ELOC	c - combustion turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_ELOCc,t k,h =	The formula for RT_ELOCc,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELOCc,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.9	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPc k,h	RT_OLOC	c - combustion turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_OLOCc,t k,h =	The formula for RT_OLOCc,t k,h has been provided, however definition of this is missing. What is the definition of RT_OLOCc,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_ELC	s - steam turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h'	RT - MWP - RT_ELCs,t k,h =	The formula for RT_ELCs,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELCs,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.

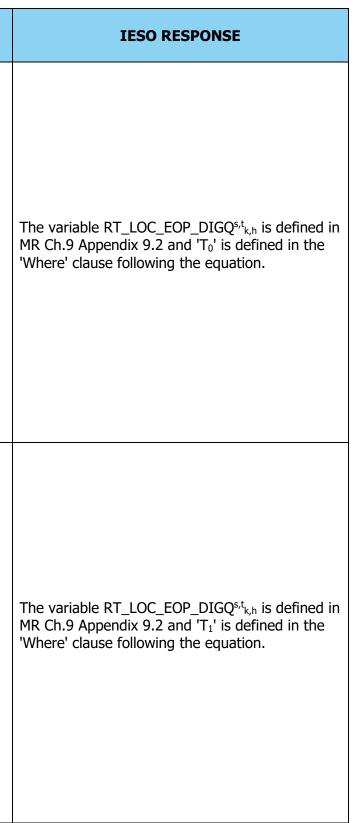| MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
				k - market participant			
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_ELOC	s - steam turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_ELOCs,t k,h =	The formula for RT_ELOCs,t k,h has been provided, however definition of this is missing. What is the definition of RT_ELOCs,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_OLC	s - steam turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_OLCs,t k,h =	The formula for RT_OLCs,t k,h has been provided, however definition of this is missing. What is the definition of RT_OLCs,t k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_OLOC	s - steam turbine delivery point h - each settlement hour in a trading day t - each metering interval in settlement hour 'h' k - market participant	RT - MWP - RT_OLOCs,k,h =	The formula for RT_OLOCs,k,h has been provided, however definition of this is missing. What is the definition of RT_OLOCs,k,h	MR Ch.9 s.3.5.1.2 define ELC, OLC, ELOC and OLOC, and this section further identifies where these variables are determined.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_LMP (RT_ELOC)	s - steam turbine delivery point h - each settlement hour in a trading day t0 - each metering interval in settlement hour 'h' when none of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point	RT - MWP - RT_LMPs,t0 h =	Please provide definition and formula for RT_LMPs,t0 h	The variable $RT\_LMP^{s,t}_h$ is defined in MR Ch.9 Appendix 9.2 and 'T_0' is defined in the 'Where' clause following the equation.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_LMP (RT_ELOC)	s - steam turbine delivery point h - each settlement hour in a trading day t1 - each metering interval in settlement hour 'h' when at least one of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point	RT - MWP - RT_LMPs,t1 h =	Please provide definition and formula for RT_LMPs,t0 h	The variable $RT\_LMP^{s,t}_h$ is defined in MR Ch.9 Appendix 9.2 and 'T_0' is defined in the 'Where' clause following the equation.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_LOC_EOP_DIGQ (RT_ELOC)	s - steam turbine delivery point h - each settlement hour in a trading day t0 - each metering interval in settlement hour 'h' when none of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point k - market participant	RT - MWP - RT_LOC_EOP_ DIGQs,t0 k,h =	Please provide definition and formula for RT_LOC_EOP_DIGQs,t0 k,h	The variable $RT\_LOC\_EOP\_DIGQ^{s,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'T_0' is defined in the 'Where' clause following the equation.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_LOC_EOP_DIGQ (RT_ELOC)	s - steam turbine delivery point h - each settlement hour in a trading day t1 - each metering interval in settlement hour 'h' when at least one of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point k - market participant	RT - MWP - RT_LOC_EOP_ DIGQs,t1 k,h =	Please provide definition and formula for RT_LOC_EOP_DIGQs,t1 k,h	The variable $RT\_LOC\_EOP\_DIGQ^{s,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'T_1' is defined in the 'Where' clause following the equation.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_DIPC (RT_ELOC)	s - steam turbine delivery point h - each settlement hour in a trading day t0 - each metering interval in settlement hour 'h' when none of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point k - market participant k - market participant	RT - MWP - RT_DIPCs,t0 k,h =	Please provide definition and formula for RT_LOC_EOP_DIGQs,t1 k,h	The variable $RT\_LOC\_EOP\_DIGQ^{s,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'T$_1$' is defined in the 'Where' clause following the equation.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	RT_MWPs k,h	RT_DIPC (RT_ELOC)	s - steam turbine delivery point h - each settlement hour in a trading day t1 - each metering interval in settlement hour 'h' when at least one of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point k - market participant	RT - MWP - RT_DIPCs,t1 k,h =	Please provide definition and formula for RT_DIPCs,t1 k,h	The variable $RT\_DIPC^{s,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'T$_1$' is defined in the 'Where' clause following the equation.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	**RT_MWPs k,h**	**RT_QSI_DIGQ (RT_ELOC)**	s - steam turbine delivery point h - each settlement hour in a trading day t0 - each metering interval in settlement hour 'h' when none of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point k - market participant k - market participant	RT - MWP - RT_QSI_DIGQs ,t0 k,h =	Please provide definition and formula for RT_QSI_DIGQs,t0 k,h	The variable $RT\_QSI\_DIGQ^{s,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'T_0' is defined in the 'Where' clause following the equation.
3.5.10	Real time make-payment_dispatchable generation resource_pseudo-unit	**RT_MWPs k,h**	**AQEI (RT_ELOC)**	s - steam turbine delivery point h - each settlement hour in a trading day t0 - each metering interval in settlement hour 'h' when none of the combustion turbines associated with steam turbine have a real-time schedule that is less than its respective minimum loading point k - market participant k - market participant	RT - MWP - AQEIs,t0 k,h =	Please provide definition for AQEIs,t0 k,h	The variable $AQEI^{s,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and 'T_0' is defined in the 'Where' clause following the equation.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
3.6.3	Real-Time Intertie Offer Guarantee	RT_IOGi k,h	Potential_IOG	h - each settlement hour in a trading day k - market participant i - intertie metering points	RT - MWP - Potential_IOGi k,h =	Please provide definition for Potential_IOGi k,h	The Potential_IOG is defined in Market Manual 5.5: IESO-Administered Markets Settlement Amounts s.2.18.1.
3.6.4	Real-Time Intertie Offer Guarantee	RT_IOGi k,h	IOG_RATE (IOG_Offset)	h - each settlement hour in a trading day k - market participant i - intertie metering points	RT - IOG - IOG_RATEi k,h =	Please provide definition and formula to calculate IOG_RATEi k,h	The formula to calculate $IOG\_RATE^i_{k,h}$ is in MR Ch.9 s.3.6.4. Please refer to (1) Detailed Design Document: Market Settlement and (2) Market Manual 5.5: IESO-Administered Markets Settlement Amounts for information
3.7.4	Real-time import failure charge	RT_IMFCi k,h	RT_IBP	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h'	RT - IMFC - RT_IBPi,t h =	Please provide definition for RT_IBPi,t h	The variable $RT\_IBP^{i,t}_h$ is defined in MR Ch.9 Appendix 9.2.
3.7.4	Real-time import failure charge	RT_IMFCi k,h	PB_IM	h - each settlement hour in a trading day t - each metering interval in settlement hour 'h'	RT - IMFC - BP_IMt h =	Please provide definition for BP_IMt h	The variable $PB\_IM^t_h$ is defined in MR Ch.9 Appendix 9.2. Refer to (1) Market Manual 5.5: IESO-Administered Markets Settlement Amounts Appendix C and (2) the IESO website for information.
3.7.4	Real-time import failure charge	RT_IMFCi k,h	RT_ISD	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h'	RT - IMFC - RT_ISDi,t k,h =	Please provide definition for RT_ISDi,t k,h	As part of recent design changes, the variable $RT\_ISD^{i,t}_{k,h}$ will be updated and defined as part of a future release.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
				k - market participant			
3.7.6	Real-time export failure charge	$RT\_EXFC_{i\,k,h}$	RT_IBP	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h'	RT - EXFC - $RT\_IBP_{i,t}$ h =	Please provide definition for $RT\_IBP_{i,t}$ h	The variable $RT\_IBP^{i,t}_{h}$ is defined in MR Ch.9 Appendix 9.2.
3.7.6	Real-time export failure charge	$RT\_EXFC_{i\,k,h}$	RT_ESD	h - each settlement hour in a trading day k - market participant i - intertie metering points t - each metering interval in settlement hour 'h'	RT - EXFC - $RT\_ESD_{i,t}$ k,h =	Please provide definition for $RT\_ESD_{i,t}$ k,h	As part of recent design changes, the variable $RT\_ESD^{i,t}_{k,h}$ will be updated and defined as part of a future release.
3.10.2	Hourly uplift settlement amount	$HUSA_{k,h}$ (collected or disbursed)	DAM_BCQ (RQ)	m - delivery points h - each settlement hour in a trading day k - market participant i - intertie metering points b - buying market participants	HUSA - $DAM\_BCQ_{m,i}$ k,b,h =	Please provide definition for $DAM\_BCQ_{m,i}$ k,b,h	The variables $DAM\_BCQ^{m}_{k,b,h}$ and $DAM\_BCQ^{i}_{k,b,h}$ are defined in MR Ch.9 Appendix 9.2.
3.10.2	Hourly uplift settlement amount	$HUSA_{k,h}$ (collected or disbursed)	DAM_BCQ (RQ)	m - delivery points h - each settlement hour in a trading day k - market participant i - intertie metering points	HUSA - $DAM\_BCQ_{m,i}$ s,k,h =	Please provide definition for $DAM\_BCQ_{m,i}$ s,k,h	The variables $DAM\_BCQ^{m}_{s,k,h}$ and $DAM\_BCQ^{i}_{s,k,h}$ are defined in MR Ch.9 Appendix 9.2.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
				s - selling market participants			
3.10.2	Hourly uplift settlement amount	$HUSA_{k,h}$ (collected or disbursed)	BCQ (RQ)	m - delivery points h - each settlement hour in a trading day k - market participant i - intertie metering points b - buying market participants t - each metering interval in settlement hour 'h'	HUSA - $BCQ_{m,i,t\ k,b,h}$ =	Please provide definition for $BCQ_{m,i,t\ k,b,h}$	The variables $BCQ^{m,t}_{k,b,h}$ and $BCQ^{i,t}_{k,b,h}$ are defined in MR Ch.9 Appendix 9.2.
3.10.2	Hourly uplift settlement amount	$HUSA_{k,h}$ (collected or disbursed)	BCQ (RQ)	m - delivery points h - each settlement hour in a trading day k - market participant i - intertie metering points s - selling market participants t - each metering interval in settlement hour 'h'	HUSA - $BCQ_{m,i,t\ s,k,h}$ =	Please provide definition for $BCQ_{m,i,t\ s,k,h}$	The variables $BCQ^{m,t}_{s,k,h}$ and $BCQ^{i,t}_{s,k,h}$ are defined in MR Ch.9 Appendix 9.2.
4.4.12	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	$DAM\_GOG_{c\ k}$ (Variant 1)	DAM_GOG_ COMP1	c - combustion turbine delivery point k - market participant	DAM - GOG - DAM_GOG_CO MP1c k =	Please provide definition for DAM_GOG_COMP1c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.12	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	$DAM\_GOG_{c\ k}$ (Variant 1)	DAM_GOG_ COMP2	c - combustion turbine delivery point k - market participant	DAM - GOG - DAM_GOG_CO MP2c k =	Please provide definition for DAM_GOG_COMP2c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.4.12	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 1)	DAM_GOG_ COMP4	c - combustion turbine delivery point k - market participant	DAM - GOG - DAM_GOG_CO MP4c k =	Please provide definition for DAM_GOG_COMP4c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.12	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 1)	DAM_GOG_ COMP5	c - combustion turbine delivery point k - market participant	DAM - GOG - DAM_GOG_CO MP5c k =	Please provide definition for DAM_GOG_COMP5c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.13	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 2)	DAM_GOG_ COMP1	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_CO MP1c k =	Please provide definition for DAM_GOG_COMP1c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.13	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 2)	DAM_GOG_ COMP2	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_CO MP2c k =	Please provide definition for DAM_GOG_COMP2c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.13	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 2)	DAM_GOG_ COMP3	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_CO MP3c k =	Please provide definition for DAM_GOG_COMP3c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.13	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 2)	DAM_GOG_ COMP5	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_CO MP5c k =	Please provide definition for DAM_GOG_COMP5c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.14	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 3)	DAM_GOG_ COMP1	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_CO MP1c k =	Please provide definition for DAM_GOG_COMP1c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.4.14	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 3)	DAM_GOG_COMP2	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_COMP2c k =	Please provide definition for DAM_GOG_COMP2c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.14	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k (Variant 3)	DAM_GOG_COMP5	k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_GOG_COMP5c k =	Please provide definition for DAM_GOG_COMP5c k	All DAM_GOG components are defined in MR Ch.9 s.4.4.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.4.15	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k	ST_Portion (DAM_GOG_COMP1)	p - pseudo delivery point k - market participant d1 -	DAM - GOG - ST_Portionp k,d1=	Please provide definition for ST_Portionp k,d1	The variable $ST\_Portion^{p}_{k,d}$ and subscript d1 are defined in MR Ch.9 Appendix 9.3.
4.4.18.1	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k	ST_Portion (DAM_GOG_COMP4)	p - pseudo delivery point d1 - k - market participant	DAM - GOG - ST_Portionp k,d1 = Repeated	Please provide definition for	The variable $ST\_Portion^{p}_{k,d}$ and subscript d1 are defined in MR Ch.9 Appendix 9.3.
4.4.20	Day ahead market generator offer guarantee_combustion turbine associated with pseudo-unit	DAM_GOGc k	DAM_MWP (DAM_GOG_COMP5)	h - each settlement hour in a trading day k - market participant c - combustion turbine delivery point	DAM - GOG - DAM_MWPc k,h =	Please provide definition for DAM_MWPc k,h	The variable $DAM\_MWP^{c}_{k,h}$ is defined in MR Ch.9 s.3.4.14.
4.4.22	Day ahead market generator offer guarantee_steam turbine associated with pseudo-unit	DAM_GOGs k	N (DAM_GOG_COMP1)	h - each settlement hour in a trading day p - pseudo delivery point k - market participant	DAM - GOG - Np k,h =	Please provide definition for Np k,h	The variable $N^{p}_{k,h}$ is defined in MR Ch.9 s.4.4.22.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.4.22	Day ahead market generator offer guarantee_steam turbine associated with pseudo-unit	DAM_GOGs k	DAM_MWP (DAM_GOG_COMP5)	h - each settlement hour in a trading day s - selling market participants k - market participant	DAM - GOG - DAM_MWPs k,h =	Please provide definition for DAM_MWPs k,h	The variable DAM_MWP$^s_{k,h}$ is defined in MR Ch.9 s.3.4.15.
4.5.12	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k (Variant 1)	RT_GOG_COMP1	k - market participant c - combustion turbine delivery point	RT - GOG - RT_GOG_COMP1 =	Please provide definition for RT_GOG_COMP1	All RT_GOG components are defined in MR Ch.9 s.4.5.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.5.12	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k (Variant 1)	RT_GOG_COMP2	k - market participant c - combustion turbine delivery point	RT - GOG - RT_GOG_COMP2 =	Please provide definition for RT_GOG_COMP2	All RT_GOG components are defined in MR Ch.9 s.4.5.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.5.12	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k (Variant 1)	RT_GOG_COMP4	k - market participant c - combustion turbine delivery point	RT - GOG - RT_GOG_COMP4 =	Please provide definition for RT_GOG_COMP4	All RT_GOG components are defined in MR Ch.9 s.4.5.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.5.12	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k (Variant 1)	RT_GOG_COMP5	k - market participant c - combustion turbine delivery point	RT - GOG - RT_GOG_COMP5 =	Please provide definition for RT_GOG_COMP5	All RT_GOG components are defined in MR Ch.9 s.4.5.1.2 and each of the superscripts and subscripts have the meaning as per MR Ch.9 Appendix 9.2, unless otherwise defined in MR. Ch.9.
4.5.16	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k	RT_OR_CMT_DIPC (RT_GOG_COMP2)	c - combustion turbine delivery point h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h' r - class r reserve	RT - GOG - RT_OR_CMT_DIPCc,t r,k,h =	Please provide definition for RT_OR_CMT_DIPCc,t r,k,h	The variable RT_OR_CMT_DIPC$^{c,t}_{r,k,h}$ will be defined in MR Ch.9 Appendix 9.2 as part of a future release.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.5.17	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k	RT_CM_DIPC (RT_GOG_COMP3)	c - combustion turbine delivery point h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	RT - GOG - RT_CM_DIPCc, t k,h =	Please provide definition for RT_CM_DIPCc,t k,h	The variable $RT\_CMT\_DIPC^{c,t}_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and further information will be added to MR Ch.9 Appendix 9.3 as part of a future release. Please note that the variable provided in your 'Comments/Questions' includes a typo.
4.5.20	Real time offer guarantee_combustion turbine associated with pseudo-unit	RT_GOGc k	RT_MWP (RT_GOG_COMP5)	c - combustion turbine delivery point h - each settlement hour in a trading day k - market participant	RT - GOG - RT_MWPc k,h =	Please provide definition for RT_MWPc k,h	The variable $RT\_MWP^{c}_{k,h}$ is defined in MR Ch.9 s.3.5.9.
4.7.2	Congestion rent and loss residual	CRLR	DAM_PNISL	h - each settlement hour in a trading day i - intertie metering points t - each metering interval in settlement hour 'h'	CRLR - DAM_PNISLi,t h =	Please provide definition for DAM_PNISLi,t h	The variable $DAM\_PNISL^{i}_{h}$ is defined MR Ch.9 Appendix 9.2. Please note that the variable provided in your 'Comments/Questions' includes a typo.
