Philippine Electricity Market Corporation

WHOLESALE ELECTRICITY SPOT MARKET
RULES CHANGE COMMITTEE

RESOLUTION NO. 2017-07

Proposed General Amendments to the WESM Manuals on (a) Price Determination Methodology and (b) Constraint Violation Coefficient and Pricing Re-run regarding the Implementation of WESM Design Enhancements

WHEREAS, on 11 April 2017, the Philippine Electricity Market Corporation-Market Operator (PEMC-MO) submitted to the Rules Change Committee (RCC) the Proposed General Amendments to the WESM Manuals on (a) Price Determination Methodology (PDM), and (b) Constraint Violation Coefficient and Pricing Re-run (CVC-PR) regarding the Implementation of WESM Design Enhancements;

WHEREAS, the proposal is a re-submission of the Proposed Urgent Amendments to the same Manuals which was approved by the RCC[1] and subsequently submitted to the PEM Board on 06 March 2017, pursuant to the DOE's recommendation in a letter to PEMC dated 10 March 2017 to submit said urgent amendments as general amendments as the DOE deems it necessary to review and approve any amendments to the WESM Rules and Market Manuals concerning WESM design enhancements;

WHEREAS, the proposed changes seek to revise the DOE-approved PDM Manual Issue 1 and proposed amendments to the CVC-PR Manual as embodied in the DOE Department Circular No. DC2017-03-0001 dated 20 March 2017;

WHEREAS, the proposed amendments to the PDM Manual aim to:

(i)   revise the proposed calculation of price adjustment for customers in the non-administered region to ensure there is no cross-subsidy when the administered region under market intervention or suspension is exporting power to the non-administered region;

(ii) clarify that both Must-Run Units and constrained-on generating units may apply for additional compensation;

(iii) specify that Must-Run Units or constrain-on generators are price takers; and

(iv) delete the provision stating that administered price will only be applied to an isolated portion of the grid under market suspension or intervention since (a) there have been no declaration by the System Operator of local market intervention and suspension that only affects a certain portion of the grid, and (b) the new Market Management System is capable of determining prices for an isolated system in the grid, thereby having no need to declare local market intervention;

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[1] RCC Resolution No. 2017-03 dated 03 March 2017

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*Proposed General Amendments to the WESM Manuals on (a) Price Determination Methodology and
(b) Constraint Violation Coefficient and Pricing Re-run regarding the Implementation of
WESM Design Enhancements*

WHEREAS, the proposed amendments to the CVC-PR Manual intend to:

(i)   add constraints to provide the details of the categories and distinguish the priority among transmission equipment,

(ii)   revise the order of CVCs,

(iii)   reflect changes to ensure consistency with the revision to the order of CVCs;

(iv)   revise the nomenclature of certain CVCs to be consistent with those used in the 2016 Philippine Grid Code;

(v)   clarify the actions undertaken by the System Operator during instances when certain CVCs are violated; and

(vi)   reflect clerical edits;

WHEREAS, during the 128th Meeting of the RCC on 11 April 2017, the proposed amendments were presented to the RCC and, following the body's initial discussions, was thereafter approved for publication in the market website for comments of WESM Members and stakeholders;

WHEREAS, WESM Members and stakeholders were given until 30 May 2017, 30-working days after the proposal was published, to submit their comments;

WHEREAS, having received no comments, the RCC proceeded to deliberate on the proposal during its 130th Meeting on 09 June 2017 and approved the same as submitted;

NOW THEREFORE, we, the undersigned and in behalf of the sector we represent, hereby resolve as follows:

RESOLVED, that the Proposed General Amendments to the WESM Manuals on (a) Price Determination Methodology, and (b) Constraint Violation Coefficient and Pricing Re-run regarding the Implementation of WESM Design Enhancements are hereby approved by the RCC;

RESOLVED FURTHER, that the attached Annexes of the Proposed Urgent Amendments to the WESM Manuals on (a) Price Determination Methodology, and (b) Constraint Violation Coefficient and Pricing Re-run regarding the Implementation of WESM Design Enhancements are hereby endorsed to the PEM Board for approval and endorsement to the DOE.

Done this 09 June 2017, Pasig City.

