

PUBLIC

WESM Manual

Dispatch Protocol Issue No.12.0

Abstract	This document covers the timetable and procedures of the Dispatch Protocol
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Document Identity:	WESM-DP-012
Issue No.:	12.0
Reason for Issue:	Various amendments
Approval Date:	20 April 2017
Publication Date:	02 June 2017
Effective Date:	17 June 2017

Document Change History

Issue No.	Proponent	Date of Effectivity	Reason for Amendment
0	MO, PEMC	02/07/2005	New Document / Draft Format
2	MO, PEMC	03/10/2005	Minor revisions were introduced based on consolidated WESM-TWG comments
	MO, PEMC	01/12/2006	Revision of procedures during market suspension and intervention.
3			Inclusion of procedures on revision of bids and offers in Appendix A-1.
	MO, PEMC	07/06/2006	Revision of gate closure period from four to two hours before RTD execution, found in Appendix A.1, Section 4.4.
4	MO, PEMC	02/28/2007	Revision of Appendix A.1, Section 4.5 to allow cancellation of bids/offers and Glossary to include definition of maximum available capacity
5	Rules Change Committee	02/11/2008	Revision of Appendix A.1 Section 4.4 to change gate closure from two hours to one hour
6	PEMC	09/29/2010	Revision of Appendix A.4, Section 4.4. and Appendix A.6, Section 4.2 to remove contingency list from the Ex-Post Process <i>(approved by the PEM Board as Urgent Amendments on 27 October 2010 and as General Amendments on 28 April 2011)</i>
7	Generators, PEMC-MO, NGCP-SO	11/15/2012	Revisions to: <ul style="list-style-type: none"> • Include the Merit Order Table (MOT) in pertinent sections of the Manual • Add definition of MOT in Glossary of Terms and Abbreviations • Include detailed procedures on the generation of MOT (Attachment D.1) • Clarify the implementation of re-dispatch process on a per case basis

Issue No.	Proponent	Date of Effectivity	Reason for Amendment
			<ul style="list-style-type: none"> Include SO's responsibility in logging and reporting to MO any deviation of their dispatch instructions from the RTD schedule
8	PEMC-MO	05/21/ 2013	<ul style="list-style-type: none"> Revision of Appendix A.1 to remove the provision "at any time" and replace it with provisions on gate closure, to reflect the changes made in the WESM Rules
9	PEMC-MO	02/19/2013	<ul style="list-style-type: none"> Additional Appendix A.12 on the Scheduling and Dispatch of Reserves
10	PEMC-MO	08/04/2014	<ul style="list-style-type: none"> Re-submission of approved urgent amendments as general amendments(Additional Appendix A.12 on the Scheduling and Dispatch of Reserves)
11	RCC	09/29/2014	<ul style="list-style-type: none"> Revision of Dispatch Protocol Manual pursuant to DOE Directives relative to the Manual on the Management of Must Run Units
12	PEMC-MO		<ul style="list-style-type: none"> Revised format of entire document to address findings and recommendations of the PA Consulting Services Ltd. in its operational audit reports, with revisions including the following – <ul style="list-style-type: none"> Added references to provisions of the WESM Rules relevant to each procedure Clarified statements of responsibilities pertaining to the Market Operator, System Operator and Trading Participants Added the following sections <ul style="list-style-type: none"> Start-up and shutdown of generating units, thus merging the WESM Manual

Issue No.	Proponent	Date of Effectivity	Reason for Amendment
			<p>on Procedures for Start-up and Shutdown of Generating Units</p> <ul style="list-style-type: none"> Deleted appendices/sections on the following as these are already covered in separate market manuals – <ul style="list-style-type: none"> Load forecasting methodology or demand forecasting Market operator information publication Revised Glossary to remove terms and abbreviations which are already defined in the WESM Rules Incorporated provisions on dispatch tolerance standards Revised the definition of maximum available capacity to basically reflect that co-generation facilities' maximum available capacity is net of their load. Revised provisions on Market Intervention and Market Suspension to align the Manual with recent WESM Rules changes on Market Intervention and Market Suspension Intended to align several affected provisions of the DPM with the promulgated amendments to the WESM Rules for the implementation of preferential dispatch, per DOE Department Circular No. DC2016-01-0002.

Document Approval

Issue No.	RCC Approval	RCC Resolution No.	PEM Board Approval	PEM Board Resolution No.	DOE Approval	DOE DC No.
0	15 March 2005		16 May 2005	2005-08		
2	05 January 2006	2006-06	19 January 2006	2006-03		
	12 January 2006	2006-07	19 January 2006	2006-05		
3	06 July 2006	2006-21	06 July 2006	2006-32		
	14 November 2006	2006-36	17 November 2006	2006-63		
4	15 February 2007	2007-03	28 February 2007	2007-03		
5	28 January 2008	2008-01	11 February 2008	2008-02		
5	18 August 2010	2010-11	05 October 2010	2010-64		
6	13 October 2010 <i>(as Urgent Amendments)</i>	2010-13	27 October 2010 <i>(as Urgent Amendments)</i>	2010-73		
	06 April 2011 <i>(as General Amendments)</i>		28 April 2011 <i>(as General Amendments)</i>	2011-26		
7	08 February 2012	2012-02	27 February 2012	2012-08		
8	07 August 2013	2013-08	29 August 2013	2013-46		
	21 February 2014	2014-07	27 February 2014	2014-11		
10	10 September 2014 <i>(as General Amendments)</i>	2014-17	29 September 2014 <i>(as General Amendments)</i>	2014-43		
	10 September 2014	2014-13	29 September 2014	2014-44		
12	05 October 2016	2016-11	29 November 2017	2016-39	20 April 2017	2017-004-0007

Reference Documents

Document ID	Document Title
	WESM Rules
	Philippine Grid Code
	Revised Price Determination Methodology
	WESM Market Manual - Emergency Procedures
	WESM Market Manual - Load Forecasting Methodology
	WESM Market Manual - Management of Must Run Units
	WESM Market Manual - Management Procedure for Excess Generation
	WESM Market Manual - Management Procedure for Load Shedding
	WESM Market Manual - Market Network Model Development And Maintenance – Criteria And Procedures
	WESM Market Manual - Market Operator Information Disclosure and Confidentiality Manual
	WESM Market Manual - System Security and Reliability Guidelines
	WESM Market Manual - Ancillary Services Monitoring Manual

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SECTION 1 INTRODUCTION

1.1 OVERVIEW OF WESM OPERATIONS

1.1.1 The commencement of the operations of the WESM introduced significant changes in the functional responsibility of the System Operator in the operations of the grid. The following figure shows a simplified overview of the operational arrangements between the System Operator and the Market Operator.

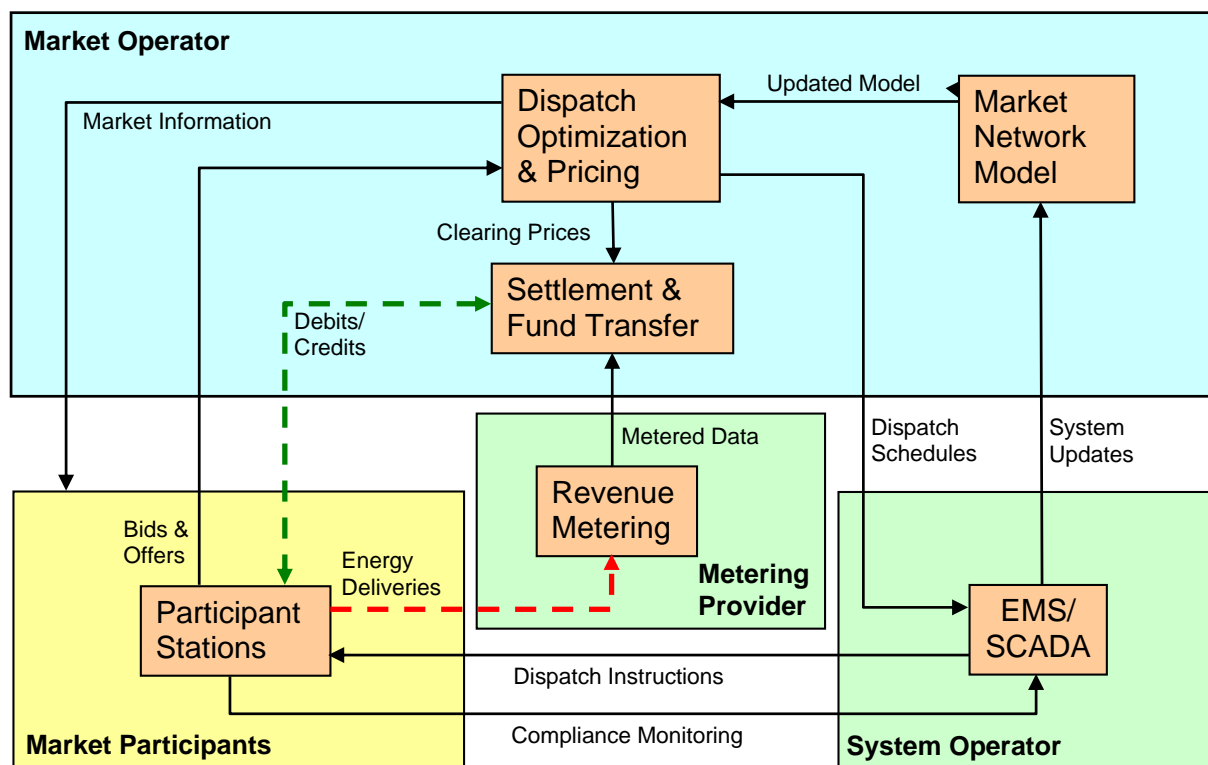


Figure 1. Overview of WESM Operations

1.1.2 As shown, dispatch implementation continues to be performed by the System Operator with the operation of the WESM, while demand forecasting and scheduling of generation and loads are functions of the Market Operator. Dispatch scheduling is performed by the Market Operator using hourly demand bids and generation offers submitted by the trading participants.

1.1.3 An economic real-time dispatch (RTD) schedule is generated by the Market Operator taking into consideration information on system status and

constraints. The Market Operator likewise prepares a merit order table (MOT) that presents the list of available generating units ranked in accordance with the offer prices submitted for these units. These schedules are submitted to the System Operator for dispatch implementation. Post-dispatch reports are thereafter relayed by the System Operator to the Market Operator.

- 1.1.4 The Market Operator uses a market dispatch optimization model with a representation of the transmission network so that transmission constraints and losses are considered in the preparation of dispatch schedules. Self-commitment is adopted in the dispatch model instead of centralized unit commitment, consistent with the policy of competition in the generation sector as set out in Section 6 of Republic Act No. 9136.
- 1.1.5 WESM Rules Clause 3.4.2 requires the Market Operator to operate the market in accordance with a timetable which it is required to maintain, publish and continuously update. The timetable shall include the schedule for –
 - a) Determining and publishing week-ahead projections and day-ahead projections, including the precise specifications of the market horizon to be used for such projections;
 - b) Submitting offers, bids and data;
 - c) If necessary, for any other action to be taken by the Market Operator, the System Operator, or any WESM Member during the operation of the spot market.
- 1.1.6 Under this timetable, trading activities in the WESM operate at different time frames starting from the week before until the day following the trading day.
- 1.1.7 The scheduling process starts with the week-ahead market projection (WAP) which gives the indicative hourly dispatch schedules and spot prices for the next seven (7) days. This projection takes into consideration all available information including nomination of *loading levels*, *projected outputs*, *bids* and *offers* from participants, demand forecasts, outage schedules and the current status of the grid.
- 1.1.8 The day-ahead market projection (DAP) is prepared every four (4) hours of the day covering the hours succeeding each DAP run up to the end of the following day. It utilizes the most recent nomination of *loading levels*, *projected outputs*, *bids* and *offers* of participants as well as information on power system status,

reserve requirements and outage schedules. The *day-ahead projection* allows the *System Operator* to prepare a more accurate *contingency* plan for the succeeding *trading intervals* or *dispatch* day.