4.8.3	Real-time external congestion residual settlement amount	RT_ECRUk	RT_ECRI		RT - ECRU -	Please provide definition for ECRU	MR Ch.9 s.4.8.2 defines RT_ECR as "the real-time external congestion residual", that represents the total external congestion residual to be disbursed/collected, and MR Ch.9 s.4.8.3 defines RT_ECRU as the settlement amount that is disbursed to or collected from individual market participants.
4.8.3	Real-time external congestion residual settlement amount	RT_ECRUk	RT_ECR (RT_ECRI)		RT - ECRU - RT_ECR =	Please provide definition for RT_ECR	MR Ch.9 s.4.8.2 defines RT_ECR as "the real-time external congestion residual", that represents the total external congestion residual to be disbursed/collected, and MR Ch.9 s.4.8.3 defines RT_ECRU as the settlement amount that is disbursed to or collected from individual market participants.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.8.3	Real-time external congestion residual settlement amount	RT_ECRUk	TDc (RT_ECRl)		RT - ECRU - TDc =	Please provide definition for TDc	The variable TD_c is defined in MR Ch.9 s.4.8.1.2.
4.8.3	Real-time external congestion residual settlement amount	RT_ECRUk	TDc,c1 (RT_ECRl)		RT - ECRU - TDc,c1 =	Please provide definition for TDc,c1	The variable $TD_{c,c1}$ is defined in MR Ch.9 s.4.8.1.3.
4.8.4	Real-time external congestion residual settlement amount	RT_ECRUk	RT_ECRe		RT - ECRU - RT_ECRe =	Please provide definition for RT_ECRe	The variable RT_ECR_E is defined in MR Ch.9 s.4.8.4.
4.8.7	Day ahead market NISL residual	DAM_NISLUk	DAM_NISLR		DAM - NISLU -	Please provide definition for NISLU	DAM_NISLU is defined in MR Ch.9 s.4.8.7.
4.9.2	Transmission rights clearing account	TRCACk	TRCAD		TRCACk - TRCAD =	Please provide definition for TRCAD	The variable TRCAD is defined in MR Ch.9 s.4.9.2.2(d).
4.10.9	Pseudo unit market price component	GFC_MPCs k,h	GFC_MPC	s - steam turbine delivery point h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	GFC - MPC - GFC_MPCs,t k,h =	Please provide definition for GFC_MPCs,t k,h	The variable $GFC\_MPC^s_{k,h}$ is defined in MR Ch.9 s.4.10.9.
4.10.9	Pseudo unit market price component	GFC_MPCs k,h	PD_LMP (GFC_MPCs, t k,h - less than four hours notice)	s - steam turbine delivery point pdm - h - each settlement hour in a trading day	GFC - MPC - PD_LMPs,pdm h = pre-dispatch locational marginal price for energy (in $/MWh) at steam turbine	Please provide formula to calculate PD_LMPs,pdm h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					delivery point 's' in settlement hour 'h' for pre-dispatch run 'pdm'.		
4.10.9	Pseudo unit market price component	GFC_MPCs k,h	PD_STP_QSI (GFC_MPCs, t k,h - less than four hours notice)	p - pseudo delivery point h - each settlement hour in a trading day k - market participant pdm -	GFC - MPC - $PD\_STP\_QSI^{p,pdm}_{k,h}$ = the steam turbine portion of the pre-dispatch schedule of energy for injection (in MWh) from pre-dispatch run 'pdm' for market participant 'k' at pseudo-unit delivery point 'p' in settlement hour 'h', and derived as the difference between $PD\_QSI_{k,h}^{p,pdm}$ and $PD\_QSI_{k,h}^{c,pdm}$.	Please provide formula to calculate PD_STP_QSIp,pdm k,h	The variable $PD\_STP\_QSI^{p,pdm}_{k,h}$ and the calculation of are defined in MR Ch.9 Appendix 9.3.
4.10.9	Pseudo unit market price component	GFC_MPCs k,h	PD_LMP (GFC_MPCs, t k,h - more than four hours notice)	s - steam turbine delivery point h - each settlement hour in a trading day pd1 -	GFC - MPC - $PD\_LMP^{s,pd1}_{h}$ = pre-dispatch locational marginal price for energy (in $/MWh) at delivery point 'm' in settlement hour 'h' for	Please provide formula to calculate PD_LMPs,pd1 h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					pre-dispatch run 'pd1'.		
4.10.9	Pseudo unit market price component	GFC_MPCs k,h	PD_STP_QSI (GFC_MPCs, t k,h - more than four hours notice)	p - pseudo delivery point k - market participant h - each settlement hour in a trading day pdm -	GFC - MPC - $PD\_STP\_QSI^{p,pdm}_{k,h}$ = the steam turbine portion of the pre-dispatch schedule of energy for injection (in MWh) from pre-dispatch run 'pdm' for market participant 'k' at pseudo-unit delivery point 'p' in settlement hour 'h', and derived as the difference between $PD\_QSI^{p,pdm}_{k,h}$ and $PD\_QSI^{c,pdm}_{k,h}$.	Please provide formula to calculate $PD\_STP\_QSI^{p,pdm}_{k,h}$	The variable $PD\_STP\_QSI^{p,pdm}_{k,h}$ and the calculation of are defined in MR Ch.9 Appendix 9.3.
4.10.9	Pseudo unit market price component	GFC_MPCs k,h	PD_LMP (GFC_MPCs, t k,h - more than four hours notice)	s - steam turbine delivery point h - each settlement hour in a trading day pdm -	GFC - MPC - $PD\_LMP^{s,pdm}_{h}$ = pre-dispatch locational marginal price for energy (in $/MWh) at steam turbine delivery point 's' in	Please provide formula to calculate $PD\_LMP^{s,pdm}_{h}$	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					settlement hour 'h' for pre-dispatch run 'pdm'.		
4.10.10	Pseudo unit guarantee cost component	GFC_GCCc k,f	PD_SU_Ratio	c - combustion turbine delivery point k - market participant f - forbidden region set	GFC - MPC - PD_SU_Ratioc k,f =	Please provide definition for PD_SU_Ratioc k,f	The variable $PD\_SU\_Ratio^c_{k,f}$ is defined in MR Ch.9 s.4.10.10(e) and will be updated for further clarity as part of Final Alignment.
4.10.10	Pseudo unit guarantee cost component	GFC_GCCc k,f	SU_NICR	p - pseudo delivery point pdm - k - market participant f - forbidden region set	GFC - MPC - SU_NICRp,pdm k,f =	Please provide definition for SU_NICRp,pdm k,f	The variable $SU\_INCR^{p,pdm}_{k,f}$ is defined in MR Ch.9 s.4.10.10(b),(c) and (d). Please note that the variable provided in your 'Comments/Questions' includes a typo.
4.10.10	Pseudo unit guarantee cost component	GFC_GCCc k,f	PD_BE_SNL	p - pseudo delivery point pdm - k - market participant h - each settlement hour in a trading day	GFC - MPC - PD_BE_SNLp,pdm k,h =	Please provide definition for PD_BE_SNLp,pdm k,h	The variable $PD\_BE\_SNL^{p,pdm}_{k,h}$ will be added to MR Ch.9 Appendix 9.2 as part of a future release.
4.10.10	Pseudo unit guarantee cost component	GFC_GCCc k,f	PD_QSI (M1)	c - combustion turine delivery point h - each settlement hour in a trading day k - market participant pdm -	GFC - MPC - PD_QSIc,pdm k,h = pre-dispatch schedule quantity of energy (in MWh) scheduled for injection by pre-dispatch run 'pdm' for market participant 'k'	Please provide formula to calculate PD_QSIc,pdm k,h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					at combustion turbine delivery point 'p' in settlement hour 'h'.		
4.10.10	Pseudo unit guarantee cost component	GFC_GCCc k,f	SU_INCR (M1)	f - forbidden region set h - each settlement hour in a trading day k - market participant pdm -	GFC - MPC - SU_INCRp,pdm k,f =	Please provide definition for PD_QSIc,pdm k,h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.
4.10.10	Pseudo unit guarantee cost component	GFC_GCCc k,f	PD_SU_Ratio (M1)	f - forbidden region set c - combustion turbine delivery point k - market participant	GFC - MPC - PD_SU_Ratioc k,f =	Please provide definition for PD_SU_Ratioc k,f	The variable $PD\_SU\_Ratio^c_{k,f}$ is defined in MR Ch.9 s.4.10.10(e) and will be updated for further clarity as part of a future release.
4.10.11	Pseudo unit guarantee cost component	GFC_GCCs k	SU_INCR	f - forbidden region set p - pseudo delivery point k - market participant pdm -	GFC - MPC - SU_INCRp,pdm k,f =	Please provide definition for SU_INCRp,pdm k,f	The variable $SU\_INCR^{p,pdm}_{k,f}$ is defined in MR Ch.9 s.4.10.11(b),(c) and (d). Please note that the variable provided in your 'Comments/Questions' includes a typo.
4.10.11	Pseudo unit guarantee cost component	GFC_GCCs k	PD_BE_SNL	h - each settlement hour in a trading day k - market participant p - pseudo delivery point pdm -	GFC - MPC - PD_BE_SNLp,pdm k,h =	Please provide definition for PD_BE_SNLp,pdm k,h	The variable $PD\_BE\_SNL^{p,pdm}_{k,h}$ will be added to MR Ch.9 Appendix 9.2 as part of a future release.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.10.11	Pseudo unit guarantee cost component	GFC_GCCs k	PD_LMP	h - each settlement hour in a trading day s - steam turbine delivery point pdm -	GFC - MPC - $PD\_LMP_{s,pdm}$ h = pre-dispatch locational marginal price for energy (in $/MWh) at steam turbine delivery point 's' in settlement hour 'h' for pre-dispatch run 'pdm'.	Please provide formula to calculate $PD\_LMP_{s,pdm}$ h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.
4.10.11	Pseudo unit guarantee cost component	GFC_GCCs k	PD_STP_QSI (M1)	p - pseudo delivery point pdm - h - each settlement hour in a trading day k - market participant	GFC - MPC - $PD\_STP\_QSI_{p,pdm\ k,h}$ = the steam turbine portion of the pre-dispatch schedule of energy for injection (in MWh) from pre-dispatch run 'pdm' for market participant 'k' at pseudo-unit delivery point 'p' in settlement hour 'h', and derived as the difference between $PD\_QSI_{k,h\ p,pdm}$ and $PD\_QSI_{k,h\ c,pdm}$.	Please provide formula to calculate $PD\_STP\_QSI_{p,pdm\ k,h}$	The variable $PD\_STP\_QSI^{p,pdm}_{k,h}$ and the calculation of are defined in MR Ch.9 Appendix 9.3.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.10.11	Pseudo unit guarantee cost component	**GFC_GCCs k**	**SU_INCR (M1)**	p - pseudo delivery point pdm - k - market participant f - forbidden region set	GFC - MPC - SU_INCRp,pdm k,f =	Please provide definition for SU_INCRp,pdm k,f	The variable $SU\_INCR^{p,pdm}_{k,f}$ is defined in MR Ch.9 s.4.10.11(b),(c) and (d). Please note that the variable provided in your 'Comments/Questions' includes a typo.
4.10.11	Pseudo unit guarantee cost component	**GFC_GCCs k**	**PD_BE_SU (M1)**	p - pseudo delivery point pdm - k - market participant f - forbidden region set	GFC - MPC - PD_BE_SUp,pdm k,f = start-up offer submitted in the pre-dispatch process (in $/start) at pseudo-unit 'p' for market participant 'k' for the first settlement hour 'h' of the pre-dispatch operational commitment committed by the pre-dispatch calculation engine in pre-dispatch run 'pdm' that the generator failure 'f' occurred in.	Please provide formula to calculate PD_BE_SUp,pdm k,f	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the pre-dispatch calculation engine and provided directly to the settlement process.
4.14.4.1	Day ahead market reliability scheduling uplift settlement amount_virtual zonal resources	**V_DRSUk**	**DAM_NDL_OF**		V - DRSU - DAM_NDL_OF = total quantity of energy that was over-forecasted in the day-ahead	Please provide formula to calculate DAM_NDL_OF	The formula to calculate DAM_NDL_OF is in MR Ch.9 s.4.14.4.1.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					market for non-dispatchable loads, as determined by the IESO as follows:		
4.14.4.1	Day ahead market reliability scheduling uplift settlement amount_virtual zonal resources	**V_DRSUk**	**DAM_HDR_ QSW (DAM_NDL_ OF)**	m1 - set of all delivery points 'm' for physical hourly demand response resources h - each settlement hour in a trading day k - market participant	V - DRSU - DAM_HDR_QS Wm1 k,h =	Please provide definition for DAM_HDR_QSWm1 k,h	The variable $DAM\_HDR\_QSW^m_{k,h}$ is defined in MR Ch.9 Appendix 9.2 and superscript m1 is defined in MR Ch.9 s.4.14.4.1. The superscript 'm' would be replaced with 'm1'.
4.14.5	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions	**DAM_P2_PMT**	**Imp_DAM_ MWP**	h - each settlement hour in a trading day k - market participant i - intertie metering points p1 -	DAM - P2 - PMT - Imp_DAM_MW Pi,p1 k,h =	Please provide definition for Imp_DAM_MWPi,p1 k,h	The variable $Imp\_DAM\_MWP^{i,p1}_{k,h}$ is defined in MR Ch.9 s.4.14.7.
4.14.5	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions	**DAM_P2_PMT**	**Imp_DAM_ MWP**	h - each settlement hour in a trading day k - market participant i - intertie metering points p2 -	DAM - P2 - PMT - Imp_DAM_MW Pi,p2 k,h =	Please provide definition for Imp_DAM_MWPi,p2 k,h	The variable $Imp\_DAM\_MWP^{i,p2}_{k,h}$ is defined in MR Ch.9 s.4.14.6.
4.14.5	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions	**DAM_P2_PMT**	**DAM_GOG**	m - delivery points h - each settlement hour in a trading day k - market participant	DAM - P2 - PMT - DAM_GOGm k,h =	Please provide definition for DAM_GOGm k,h	The variable $DAM\_GOG^m_{k,h}$ is defined in MR Ch.9 s.4.14.5(d) which makes reference to MR Ch.9 s.4.4 which is the settlement of day-ahead market generator offer guarantee for the specific resources that are relevant to this calculation.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.14.6	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions_Pass2	Imp_DAM_MWPi,p2 k,h	DAM_QSI (DAM_COMP 1)	h - each settlement hour in a trading day k - market participant i - intertie metering points p2 -	Imp - DAM - MWP - DAM_QSIi,p2 k,h = quantity of energy (in MWh) scheduled for injection by market participant 'k' at intertie metering point 'i' in settlement hour 'h', as scheduled by Pass 2: Reliability Scheduling and Commitment.	Please provide formula to calculate DAM_QSIi,p2 k,h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the day-ahead market calculation engine and provided directly to the settlement process.
4.14.6	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions_Pass2	Imp_DAM_MWPi,p2 k,h	DAM_QSOR (DAM_COMP 2)	h - each settlement hour in a trading day k - market participant i - intertie metering points r - class r reserve p2 -	Imp - DAM - MWP - DAM_QSORi,p2 r,k,h = scheduled quantity (in MWh) of class r reserve for market participant 'k' at intertie metering point 'i' in settlement hour 'h', as scheduled by Pass 2: Reliability Scheduling and Commitment, where r1, r2, and r3 are all applicable.	Please provide formula to calculate DAM_QSORi,p2 r,k,h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the day-ahead market calculation engine and provided directly to the settlement process.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
4.14.6	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions_Pass2	Imp_DAM_M WPi,p2 k,h	DAM_EOP (DAM_COMP 2)	h - each settlement hour in a trading day k - market participant i - intertie metering points r - class r reserve	Imp - DAM - MWP - DAM_EOPi r,k,h =	Please provide definition for DAM_EOPi r,k,h	The equation will be updated to reflect the variable DAM_OR_EOP$^i_{r,k,h}$ as part of a future release.
4.14.7	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions_Pass1	Imp_DAM_M WPi,p1 k,h	DAM_QSI (DAM_COMP 1)	h - each settlement hour in a trading day k - market participant i - intertie metering points p1 -	Imp - DAM - MWP - DAM_QSIi,p1 k,h = quantity of energy (in MWh) scheduled for injection by market participant 'k' at intertie metering point 'i' in settlement hour 'h', as scheduled by Pass 1: Market Commitment and Market Power Mitigation.	Please provide formula to calculate DAM_QSIi,p1 k,h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the day-ahead market calculation engine and provided directly to the settlement process.
4.14.7	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions_Pass1	Imp_DAM_M WPi,p1 k,h	DAM_QSOR (DAM_COMP 2)	h - each settlement hour in a trading day k - market participant i - intertie metering points r - class r reserve p1 -	Imp - DAM - MWP - DAM_QSORi,p2 r,k,h = scheduled quantity (in MWh) of class r reserve for market participant 'k' at intertie metering point 'i' in settlement hour 'h' described in	Please provide formula to calculate DAM_QSORi,p2 r,k,h	As defined in MR Ch.9 Appendix 9.2, this variable is an output of the day-ahead market calculation engine and provided directly to the settlement process.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					the day-ahead schedule, where only r2 and r3 are applicable.		
4.14.7	Day ahead market make-whole payment disbursed_boundary entity resources_import transactions_Pass1	Imp_DAM_MWPi,p1 k,h	DAM_EOP (DAM_COMP 2)	h - each settlement hour in a trading day k - market participant i - intertie metering points r - class r reserve	Imp - DAM - MWP - DAM_EOPi r,k,h =	Please provide definition for DAM_EOPi r,k,h	The equation will be updated to reflect the variable DAM_OR_EOPi,r,k,h as part of a future release.
4.14.8	Fuel Cost Compensation Uplift	FCCUk	FCC	m - delivery points k - market participant	FCCU - FCCm k =	Please provide definition for FCCm k	The variable FCCmk is defined in MR Ch.9 s.4.14.8(c)
5.3.1	Real time market reference level settlement charge	RT_RLSCm k,h	PM_RLSC	m - delivery points c - combustion turbine delivery point p - pseudo delivery point e - w -	RT - RSLC - PM_RLSCmcepw = is the persistence multiplier for market control entity for physical withholding 'mcepw' of the relevant resource for the relevant settlement hour, determined as the number of trading days in which any resource associated with the market control entity for physical	Please provide formula to calculate PM_RLSCmcepw	As part of recent design changes, the equation will be updated as part of a future release.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					withholding is subject to a day-ahead market reference level settlement charge settlement amount or a real-time market reference level settlement charge settlement amount within the last 18 months, up to a maximum of 3.		
5.4.1	Ex-post mitigation for physical withholding settlement charge	$EXP\_PWSC^m_k$	PW_E	m - delivery points k - market participant	$EXP\_PWSC\_PW\_E^m_k =$	Please provide definition for $PW\_E^m_k$	$PW\_E^m_k$ is the physical withholding for energy determined in accordance with MR Ch.9 s.5.4.1.1.
5.4.1	Ex-post mitigation for physical withholding settlement charge	$EXP\_PWSC^m_k$	PW_OR	m - delivery points k - market participant	$EXP\_PWSC\_PW\_OR^m_k =$	Please provide definition for $PW\_OR^m_k$	$PW\_OR^m_k$ is the physical withholding for operating reserve determined in accordance with MR Ch.9 s.5.4.1.2.
5.4.1.1	Ex-post mitigation for physical withholding settlement charge	$EXP\_PWSC^m_k$	DAM_PW $(PW\_E^m_k)$	m - delivery points h - each settlement hour in a trading day k - market participant	$EXP\_PWSC\_DAM\_PW^m_{k,h} =$	Please provide definition for $DAM\_PW^m_{k,h}$	$DAM\_PW^m_k$ is the day-ahead market physical withholding determined in accordance with MR Ch.9 s.5.4.1.1(c).