Proposed General Amendments to the WESM Manuals on (a) Price Determination Methodology and (b) Constraint Violation Coefficient and Pricing Re-run regarding the Implementation of WESM Design Enhancements

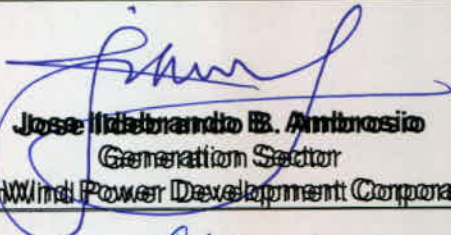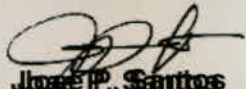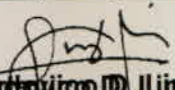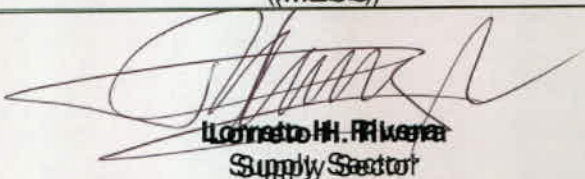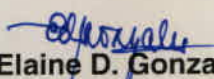| Approved by: **RULES CHANGE COMMITTEE**	
Maila Lourdes G. de Castro Chairperson Independent	
Members:	
Concepcion L. Tanglao Independent	**Francisco L.R. Castro, Jr.** Independent
Allan C. Nerves Independent	**Isidro E. Cacho, Jr.** Market Operator Philippine Electricity Market Corporation (PEMC)
Ambrocio R. Rosales Transmission Sector National Grid Corporation of the Philippines (NGCP)	**Abner B. Tolentino** Generation Sector Power Sector Assets and Liabilities Management Corporation (PSALM)
Jose Ildebrando B. Ambrosio Generation Sector NorthWind Power Development Corporation	**Theo C. Sunico** Generation Sector Wixant Corporation
Cipriniilo C. Meneses Distribution Sector (PDU) Manila Electric Company (MERALCO)	**Jose P. Santos** Distribution Sector (EC) Ilocos Norte Electric Cooperative, Inc. (INEC)
Juanito Tolentino Distribution Sector Mactan Electric Company (MECO)	**Ludovico D. Lim** Distribution Sector Antique Electric Cooperative, Inc. (ANTECO)
Lucretto H. Rivera Supply Sector TeaM (Philippines) Energy Corporation (TPEC)	Reviewed by: **Elaine D. Gonzales** Manager - Market Data and Analysis
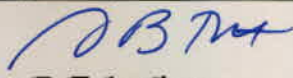
Proposed General Amendments to the WESM Manual on Price Determination Methodology regarding the Implementation of WESM Design Enhancements

Title	Section	Provision[1]	Proposed Amendment	Rationale
Administered Prices	7.1.2	7.1.2 The administered price shall be established by the Market Operator in accordance with the following guiding principles: a. The administered price shall be fair and reasonable to both the suppliers and consumers of electricity. b. Administered prices shall be determined and shall replace market prices for energy, i.e. energy administered prices shall replace the nodal energy dispatch prices, and reserves, i.e. reserve administered prices shall replace the reserve prices. c. The process for determining the administered price shall be transparent to the Trading Participants and administratively simple to implement. d. The process for determining the administered price shall be based on the market information available prior to market intervention or market suspension. e. The administered price shall be applied in the region where the market suspension or market intervention is declared. For this purpose, the regions are Luzon, Visayas and Mindanao. f. Where market suspension or market intervention is declared in an island grid ("grid islanding"), the administered prices shall be applied only to the resources in the	7.1.2 The administered price shall be established by the Market Operator in accordance with the following guiding principles: a. The administered price shall be fair and reasonable to both the suppliers and consumers of electricity. b. Administered prices shall be determined and shall replace market prices for energy, i.e. energy administered prices shall replace the nodal energy dispatch prices, and reserves, i.e. reserve administered prices shall replace the reserve prices. c. The process for determining the administered price shall be transparent to the Trading Participants and administratively simple to implement. d. The process for determining the administered price shall be based on the market information available prior to market intervention or market suspension. e. The administered price shall be applied in the region where the market suspension or market intervention is declared. For this purpose, the regions are Luzon, Visayas and Mindanao. f. Where market suspension or market intervention is declared in an island grid ("grid islanding"), the administered prices shall be applied only to the resources in the island grid where the market suspension or market intervention was declared. g f. The administered price will apply only to transactions above the declared bilateral contract quantities.	• To delete the provision since: (i) there have been no declaration by the System Operator of local market intervention and suspension that only affects a certain portion of the grid; and (ii) the new Market Management System is capable of determining prices for an isolated system in the grid, having no need to declare local market intervention. • To align with the RCC-approved changes to the related provision (Section 16.5.3 – *Declaration of Market Suspension or Intervention*) in the