- 1.1.9 During the dispatch day, Trading Participants are allowed to revise their nomination of *loading levels*, *projected outputs*, *bids* and *offers* within the open market window which is not later than the established gate closure or cut-off time. Nominations of *loading levels*, *projected outputs*, *bids* and *offers* for a trading interval are fixed after the gate closure or cut-off time. The real-time dispatch (RTD) schedule and the merit order table (MOT) generated by the Market Operator and transmitted to the System Operator are based on the nomination of *loading levels*, *projected outputs*, *bids* and *offers* submitted by the cut-off time.
- 1.1.10 The real-time dispatch schedule generated by the Market Operator is comprised of the energy and reserve schedules. The energy schedule contains the target loading level, in MW, that all facilities should meet at the end of the relevant trading interval. The reserve schedule contains the capacities scheduled for provision of ancillary services, but covering only the reserves that are traded in the WESM.
- 1.1.11 The System Operator implements the real-time dispatch schedules during the trading day, issues dispatch instructions to and ensures compliance by the trading participants with such instructions, and maintains overall security of the power system.
- 1.1.12 Relevant information on the actual dispatch implementation is transmitted by the System Operator to the Market Operator to allow accounting of the deviations from the dispatch schedules or non-compliances to dispatch instructions. The determination of the ex-post prices at the end of the trading interval accounts for these deviations.
- 1.1.13 After the trading day, the System Operator provides a report of the dispatch results which incorporates all the actual dispatched generation, actual demand and other significant events that occurred during the previous trading day which had impact on market results.
- 1.1.14 WESM Rules Chapter 3 provides for the guidelines and procedures relevant to the various processes for the operation of the WESM, including, submission

of bids, offers and data; provision of ancillary services; preparation of week ahead and day ahead projections; and scheduling and dispatch. Chapter 6, meanwhile, provides for the rules and procedures that will be followed during market suspension and intervention.

1.2 PURPOSE

- 1.2.1 This Dispatch Protocol aims to define the delineation of the functions and responsibilities between the Market Operator and the System Operator in respect to dispatch scheduling and implementation in the WESM.
- 1.2.2 More specifically, the objectives of this Dispatch Protocol are –
- a) Establish the WESM timetable as provided for in WESM Rules Clauses 3.4.2 and 10.4.8.1; and
 - b) Establish the scheduling and dispatch procedures during normal system conditions and during emergency conditions that are consistent with the WESM timetable and the features of the Market Management System. The procedures for emergency conditions include those that will apply during market suspension and restoration.

1.3 SCOPE

- 1.3.1 This Dispatch Protocol covers the procedures for dispatch scheduling and implementation during normal system conditions and during emergency conditions. The procedures on energy metering, billing and settlements, as well as that involving fund administration, are not covered in this Dispatch Protocol.
- 1.3.2 This Dispatch Protocol shall apply to the Market Operator, the System Operator and all WESM members, including intending WESM members, and participants in the electric power industry.
- 1.3.3 This Dispatch Protocol shall apply in the grids where the WESM is in operation.

SECTION 2 DEFINITIONS, REFERENCES AND INTERPRETATION
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2.1 DEFINITIONS

- 2.1.1 Unless otherwise defined in the Glossary of this document or unless the context provides otherwise, all terms used in this Dispatch Protocol that are defined in the WESM Rules shall take the meaning as so defined in the WESM Rules.

2.2 REFERENCES

- 2.2.1 This Dispatch Protocol should be read in association with Chapter 3 and Chapter 6 of the WESM Rules and other market manuals, including but not limited to the reference documents listed in the Reference Documents table. Other references are also stated in relevant sections of this Dispatch Protocol.

2.3 INTERPRETATION

- 2.3.1 The rules on interpretation set out in Chapter 9 of the WESM Rules, as these may be amended from time to time, shall govern the interpretation of this Dispatch Protocol.

SECTION 3 RESPONSIBILITIES

3.1 MARKET OPERATOR

- 3.1.1 The Market Operator is responsible for the administration of the Wholesale Electricity Spot Market (WESM) in accordance with the WESM Rules. Among other functions, it is responsible for determining the dispatch schedule of all facilities in the WESM, which schedule shall be submitted to the System Operator (WESM Rules Clause 1.3.1).
- 3.1.2 In administering the operations of the WESM, the Market Operator shall carry out its functions by performing and complying with the obligations and procedures set out in this Dispatch Protocol.
- 3.1.3 The Market Operator is responsible for the development of Procedures, Processes and Systems relevant to its functions contained in this Market Manual as well as the regular review of this Manual to ensure consistency with the WESM Rules.

3.2 SYSTEM OPERATOR

- 3.2.1 The System Operator shall be responsible for the implementation of the dispatch schedule as provided by the Market Operator on an hourly basis and shall operate the power system in accordance with the WESM Rules, the Grid Code and other related rules in relation to the security and reliability guidelines. Its primary responsibilities include providing central dispatch to all generation facilities and loads connected, directly and indirectly, to the transmission system in accordance with the dispatch schedule submitted by the Market Operator (WESM Rules clause 1.3.3).
- 3.2.2 The System Operator shall carry out its functions by performing and complying with the procedures and obligations set out in this Dispatch Protocol.
- 3.2.3 The System Operator is responsible for the development of Procedures, Processes and Systems relevant to its functions contained in this Market Manual. Also, the System Operator shall regularly review its internal processes to ensure consistency with this manual.

3.3 TRADING PARTICIPANTS AND OTHER WESM MEMBERS

- 3.3.1 All trading participants and other WESM members shall comply with the timetable and procedures for scheduling and dispatch that are set out in this Dispatch Protocol as such procedures apply to them. They shall ensure that their respective internal processes, systems and infrastructure, as well as their protocols with their counterparties, are compliant with this Dispatch Protocol.
- 3.3.2 Pursuant to WESM Rules Clause 2.3.1.7, scheduled generation companies are required to operate their scheduled generating units in accordance with the scheduling and dispatch procedures described in Chapter 3 of the WESM Rules. Among the scheduling and dispatch procedures referred to are set out in more detail in this Dispatch Protocol.
- 3.3.3 Trading Participants are responsible for the actions of any person or entity acting for or in their behalf, as such actions are considered the actions of the Trading Participant, pursuant to WESM Rules Clause 7.2.6.

SECTION 4 WESM TIMETABLE

4.1 BACKGROUND

- 4.1.1 WESM Rules Clause 3.4.2.1 requires that the Market Operator shall operate the spot market in accordance with the timetable. The timetable is to be maintained, published and continuously updated by the Market Operator, as directed in WESM Rules Clause 3.4.2.3. WESM Rules Clause 3.4.2.4 further directs that changes on the timetable and related procedures shall be approved by the DOE in accordance with the rules change process set out in Chapter 8 of the WESM Rules.
- 4.1.2 The schedules and procedures for the following processes are required, under WESM Rules clause 3.4.2.2, to be included in the WESM timetable –
- a) Determining and publishing week-ahead projections including the precise specification of the market horizon to be used for such projections;
 - b) Determining and publishing day-ahead projections including precise specification of the market horizon to be used for such projections;
 - c) Submitting offers, bids and data; and
 - d) If necessary, for any other action to be taken by the Market Operator, the System Operator or any WESM Member during the operation of the spot market.
- 4.1.3 The schedules and procedures presented in this Dispatch Protocol are those prepared and maintained pursuant to the foregoing requirements of the WESM Rules. The schedules are as presented in this Section while the procedures are set out in other sections of this Dispatch Protocol.

4.2 SCOPE OF THE WESM TIMETABLE

- 4.2.1 The WESM Timetable is the overall schedule of market activities under different time frames of operations as embodied in the WESM Rules. These activities are presented in the timetable in four (4) different but inter-related time frames, as follows -
- a) Week-Ahead Market Projection (WAP)
 - b) Day-Ahead Market Projection (DAP)
 - c) Real-Time Dispatch (Hour-Ahead) Schedule (RTD)
 - d) Real-Time Ex-Post Dispatch Schedule (RTX)

4.2.2 The market horizon covered by each activity is presented in the following table as the period covered.

4.3 WEEK-AHEAD MARKET PROJECTION (WAP)

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
D	0855H	Retrieve System Snapshot from EMS	SO	MO	0855H of D-7
		MO to determine the Reserve Requirement			
D	Before 0855H	Retrieve Other Information from SO re: 1. Outage Schedules 2. Transmission Limits 3. Overriding Constraints	SO	MO	7 Days Ahead 168 Hours (=7x24) D+1 to D+7
D	Before 0800H	Gather Weather Forecast	MO		7 Days Ahead 168 Hours (=7x24) D+1 to D+7
D	Before 0855H	Perform Demand Forecast	MO		7 Days Ahead 168 Hours (=7x24) D+1 to D+7
D	Before 0900H	MDOM Refinements ¹	MO		7 Days Ahead 168 Hours (=7x24) D+1 to D+7
D	Before 0900H	Nomination of Loading Levels, Projected Outputs, Bids and Offers Submission <i>Trading Participants may submit nomination of loading levels, projected outputs, bids and offers for the study horizon through either the daily bid or standing bid formats.</i>	TPs	MO	7 Days Ahead 168 Hours (=7x24) D+1 to D+7

¹ Changes to Settings in MDOM

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
		Nomination of <i>loading levels, projected outputs, bids and offers</i> must be effective prior to <i>week-ahead projection</i> execution.			
D	0900H	Perform WAP	MO		7 Days Ahead 168 Hours (=7x24) D+1) to D+7
D	0900H to 1700H	WAP Results Analysis and Coordination with SO	MO	SO	7 Days Ahead 168 Hours (=7x24) D+1 to D+7
D	1700H	Publish WAP Results to the WESM Market Information Website and MPI ²	MO	TPs	7 Days Ahead 168 Hours (=7x24) D+1 to D+7

4.4 DAY-AHEAD MARKET PROJECTION (DAP)

4.4.1 The Day-Ahead Projection market runs shall be executed at the following time of the day, represented as “T” in the following timetable –

DAY	EXECUTION TIME (T)	PERIOD COVERED OR HORIZON
D	0400H	0500H to 2400H of D
D	0800H	0900H to 2400H of D
D	1200H	1300H of D to 2400H of D+1
D	1600H	1700H of D to 2400H of D+1
D	2000H	2100H of D to 2400H of D+1
D	2400H	0100H to 2400H of D+1

4.4.2 The DAP timetable is presented in the following table -

²MPI refers to the Market Participant Interface, which is a secured website used by the Trading Participants in their daily transactions with the WESM such as in the submission of offers, viewing of market results, etc. It is managed by the Market Operator.