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
5.4.1.1	Ex-post mitigation for physical withholding settlement charge	EXP_PWSCm k	RT_PW (PW_Em k)	m - delivery points h - each settlement hour in a trading day k - market participant	EXP - PWSC - RT_PWm k,h =	Please provide definition for RT_PWm k,h	RT_PW^m_k is the real-time market physical withholding determined in accordance with MR Ch.9 s.5.4.1.1(d).
5.4.1.1	Ex-post mitigation for physical withholding settlement charge	EXP_PWSCm k	PM_PW (PW_Em k)	m - delivery points c - combustion turbine delivery point p - pseudo delivery point e - w -	EXP - PWSC - PW_PWmcepw = is the persistence multiplier applicable to the mcepw relevant trading day for the market control entity for physical withholding 'mcepw' that the registered market participant for the applicable resource designated, as determined in accordance with the applicable market manual.	Please provide formula to calculate PW_PWmcepw	As noted in MR Ch.9 s.5.4.1.1(b), the variable PM_PW$_{mcepw}$ is determined in accordance with the applicable market manual. Please see MM14.1: Market Power Mitigation Procedures for further information.
5.4.1.1	Ex-post mitigation for physical withholding settlement charge	EXP_PWSCm k	DAM_LMP (DAM_PWm k,h)	m - delivery points h - each settlement hour in a trading day k - market participant	EXP - PWSC - DAM_LMPm k,h =	Please provide definition for DAM_LMPm k,h	The variable DAM_LMP^m_h is defined in MR Ch.9 Appendix 9.2.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
5.4.1.1	Ex-post mitigation for physical withholding settlement charge	EXP_PWSCm k	RT_LMP (RT_PWm k,h)	m - delivery points h - each settlement hour in a trading day k - market participant t - each metering interval in settlement hour 'h'	EXP - PWSC - RT_LMPm,t k,h =	Please provide definition for RT_LMPm,t k,h	The variable $RT\_LMP^{m,t}_h$ is defined in MR Ch.9 Appendix 9.2.
5.4.1.2	Ex-post mitigation for physical withholding settlement charge	EXP_PWSCm k	DAM_PW (PW_ORm k)	m - delivery points h - each settlement hour in a trading day k - market participant	EXP - PWSC - DAM_PWm k,h =	Please provide definition for DAM_PWm k,h	$DAM\_PW^m_k$ is the day-ahead market physical withholding determined in accordance with MR Ch.9 s.5.4.1.2(c).
5.4.1.2	Ex-post mitigation for physical withholding settlement charge	EXP_PWSCm k	RT_PW (PW_ORm k)	m - delivery points h - each settlement hour in a trading day k - market participant	EXP - PWSC - RT_PWm k,h =	Please provide definition for RT_PWm k,h	$RT\_PW^m_k$ is the real-time market physical withholding determined in accordance with MR Ch.9 s.5.4.1.2(d).
5.5.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	EW_E	k - market participant i - intertie metering points	EXP - PWSC - EW_Ei k =	Please provide definition for EW_Ei k	$EW\_E^i_k$ is the economic withholding for energy determined in accordance with MR Ch.9 s.5.5.1.1.
5.5.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	EW_MWP	k - market participant i - intertie metering points	EXP - PWSC - EW_MWPi k =	Please provide definition for EW_MWPi k	$EW\_MWP^i_k$ is the economic withholding for make-whole payment determined in accordance with MR Ch.9 s.5.5.1.2.