Title	Section	Provision[1]	Proposed Amendment	Rationale
		island grid where the market suspension or market intervention was declared. g. The administered price will apply only to transactions above the declared bilateral contract quantities.		Dispatch Protocol Manual regarding the Implementation of WESM Design Enhancements
Administered Prices	7.3.4	In case only one region is under market suspension or market intervention and the said region is exporting power to the other region and the nodal energy dispatch prices in the region that is not under market suspension or market intervention were determined in accordance with WESM Rules Clause 3.6, the nodal energy dispatch prices for the customer resources within the region that is not under market suspension or market intervention shall be adjusted by adding the following: $$NARAPA_{b\text{-}NAR,\,i} = \frac{SQ_{ITC,\,i} {}^*(GWAP_{NAR,\,i} - GWAEAP_i)}{\sum_{b \in B\text{-}NAR_i} EDS_{b\text{-}NAR,\,i}}$$ Where: $NARAPA_{b\text{-}NAR,i}$ refers to the non-administered region administered price adjustment for a customer resource within the non-administered region for dispatch interval i $SQ_{ITC,i}$ refers to the snapshot quantity of the interconnection for dispatch interval i $GWAP_{NAR,i}$ refers to the generator weighted average price at the non-administered region using energy dispatch schedule for dispatch interval i	In case only one region is under market suspension or market intervention and the said region is exporting power to the other region and the nodal energy dispatch prices in the region that is not under market suspension or market intervention were determined in accordance with WESM Rules Clause 3.6, the nodal energy dispatch prices for the customer resources within the region that is not under market suspension or market intervention shall be adjusted by adding the following: $$NARAPA_{b\text{-}NAR,\,i} = \frac{SQ_{ITC,\,i} {}^*(\cancel{GWAP_{NAR,\,i}} GWAEAP_i - \mathbf{GWAP_{NAR,\,i}})}{\sum_{b \in B\text{-}NAR_i} EDS_{b\text{-}NAR,\,i}}$$ Where: $NARAPA_{b\text{-}NAR,i}$ refers to the non-administered region administered price adjustment for a customer resource within the non-administered region for dispatch interval i $SQ_{ITC,i}$ refers to the snapshot quantity of the interconnection for dispatch interval i $GWAP_{NAR,i}$ refers to the generator weighted average price at the non-administered region using energy dispatch schedule for dispatch interval i $GWAEAP_i$ refers to the generator weighted average energy administered price using snapshot quantity for dispatch interval i $EDS_{b\text{-}NAR,i}$ refers to the energy dispatch schedule of customer resource b within the non-administered region for dispatch interval i	To revise the formula ensuring that there is no cross-subsidy when the region under market intervention or market suspension is exporting power to the non-administered region.

Proposed General Amendments to the WESM Manual on Price Determination Methodology regarding the Implementation of WESM Design Enhancements

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Title	Section	Provision[1]	Proposed Amendment	Rationale
		GWAEAP$_i$ refers to the generator weighted average energy administered price using snapshot quantity for dispatch interval i EDS$_{b\text{-NAR},i}$ refers to the energy dispatch schedule of customer resource b within the non-administered region for dispatch interval i B-NAR$_i$ refers to the set of all customer resources within the non-administered region for dispatch interval i b-NAR refers to a customer resource within the non-administered region	B-NAR$_i$ refers to the set of all customer resources within the non-administered region for dispatch interval i b-NAR refers to a customer resource within the non-administered region	
Additional Compensation	8.3.1	8.3.1 A Trading Participant may be entitled to additional compensation when the costs incurred in complying with dispatch instructions are not sufficiently covered by the trading amounts related to settlement intervals with dispatch intervals under any of the following conditions: a. Market suspension or market intervention; or b. When the same Trading Participant was designated as must-run unit.	8.3.1 A Trading Participant may be entitled to additional compensation when the costs incurred in complying with dispatch instructions are not sufficiently covered by the trading amounts related to settlement intervals with dispatch intervals under any of the following conditions: a. Market suspension or market intervention **and was paid at the administered price in accordance with Section 7**; or b. When the same Trading Participant was designated as must-run unit or constrain-on generating unit **and was paid at the WESM price in accordance with Section 4.12.**	▪ To clarify that both Must-Run Units and constrained-on generating units may apply for additional compensation; ▪ To align with the RCC-approved changes to the related provision (Section 11.6.4 – *Re-dispatch Process*) in the Dispatch Protocol Manual regarding the Implementation of WESM Design Enhancements