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
D	T – 5 min	Retrieve System Snapshot from EMS	SO	MO	T – 5 min of D
		MO to determine the Reserve Requirement			
D	Before T – 5 min	Retrieve Other Information from SO re: 1. Outage Schedules 2. Contingency Lists 3. Transmission Limits 4. Overriding Constraints	SO	MO	For the Study Horizon
D	Before T – 5 min	Nomination of Loading Levels, Projected Outputs, Bids and Offers Submission <i>Trading Participants may submit nomination of loading levels, projected outputs, bids and offers for the study horizon through either the daily bid or standing bid formats.</i> Nomination of loading levels, projected outputs, bids and offers must be effective prior to day-ahead projection execution.	TPs	MO	For the Study Horizon
D	Before T	Gather Weather Forecast	MO		For the Study Horizon
D	Before T	Perform Demand Forecast	MO		For the Study Horizon
D	Before T	MDOM Refinements	MO		For the Study Horizon
	T	Perform DAP	MO		Study Horizon
D	T to (T+1Hour)	DAP Results Analysis and Coordination with SO	MO	SO	For the Study Horizon

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
D	T + 1Hour	Publish DAP Results to the WESM Market Information Website and MPI	MO	TPs	For the Study Horizon

4.5 REAL-TIME DISPATCH SCHEDULE (RTD) OR HOUR-AHEAD SCHEDULE

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
D	T – 5 min	Retrieve System Snapshot from EMS	SO	MO	T – 5 min of D
		MO to determine the Reserve Requirement			
D	Before T – 5 min	Retrieve Other Information from SO re: 1. Outage Schedules 2. Contingency Lists 3. Transmission Limits 4. Overriding Constraints	SO	MO	T + 1 hour (Hour Ahead)
D	Before T – 5 min	Submit VRE Aggregated Generation Forecasts	SO	MO	T + 1 hour to T + 24 hours
D	Before T – 5 min	Submit forecasts on the loading levels of <i>must dispatch generating units</i>	SO	MO	T + 1 hour (Hour Ahead)
D	Before T – 5 min	Nomination of Loading Levels, Projected Outputs, Bids and Offers Submission <i>Trading Participants may submit nomination of loading levels, projected outputs, bids and offers for the study horizon through either the daily bid or standing bid formats.</i> <i>Nomination of loading levels, projected outputs, bids and offers must be</i>	TP's	MO	T + 1 hour (Hour Ahead)

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
		effective prior to RTD execution.			
D	T – 5 min	Perform Nodal Demand Forecast	MO		T + 1 hour (Hour Ahead)
D	Before T – 5 min	MDOM Refinements	MO		T + 1 hour (Hour Ahead)
D	T – 4.5 min	Perform RTD	MO		T + 1 hour (Hour Ahead)
D	Before T	Transmittal of Energy and Reserve Schedules, and Merit Order Table	MO	SO	T + 1 hour (Hour Ahead)
D	Before T	Validate dispatch schedule if necessary and issue dispatch instructions	SO	TPs	T + 1 hour (Hour Ahead)
D	T	Publish RTD Results to the MPI	MO	TPs	T + 1 hour (Hour Ahead)

4.6 REAL-TIME EX-POST DISPATCH (RTX) SCHEDULE

DAY	TIME	ACTIVITY	From	To	PERIOD COVERED
D	Before T	Retrieve System Snapshot from EMS	SO	MO	T(end of trading interval)
D	Before T	MO to retrieve Other Information from RTD Save Case: 1. Reserve Requirements 2. Outage Schedules 3. Contingency Lists 4. Transmission Limits 5. Overriding Constraints			T
D	Before T	MDOM Refinements	MO		T
D	T	Perform RTX	MO		T
D	T+5 min	Publish RTX Results to the MPI	MO	TPs	T

5.1 BACKGROUND

5.1.1 In addition to schedules, the timetable that WESM Rules Clause 3.4.2 requires to be maintained, published and continuously updated, shall also include procedures that are to be followed in carrying out the various market operations processes. These processes include the following –

- a) Determining and publishing week-ahead projections including the precise specification of the market horizon to be used for such projections;
- b) Determining and publishing day-ahead projections including precise specification of the market horizon to be used for such projections;
- c) Submitting offers, bids and data.

5.1.2 In addition to the foregoing processes, there are also other activities and processes carried out in the WESM for which schedules and procedures need to be maintained. These include, but are not limited to, the –

- a) Procedures pertaining to the scheduling of reserves that are traded in the WESM and monitoring of reserves provision, in accordance with Chapter 3 of the WESM Rules; and
- b) Procedures that are to be followed by the Market Operator, the System Operator and WESM Participants in an emergency and in the event of a threat to system security, in accordance with Chapter 6 of the WESM Rules.

5.2 SCHEDULING AND DISPATCH PROCEDURES

5.2.1 The procedures pertaining to scheduling and dispatch that are to be followed in the WESM are set out in this Dispatch Protocol and other market manuals approved for implementation in the WESM.

5.2.2 The following table contains a non-exhaustive list of the various procedures that are being maintained and indicates if the procedure is contained in this Dispatch Protocol or in other market manuals. Other procedures may be formulated and listed procedures may be modified or superseded from time to time, following relevant amendatory processes, without need of amending this list –

ACTIVITY/PROCEDURE	DOCUMENT
Submission and Processing of Bids and Offers	Dispatch Protocol
Demand forecasting	Other Market Manual
System Operator Data Inputs and Reports – <ul style="list-style-type: none"> Contingency lists Outage Schedules Overriding Constraints Transmission limits System snapshot System advisories 	Dispatch Protocol
Pre-dispatch market projections <ul style="list-style-type: none"> Week-ahead projections (WAP) Day-ahead projections (DAP) 	Dispatch Protocol
Real-time dispatch scheduling <ul style="list-style-type: none"> Ex-ante or real-time dispatch (RTD) Ex-post or real-time ex-post (RTX) 	Dispatch Protocol
Preparation and use of the WESM Merit Order Table (MOT)	Dispatch Protocol
Dispatch implementation	Dispatch Protocol
Start-up and Shutdown of Generating Units	Dispatch Protocol
Management of Must Run and Must Stop Units	Other manual
Management of load shedding	Other manual
Emergency procedures	Other manual
Management of excess generation	Other manual
Scheduling and dispatch of reserves <ul style="list-style-type: none"> Determination of reserve requirements Reserve providers monitoring 	Dispatch Protocol
Post-dispatch reporting	Dispatch Protocol Other Market Manual
Procedures during Market Intervention and Suspension	Dispatch Protocol

ACTIVITY/PROCEDURE	DOCUMENT
Market Operator Information Disclosure and Confidentiality	Other manual

5.3 MARKET INFRASTRUCTURE

- 5.3.1 The pre-dispatch projection and real-time dispatch market runs described in this Dispatch Protocol shall be carried out using the Market Management System, which is the infrastructure that supports the operations of the WESM. The MMS contains the Market Dispatch Optimization Model (MDOM) that will be used for determining week-ahead and day-ahead projections and the real-time dispatch schedules and prices.
- 5.3.2 Submissions and transmittal of data or information between the Market Operator and the System Operator shall be through a data exchange facility that supports data exchange between the MMS and the Energy Management System (EMS) of the System Operator. Unless otherwise provided, submissions and transmittal of data between the System Operator and the Market Operator shall be through this data exchange facility.
- 5.3.3 The MMS includes the Market Participant Interface (MPI) to and from which the Trading Participants submit required data to the Market Operator and access data on market results, advisories and other information notified and published to it in accordance with this Dispatch Protocol.
- 5.3.4 Other publications required by this Dispatch Protocol are made available in the market information website, which includes a portal accessible only to registered WESM members.

SECTION 6 BIDS, OFFERS AND DATA SUBMISSION AND PROCESSING

6.1 BACKGROUND

- 6.1.1 WESM Rules section 3.5 provides for the rules in respect of the submission of generation offers. Under said section, each scheduled generation company including those with bilateral contracts shall submit standing generation offers for each of its scheduled generating units for each trading interval of each trading day. Non-scheduled generation companies, meanwhile, shall submit a standing schedule of the loading levels for each of its non-scheduled generating units, while generation companies in respect of their must dispatch generating units and priority dispatch generating units shall submit standing projected outputs of their generating units.
- 6.1.2 Qualified customers or those registered by the Market Operator as dispatchable load may submit standing demand bids in respect of each trading interval for each of its registered scheduled load facilities for each trading day of the week in accordance with the timetable. Submission of demand bids are provided for in WESM Rules Clause 3.5.6.
- 6.1.3 Upon commencement of the trading of reserves in the WESM, each scheduled generation company registered as an ancillary services provider shall submit reserve offers for each of its relevant reserve facilities in respect of a reserve region. Customers registered as ancillary services provider, meanwhile, may submit reserve offers for their interruptible load facilities. In either case, the submissions are made for each trading interval of each trading day. Submission of reserve offers are provided for in WESM Rules Clauses 3.5.7 and 3.5.8.
- 6.1.4 Revision of market offers and bids is provided for in WESM Rules Clause 3.5.11. Trading Participants may revise any of their nomination of *loading levels*, *projected outputs*, *bids*, and *offers* but the revisions must be made within the timetable set for submission of nomination of *loading levels*, *projected outputs*, *bids*, and *offers*. Some specific revisions are directed under the WESM Rules. WESM Rules Clause 3.5.11.2 directs generation companies that have submitted a schedule of the loading levels of their non-scheduled generating units to revise the same if it reasonably expects that any of its anticipated loading levels will differ materially from those previously submitted. WESM Rules Clause 3.5.11.5 requires Trading Participants to revise their bids or offers if they no longer represent a reasonable estimate of either the expected availability for the trading interval of the relevant generating unit or scheduled load or the demands bids or offers likely to apply in the real-time dispatch optimization for the trading interval.

- 6.1.5 Trading Participants that cancel their bids or offers, or submit bids or offers less than the registered capacity of their facility or generating unit are required to provide information on the reasons or circumstances of such cancellation or submission. This is pursuant to WESM Rules Clause 3.5.11.6.
- 6.1.6 Trading Participants are also required to immediately notify the System Operator and the Market Operator of any circumstances which threaten a significant probability of material adverse change in the state of their facilities. A non-exhaustive list of events that will be deemed to be or to cause material adverse change is required to be published. In compliance with the foregoing, a non-exhaustive list is included in this Section (6.16.3 of this manual). This is pursuant to WESM Rules Clause 3.5.11.7.

6.2 SCOPE

- 6.2.1 This Section sets out the procedures for submitting, revising and processing *bids*, *offers*, and other data for energy and reserve in the WESM. *Bids*, *offers*, and other data submitted shall be used in the pre-dispatch market projections (i.e., day-ahead and week-ahead projections) and real time dispatch market runs.
- 6.2.2 The requirements and conditions for a valid cancellation of nomination of *loading levels*, *projected outputs*, *bids*, and *offers* are also set out in this Section.

6.3 RESPONSIBILITIES

- 6.3.1 Trading Participants are responsible for timely submission of nomination of *loading levels*, *projected outputs*, *bids*, and *offers* and associated data submissions which are compliant with the requirements of the WESM Rules, this Dispatch Protocol and other relevant market manuals, as well as to the format and procedures required for submission to the Market Management System. They are also responsible for ensuring that their facilities are able to access the Market Participant Interface of the MMS at all times.
- 6.3.2 The Market Operators shall maintain a Market Participant Interface (MPI) to which access to the Market Management System (MMS) is provided to the Trading Participants for the submission of nomination of *loading levels*,

projected outputs, bids, and offers and other data requirements, and for accessing market data and reports.

6.4 CATEGORIES OF BIDS AND OFFERS

6.4.1 The nomination of *loading levels, projected outputs, bids, and offers* that can be submitted in the WESM are as follows -

- a) Real Time Energy Offers for scheduled generating units of scheduled generation companies;
- b) Operating Reserves Offers for certified reserve providers;
- c) Demand Bids from customer trading participants;

6.4.2 Other related submissions are as follows –

- a) Schedule of loading levels (i.e., energy quantities only) for non-scheduled generating units of non-scheduled generation companies; and
- b) Projected output (i.e., energy quantities only) of generation companies with must dispatch generating units and priority dispatch generating units

6.4.3 For brevity, all references to “nomination of *loading levels, projected outputs, bids, and offers*” or “bids or offer” or “bids” in this Section shall also include submission of the schedule of loading levels of non-scheduled generating units, projected output of must dispatch generating units and priority dispatch generating units, and demand bids of customers, unless the context clearly provides otherwise.