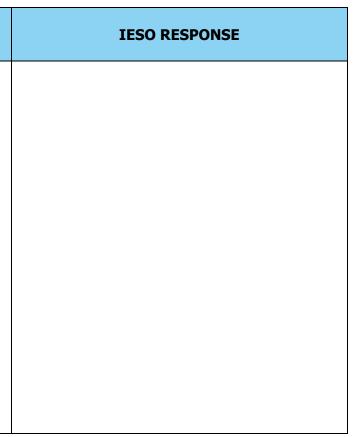| MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
5.5.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	EW_OR	k - market participant i - intertie metering points	EXP - PWSC - EW_ORi k =	Please provide definition for EW_ORi k	EW_OR^i_k is the economic withholding for operating reserve determined in accordance with MR Ch.9 s.5.5.1.3.
5.5.1.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	DAM_EWUI (EW_Ei k)	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - PWSC - DAM_EWUIi k,h =	Please provide definition for DAM_EWUIi k,h	DAM_EWUi$_{k,h}$ is the day-ahead market economic withholding on uncompetitive interties determined in accordance with MR Ch.9 s.5.5.1.1(b).
5.5.1.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	RT_EWUI (EW_Ei k)	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - PWSC - RT_EWUIi k,h =	Please provide definition for RT_EWUIi k,h	RT_EWUi$_{k,h}$ is the real-time economic withholding on uncompetitive interties determined in accordance with MR Ch.9 s.5.5.1.1(c).
5.5.1.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	DAM_LMP (DAM_EWUI i k,h)	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - PWSC - DAM_LMPi k,h =	Please provide definition for DAM_LMPi k,h	The variable DAM_LMP^i_h and superscript 'k' are defined in MR Ch.9 Appendix 9.2.
5.5.1.1	Ex-post mitigation for economic withholding on uncompetitive interties	EXP_EWSCi k	RT_LMP (DAM_EWUI i k,h)	h - each settlement hour in a trading day k - market participant i - intertie metering points t - each metering interval in settlement hour 'h'	EXP - PWSC - RT_LMPi,t k,h =	Please provide definition for RT_LMPi,t k,h	The variable RT_LMP$^{i,t}_h$ and superscript 'k' are defined in MR Ch.9 Appendix 9.2.

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
5.5.1.2	Ex-post mitigation for economic withholding on uncompetitive interties	EW_MWPi k	DAM_MWP	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - MWP - DAM_MWPi k,h =	Please provide definition for DAM_MWPi k,h	The variable $DAM\_MWP^i_{k,h}$ is defined in MR Ch.9 s.3.4.11.
5.5.1.2	Ex-post mitigation for economic withholding on uncompetitive interties	EW_MWPi k	RT_MWP	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - MWP - RT_MWPi k,h =	Please provide definition for RT_MWPi k,h	The variable $RT\_MWP^i_{k,h}$ is defined in MR Ch.9 s.3.5.8.1.
5.5.1.2	Ex-post mitigation for economic withholding on uncompetitive interties	EW_MWPi k	RT_IOG	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - MWP - RT_IOGi k,h =	Please provide definition for RT_IOGi k,h	The variable $RT\_IOG^i_{k,h}$ is defined in MR Ch.9 s.3.6.3.
5.5.1.3	Ex-post mitigation for economic withholding on uncompetitive interties	EW_ORi k	DAM_EWUI	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - OR - DAM_EWUIi k,h =	Please provide definition for DAM_EWUIi k,h	$DAM\_EWUi_{k,h}$ is the day-ahead market economic withholding on uncompetitive interties determined in accordance with MR Ch.9 s.5.5.1.3(b).
5.5.1.3	Ex-post mitigation for economic withholding on uncompetitive interties	EW_ORi k	RT_EWUI	h - each settlement hour in a trading day k - market participant i - intertie metering points	EXP - OR - RT_EWUIi k,h =	Please provide definition for RT_EWUIi k,h	$RT\_EWUi_{k,h}$ is the real-time economic withholding on uncompetitive interties determined in accordance with MR Ch.9 s.5.5.1.3(c).