Proposed General Amendments to the WESM Manual on Price Determination Methodology regarding the Implementation of WESM Design Enhancements

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Proposed General Amendments to the WESM Manual on Constraint Violation Coefficient and Pricing Re-run for the Implementation of WESM Design Enhancements

Title	Section	Provision[1]	Proposed Amendment	Rationale
Definitions	2.1.2	NEW	**b. Branch Group. A group of lines and/or transformers**	To clarify the definition of branch group as used in this Manual.
Soft Constraints	4.2	The following soft constraints may be relaxed in the market dispatch optimization model and shall have an associated constraint violation coefficient. a. xxx e. Transmission Group Constraint, where the power flow through a branch group, or an interconnection equipment between grids (i.e. HVDC links) should be within its normal limits. f. xxx g. xxx	The following soft constraints may be relaxed in the market dispatch optimization model and shall have an associated constraint violation coefficient. a. xxx e. ~~Transmission Group Constraint, where the power flow through a branch group, or an interconnection equipment between grids (i.e. HVDC links) should be within its normal limits.~~ ~~f.~~ xxx ~~g~~ f. xxx	• Power flow constraint of a branch group or an interconnection equipment between grids is provided as additional constraints under Thermal Contingency and Thermal Base Case Constraints. See Section 4.3.4 below. • Renumbering.
Order of Constraint Violation Coefficients	4.3.1	The order of relaxing soft constraints shall be set such that constraints resulting in the lowest reduction in the capability of the network, load or generating units shall be allowed to occur first, as follows: a. Delayed Contingency Reserve Requirement Constraint b. Slow Contingency Reserve Requirement Constraint c. Fast Contingency Reserve Requirement Constraint d. Nodal VoLL or Nodal Energy Balance Constraint e. System Energy Balance Constraint f. Self-scheduled Generation Constraint g. Thermal Contingency Constraint	The order of relaxing soft constraints shall be set such that constraints resulting in the lowest reduction in the capability of the network, load or generating units shall be allowed to occur first, as follows: a. ~~Delayed Contingency~~ **Tertiary** Reserve Requirement Constraint b. ~~Slow Contingency~~ **Primary** Reserve Requirement Constraint ~~c. Fast Contingency Reserve Requirement Constraint~~ **c.** ~~d.~~ Nodal VoLL or Nodal Energy Balance Constraint **d.** ~~e.~~ System Energy Balance Constraint **e.** ~~f.~~ Self-scheduled Generation Constraint	• To distinguish the priority among the thermal contingency and thermal base case constraints of transmission equipment, such as line, transmission, and branch group. • To align the terminologies on reserve requirement with the PGC 2016 edition. • Renumbering

[1] As provided in the DOE-approved Constraint Violation Coefficient and Pricing Re-run Manual per DOE DC2017-03-0001 dated 20 March 2017

Title	Section	Provision[1]	Proposed Amendment	Rationale
		h. Regulating Reserve Requirement Constraint i. Transmission Group Constraint j. Thermal Base Case Constraint	f. g. Thermal Contingency Constraint – **Transformer** **g. Thermal Contingency Constraint – Line** **h. Thermal Contingency Constraint – Branch Group** i. h . Regulating **Secondary** Reserve Requirement Constraint i. Transmission Group Constraint j Thermal Base Case Constraint – **Transformer** **k. Thermal Base Case Constraint – Line** **l. Thermal Base Case Constraint – Branch Group**	
Order of Constraint Violation Coefficients	4.3.4	The following table provides the constraint violation coefficients, which is reflective of the order of relaxing soft constraints established in Section 4.3.1 of this Market Manual, and the corresponding action to be undertaken by the System Operator.	The following table provides the constraint violation coefficients, which is reflective of the order of relaxing soft constraints established in Section 4.3.1 of this Market Manual, and the corresponding action to be undertaken by the System Operator.	• To distinguish the priority among the thermal contingency and thermal base case constraints of transmission equipment, such as line, transmission, and branch group. • To clarify the actions undertaken by the System Operator when certain CVCs are violated. • To align the terminologies on reserve requirement with the PGC 2016 edition.