6.5 REQUIREMENTS FOR BIDS/OFFERS AND DATA SUBMISSIONS

6.5.1 Each nomination of *loading levels, projected outputs, bids, or offers* is in respect of one (1) trading interval and of one (1) registered resource. Each nomination contains one entry for each resource owned or operated by the Trading Participant concerned. For example, if the trading participant has six registered resources, that trading participant will submit six (6) separate nominations of *loading levels, projected outputs, bids, and offers*, one for each registered resource; each submission with its own nominated price and energy quantities.

- 6.5.2 Each nomination of *loading levels, projected outputs, bids, or offers* must be compliant with and must contain the information required in Appendix A1 of the WESM Rules.
- 6.5.3 Each nomination of *loading levels, projected outputs, bids, or offers* can consist of a complete set or a subset of the nomination of *loading levels, projected outputs, bids, and offers* for the 24 trading intervals of a trading day and each of the 24 trading intervals can have different bid/offer data.
- 6.5.4 The nomination of *loading levels, projected outputs, bids, and offers* shall be submitted through the Market Participant Interface provided by the Market Operator in the format set out in this Section.
- 6.5.5 The nomination of *loading levels, projected outputs, bids, or offers* for a particular trading interval shall be submitted within the open market window and before the gate closure.
- 6.5.6 Each nomination of *loading levels, projected outputs, bids, or offers* submission or re-submission is validated against the validation rules set for that particular market window.

6.6 OPEN MARKET WINDOW AND GATE CLOSURE TIME

- 6.6.1 **Open market window.** The Open Market Window covers the period seven (7) days before and after the current date. The covered dates are the trading dates where nomination of *loading levels, projected outputs, bids, or offers* can be created, submitted, revised, canceled, or retrieved. Trading Participants can only submit nominations of *loading levels, projected outputs, bids, or offers* for trading intervals that are within the Open Market Window.
- 6.6.2 Only nomination of *loading levels, projected outputs, bids, or offers* that passed validation (“valid” nomination of *loading levels, projected outputs, bids, or offers*) submitted within the open market window can be cancelled, changed, or retrieved.
- 6.6.3 **Gate closure.** Gate closure time is the time before which nominations of *loading levels, projected outputs, bids, or offers* for a particular trading interval can be accepted. Gate closure is one (1) hour before the start of the trading

interval (e.g., for the target trading interval 1000H, which starts at 0901H, the gate closure time is at 0800H).

- 6.6.4 The most recently submitted bids which have passed validation and which had been “converted” as a valid bid shall be used for the Pre-Dispatch Market Projection (Day-Ahead Projections, DAP or Week-Ahead Projections, WAP) or Real Time Dispatch (RTD and RTX) market runs.
- 6.6.5 For the Real Time Dispatch Schedule (RTD) market runs, nominations of *loading levels, projected outputs, bids and offers* that were accepted and passed validation prior to the gate closure time are binding and are considered in the real time ex-ante scheduling and pricing processes.

6.7 MARKET PARTICIPANT INTERFACE

- 6.7.1 Registered Trading Participants shall have an access to the WESM Market Management System (MMS) through a Market Participant Interface (MPI). The MPI shall be used by Trading Participants for submitting their *loading levels, projected outputs, bids and offers*, and other data in the WESM, as well as access previously submitted bids, registration information, and other market information or advisories published in the form of system messages and market status displays.
- 6.7.2 Specific URLs to access the MPI shall be advised by the Market Operator to the Trading Participants from time to time.

6.8 TYPES OF BIDS, OFFERS AND DATA SUBMISSIONS

- 6.8.1 Through the MPI, a Trading Participant can create and submit either a Daily Submission or a Standing Submission.
- 6.8.2 **Daily Submission.** A daily submission is a submission for a specific trading interval or trading intervals of a specific calendar date (e.g., trading intervals 0100H to 2400H for 26 June 2006). Daily submissions that are submitted and passed validation shall become effective starting one (1) hour after its submission. A daily submission will supersede a previously submitted daily submission or a converted standing submission.

6.8.3 Standing Nominations of Loading Levels, Projected Outputs, Bids, or Offer. Standing nominations of loading levels, projected outputs, *bids* or *offers* are standard bid profiles for a given type of day of a week. A Standing Bid is submitted to ensure a default bid is used if no Daily Bid is submitted. A Standing Bid is submitted in the same way as a Daily Bid except that the bid is identified as “Standing” and that a “Day Type” is identified.

- a) Standing nomination of loading levels, projected outputs, *bids* or *offers* for the following day types can be submitted –

Type of Day	Label (in MMS)
Holiday	HOL
All days in a week	ALL
Specific day of the week	MON. . . . SUN

- b) The order of precedence is HOL > ALL > MON.....SUN. Thus, a nomination of loading level, projected output, *bid* or *offer* submission for day type “HOL” will supersede bids for any of the other day types.
- c) A submitted and validated standing nomination of loading level, projected output, *bid* or *offer* becomes a standing nomination of loading level, projected output, *bid* or *offer* profile of a resource or power facility starting on the seventh day after the nomination of loading level, projected output, *bid* or *offer* is submitted. For example, a standing bid submitted on 1 June will become effective on 8 June. Each day onwards, the standing nomination of loading level, projected output, *bid* or *offer* profile for that resource shall be converted to a regular bid subject to validation. Conversion of standing nomination of loading level, projected output, *bid* or *offer* is carried out in the MMS prior to a relevant market run (i.e., WAP, DAP or RTD).
- d) The standing nomination of loading level, projected output, *bid* or *offer* that passed validation stays in effect until superseded or until a defined “expiration date”. If an expiration date is specified, the standing nomination of loading level, projected output, *bid* or *offer* will be used until that expiration date and will be automatically cancelled on the trading date after the expiration date. For example, if the expiration date specified is 1 June, the standing nomination of loading level, projected output, *bid* or *offer* will be used until 1 June and will no longer be used starting 2 June. If no

expiration date is given, the standing nomination of loading level, projected output, *bid* or *offer* will be used indefinitely, or until the participant cancels or supersedes the bid or exits the market.

6.9 FORMAT AND CONTENTS OF BIDS/OFFERS SUBMISSIONS

- 6.9.1 Nomination of *loading levels*, *projected outputs*, bids or *offers* are submitted to or retrieved from the MMS using the MPI in either of two formats, namely –
- Templates (XML Format) which utilizes a “Formatted” page in the MPI where bid data is inputted or specified. The template will then be “Submitted” in the MMS.
 - Web Page (HTML Format) which is a data file which contains the nomination of *loading levels*, *projected outputs*, *bids* and *offers* of a Trading Participant. The XML File will then be “Uploaded” in the MMS.
- 6.9.2 All nominations of *loading levels*, *projected outputs*, *bids*, or *offers* submissions shall contain the following –
- Bid Header – to identify the participant and his resource
 - Bid Submission – includes the details of the Bid/Offer
- 6.9.3 The parameters and formats of the nominations of *loading levels*, *projected outputs*, *bids*, or *offers* submissions are specified in the following attachments of this Dispatch Protocol –

Bid Type	Reference Attachment
Real Time Energy	Attachment 6A
Operating Reserves	Attachment 6B
Demand Bids	Attachment 6C
Non-Scheduled Generation Scheduled Loading Levels	Attachment 6D

6.10 ACKNOWLEDGEMENT OF NOMINATIONS OF LOADING LEVELS, PROJECTED OUTPUTS, BIDS AND OFFERS SUBMISSIONS

- 6.10.1 The MPI issues a unique Transaction ID for each nomination of *loading level, projected output, bid, or offer* submissions. The Transaction ID shall be attached to the hourly nomination of *loading level, projected output, bid, or offer* data whether they are accepted or determined as an invalid nomination of *loading level, projected output, bid, or offer*.
- 6.10.2 The transaction ID is attached by submission. Thus, nominations of *loading levels, projected outputs, bids, or offers* for more than one trading interval that are submitted collectively shall have the same transaction ID. For example, if one bid submission covers twelve (12) trading intervals, the same transaction ID will be issued for each of the 12 bids/offers data.
- 6.10.3 For standing nominations of *loading levels, projected outputs, bids, or offers* that are converted to a regular bid, the submission will have the same transaction ID as when it was submitted as a standing nomination of *loading levels, projected outputs, bids, or offers*.
- 6.10.4 The MMS keeps a database of both the “Accepted” nominations of *loading level, projected output, bid, or offer* and “Invalid” nominations of *loading level, projected output, bid, or offer* submissions.
- 6.11 UPDATING OF NOMINATION OF LOADING LEVEL, PROJECTED OUTPUT, BID OR OFFER SUBMISSIONS**
- 6.11.1 Within the open market window, a nomination of *loading level, projected output, bid, or offer* may be updated or revised as often as the Trading Participant desires. Subject to the requirements set out in this Section for cancellation and revision of bids, previously submitted nominations of *loading level, projected output, bid, or offer* may be cancelled or revised within the open market window.
- 6.11.2 **Retrieval of Nominations of *Loading Levels, Projected Outputs, Bids or Offers* Submissions.** To revise nominations of *loading levels, projected outputs, bids, or offers*, previously submitted nominations of *loading levels, projected outputs, bids, or offers* can be retrieved through the MPI using the Template or XML File options as discussed in the preceding clauses. Retrieved nominations of *loading levels, projected outputs, bids, or offers* submissions may then be updated, modified or cancelled.

6.11.3 **Updating/Revision.** Nominations of *loading levels, projected outputs, bids, or offers* that are updated or revised will be submitted through the MPI following the same procedures for submission of nominations of *loading levels, projected outputs, bids, or offers*. Such revised/updated submission will be subject to the same acknowledgement and validation process set out in this Section. Standing bids which have been “converted” into a Daily Bid can be modified using the Daily Bid option.

6.11.4 **Cancellation.** Cancellation of previously submitted bids follows the same process as submission of nominations of *loading levels, projected outputs, bids, or offers* above except that instead of “SUBMIT” entry in the MPI, a “CANCEL” entry is specified. The cancellation of a standing nominations of *loading levels, projected outputs, bids, or offers* shall become effective after the seventh day from cancellation but the corresponding standing bid profile must be deleted immediately upon submission of the cancellation.

6.12 VALIDATION OF BIDS/OFFERS SUBMISSIONS

6.12.1 Nominations of *loading levels, projected outputs, bids, or offers* submissions shall be subject to the validation set out in the following paragraphs. Validation shall be performed in the MMS.

6.12.2 **Syntax / Semantic Validation.** This validation is performed to verify submitted data for consistency to required formats or data templates.

6.12.3 **Market-Based Validation.** This validation is performed to verify submitted data for consistency with the following -

- a) Price Curves
- b) Ramp Rate Curves
- c) Market Status
- d) Master File

6.12.4 Market-based validation include the following criteria –

- a) **Registration data.** All nominations of *loading levels, projected outputs, bids and offers* are validated against operational data originally approved and submitted to the MMS at the time of the registration, subject to any approved amendments thereof, by the Trading Participants and/or their respective generating units, or subsequent revisions to the same data

approved and submitted to the MMS in their application for registration in the WESM and revisions to the registration data which are submitted no later than seven (7) calendar days prior to the trading interval for which the nomination of loading level, projected output, *bid* and *offer* is submitted.