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
6.16.6.3.1	Portion of short term funds borrowed by IESO to be recovered in current billing period	TRCACk	TRCAD	L -	EXP - OR - TRCADl = the portion of the total dollar value of all disbursements from the TR clearing account authorized by the IESO Board in the current energy market billing period allocated to market participants that have paid provincial transmission serviceservices charges "C" in the energy market billing periods immediately preceding the current energy market billing period, as determined by the IESO Board.	Please provide formula to calculate TRCADl	The formula to calculate $TRCAD_L$ is defined in MR Ch.9 s.6.16.6.3.2(i).
6.16.6.3.2	Portion of short term funds borrowed by IESO to be recovered in current billing period	TRCACk	TRCAD	e -	EXP - OR - TRCADe = the portion of the total dollar value of all disbursements from the TR clearing account authorized by the IESO Board in the current	Please provide formula to calculate TRCADe	The formula to calculate $TRCAD_E$ is defined in MR Ch.9 s.6.16.6.3.2(ii).

MR SECTION	DESCRIPTION	SETTLEMENT AMOUNT	VARIABLES IN FORMULA	Constants Used	DEFINITION OF INPUTS	Comments /Questions	IESO RESPONSE
					energy market billing period allocated to market participants that have paid export transmission serviceservices charges "C1" in the energy market billing periods immediately preceding the current energy market billing period, as determined by the IESO Board.		

Color scheme:

1. Header
2. Charge type and section
3. Document
4. Comments
5. Differences in equations highlighted

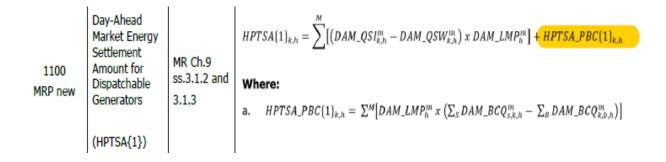## 1. Day - Ahead Market Energy Settlement Amount for Dispatchable Generators

Charge type 1100; 3.1.2 and 3.1.3

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{1\}_{k,h} = \sum^{M}\left[(DAM\_QSI_{k,h}^{m} - DAM\_QSW_{k,h}^{m}) \times DAM\_LMP_{h}^{m} + (DAM\_QSI_{k,h}^{i} - DAM\_QSW_{k,h}^{i}) \times DAM\_LMP_{h}^{i}\right]$$

$$HPTSA\_PBC\{1\}_{k,h}$$
$$= \sum^{M}\left[DAM\_LMP_{h}^{m} \times \left(\sum_{S} DAM\_BCQ_{s,k,h}^{m} - \sum_{B} DAM\_BCQ_{k,b,h}^{m}\right) + DAM\_LMP_{h}^{i} \times \left(\sum_{S} DAM\_BCQ_{s,k,h}^{i} - \sum_{B} DAM\_BCQ_{k,b,h}^{i}\right)\right]$$

B. IESO Charge Types and Equations

1100 MRP new	Day-Ahead Market Energy Settlement Amount for Dispatchable Generators (HPTSA{1})	MR Ch.9 ss.3.1.2 and 3.1.3	$HPTSA\{1\}_{k,h} = \sum^{M}\left[(DAM\_QSI_{k,h}^{m} - DAM\_QSW_{k,h}^{m}) \times DAM\_LMP_{h}^{m}\right] + HPTSA\_PBC\{1\}_{k,h}$ **Where:** a. $HPTSA\_PBC\{1\}_{k,h} = \sum^{M}\left[DAM\_LMP_{h}^{m} \times \left(\sum_{S} DAM\_BCQ_{s,k,h}^{m} - \sum_{B} DAM\_BCQ_{k,b,h}^{m}\right)\right]$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Day - Ahead Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not included in the market rules document. The equation for calculation of physical bilateral contract is also different, please calrify.

IESO Response:

The day-ahead market equation represented in MR Ch.9 s.3.1.3 is the aggregate for all "delivery points 'm' and intertie metering points 'i' associated with a dispatchable load, a dispatchable generation resource, a dispatchable electricity storage resource, or a boundary entity resource".

In IESO Charge Types and Equations, each of these resource types is assigned a charge type number and settled on an individual basis. Therefore, the aggregate equation in MR Ch.9 s.3.1.3 for HPTSA{1} is broken out into the following four charge type numbers:

1. Charge type 1100 – Day-Ahead Market Energy Settlement Amount for Dispatchable Generators

2. Charge type 1102 – Day-Ahead Market Energy Settlement Amount for Dispatchable Loads

3. Charge type 1110 – Day-Ahead Market Energy Settlement Amount for Imports

4. Charge type 1112 – Day-Ahead Market Energy Settlement Amount for Exports

Similarly, the equation represented in MR Ch.9 s.3.1.2 for HPTSA_PBC{1} is the aggregate equation for all "delivery points 'm' and intertie metering points 'i' associated with a physical bilateral contract".

For the four charge types listed above (CT1100, 1102, 1110 and 1111) the aggregate equation in MR Ch.9 s.3.1.2 for HPTSA_PBC{1} is broken out according to resource type and added to each of respective charge types.

2. **Real - Time Energy Settlement Amount for Dispatchable Generators**

   Charge type 1101; 3.1.5 and 3.1.6

   A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{2\}\_PBC_{k,h}$$

$$= \sum_{}^{M,T} RT\_LMP_h^{m,t} \times \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t}\right)$$

$$+ \sum_{}^{M,T} RT\_LMP_h^{i,t} \times \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t}\right)$$

$$HPTSA\{2\}_{k,h} = \sum_{}^{M,T} RT\_LMP_h^{m,t} \times \frac{\left((AQEI_{k,h}^{m,t} - DAM\_QSI_{k,h}^m) - (AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m)\right)}{12}$$

$$+ RT\_LMP_h^{i,t} \times \frac{\left((SQEI_{k,h}^{i,t} - DAM\_QSI_{k,h}^i) - (SQEW_{k,h}^{i,t} - DAM\_QSW_{k,h}^i)\right)}{12}$$

B. IESO Charge Types and Equations

1101 MRP updated	Real-Time Energy Settlement Amount for Dispatchable Generators (HPTSA{2})	MR Ch.9 ss.3.1.5 and 3.1.6	$HPTSA\{2\}_{k,h} = \sum_{}^{M,T} RT\_LMP_h^{m,t} \times \frac{\left((AQEI_{k,h}^{m,t} - DAM\_QSI_{k,h}^m) - (AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m)\right)}{12}$ $+ HPTSA\_PBC\{2\}_{k,h}$ **Where:** a. $HPTSA\{2\}\_PBC_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \times \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t}\right)$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Real - Time Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not included in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

IESO Response:

The real-time equation represented in MR Ch.9 s.3.1.6 is the aggregate for all "delivery points 'm' and intertie metering points 'i' associated with a dispatchable load, a dispatchable generation resource, a dispatchable electricity storage resource, or a boundary entity resource".

In IESO Charge Types and Equations, each of these resource types is assigned a charge type number and settled on an individual basis. Therefore, the aggregate equation in MR Ch.9 s.3.1.6 for HPTSA{2} is broken out into the following four charge type numbers:

1. Charge type 1101 – Real-Time Energy Settlement Amount for Dispatchable Generators

2. Charge type 1103 – Real-Time Energy Settlement Amount for Dispatchable Loads

3. Charge type 1111 – Real-Time Energy Settlement Amount for Imports

4. Charge type 1113 – Real-Time Energy Settlement Amount for Exports
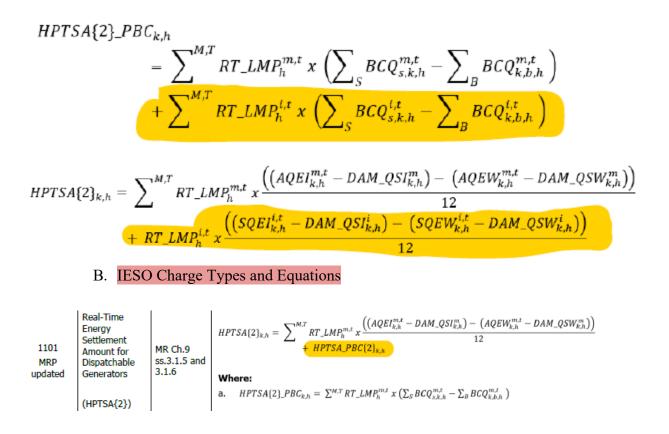
Similarly, the equation represented in MR Ch.9 s.3.1.5 for HPTSA_PBC{2} is the aggregate equation for all "delivery points 'm' and intertie metering points 'i' associated with a physical bilateral contract in the real-time market".

For the four charge types listed above (CT1101, 1103, 1111 and 1112) the aggregate equation in MR Ch.9 s.3.1.5 for HPTSA_PBC{2} is broken out according to resource type and added to each of respective charge types.

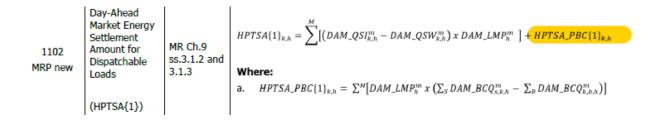### 3. Day-Ahead Market Energy Settlement Amount for Dispatchable Loads

Charge type 1102; 3.1.2 and 3.1.3

    A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{1\}_{k,h} = \sum^{M} \left[\left(DAM\_QSI_{k,h}^{m} - DAM\_QSW_{k,h}^{m} \right) \times DAM\_LMP_{h}^{m} \right.$$
$$\left. + \left(DAM\_QSI_{k,h}^{i} - DAM\_QSW_{k,h}^{i} \right) \times DAM\_LMP_{h}^{i} \right]$$

$$HPTSA\_PBC\{1\}_{k,h}$$
$$= \sum^{M} \left[DAM\_LMP_{h}^{m} \times \left(\sum_{S} DAM\_BCQ_{s,k,h}^{m} - \sum_{B} DAM\_BCQ_{k,b,h}^{m} \right) \right.$$
$$\left. + DAM\_LMP_{h}^{i} \times \left(\sum_{S} DAM\_BCQ_{s,k,h}^{i} - \sum_{B} DAM\_BCQ_{k,b,h}^{i} \right) \right]$$

    B. IESO Charge Types and Equations

1102 MRP new	Day-Ahead Market Energy Settlement Amount for Dispatchable Loads (HPTSA{1})	MR Ch.9 ss.3.1.2 and 3.1.3	$HPTSA\{1\}_{k,h} = \sum^{M} \left[\left(DAM\_QSI_{k,h}^{m} - DAM\_QSW_{k,h}^{m} \right) \times DAM\_LMP_{h}^{m} \right] + HPTSA\_PBC\{1\}_{k,h}$ **Where:** a. $HPTSA\_PBC\{1\}_{k,h} = \sum^{M} \left[DAM\_LMP_{h}^{m} \times \left(\sum_{S} DAM\_BCQ_{s,k,h}^{m} - \sum_{B} DAM\_BCQ_{k,b,h}^{m} \right) \right]$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Day - Ahead Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

Please clarify how this charge type is different from charge type 1100. Dispatchable loads and generators have same sections in market rules, so please elaborate on the reasoning for them to have different charge types.