Provision table (4.3.4):

Order	Constraint Violation Coefficient Name	CVC	SO Action
1	Delayed Contingency Reserve Requirement	100,000	Automatic load drop to cover for loss of generation if contingency reserve is insufficient.
2	Slow Contingency Reserve Requirement	200,000	Automatic load drop to cover for loss of generation if contingency reserve is insufficient.
3	Fast Contingency Reserve Requirement	400,000	Automatic load drop to cover for loss of generation if contingency reserve is insufficient.

Proposed Amendment table (4.3.4):

Order	Constraint Violation Coefficient Name	CVC	SO Action
1	Delayed Contingency **Tertiary** Reserve Requirement	100,000	Automatic load drop to cover for loss of generation if contingency reserve is insufficient. **None**
2	Slow Contingency **Primary** Reserve Requirement	200,000	Automatic load drop to cover for loss of generation if contingency reserve is insufficient. **None**

Proposed General Amendments to the WESM Manual on Constraint Violation Coefficient regarding the Implementation of WESM Design Enhancements

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Title	Section	Provision[1]				Proposed Amendment				Rationale
		4	Nodal Value of Lost Load or Nodal Energy Balance Constraint	800,000	Re-dispatch generation and/or drop load as necessary.	~~3~~	~~Fast Contingency Reserve Requirement~~	~~400,000~~	~~Automatic load drop to cover for loss of generation if contingency reserve is insufficient.~~	
		5	System Energy Balance Constraint	1,300,000	For over-generation, identify generating units to be shut down to eliminate excess capacity. For under-generation, identify must-run units that can be dispatched or drop load as necessary	3 4	Nodal Value of Lost Load or Nodal Energy Balance Constraint	800,000	Re-dispatch generation and/or drop load as necessary.	
		6	Self-Scheduled Generation Constraint	1,400,000	The projected output or schedule of loading level of the relevant generating unit(s) shall be curtailed.	4 5	System Energy Balance Constraint	1,300,000	For over-generation, identify generating units to be shut down to eliminate excess capacity. For under-generation, identify must-run units that can be dispatched or drop load as necessary	
		7	Thermal Contingency Constraint	2,400,000	Re-dispatch generation and/or drop load as necessary.	5 6	Self-Scheduled Generation Constraint	1,400,000	The projected output or schedule of loading level of the relevant generating unit(s) shall be curtailed.	
		8	Regulating Reserve Requirement	2,800,000	Re-dispatch generation and/or drop load as necessary.	6 7	Thermal Contingency Constraint - **Transformer**	~~2,400,000~~ **1,500,000**	Re-dispatch generation and/or drop load as necessary.	
		9	Transmission Group Constraint	2,900,000	Re-dispatch generation and/or drop load as necessary.	7	**Thermal Contingency Constraint - Line**	1,500,000		
						8	**Thermal Contingency Constraint - Branch Group**	2,000,000		

Proposed General Amendments to the WESM Manual on Constraint Violation Coefficient regarding the Implementation of WESM Design Enhancements

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Title	Section	Provision[1]					Proposed Amendment					Rationale
		10	Thermal Base Case Constraint	3,000,00 0	Re-dispatch generation and/or drop load as necessary.		9 8	Regulating **Secondary** Reserve Requirement	2,800,000 **3,500,000**	Re-dispatch generation and/or drop load as necessary.		
							9	Transmission Group Constraint	2,900,000	Re-dispatch generation and/or drop load as necessary.		
							10	Thermal Base Case Constraint **- Transformer**	3,000,000 **4,000,000**	Re-dispatch generation and/or drop load as necessary.		
							11	**Thermal Base Case Constraint – Line**	**4,000,000**			
							12	**Thermal Base Case Constraint – Branch Group**	**4,500,000**			
Automatic Pricing Re-Run Parameters	5.3.1	The corresponding constraint relaxation formulas for the constraint violation coefficients during pricing re-runs shall be as provided in Table 2 below:										▪ To distinguish the priority among the thermal contingency and thermal base case constraints of transmission equipment, such as line, transmission, and branch group. ▪ To provide the corresponding re-run prices for the proposed additional constraints. ▪ To align the terminologies on reserve requirement with the PGC 2016 edition.