- b) **Current system status.** Nominations of *loading levels*, *projected outputs*, *bids* and *offers* submitted are validated against real-time information relevant to the facility for which a nomination of *loading levels*, *projected outputs*, *bids* or *offers* is submitted. Real-time snapshots from the System Operator are used for validation and shall serve as the latest information on system status to be transmitted to the MMS of the Market Operator.
- c) **Outages.** Generating facilities which are included in the outage list submitted by the System Operator to the MMS are automatically excluded from the scheduling and dispatch processes, and are thus not included in the generation of real-time dispatch (RTD) schedules and the WESM merit order table (MOT).
- d) **Overriding Constraint Limits.** Overriding constraints imposed and submitted by the System Operator shall override the nomination of *loading levels*, *projected outputs*, *bids* and *offers* submissions of generating facilities. These include security and non-security related requirements.

6.12.5 **Standing Bids Validation.** Standing bids will be validated upon submission and every time that they are converted into a daily bid. Upon passing validation, the participant will be informed that the standing bid was accepted. Validation of standing bids will be performed to the extent it can be done, e.g., such items as Participant Name, Price Curve Formats and Expiration Dates are validated. Standing Bids are also validated for “Day Type” consistency:

6.13 REVISIONS OF NOMINATION OF LOADING LEVELS, PROJECTED OUTPUTS, BIDS AND OFFERS BASED ON REASONABLE ESTIMATES

6.13.1 Trading Participants shall revise their nomination of *loading levels*, *projected outputs*, *bids* or *offers*, prior to gate closure time, for submission of nomination of *loading levels*, *projected outputs*, *bids* or *offers*, if the nomination of *loading level*, *projected output*, *bid* or *offer* submitted no longer represent a reasonable estimate of either the following –

- a) The expected availability for the trading interval of the relevant generating unit or scheduled load; or

- b) The *loading level, projected output, bid or offer* likely to apply in the real-time dispatch optimization for the trading interval.

6.14 CANCELLATION OF NOMINATIONS OF LOADING LEVELS, PROJECTED OUTPUTS, BIDS AND OFFERS

6.14.1 Trading participants may cancel their daily bids or “converted” standing nominations of *loading levels, projected outputs, bids or offers* for a particular trading interval under the following conditions –

- a) The 1600H Day-Ahead Projections (DAP) results indicate that the demand for that trading interval is less than summation of the registered technical minimum generating capacity (aggregate Pmin) of all the generating units that are classified as scheduled generation units.
- b) Cancellation of nominations of *loading levels, projected outputs, bids or offers* shall be made within the open market window and prior to the gate closure for the particular trading interval.
- c) Cancelled nominations of *loading levels, projected outputs, bids or offers* maybe revoked and re-submitted or revised within the open market window and prior to the gate closure.

6.14.2 For this purpose, the Market Operator shall publish for the information of trading participants the hourly total registered minimum generating capacity (Pmin) of all scheduled generating units based on the Day-Ahead Market Projections not later than 1800H of each trading day.

6.15 REPORT ON CANCELLATION OF NOMINATIONS OF LOADING LEVELS, PROJECTED OUTPUTS, BIDS AND OTHER INFORMATION

6.15.1 The nominations of *loading levels, projected outputs, bids or offers* submission shall include the following information –

- a) Circumstances or reasons for cancellation, if cancelled
- b) Circumstances or reasons surrounding submission of *loading levels, projected outputs, bids or offers* or offers that are less than the registered maximum capacity of the facility or generating unit.

6.15.2 The information submitted may be used for market surveillance, audit, and enforcement and compliance purposes.

6.16 REPORT OF MATERIAL ADVERSE CHANGE IN STATE OF TRADING PARTICIPANT FACILITIES

6.16.1 WESM Rules Clause 3.5.11.7 requires Trading Participants to advise the System Operator and the Market Operator of any circumstances which threaten a significant probability of material adverse change in the state of their facilities in any trading interval of any trading day in the current week-ahead market horizon. Trading Participants will give notice to the Market Operator and the System Operator within the relevant WESM timetable.

6.16.2 After the occurrence of the significant event, *Trading Participants* are further required to submit a written report with supporting data to the *Market Operator*. The report is to be submitted within the following *trading day*.

6.16.3 To facilitate compliance by the *Trading Participants* with their reporting obligations, the *System Operator* and the *Market Operator*, at their discretion, establish separate *facilities* for submission of notices and reports and prescribe procedures for submission.

6.16.4 The following is a non-exhaustive list of the material adverse changes to be reported by the Trading Participants –

- a) Inadvertent omissions or cancellation of nomination of *loading levels, projected outputs, bids, and offers* of significant quantity relative to the demand in the specific trading interval for which such nomination of *loading levels, projected outputs, bids, or offers* apply.
- b) Gross errors in the submission of nomination of *loading levels, projected outputs, bids, or offers* by the Trading Participants which deviate from a reasonable estimate of the current state of its facilities or system.
- c) Scheduled or forced outages of the system or facilities of a Trading Participant which may impede its ability to commit to its nomination of *loading levels, projected outputs, bids, or offers* submission in the WESM.

- d) Impending emergencies which may require the facilities or system of a Trading Participant to be operational or to shutdown to prevent any potential disaster or threat to human life or property.
- e) Local or national calamities which may affect a significant portion of the system or facilities of a Trading Participant.
- f) Labor and management conflict which may result in work stoppage and prevent the Trading Participant or significantly reduce its ability to participate in the WESM.
- g) A significant event that is expected to cause the Trading Participant to cancel or revise its standing nomination of loading levels, projected outputs, bids or offers, or to submit offers for scheduled generating units that are less than the registered maximum capacities of said units.

SECTION 7 SYSTEM OPERATOR INPUT DATA AND REPORTS

7.1 BACKGROUND

- 7.1.1 WESM Rules Clause 3.5.3 provides for the responsibility of the System Operator to submit to the Market Operator standing network data relating to all network elements which are included in the market network model. In this regard, Network Service Providers are required, under WESM Rules Clause 3.5.2 to submit to the System Operator standing network data relating to all network elements under its control and included in the market network model. Data required to be submitted are set out in Appendix A2 of the WESM Rules.
- 7.1.2 The System Operator is also required under WESM Rules Clause 3.5.3.2 to advise the Market Operator, when necessary, of the need to vary the market network model employed for any trading interval to take account of information provided by Network Service Providers, as well as the need to apply or vary any system security constraints, over-riding constraints or reserve requirement constraints to be applied in any trading interval to take into account current or projected system conditions.
- 7.1.3 The Price Determination Methodology approved for the WESM also provide for the input data required of the System Operator which shall be considered in the market scheduling and pricing processes.

7.2 SCOPE AND PURPOSE

- 7.2.1 This Section contains the procedures that will be followed for the submission by the System Operator to the Market Operator of the data required for the market scheduling and pricing processes, as well as the submission of other System Operator data, report, messages and advisories.
- 7.2.2 The data and information requirements listed in this Section is a non-exhaustive list of the data required, and other information may also be required to be submitted under other market manuals and the WESM Rules. Where applicable and if not otherwise provided, the submission of such other data and information shall also follow the procedures set out in this Section.
- 7.2.3 Data and report submissions relevant to the scheduling and dispatch of reserves traded in the WESM are covered in a separate section of this Dispatch Protocol.

7.3 RESPONSIBILITIES

- 7.3.1 **Market Operator.** The Market Operator shall be responsible for –
- a) Providing and maintaining the data exchange and communication facilities it needs to ensure timely submission of dispatch schedules (RTD/DAP/WAP), messages and advisories transmitted by the Market Operator to the System Operator and Trading Participants; and
 - b) Ensuring that data inputs required of the System Operator are considered in the market dispatch optimization runs.
- 7.3.2 **System Operator.** The System Operator shall be responsible for –
- a) Preparing the data and reports required to be submitted as set out in this Dispatch Protocol and relevant provisions of the WESM Rules and other market manuals, and for transmitting the same to the Market Operator in accordance with the schedules and procedures set out in this Section;
 - b) Preparing and submitting additional contingency lists for a particular trading interval or trading day if necessary;
 - c) Submitting the approved schedules to the Market Operator; and
 - d) Providing and maintaining the data exchange and communication facilities it needs to ensure timely data and report transmittal to the Market Operator.

7.3.3 Network Service Providers. Network service providers shall ensure timely submission of requests and schedules for outages of their respective transmission lines and sub-station equipment to the System Operator.

7.3.4 Trading Participants. The trading participants shall ensure timely submission to the System Operator of their requests and schedules for outages of their generating units. Trading participants shall submit to the System Operator a three-year outage plan and an annual outage plan for their generating units in accordance with the Grid Operations and Management Program set out in the Grid Code.

7.4 DATA AND REPORT REQUIREMENTS

7.4.1 Market run data Inputs. For each trading interval, the System Operator shall submit the following data which shall be used in the pre-dispatch projections and real time dispatch market runs –

- a) Outage schedules
- b) Contingency lists
- c) Overriding constraints

7.4.2 System Status. During a trading interval, the System Operator shall submit the following information –

- a) Grid snapshots; and
- b) System advisories on the anticipated condition of the grid.

7.5 OUTAGE SCHEDULES

7.5.1 The outage schedules that shall be submitted by the System Operator to the Market Operator are those outage schedules that are approved for the following –

- a) Generating units;
- b) Transmission lines; and
- c) Sub-station equipment

7.5.2 Only outage schedules approved by the System Operator shall be submitted and shall be considered in the market dispatch optimization runs, i.e., week-ahead projections (WAP), day-ahead projections (DAP) and real-time dispatch (RTD) market runs.

7.6 OVER-RIDING CONSTRAINTS

7.6.1 The MMS provides a functionality that allows the Market Operator to make adjustments in the Operating Constraints of the Market Dispatch Optimization Model for a particular Trading Interval. Such adjustments or overriding constraints in the Market Dispatch Optimization Model is imposed by the Market Operator upon the recommendation of the System Operator through a database interchange program between the Market Operator and System Operator.

Imposition of Overriding Constraints in the Market Dispatch Optimization Model include the following:

- Security Limits
 - Must-Run Units (MRU)
 - Emergency de-rating/ outage of specific transmission lines;
 - Other types as may be recommended by the System Operator
- Non Security Limits:
 - Generating Unit Limitations
 - Regulatory and Commercial Testing

Over-riding constraints in the scheduling and dispatch of generating units qualifying as must run units may be compensated based on the mechanism set forth in the Manual on the Management of Must-Run and Must-Stop Units. Over-riding constraints for the scheduling and dispatch of generating units undergoing Regulatory and Commercial testing process shall be considered as price takers in the WESM, for generation traded in the spot market.

7.6.2 **Security Limits.** The System Operator may impose security limits to override the generation offers and address possible threats in system security. These security limits may vary under different system conditions. Security limits include generator operating limits and transmission limits, described as follows

—

- a) Generator operating limits (P_{min} , P_{max}) may vary based on different plant and system conditions. Some generators are required to produce no less than certain amount of output for system reliability reasons. Some generators are required to restrain their output due to stability considerations. Generating units nominated by the System Operator as a

must run unit (MRU) falls in this category. Refer to the WESM Manual on Management of Must-Run and Must-Stop Units for more details.

- b) HVDC transmission limits may vary constraining power transmission from one region to another. The HVDC limits are modeled.

The imposition of over-riding constraints in the Market Dispatch Optimization Model include the following:

a) Security Limits;

- Must-Run Units (MRU)
- Emergency de-rating/ outage of specific transmission lines;
- Other types as may be recommended by the System Operator

b) Non Security Limits:

- Generating Unit Limitations
- Regulatory and Commercial Testing

Over-riding constraints in the scheduling and dispatch of generating units qualifying as must run units may be compensated based on the mechanism set forth in the Manual on the Management of Must-Run and Must-Stop Units.