IESO Response:

Please refer to IESO response provided for question 1 (1. Day-Ahead Market Energy Settlement Amount for Dispatchable Generators).
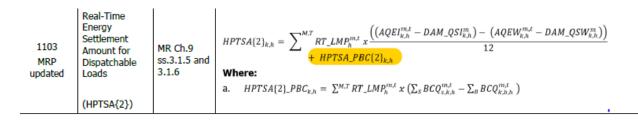
4. **Real-Time Energy Settlement Amount for Dispatchable Loads**

Charge type 1103; 3.1.5 and 3.1.6

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{2\}_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \; x \; \frac{\left(\left(AQEI_{k,h}^{m,t} - DAM\_QSI_{k,h}^m\right) - \left(AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m\right)\right)}{12}$$
$$+ \; RT\_LMP_h^{i,t} \; x \; \frac{\left(\left(SQEI_{k,h}^{i,t} - DAM\_QSI_{k,h}^i\right) - \left(SQEW_{k,h}^{i,t} - DAM\_QSW_{k,h}^i\right)\right)}{12}$$

$$HPTSA\{2\}\_PBC_{k,h}$$
$$= \sum^{M,T} RT\_LMP_h^{m,t} \; x \; \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t}\right)$$
$$+ \sum^{M,T} RT\_LMP_h^{i,t} \; x \; \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t}\right)$$

B. IESO Charge Types and Equations

1103 MRP updated	Real-Time Energy Settlement Amount for Dispatchable Loads (HPTSA{2})	MR Ch.9 ss.3.1.5 and 3.1.6	$HPTSA\{2\}_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \; x \; \frac{\left(\left(AQEI_{k,h}^{m,t} - DAM\_QSI_{k,h}^m\right) - \left(AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m\right)\right)}{12}$ $+ \; HPTSA\_PBC\{2\}_{k,h}$ **Where:** a. $HPTSA\{2\}\_PBC_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \; x \; \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t}\right)$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Real - Time Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

Please clarify how this charge type is different from charge type 1101. Dispatchable loads and generators have same sections in market rules, so please elaborate on the reasoning for them to have different charge types.

IESO Response:

Please refer to IESO response provided for question 2 (2. Real-Time Energy Settlement Amount for Dispatchable Generators).

5. **Day-Ahead Market Energy Settlement Amount for Price Responsive Loads**

Charge type 1104; 3.1.2 and 3.1.4

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$HPTSA\_PBC\{1\}_{k,h}$

$$= \sum^{M} \left[DAM\_LMP_h^m \ x \ \left(\sum_{S} DAM\_BCQ_{s,k,h}^m - \sum_{B} DAM\_BCQ_{k,b,h}^m \right) \right.$$
$$\left. + DAM\_LMP_h^l \ x \ \left(\sum_{S} DAM\_BCQ_{s,k,h}^l - \sum_{B} DAM\_BCQ_{k,b,h}^l \right) \right]$$

$HPTSA\{1\}\_PRL\_SSW_{k,h}$

$$= -1 \ x \ \left[\sum^{M1} \left(DAM\_QSW_{k,h}^m \times DAM\_LMP_h^m \right) \right.$$
$$\left. + \sum^{M2} \left(DAM\_QSW_{k,h}^m \times DAM\_LMP_h^m \right) \right]$$

B. IESO Charge Types and Equations

1104 MRP new	Day-Ahead Market Energy Settlement Amount for Price Responsive Loads (HPTSA{1})	MR Ch.9 ss.3.1.2 and 3.1.4	$HPTSA\{1\}\_PRL\_SSW_{k,h}$ $= -1 \times \left[\sum^{M1} (DAM\_QSW_{k,h}^m \times DAM\_LMP_h^m) + \sum^{M2} (DAM\_QWS_{k,h}^m \times DAM\_LMP_h^m) \right.$ $\left. + HPTSA\_PBC\{1\}_{k,h} \right.$ **Where:** a. $HPTSA\_PBC\{1\}_{k,h} = \sum^{M1}\left[DAM\_LMP_h^m \times \left(\sum_S DAM\_BCQ_{s,k,h}^m - \sum_B DAM\_BCQ_{k,b,h}^m \right) \right]$ b. M1 = the set of all *delivery points* 'm' for *price responsive loads* and *self-scheduling electricity storage resources* that are withdrawing; and c. M2 = the set of all *delivery points* 'm' for *price responsive loads* used as physical *hourly demand response resources* to fulfill *capacity obligations*.

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Day - Ahead Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

IESO Response

The day-ahead market equation represented in MR Ch.9 s.3.1.4 is specific to all "delivery points 'm' associated with a price responsive load or a self-scheduling electricity storage resource that is withdrawing" and is settled under charge type 1104 – Day-Ahead Market Energy Settlement Amount for Price Responsive Loads.

The equation represented in MR Ch.9 s.3.1.2 for HPTSA_PBC{1} is the aggregate equation for all "delivery points 'm' and intertie metering points 'i' associated with a physical bilateral contract". In IESO Charge Types and Equations, this equation is broken out according to the resource type and added to the respective charge type. For charge type 1104, only the "delivery point 'm'" part of the equation is applicable to charge type 1104.

6. **Real-Time Energy Settlement Amount for Price Responsive Loads**

Charge type 1105; 3.1.5 and 3.1.7

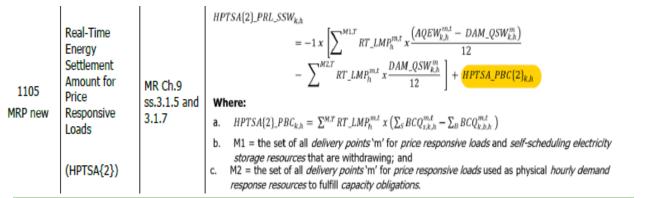   A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{2\}\_PBC_{k,h}$$
$$= \sum^{M,T} RT\_LMP_h^{m,t} \times \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t} \right)$$
$$+ \sum^{M,T} RT\_LMP_h^{i,t} \times \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t} \right)$$

$$HPTSA\{2\}\_PRL\_SSW_{k,h}$$
$$= -1 \times \left[\sum^{M1,T} RT\_LMP_h^{m,t} \times \frac{\left(AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m \right)}{12} \right.$$
$$\left. - \sum^{M2,T} RT\_LMP_h^{m,t} \times \frac{DAM\_QSW_{k,h}^m}{12} \right]$$

B. IESO Charge Types and Equations

1105 MRP new	Real-Time Energy Settlement Amount for Price Responsive Loads (HPTSA{2})	MR Ch.9 ss.3.1.5 and 3.1.7	$HPTSA\{2\}\_PRL\_SSW_{k,h}$ $= -1 \times \left[\sum^{M1,T} RT\_LMP_h^{m,t} \times \frac{\left(AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m \right)}{12} - \sum^{M2,T} RT\_LMP_h^{m,t} \times \frac{DAM\_QSW_{k,h}^m}{12} \right] + HPTSA\_PBC\{2\}_{k,h}$ **Where:** a. $HPTSA\{2\}\_PBC_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \times \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t} \right)$ b. M1 = the set of all *delivery points* 'm' for *price responsive loads* and *self-scheduling electricity storage resources* that are withdrawing; and c. M2 = the set of all *delivery points* 'm' for *price responsive loads* used as physical *hourly demand response resources* to fulfill *capacity obligations*.

The equations for HPTSA don't match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Real - Time Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document, need clarification because it wasn't added in the market rules document. The equation for calculation of physical bilateral contract is also different, please guide on that.

IESO Response:

The real-time equation represented in MR Ch.9 s.3.1.7 is specific to all "delivery points 'm' associated with a price responsive load or a self-scheduling electricity storage resource that is withdrawing" and is settled under charge type 1105 – Real-Time Energy Settlement Amount for Price Responsive Loads.

The equation represented in MR Ch.9 s.3.1.5 for HPTSA_PBC{2} is the aggregate equation for all "delivery points 'm' and intertie metering points 'i' associated with a physical bilateral contract". In IESO Charge Types and Equations, this equation is broken out according to the resource type and
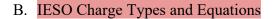
added to the respective charge type. For charge type 1105, only the "delivery point 'm'" part of the equation is applicable to charge type 1105.

7. **Day - Ahead Market Energy Settlement Amount for Virtual Transactions to Sell**

Charge type 1106; 3.1.8

    A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HVTSA\{1\}_{k,h} = \sum^{V} (DAM\_QVSI^v_{k,h} - DAM\_QVSW^v_{k,h}) \times DAM\_LMP^{vz}_h$$

    B. IESO Charge Types and Equations

1106 MRP new	Day-Ahead Market Energy Settlement Amount for Virtual Transactions to Sell (HVTSA{1})	MR Ch.9 s.3.1.8	$HVTSA\{1\}_{k,h} = \sum^{V} DAM\_QVSI^v_{k,h} \times DAM\_LMP^{vz}_h$

The equations do not match. It looks like injections and withdrawals are calculated separately but in the market rules it seems to be netting injections and withdrawals, please clarify and provide guidance on that.

IESO Response:

The day-ahead market equation represented in MR Ch.9 s.3.1.8 is the aggregate for all "virtual zonal resources 'v'". This includes both virtual zonal resources with virtual transactions to sell and virtual transactions to buy (withdraw).

In IESO Charge Types and Equations, each virtual transaction (to sell or to buy) is assigned a charge type number and settled on an individual basis. Therefore, the aggregate equation in MR Ch.9 s.3.1.8 for HVTSA{1} is broken out into the following two charge type numbers:

1. Charge type 1106 – Day-Ahead Market Energy Settlement Amount for Virtual Transactions to Sell

2. Charge type 1108 – Day-Ahead Market Energy Settlement Amount for Virtual Transactions to Buy
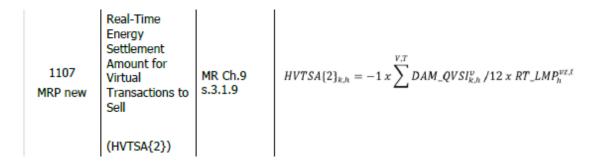
8. Real-Time Energy Settlement Amount for Virtual Transactions to Sell

Charge type 1107; 3.1.9

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HVTSA\{2\}_{k,h} = -1 \times \sum^{V,T} (DAM\_QVSI^v_{k,h} - DAM\_QVSW^v_{k,h})/12 \times RT\_LMP^{vz,t}_h$$

B. IESO Charge Types and Equations

1107 MRP new	Real-Time Energy Settlement Amount for Virtual Transactions to Sell (HVTSA{2})	MR Ch.9 s.3.1.9	$HVTSA\{2\}_{k,h} = -1 \times \sum^{V,T} DAM\_QVSI^v_{k,h} /12 \times RT\_LMP^{vz,t}_h$

The equations do not match. It looks like injections and withdrawals are calculated separately but in the market rules it seems to be netting injections and withdrawals, please clarify and provide guidance on that.

IESO Response:

The real-time market equation represented in MR Ch.9 s.3.1.9 is the aggregate for all "virtual zonal resources 'v'". This includes both virtual zonal resources with virtual transactions to sell and virtual transactions to buy (withdraw).