Proposed General Amendments to the WESM Manual on Constraint Violation Coefficient regarding the Implementation of WESM Design Enhancements

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Original							Proposed Amendments					
Order	Constraint Violation Coefficient Name	CVC	Violation Variable Value	Delta	Constraint Relaxation during Pricing Re-Run	Re-run Price[2]	Order	Constraint Violation Coefficient Name	CVC	Violation Variable Value	Delta	Constraint Relaxation during Pricing Re-Run	Re-run Price[2]
1	Delayed Contingency Reserve Requirement	100,000	x	0.1	x + delta	EDP AND RP	1	~~Delayed Contingency~~ Deficit **Tertiary** ~~Reserve~~ Requirement	100,000	x	0.1	x + delta	EDP AND RP
2	Slow Contingency Reserve Requirement	200,000	x	0.1	x + delta	EDP AND RP	2	~~Slow Contingency~~ Deficit **Primary** Reserve Requirement	200,000	x	0.1	x + delta	EDP AND RP
3	Fast Contingency Reserve Requirement	400,000	x	0.1	x + delta	EDP AND RP	3	~~Deficit Fast Contingency Reserve Requirement~~	~~400,000~~	x	~~0.1~~	~~x + delta~~	~~EDP AND RP~~
4	Nodal Energy Balance Constraint	800,000	x	0.1	x + delta	EDP AND RP	~~3~~ 4	Nodal Energy Balance Constraint	800,000	x	0.1	x + delta	EDP AND RP
5	System Energy Balance Constraint	1,300,000	x	0	delta	Excess Price for over-generation / Shortage Price for under-generation	~~4~~ 5	System Energy Balance Constraint	1,300,000	x	0	delta	Excess Price for over-generation / Shortage Price for under-generation
6	Self-Scheduled Generation Constraint	1,400,000	x	0.1	x + delta	EDP AND RP	~~5~~ 6	Self-Scheduled Generation Constraint	1,400,000	x	0.1	x + delta	EDP AND RP
7	Thermal Contingency Constraint	2,400,000	x	0.1	x + delta	EDP AND RP	~~6~~ 7	Thermal Contingency Constraint - **Transformer**	~~2,400,000~~ 1,500,000	x	0.1	x + delta	EDP AND RP
							7	**Thermal Contingency Constraint - Line**	1,500,000	x	0.1	x + delta	**EDP AND RP**
							8	**Thermal Contingency Constraint - Branch Group**	2,000,000	x	0.1	x + delta	**EDP AND RP**

[2] EDP refers to *nodal energy dispatch price;* and RP refers to *reserve price*

Proposed General Amendments to the WESM Manual on Constraint Violation Coefficient regarding the Implementation of WESM Design Enhancements

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Original							Proposed Amendments						
8	Regulating Reserve Requirement	2,800,000	x	0.1	x + delta	EDP AND RP	9 8	Regulating **Secondary** Requirement	2,800,000 **3,500,000**	x	0.1	x + delta	EDP AND RP
9	Transmission Group Constraint	2,900,000	x	0.1	x + delta	EDP AND RP	9	Transmission Group Constraint	2,900,000	x	0.1	x + delta	EDP AND RP
10	Thermal Base Case Constraint	3,000,000	x	0.1	x + delta	EDP AND RP	10	Thermal Base Case Constraint - **Transformer**	3,000,000 **4,000,000**	x	0.1	x + delta	EDP AND RP
							11	**Thermal Base Case Constraint – Line**	**4,000,000**	**x**	**0.1**	**x + delta**	**EDP AND RP**
							12	**Thermal Base Case Constraint – Branch Group**	**4,500,000**	**x**	**0.1**	**x + delta**	**EDP AND RP**

Proposed General Amendments to the WESM Manual on Constraint Violation Coefficient regarding the Implementation of WESM Design Enhancements

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