Over-riding constraints for the scheduling and dispatch of generating units undergoing Regulatory and Commercial testing process shall be considered as price takers in the WESM, for generation traded in the spot market.

- 7.6.3 Transmission Limits.** Transmission limits are generally thermal limits of individual transmission lines, transformers, and related facilities. The transmission limits are used in security analysis application to check constraint violations.

7.7 CONTINGENCY LIST REQUIREMENTS

- 7.7.1** The security and reliability of the grid shall be based on the single outage contingency (N-1) criterion. This criterion specifies that the grid shall continue to operate in the normal state following the loss of one generating unit, transmission line, or transformer.

- 7.7.2** The identified contingencies for a trading interval shall conform to the provisions of the WESM System Security & Reliability Guidelines.

- 7.7.3 The default contingency list contains the definition of credible contingencies as provided by the System Operator (i.e. pre-defined outage scenarios) and each contingency event shall be loaded into the MMS database of the Market Operator. The MDOM solution shall provide an RTD which is a security-constrained dispatch schedule.
- 7.7.4 In coming up with a contingency list, the System Operator shall also look into the following considerations –
- a) Loading limits of transmission lines, transformers and generating units;
 - b) Single circuit outage (N-1) contingency including loss of Interconnection;
 - c) Selective multiple circuit outage with corresponding System Integrity Protection Scheme (SIPS); and
 - d) Other forms of contingencies submitted by the System Operator.
- 7.7.5 The contingency list does not include the outage of a generating unit. The MDOM considers the utilization of operating reserves in the emergency outage of a generating unit.

7.8 SYSTEM STATUS

- 7.8.1 The System Operator shall provide snapshot data on the status of the power system and advisories on the anticipated condition of the power system to the Market Operator. The data to be provided covers the Luzon, Visayas and Mindanao grids.
- 7.8.2 **System Snapshot.** The system snapshot depicts the status of individual power facilities in the grid. The system snapshot is collected via the System Operator's EMS/SCADA system and further processed/validated by its State Estimator program.
- a) The system snapshot contains the following information –
 - Generator Unit MW and MVAR (analog measurements)
 - Load MW and MVAR (analog measurements) and
 - Breaker Status
 - b) The WESM Market Network Model (MNM) shall be consistent with the system snapshot

- c) The system snapshot is an input to the Market Dispatch Optimization Model (MDOM) which calculates the WAP, DAP and RTD schedules. Specifically, the system snapshot data is used for the network configuration and nodal demand forecasting processes.

7.8.3 System Operator System Advisories. The System Operator system advisories contain other information not included in the submission of system snapshots. These are messages issued by the System Operator depicting particular events or incidents that would transpire prior, during or after real time condition.

7.9 MEANS OF SUBMISSION/TRANSMITTAL

7.9.1 Data and information required to be submitted under this Section shall be transmitted by the System Operator through a data exchange facility provided and maintained by the System Operator and the Market Operator specifically for this purpose.

7.10 SCHEDULE OF SUBMISSION /TRANSMITTAL

7.10.1 Market run data inputs. The market run data inputs shall be transmitted by System Operator through the established data exchange facility prior to the execution of the following market runs –

Market Run	Coverage	Execution Time	Number of Study Points
Week-Ahead Projections (WAP)	Seven (7) days ahead	Daily, once a day at 0900H a.m.	168 (7 x 24)
Day-Ahead Projections (DAP)	One (1) day ahead	Daily every four (4) hours at 0400H, 0800H, 1200H, 1600H, 2000H, 2400H	36~ 24 ~16
Real-time Dispatch (RTD)	One (1) hour ahead	Hourly At 65 minutes prior to the target hour	1

7.10.2 System status

System snapshots shall be transmitted to the Market Management System every five (5) minutes. To the extent practicable, the system snapshot data received no earlier than five (5) minutes before the start of the trading interval shall be used as input for the ex-ante or real-time dispatch (RTD) market run for that trading interval. The system snapshot received at the end of that trading interval shall be used for the ex-post or real-time ex-post (RTX) market run.

7.11 FORMAT OF DATA SUBMISSIONS

7.11.1 The required data submissions shall conform with the format set out in the following attachments of this Dispatch Protocol –

Submission/Information	Reference Attachment
Outage Schedules	Attachment 7A
Contingency	Attachment 7B
System Snapshot	Attachment 7C
System Advisory	Attachment 7D
Transmission Limit	Attachment 7E
Security Limit	Attachment 7F

7.11.2 **System Snapshot Format Conversion.** The EMS output and MMS input formats of the System Snapshot are different thus requiring conversion of the former to the required MMS format. This particularly involves naming convention and the format of the MW and MVAR data. The Market Operator shall be responsible for the conversion of the EMS data to the appropriate MMS format ensuring that there is no delay in the transmittal of the system snapshot to the MMS. The conversion shall be in accordance with the following –

Information	Reference Attachment
Look-Up Table for Naming Convention	Attachment 7G
Truth Table for Conversion of MW and MVAR Data Format	Attachment 7H
Existing EMS–SCADA Format for System Snapshot	Attachment 7I

7.11.3 Each data submission shall contain complete data for the covered period and is not an incremental update of the previous data but is a complete replacement (re-definition) of the data submission.

7.12 PUBLICATION OF SYSTEM OPERATOR DATA

- 7.12.1 Consistent with the Confidentiality Manual, the Market Operator shall publish for the information of Trading Participants the following data as used in the market runs. Other data may also be published without need of amending this Section and may include, but will not be limited to, the following data –
- a) Outage schedules submitted by the System Operator in accordance with this Dispatch Protocol; and
 - b) Overriding Constraints submitted by the System Operator in accordance with this Dispatch Protocol.

SECTION 8 PRE-DISPATCH MARKET PROJECTIONS

8.1 BACKGROUND

8.1.1 WESM Rules Clause 3.7 sets out the requirements for the preparation and publication by the Market Operator of the week-ahead projections and day-

ahead projections using the Market Dispatch Optimization Model (MDOM) and in accordance with the WESM timetable.

- 8.1.2 As set out in WESM Rules Clause 3.7.1, the week-ahead projections (WAP) are to be prepared and published daily in accordance with the WESM timetable to assist Trading Participants to anticipate and respond to a range of market conditions which might reasonably be expected to occur over the forthcoming week.
- 8.1.3 The day-ahead projections (DAP), pursuant to WESM Rules Clause 3.7.2 are to be prepared and published regularly throughout the day in accordance with the WESM timetable. These projections are to assist the Trading Participants to anticipate and respond to a range of market conditions which might reasonably be expected to occur over the forthcoming day.
- 8.1.4 The DAP, which runs every four (4) hours, also allows the Market Operator to assess possible infeasible solutions that may occur and affect the succeeding execution of the ex-ante or real-time dispatch (RTD) market run. The Market Operator and System Operator can then undertake necessary actions to prevent or minimize the occurrence of infeasible solution in the forthcoming RTD runs.
- 8.1.5 Both sets of projections are required under the said WESM Rules to be prepared for all trading intervals within the relevant market horizon as defined in the WESM timetable.
- 8.1.6 The considerations and conditions that are to be taken account of in the preparation of these market projections are set out in WESM Rules Clause 3.7.
- 8.1.7 The market projections prepared by the Market Operator are to be published in accordance with the WESM timetable. The information required to be published is set out in WESM Rules Clause 3.7.4.

8.2 SCOPE AND PURPOSE

- 8.2.1 The procedures and requirements set out in this Section shall be implemented in the preparation of the Week-Ahead (WAP) Market Projection and the Day-Ahead (DAP) Market Projection, collectively referred to in this Dispatch Protocol as the pre-dispatch market projections.

8.3 RESPONSIBILITIES

8.3.1 **Market Operator.** The Market Operator shall be responsible for the following –

- a) Ensuring the timely preparation of the Week-Ahead Projection, Day-Ahead Projection and Hour-Ahead Projection market runs are carried out in accordance with the WESM timetable;
- b) Publishing and disseminating the WAP and DAP results in accordance with the WESM timetable and with the procedures, requirements and conditions set out in WESM Rules Clause 3.7 and other relevant clauses and this Section; and
- c) Maintaining the Market Management System (MMS) which is the infrastructure that is used to support the operations of the WESM, including, among other processes, the execution of the various market runs, the publication of market results to the Trading Participants and the System Operator, and the submission of data and other inputs from the System Operator and the Trading Participants.

8.3.2 **System Operator.** The System Operator shall be responsible for –

- a) Preparing and ensuring timely submission to the Market Operator of the information required of it for the execution of the WAP and the DAP market projection runs as set out in the WESM Rules and this Dispatch Protocol; and
- b) Maintaining the necessary infrastructure it needs to carry out its functions, including, among other facilities, the data exchange facilities allowing it to transmit and receive data or information to and from the Market Management System.

8.3.3 **Trading Participants.** Trading Participants shall be responsible for –

- a) Ensuring submission of generation offers and reserve offers as set out in the WESM Rules and in accordance with the WESM timetable and the procedures and requirements set forth in this Dispatch Protocol; and
- b) Maintaining their respective infrastructure to ensure access to the Market Participant Interface of the Market Management System.

8.4 MARKET DISPATCH OPTIMIZATION MODEL (MDOM)

8.4.1 The Market Dispatch Optimization Model (MDOM) is utilized in the preparation of both the WAP and the DAP.

8.4.2 The MDOM determines the optimal dispatch schedule for each of the trading interval based on market nomination of *loading levels*, *projected outputs*, *bids*, or *offers* received by the Market Operator subject to the different constraints imposed to consider the physical limitations of the assets of the Network Service Providers and of generation assets. The formulation of the MDOM is set out in the Price Determination Methodology approved for the WESM.

8.5 SCHEDULE AND COVERAGE OF PRE-DISPATCH MARKET PROJECTIONS

8.5.1 The pre-dispatch market projections shall be performed on the following schedules, consistent with the WESM timetable –

Market Run	Market Horizon	Execution Frequency	Schedules Resolution	Number of Covered Trading Intervals
WAP	7 days ahead	Daily at 9:00a.m.	1 hour	168 (=7x24)
DAP	1 day ahead	Every 4 Hourly	1 hour	36~24~16

8.5.2 The WAP schedule of execution and the corresponding market horizon and covered trading intervals (i.e., study points) are presented in the following graph

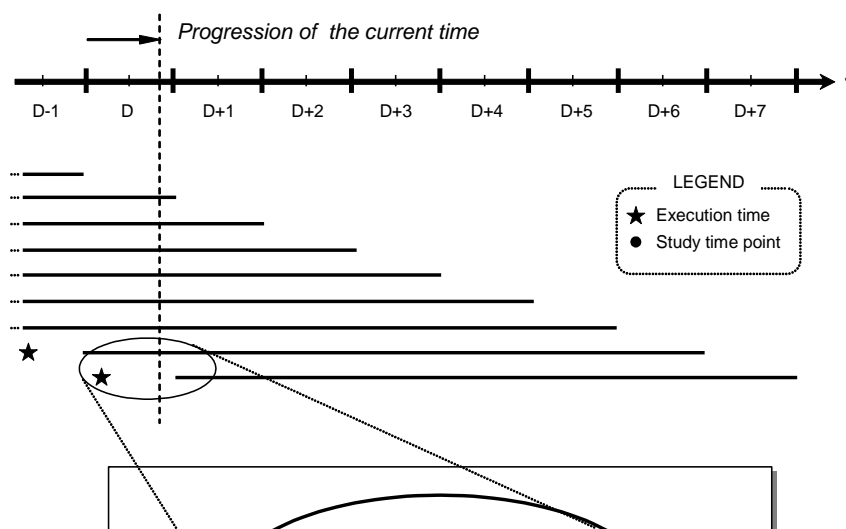


Figure 2. WAP Timeline

8.5.3 The DAP run is carried out at the following times of the day and for the following trading intervals -

DAP Execution Time	Number of Covered Trading Intervals	Trading Intervals Covered (D= current day)
0000 H	24	D (0100, 0200, ..., 2400)
0400 H	20	D (0500, 0600, ..., 2400)
0800 H	16	D (0900, 1000, ..., 2400)
1200 H	36	D (1300, 1400, ..., 2400) to D+1 (0100, 0200, ..., 2400)
1600 H	32	D (1700, 1800, ..., 2400) to D+1 (0100, 0200, ..., 2400)
2000 H	28	D (2100, 2200, ..., 2400) to D+1 (0100, 0200, ..., 2400)