In IESO Charge Types and Equations, each virtual transaction (to sell or to buy) is assigned a charge type number and settled on an individual basis. Therefore, the aggregate equation in MR Ch.9 s.3.1.9 for HVTSA{2} is broken out into the following two charge type numbers:

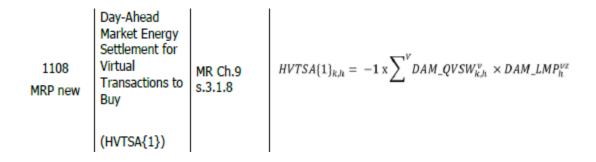1. Charge type 1107 – Real-Time Energy Settlement Amount for Virtual Transactions to Sell

2. Charge type 1109 – Real-Time Energy Settlement Amount for Virtual Transactions to Buy

9. Day - Ahead Market Energy Settlement Amount for Virtual Transactions to Buy

Charge type 1108; 3.1.8

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HVTSA\{1\}_{k,h} = \sum^{V} (DAM\_QVSI_{k,h}^{v} - DAM\_QVSW_{k,h}^{v}) \times DAM\_LMP_{h}^{vz}$$

B. IESO Charge Types and Equations

1108 MRP new	Day-Ahead Market Energy Settlement for Virtual Transactions to Buy (HVTSA{1})	MR Ch.9 s.3.1.8	$HVTSA\{1\}_{k,h} = -1 \times \sum^{V} DAM\_QVSW_{k,h}^{v} \times DAM\_LMP_{h}^{vz}$

The equations do not match. It looks like injections and withdrawals are calculated separately but in the market rules it seems to be netting injections and withdrawals, please clarify and provide guidance on that.

IESO Response:

Please refer to IESO response provided for question 7 (7. Day-Ahead Market Energy Settlement Amount for Virtual Transactions to Sell).

10. **Real-Time Energy Settlement Amount for Virtual Transactions to Buy**

Charge type 1109; 3.1.9

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HVTSA\{2\}_{k,h} = -1 \times \sum^{V,T} (DAM\_QVSI_{k,h}^{v} - DAM\_QVSW_{k,h}^{v})/12 \times RT\_LMP_{h}^{vz,t}$$

1109 MRP new	Real-Time Energy Settlement Amount for Virtual Transactions to Buy (HVTSA{2})	MR Ch.9 s.3.1.9	$HVTSA\{2\}_{k,h} = \sum^{V,T} DAM\_QVSW^v_{k,h} / 12 \times RT\_LMP^{vz,t}_h$

The equations do not match. It looks like injections and withdrawals are calculated separately but in the market rules it seems to be netting injections and withdrawals, please clarify and provide guidance on that.

IESO Response:

Please refer to IESO response provided for question 8 (8. Real-Time Energy Settlement Amount for Virtual Transactions to Sell).

11. Day-Ahead Market Energy Settlement for Imports

Charge type 1110; 3.1.2 and 3.1.3

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\_PBC\{1\}_{k,h}$$
$$= \sum^M \left[DAM\_LMP^m_h \times \left(\sum_S DAM\_BCQ^m_{s,k,h} - \sum_B DAM\_BCQ^m_{k,b,h} \right) \right.$$
$$\left. + DAM\_LMP^i_h \times \left(\sum_S DAM\_BCQ^i_{s,k,h} - \sum_B DAM\_BCQ^i_{k,b,h} \right) \right]$$

$$HPTSA\{1\}_{k,h} = \sum^M \left[\left(DAM\_QSI^m_{k,h} - DAM\_QSW^m_{k,h} \right) \times DAM\_LMP^m_h \right.$$
$$\left. + \left(DAM\_QSI^i_{k,h} - DAM\_QSW^i_{k,h} \right) \times DAM\_LMP^i_h \right]$$

B. IESO Charge Types and Equations

1110 MRP new	Day-Ahead Market Energy Settlement for Imports (HPTSA{1})	MR Ch.9 ss.3.1.2 and 3.1.3	$HPTSA\{1\}_{k,h} = \sum^M \left[\left(DAM\_QSI^i_{k,h} - DAM\_QSW^i_{k,h} \right) \times DAM\_LMP^i_h \right] + HPTSA\_PBC\{1\}_{k,h}$ **Where:** a. $HPTSA\_PBC\{1\}_{k,h} = \sum^M \left[DAM\_LMP^i_h \times \left(\sum_S DAM\_BCQ^i_{s,k,h} - \sum_B DAM\_BCQ^i_{k,b,h} \right) \right]$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Day - Ahead Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

IESO Response:

Please refer to IESO response provided for question 1 (1. Day-Ahead Market Energy Settlement Amount for Dispatchable Generators).

12. Real Time Energy Settlement Amount for Imports

Charge type 1111; 3.1.5 and 3.1.6

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{2\}_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \, x \, \frac{\left(\left(AQEI_{k,h}^{m,t} - DAM\_QSI_{k,h}^m\right) - \left(AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m\right)\right)}{12}$$
$$+ RT\_LMP_h^{i,t} \, x \, \frac{\left(\left(SQEI_{k,h}^{i,t} - DAM\_QSI_{k,h}^i\right) - \left(SQEW_{k,h}^{i,t} - DAM\_QSW_{k,h}^i\right)\right)}{12}$$

$$HPTSA\{2\}\_PBC_{k,h}$$
$$= \sum^{M,T} RT\_LMP_h^{m,t} \, x \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t}\right)$$
$$+ \sum^{M,T} RT\_LMP_h^{i,t} \, x \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t}\right)$$

B. IESO Charge Types and Equations

1111 MRP updated (HPTSA{2})	Real-Time Energy Settlement Amount for Imports	MR Ch.9 ss.3.1.5 and 3.1.6	$HPTSA\{2\}_{k,h} = \sum^{M,T} RT\_LMP_h^{i,t} \, x \, \frac{\left(\left(SQEI_{k,h}^{i,t} - DAM\_QSI_{k,h}^i\right) - \left(SQEW_{k,h}^{i,t} - DAM\_QSW_{k,h}^i\right)\right)}{12}$ $+ HPTSA\_PBC\{2\}_{k,h}$ **Where:** a. $HPTSA\{2\}\_PBC_{k,h} = \sum^{M,T} RT\_LMP_h^{i,t} \, x \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t}\right)$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Real - Time Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

IESO Response:

Please refer to IESO response provided for question 2 (2. Real-Time Energy Settlement Amount for Dispatchable Generators).

13. Day Ahead Market Energy Settlement Amount for Exports

Charge type 1112; 3.1.2 and 3.1.3

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\_PBC\{1\}_{k,h}$$
$$= \sum^{M} \left[DAM\_LMP_h^m \times \left(\sum_S DAM\_BCQ_{s,k,h}^m - \sum_B DAM\_BCQ_{k,b,h}^m \right) \right.$$
$$\left. + DAM\_LMP_h^i \times \left(\sum_S DAM\_BCQ_{s,k,h}^i - \sum_B DAM\_BCQ_{k,b,h}^i \right) \right]$$

$$HPTSA\{1\}_{k,h} = \sum^{M} \left[\left(DAM\_QSI_{k,h}^m - DAM\_QSW_{k,h}^m \right) \times DAM\_LMP_h^m \right.$$
$$\left. + \left(DAM\_QSI_{k,h}^i - DAM\_QSW_{k,h}^i \right) \times DAM\_LMP_h^i \right]$$

B. IESO Charge Types and Equations

1112 MRP new	Day-Ahead Market Energy Settlement for Exports (HPTSA{1})	MR Ch.9 ss.3.1.2 and 3.1.3	$HPTSA(1)_{k,h} = \sum^{M} \left[(DAM\_QSI_{k,h}^i - DAM\_QSW_{k,h}^i) \times DAM\_LMP_h^i \right] + HPTSA\_PBC\{1\}_{k,h}$ **Where:** a. $HPTSA\_PBC\{1\}_{k,h} = \sum^{M} \left[DAM\_LMP_h^i \times (\sum_S DAM\_BCQ_{s,k,h}^i - \sum_B DAM\_BCQ_{k,b,h}^i) \right]$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Real - Time Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please clarify.

By comparing charge type 1110 and 1112, imports and exports are settled separately but in the market rules document they are not categorised, please clarify on the preferred method out of the two.

IESO Response:

Please refer to IESO response provided for question 1 (1. Day-Ahead Market Energy Settlement Amount for Dispatchable Generators).
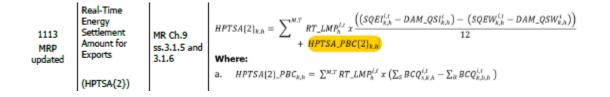
14. Real Time Energy Settlement Amount for Exports

Charge type 1113; 3.1.5 and 3.1.6

A. Document - Market Rules - Chapter 9 (Settlements and Billings)

$$HPTSA\{2\}_{k,h} = \sum^{M,T} RT\_LMP_h^{m,t} \, x \, \frac{\left(\left(AQEI_{k,h}^{m,t} - DAM\_QSI_{k,h}^m\right) - \left(AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^m\right)\right)}{12}$$
$$+ RT\_LMP_h^{i,t} \, x \, \frac{\left(\left(SQEI_{k,h}^{i,t} - DAM\_QSI_{k,h}^i\right) - \left(SQEW_{k,h}^{i,t} - DAM\_QSW_{k,h}^i\right)\right)}{12}$$

$$HPTSA\{2\}\_PBC_{k,h}$$
$$= \sum^{M,T} RT\_LMP_h^{m,t} \, x \left(\sum_S BCQ_{s,k,h}^{m,t} - \sum_B BCQ_{k,b,h}^{m,t}\right)$$
$$+ \sum^{M,T} RT\_LMP_h^{i,t} \, x \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t}\right)$$

B. IESO Charge Types and Equations

1113 MRP updated	Real-Time Energy Settlement Amount for Exports (HPTSA{2})	MR Ch.9 ss.3.1.5 and 3.1.6	$HPTSA\{2\}_{k,h} = \sum^{M,T} RT\_LMP_h^{i,t} \, x \, \frac{\left(\left(SQEI_{k,h}^{i,t} - DAM\_QSI_{k,h}^i\right) - \left(SQEW_{k,h}^{i,t} - DAM\_QSW_{k,h}^i\right)\right)}{12}$ $+ HPTSA\_PBC\{2\}_{k,h}$ **Where:** a. $HPTSA\{2\}\_PBC_{k,h} = \sum^{M,T} RT\_LMP_h^{i,t} \, x \left(\sum_S BCQ_{s,k,h}^{i,t} - \sum_B BCQ_{k,b,h}^{i,t}\right)$

The equations for HPTSA do not match. The equation just includes delivery points and no intertie points. Is Physical Bilateral Contract added to the Real - Time Settlement Energy Calculation for each resource type? Please guide us on how to calculate the addition of physical bilateral contract to HPTSA according to the charge type document. We need clarification because it was not added in the market rules document. The equation for calculation of physical bilateral contract is also different, please guide on that. It is observed by comparing charge type 1111 and 1113 that the imports and exports are settled separately but in the market rules document they are not categorised, please clarify on the preferred method out of the two.

IESO Response:

Please refer to IESO response provided for question 2 (2. Real-Time Energy Settlement Amount for Dispatchable Generators).