8.5.4 The DAP schedule of execution and corresponding covered trading intervals (i.e., study points) are presented in the following graph –

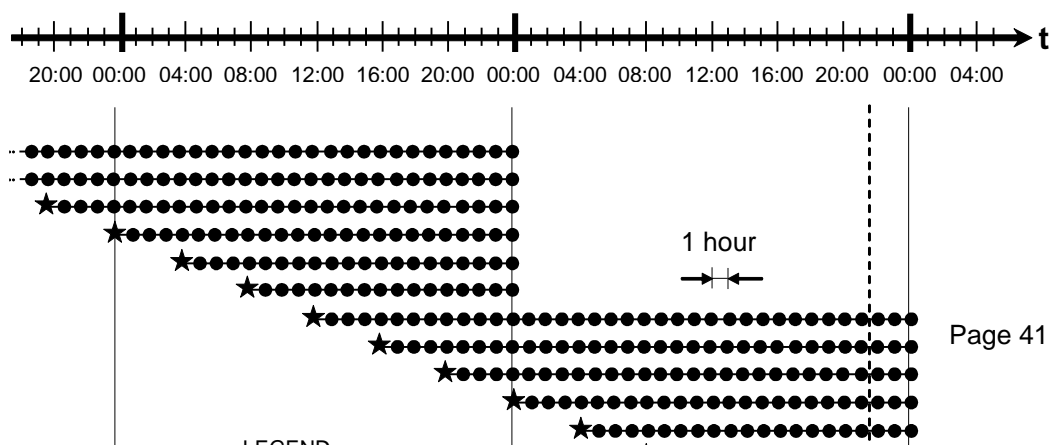


Figure 3. DAP Timeline**8.6 DATA INPUTS/INFORMATION REQUIREMENTS**

8.6.1 Pursuant to WESM Rules Clause 3.7.3, the market projections shall take into consideration various data inputs. These inputs shall be made available or submitted to the Market Operator in accordance with the WESM timetable and the procedures set out in this Dispatch Protocol and relevant provisions of the WESM Rules.

8.6.2 The data inputs for the market projections are as follows –

- a) Generation energy and reserve offers, target loading levels and demand bids
- b) Demand/load forecast determined in accordance with the WESM Load Forecasting Methodology
- c) System snapshot
- d) Outage schedules
- e) Reserve Requirements
- f) Contingency list
- g) Transmission limits
- h) Overriding Constraints
- i) System advisories

8.6.3 Data to be submitted to and considered by the Market Operator shall be for all the trading intervals within the market horizon covered by the relevant WAP and DAP run.

8.7 OUTPUTS/RESULTS OF MARKET PROJECTIONS

8.7.1 The MDOM simultaneously determines the week-ahead and day-ahead projections for the following –

- a) Dispatch targets for the end of a trading interval,
- b) Reserve allocations for the trading interval,
- c) Associated energy prices at all market trading nodes, and
- d) When applicable, reserve prices for all reserve regions.

8.7.2 Where constraints are encountered in the market runs, the results will reflect constraint violation coefficients (CVCs).

8.8 PUBLICATION AND DISSEMINATION OF WAP AND DAP RESULTS

8.8.1 The results of the DAP and WAP runs shall be transmitted to the System Operator in the format prescribed in Attachment 8A and shall contain the following information –

- a) Resource ID
- b) Trading Participant Name
- c) Dispatch data
- d) Regulation Base Point (the dispatch target)
- e) Regulation High Limit
- f) Regulation Low Limit

8.8.2 If the market run results show the occurrence of constraint violation coefficients, the System Operator shall be notified of these results through a market advisory which shall be transmitted in the format set out in Attachment 8B.

8.8.3 If the market run results indicate that nodal energy prices are expected to be equal to, or exceed, nodal VoLL at any customer nodes in the market network model, the System Operator shall be notified of the likelihood of initiating loss of load at those nodes through a market advisory which shall be transmitted in the format set out in Attachment 8B.

8.8.4 The results of the WAP and DAP runs shall be published to the Trading Participants through the Market Participant Interface (MPI). Trading

Participants will have access to the data pertaining to their registered generating unit or customer facility. Data to be published is as follows -

- a) Trading Participant Name
- b) Resource ID
- c) Bid/Offer Internal Code
- d) Energy Dispatch
- e) Reserve Type
- f) Reserve Dispatch

8.8.5 The following system data will also be published in the MPI and shall be accessible to all the Trading Participants with access to the MPI –

- a) Total energy dispatched
- b) Total dispatchable load
- c) Total reserve required per time point (for each class and area)
- d) Total system losses
- e) Reserve requirements
- f) Locational marginal prices

8.8.6 Submission to the System Operator and publication of the results of the Pre-Dispatch Market Projections in the MPI shall be in accordance with the WESM Timetable, as presented in the following table –

Process	Study Horizon	Execution Frequency	Schedules Resolution	Number of Covered Trading Intervals
WAP Results Publication	7 days ahead	Daily on or before 2400H	1 hour	168 (=7x24)
DAP Results Publication	1 day ahead	Every 4 Hours, 1 Hour after DAP Execution	1 hour	36~24~16

8.9 SAVE CASE

8.9.1 Using the Save Case functionality of the Market Management System, the Market Operator shall save the input data as well as the results of each WAP and DAP run. The saved cases shall be retrieved and utilized by the Market Operator for validation as well as for the conduct of sensitivity analysis and

other simulation studies. Data retention shall be in accordance with the relevant provisions of the WESM Rules 9.7.

SECTION 9 REAL TIME DISPATCH SCHEDULING
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9.1 BACKGROUND

- 9.1.1 WESM Rules Clause 3.8 sets out the responsibilities of the Market Operator in the scheduling of generation and load in the WESM. Among other responsibilities, WESM Rules Clause 3.8.1 directs that prior to the commencement of each trading interval, the Market Operator shall use the Market Dispatch Optimization Model (MDOM) to determine the target loading level in MW for each scheduled generating unit or each scheduled load and for each reserve facility for the end of the trading interval using the latest data from the System Operator and the Trading Participants. The Market Operator shall submit to the System Operator the dispatch schedule containing the target loading levels to be achieved at the end of the trading interval.
- 9.1.2 Chapter 11 of the WESM Rules defines loading level as the instantaneous level of output or consumption in MW of a generating unit or load. The target loading level of a generator or load is the loading level determined as an end-of-period target for that scheduled generator or load.
- 9.1.3 Additionally, the Market Operator is required under WESM Rules Clause 3.10 to calculate and publish the ex-ante and ex-post prices.

9.2 PURPOSE AND SCOPE

- 9.2.1 This Section describes the requirements and procedures for the generation and publication of the real time dispatch schedules and prices, which include the ex-ante or real time dispatch (RTD) and the ex-post or real time ex-post (RTX) dispatch schedules and prices.

9.3 RESPONSIBILITIES

- 9.3.1 **Market Operator.** The Market Operator shall be responsible for the following –

- a. Ensuring that the ex-ante (real time dispatch or RTD) and the ex-post (real time ex-post or RTX) market runs are carried out in accordance with the WESM timetable;
- b. Publishing and disseminating the RTD and RTX results in accordance with the WESM timetable and with the procedures, requirements and conditions set out in WESM Rules Clause 3.8 and Clause 3.9 and other relevant clauses and this Dispatch Protocol; and
- c. Maintaining the Market Management System (MMS) which is the infrastructure that is used to support the operations of the WESM, including, among other processes, the execution of the various market runs, the publication of market results to the Trading Participants and the System Operator, and the submission of data and other inputs from the System Operator and the Trading Participants.

9.3.2 System Operator. The System Operator shall be responsible for –

- a. Preparing and ensuring timely submission to the Market Operator of the information required of it for the execution of the RTD and the RTX market projection runs as set out in the WESM Rules and this Dispatch Protocol; and
- b. Maintaining the necessary infrastructure it needs to carry out its functions, including, among other facilities, the data exchange facilities allowing it to transmit and receive data or information to and from the Market Management System.

9.3.3 Trading Participants. Trading Participants shall be responsible for –

- a. Ensuring submission of generation offers and reserve offers as set out in the WESM Rules and in accordance with the WESM timetable and the procedures and requirements set forth in this Dispatch Protocol
- b. Meeting the target loading levels as set out in the WESM Rules and in accordance with the WESM timetable and the procedures and requirements set forth in this Dispatch Protocol

- c. Maintaining their respective infrastructure to ensure access to the Market Participant Interface of the Market Management System.

9.4 MARKET DISPATCH OPTIMIZATION MODEL (MDOM)

9.4.1 The MDOM determines the optimal dispatch schedule for each of the trading interval based on market nomination of *loading levels*, *projected outputs*, *bids*, or *offers* received by the Market Operator subject to the different constraints imposed in line with the physical limitations of the assets of the Network Service Providers and generation assets.

9.4.2 The MDOM is used to determine the real-time dispatch schedules and nodal prices (i.e., ex-ante) of all facilities connected to the Grid as well as the ex-post (i.e., RTX) nodal prices based on the actual dispatch of facilities for a particular trading interval.

9.4.3 The energy dispatch schedule is the target loading level in MW for each scheduled generating unit or scheduled load to be met at the end of a trading interval. The Generators shall ramp-up or ramp-down linearly to their target loading level. Deviations of all generators except *must dispatch generating units* from these target loading levels will be measured in terms of MWhr subject to the compliance with the dispatch tolerance standards.

9.5 SCHEDULE AND COVERAGE OF REAL TIME DISPATCH SCHEDULING

9.5.1 The execution of the real time dispatch scheduling processes shall be in accordance with the WESM Timetable.

9.5.2 The ex-ante or RTD and the ex-post or RTX market runs shall be performed on the following schedules and coverage –

Process	Time Coverage	Execution Frequency	Schedules Resolution	Number of Covered Trading Intervals
RTD	Next Hour	Hourly (every 5 minutes before the start of the Trading Interval)	1 hour	1

Process	Time Coverage	Execution Frequency	Schedules Resolution	Number of Covered Trading Intervals
RTX	The current time	Hourly (at the end of the Trading Interval)	1 hour	1

9.5.3 The schedule of the execution of the RTD and RTX market runs and corresponding coverage are presented in the following illustration –

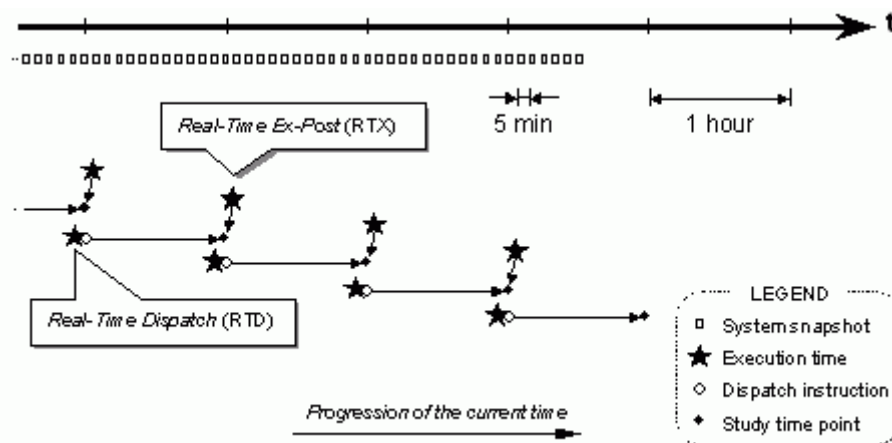


Figure 4. RTD and RTX Timeline

9.6 DATA INPUTS/INFORMATION REQUIREMENTS

9.6.1 The following data and information must be available and must be submitted to the Market Operator prior to the execution of the real-time dispatch schedules in accordance with the WESM timetable. Submission shall be in accordance with the schedules and format set out in other Sections of this Dispatch Protocol or, for the load forecasts, in the relevant market manuals.