15. Day Ahead Market Whole Payment

Charge type 1801,1802 and 1803; 3.4.13.3, 3.4.13.4 and 3.4.13.5

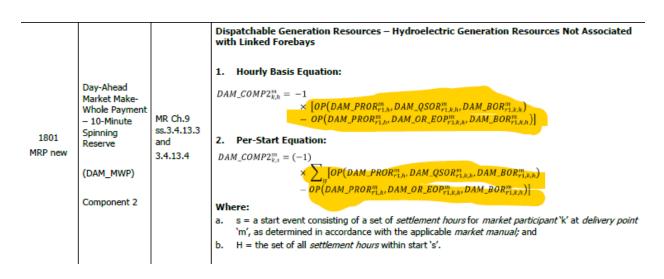   A. Document - Market Rules - Chapter 9 (Settlements and Billings)

iii. $DAM\_COMP2^m_{k,h} = -1 \times$
$$\sum_R\left[OP\left(DAM\_PROR^m_{r,h}, DAM\_QSOR^m_{r,k,h}, DAM\_BOR^m_{r,k,h}\right) - OP\left(DAM\_PROR^m_{r,h}, DAM\_OR\_EOP^m_{r,k,h}, DAM\_BOR^m_{r,k,h}\right)\right]$$

c. $DAM\_COMP2^m_{k,s} = (-1) \times$
$$\sum_H\sum_R\left[OP\left(DAM\_PROR^m_{r,h}, DAM\_QSOR^m_{r,k,h}, DAM\_BOR^m_{r,k,h}\right) - OP\left(DAM\_PROR^m_{r,h}, DAM\_OR\_EOP^m_{r,k,h}, DAM\_BOR^m_{r,k,h}\right)\right]$$

$$DAM\_COMP2^m_{k,h+TL_m} = -1 \times$$
$$\sum_R \left[OP(DAM\_PROR^m_{r,h+TL_m}, DAM\_QSOR^m_{r,k,h+TL_m}, DAM\_BOR^m_{r,k,h+TL_m}) - \right.$$
$$\left. OP(DAM\_PROR^m_{r,h+TL_m}, DAM\_OR\_EOP^m_{r,k,h+TL_m}, DAM\_BOR^m_{r,k,h+TL_m}) \right]$$

'TL_m' is the *time-lag*, for each *delivery point* 'm', equal to the number of hours downstream that the *delivery point* is from the furthest upstream *delivery point* determined by the *time-lag*, submitted by the *market participant* in the daily *dispatch data* for the *linked forebay*.

B. IESO Charge Types and Equations

| 1801 MRP new | Component 2 | | Day-Ahead Market Make-Whole Payment – 10-Minute Spinning Reserve (DAM_MWP) | MR Ch.9 s.3.4.13.5 | $DAM\_COMP2^m_{k,s} = (-1)$ $$\times \sum_H \left[OP(DAM\_PROR^m_{r1,h}, DAM\_QSOR^m_{r1,k,h}, DAM\_BOR^m_{r1,k,h}) - OP(DAM\_PROR^m_{r1,h}, DAM\_OR\_EOP^m_{r1,k,h}, DAM\_BOR^m_{r1,k,h}) \right]$$ **Where:** a. s = a start event consisting of a set of *settlement hours* for *market participant* 'k' at *delivery point* 'm', as determined in accordance with the applicable *market manual*; and b. H = the set of all *settlement hours* within start 's'. 2. The *resource* has: a. Not Attained Max Starts; or   b. Attained Max Starts but has a *day-ahead schedule* with *settlement hours* with a binding *reliability* constraint; or   c. Attained Max Starts but has a *day-ahead schedule* with *settlement hours* that are not within a start event, as determined in accordance with the applicable *market manual*, then: $DAM\_COMP2^m_{k,h+TL_m} = -1$ $$\times \left[OP(DAM\_PROR^m_{r1,h+TL_m}, DAM\_QSOR^m_{r1,k,h+TL_m}, DAM\_BOR^m_{r1,k,h+TL_m}) - OP(DAM\_PROR^m_{r1,h+TL_m}, DAM\_OR\_EOP^m_{r1,k,h+TL_m}, DAM\_BOR^m_{r1,k,h+TL_m}) \right]$$ **NOTE:** hydroelectric *generation resources* associated with *linked forebays*, which are subject to this calculation of the DAM_MWP, shall only receive a DAM_MWP *settlement amount* for a *settlement hour* when the condition as set out in MR Ch.9 s.3.4.13.5.3 is true for such *settlement hour*. **Dispatchable Generation Resources – Hydroelectric Generation Resources Associated with Linked Forebays** 1. The *resource* has   a. Attained Max Starts, then: |

1802 MRP new	Day-Ahead Market Make-Whole Payment – 10-Minute Non-Spinning Reserve (DAM_MWP) Component 2	MR Ch.9 ss.3.4.13.3 and 3.4.13.4	**Dispatchable Generation Resources – Hydroelectric Generation Resources Not Associated with Linked Forebays** 1. **Hourly Basis Equation:** $$DAM\_COMP2_{k,h}^{m} = -1 \times \left[OP\left(DAM\_PROR_{r2,h}^{m}, DAM\_QSOR_{r2,k,h}^{m}, DAM\_BOR_{r2,k,h}^{m}\right) - OP\left(DAM\_PROR_{r2,h}^{m}, DAM\_OR\_EOP_{r2,k,h}^{m}, DAM\_BOR_{r2,k,h}^{m}\right) \right]$$ 2. **Per-Start Equation:** $$DAM\_COMP2_{k,s}^{m} = (-1) \times \sum_{H} \left[OP\left(DAM\_PROR_{r2,h}^{m}, DAM\_QSOR_{r2,k,h}^{m}, DAM\_BOR_{r2,k,h}^{m}\right) - OP\left(DAM\_PROR_{r2,h}^{m}, DAM\_OR\_EOP_{r2,k,h}^{m}, DAM\_BOR_{r2,k,h}^{m}\right) \right]$$ **Where:** a. s = a start event consisting of a set of *settlement hours* for *market participant* 'k' at *delivery point* 'm', as determined in accordance with the applicable *market manual*; and

1802 MRP new	Day-Ahead Market Make-Whole Payment – 10-Minute Non-Spinning Reserve (DAM_MWP) Component 2	MR Ch.9 s.3.4.13.5	**Dispatchable Generation Resources – Hydroelectric Generation Resources Associated with Linked Forebays**
			
			1. The *resource* has
			   a. Attained Max Starts, then:
			$$DAM\_COMP2_{k,s}^{m} = (-1) \times \sum_{H} \left[OP\left(DAM\_PROR_{r2,h}^{m}, DAM\_QSOR_{r2,k,h}^{m}, DAM\_BOR_{r2,k,h}^{m}\right) - OP\left(DAM\_PROR_{r2,h}^{m}, DAM\_OR\_EOP_{r2,k,h}^{m}, DAM\_BOR_{r2,k,h}^{m}\right) \right]$$
			Where:
			a. s = a start event consisting of a set of *settlement hours* for *market participant* 'k' at *delivery point* 'm', as determined in accordance with the applicable *market manual*; and
			b. H = the set of all *settlement hours* within start 's'.
			
			2. The *resource* has:
			   a. Not Attained Max Starts; or
			   b. Attained Max Starts but has a *day-ahead schedule* with *settlement hours* with a binding *reliability* constraint; or
			   c. Attained Max Starts but has a *day-ahead schedule* with *settlement hours* that are not within a start event, as determined in accordance with the applicable *market manual*, then:
			$$DAM\_COMP2_{k,h+TL_m}^{m} = -1 \times \left[OP\left(DAM\_PROR_{r2,h+TL_m}^{m}, DAM\_QSOR_{r2,k,h+TL_m}^{m}, DAM\_BOR_{r2,k,h+TL_m}^{m}\right) - OP\left(DAM\_PROR_{r2,h+TL_m}^{m}, DAM\_OR\_EOP_{r2,k,h+TL_m}^{m}, DAM\_BOR_{r2,k,h+TL_m}^{m}\right) \right]$$

1803 MRP new	Day-Ahead Market Make-Whole Payment – 30-Minute Operating Reserve (DAM_MWP) Component 2	MR Ch.9 ss.3.4.13.3 and 3.4.13.4	**Dispatchable Generation Resources – Hydroelectric Generation Resources Not Associated with Linked Forebays** 1. **Hourly Basis Equation:** $$DAM\_COMP2_{k,h}^{m} = -1 \times \left[OP\left(DAM\_PROR_{r3,h}^{m}, DAM\_QSOR_{r3,k,h}^{m}, DAM\_BOR_{r3,k,h}^{m}\right) - OP\left(DAM\_PROR_{r3,h}^{m}, DAM\_OR\_EOP_{r3,k,h}^{m}, DAM\_BOR_{r3,k,h}^{m}\right) \right]$$ 2. **Per-Start Equation:**

1803 MRP new	Day-Ahead Market Make-Whole Payment – 30-Minute Operating Reserve (DAM_MWP) Component 2	MR Ch.9 s.3.4.13.5	$DAM\_COMP2_{k,s}^m = (-1)$ $\times \sum_H \left[OP\left(DAM\_PROR_{r3,h}^m, DAM\_QSOR_{r3,k,h}^m, DAM\_BOR_{r3,k,h}^m\right) \right.$ $\left. - OP\left(DAM\_PROR_{r3,h}^m, DAM\_OR\_EOP_{r3,k,h}^m, DAM\_BOR_{r3,k,h}^m\right) \right]$ **Where:** a. s = a start event consisting of a set of *settlement hours* for *market participant* 'k' at *delivery point* 'm', as determined in accordance with the applicable *market manual*; and b. H = the set of all *settlement hours* within start 's'.

$DAM\_COMP2_{k,s}^m = (-1)$

$\times \sum_H \left[OP\left(DAM\_PROR_{r3,h}^m, DAM\_QSOR_{r3,k,h}^m, DAM\_BOR_{r3,k,h}^m\right) \right.$

$\left. - OP\left(DAM\_PROR_{r3,h}^m, DAM\_OR\_EOP_{r3,k,h}^m, DAM\_BOR_{r3,k,h}^m\right) \right]$

Where:

a. s = a start event consisting of a set of *settlement hours* for *market participant* 'k' at *delivery point* 'm', as determined in accordance with the applicable *market manual*; and

b. H = the set of all *settlement hours* within start 's'.

Dispatchable Generation Resources – Hydroelectric Generation Resources Associated with Linked Forebays

1. The *resource* has
   a. Attained Max Starts, then:

$DAM\_COMP2_{k,s}^m = (-1)$

$\times \sum_H \left[OP\left(DAM\_PROR_{r3,h}^m, DAM\_QSOR_{r3,k,h}^m, DAM\_BOR_{r3,k,h}^m\right) \right.$

$\left. - OP\left(DAM\_PROR_{r3,h}^m, DAM\_OR\_EOP_{r3,k,h}^m, DAM\_BOR_{r3,k,h}^m\right) \right]$

Where:

a. s = a start event consisting of a set of *settlement hours* for *market participant* 'k' at *delivery point* 'm', as determined in accordance with the applicable *market manual*; and

b. H = the set of all *settlement hours* within start 's'.

2. The *resource* has:
   a. Not Attained Max Starts; or
   b. Attained Max Starts but has a *day-ahead schedule* with *settlement hours* with a binding *reliability* constraint; or
   c. Attained Max Starts but has a *day-ahead schedule* with *settlement hours* that are not within a start event, as determined in accordance with the applicable *market manual*, then:

The charge type document splits the equations in section 3.4.13.3, 3.4.13.4 and 3.4.13.5 of market rules into three categories: 10 minute spinning reserve, 10 minute non-spinning reserve and 30 minute operating reserve. This is not done in the market rules document. Is this the reason the equations have r1,r2 an r3 in them in the charge type document? Please clarify and help us understand?

IESO Response:

The day-ahead market make-whole payment equations for operating reserve are represented in the market rules as an aggregate equation.

In IESO Charge Types and Equations, each class r operating reserve (r1, r2, r3) is assigned a charge type number and settled on an individual basis, according to class r operating reserve type and resource type. The following three charge type numbers have been created:

1. Charge type 1800 – applicable to all resource types with r1 operating reserve

2. Charge type 1801 – applicable to all resource types with r2 operating reserve

3. Charge type 1802 – applicable to all resource types with r3 operating reserve