INPUTS	SOURCE	RTD	RTX
Bids & Offers or Target Loading Levels	Trading Participants	Required	Required
Load Forecast	Market Operator	Required	Not Required
System Snapshots	System Operator	Required	Required

Outage Schedule	System Operator	Required	Required
System Reserve	System Operator	Required	Required
Contingency List	System Operator	Required	Not Required
Transmission Limits	System Operator	Required	Required
Security Limits	System Operator	Required	Required
System Advisories	System Operator	Required	Required

9.7 OUTPUTS/RESULTS OF REAL TIME DISPATCH SCHEDULING

9.7.1 The MDOM simultaneously determines the following –

- Target loading levels in MW for the end of a trading interval, identified as the ex-ante or RTD dispatch schedule,
- Reserve allocations for the trading interval,
- Associated ex-ante and ex-post energy prices at all market trading nodes, and
- When applicable, reserve prices for all reserve regions.

9.7.2 Where constraints are encountered in the market runs, the results will reflect constraint violation coefficients (CVCs).

9.8 DISSEMINATION AND PUBLICATION OF MARKET RUN RESULTS

9.8.1 The RTD schedule shall be transmitted to the System Operator in the format prescribed in Attachment 8A. If the market runs results in occurrence of constraint violation coefficients (CVCs), this shall be notified to the System Operator through market advisories, which shall be transmitted in the format prescribed in Attachment 8B.

9.8.2 The results of the Real Time Dispatch (RTD & RTX) shall be published and notified to the Trading Participants through the Market Participant Interface (MPI). The Trading Participants shall be provided following information pertaining to their respective registered resource (i.e., generating unit or load)

Information	RTD Market Run	RTX Market Run
Energy	Target Loading Levels or Dispatch Targets	Actual Energy Delivered/Consumed
Nodal Price	Ex-Ante Price	Ex-Post Price

Information	RTD Market Run	RTX Market Run
Reserves (Type / Quantity)	Operating Limits	Actual Reserve Delivered
Reserve Price	Ex-Ante Price	Ex-Post Price

9.8.3 Other system data that will be published and be made available to all Trading Participants through the MPI includes include the following –

- Total energy dispatched
- Total dispatchable load
- Total reserve required per time point (for each class and area)
- Total system losses
- Reserve requirements
- Locational marginal prices

9.8.4 The results of the ex-ante and ex-post market runs shall be published in accordance with the WESM Timetable on the following schedules:

Market Run	Trading Intervals Covered	Execution Frequency	Schedules Resolution	Number of Trading Intervals Covered
RTD	1 Hour-ahead or Current Trading Interval	Hourly, at the start of Trading Interval	1 Hour	1
RTX	24 Trading Intervals of the previous Day	1200H of the following Day	1 Hour	24

9.9 SAVE CASE

9.9.1 Using the save case functionality of the MMS, the Market Operator shall save the input data as well as the results of each ex-ante and ex-post market run that have been carried out. The saved cases shall be retrieved and utilized by the Market Operator for validation as well as for the conduct of sensitivity analysis and other simulation studies. Data retention shall be in accordance with the relevant provisions of the WESM Rules.

TABLE

10.1 BACKGROUND

10.1.1 The WESM Merit Order Table (MOT) is prepared as a guide for the System Operator in selecting generating units that can be re-dispatched in the course of the operations of the power system. The use of the MOT by the System Operator shall be in accordance with the re-dispatch process described in the relevant Section of this Dispatch Protocol.

10.1.2 The WESM MOT is the stacking in an unconstrained manner of scheduled and unscheduled capacities through the generation offers submitted for the real-time dispatch or ex-ante market runs. Energy offer blocks submitted by Generator Trading Participants for a particular trading interval are arranged from lowest to the highest priced offer block, without considering any constraints. The MOT stacks energy offers into two, namely, the energy offers that were scheduled (or “Offers Dispatched”) and energy offers that were not scheduled (or “Offers Not Dispatched”).

10.1.3 The System Operator utilizes the MOT of Offers Dispatched as a guide in determining which generating units may be constrained-off, whereas the MOT of Offers Not Dispatched is a guide for determining which generating units may be constrained-on for a particular trading interval.

10.1.4 The Market Operator prepares a separate WESM MOT for each of the grids where the WESM is in commercial operation.

10.2 PURPOSE AND SCOPE

10.2.1 This Section sets out the requirements and procedures for the preparation and use of the WESM Merit Order Table (MOT) in the dispatch of generating units.

10.3 RESPONSIBILITIES

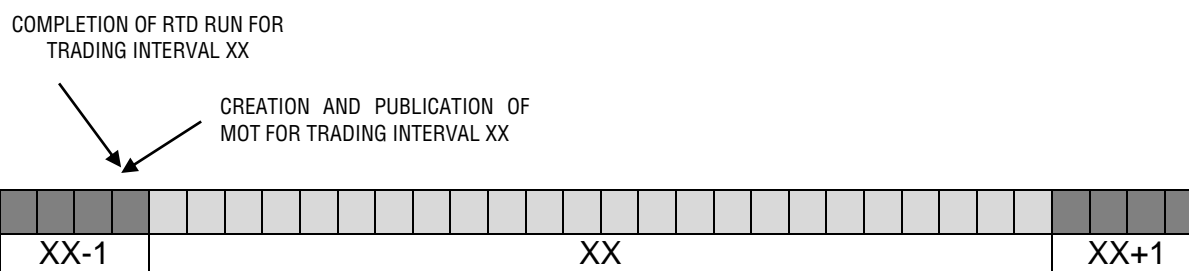
10.3.1 The Market Operator shall be responsible for preparing, disseminating and publishing the MOT in accordance with the procedures set out in this Section.

10.3.2 Consistent with its obligations set out in this Dispatch Protocol in respect to the issuance or dispatch instructions, the System Operator shall be responsible for

ensuring the application of the information provided in the MOT in the real-time operation of the grid.

10.4 TIMELINE OF THE PREPARATION OF THE MOT

10.4.1 The Market Operator shall prepare the MOT for each trading interval right after the completion of the RTD market run workflow for that trading interval, and shall immediately transmit the same to the System Operator through the EMS-MMS data exchange facility. The timeline is illustrated as follows, where “XX” refers to the trading interval to which the MOT will apply.



Where XX is the target trading interval

10.5 INPUTS AND INFORMATION REQUIREMENTS

10.5.1 The MOT shall be prepared using the offers and the real-time dispatch schedule of each generating unit for which offers were submitted for the relevant trading interval. The specific information that will be used is as follows -

Information	Description
Resource ID	Generating unit ID as registered in the MMS
OFFER DATA	
MW	MW Quantity relevant to offer block
Block	Offer block number
Price	Offer Price relevant to offer block
RTD SCHEDULE	
MW	Dispatch target for the generating unit

10.6 PREPARATION OF THE MOT

10.6.1 The MOT shall include the following –

- a. All generating units for which offers have been submitted for the relevant trading interval; and
- b. All generating units which have been scheduled or included in the RTD schedule as a result of the imposition of overriding constraints, with or without offers submitted for that trading interval.

10.6.2 The following generating units shall be excluded in the MOT –

- a. Generating units which are on outage as reflected in the outage schedule submitted by the System Operator, and
- b. Generating units which are not available as reflected in the network configuration considered in the ex-ante or RTD market run.

10.6.3 The energy offers for all generating units with offers will be segregated into two, namely, the –

- a) Offers dispatched
- b) Offers Not dispatched

10.6.4 The “**OFFERS DISPATCHED**” consists of the energy offer blocks which have been scheduled in the ex-ante or RTD schedule for the trading interval. To the extent possible, the dispatch schedule of each generating unit will be split into corresponding offer blocks. The scheduled offer blocks will then be sorted and listed from the lowest-priced to the highest-priced scheduled offer block, with the lowest-priced scheduled offer block at the bottom of the list and the highest-priced at the top of the list. The generating units for which no offers are submitted but were scheduled are considered as price takers. Their respective schedules, MW, are included in this list and are placed at the bottom of the list.

10.6.5 The “**OFFERS NOT DISPATCHED**” consists of the remaining energy offers of each generating unit that are not scheduled or included in the RTD schedule for the trading interval. To the extent possible, the remaining offers will be sorted by offer blocks. The offer blocks not dispatched will then be sorted and listed from the lowest -priced to the highest-priced scheduled offer block, with the lowest-priced scheduled offer block at the bottom of the list and the highest-priced at the top of the list.

10.6.6 Attachment 10A presents a step-by-step illustration on how the MOT is prepared.

10.7 OUTPUT

10.7.1 The hourly MOT shall contain the following information –

Information	Description
Resource ID	Generating unit ID as registered in the MMS
MW	MW Quantity relevant to offer block
Block	Offer block number
Running Total	Incremental value based on MW Quantity <ul style="list-style-type: none"> Offers Scheduled for Dispatch – increment starts from the top of this list Offers Not Scheduled for Dispatch – increment starts from the bottom of this list

10.7.2 The hourly MOT shall be published in substantially the form as presented in Attachment 10A of this Dispatch Protocol.

10.8 USE OF THE MOT

10.8.1 The System Operator shall use the MOT as reference whenever there is a requirement to constrain on or constrain off the dispatch schedule. However, the System Operator may resort in an out-of merit dispatch whenever the grid frequency is beyond the normal threshold.

10.8.2 The System Operator shall provide a post-dispatch report(s) to the Market Operator containing deviation of actual dispatch from the RTD schedule in aid of monitoring each generator's dispatch. Such reports should be able to identify, but not limited to, the following

- Non-compliance to dispatch instructions
- Designation of must-run units
- Utilized for ancillary services
- Testing Requirement
- Generator limitation

10.9 DISSEMINATION AND PUBLICATION

10.9.1 The hourly MOT shall be transmitted to the System Operator immediately after its preparation, through the EMS-MMS data exchange facility.

10.9.2 The hourly MOT shall be published to the Trading Participants through the Market Information Website after the expiration of confidentiality of generator offer information in accordance with the relevant market manual.

SECTION 11 DISPATCH IMPLEMENTATION

11.1 BACKGROUND

11.1.1 The System Operator and the Trading Participants shall communicate with each other for the target loading levels determined prior to the commencement of the trading interval and in accordance with the WESM timetable.

11.1.2 The Dispatch Schedule shall contain the target loading levels to be achieved in MW considered at the end of that trading interval. Generators who are dispatched shall use reasonable endeavours to comply with a linear ramp rate over the Trading Interval. All generators except must dispatch generating units shall be monitored for compliance with the Dispatch Tolerance standards and the required linear ramp rate. This is to ensure that the target loading for each Trading Participant shall be within the dispatch tolerance standards in MW and the linear ramping in MWhr from the start until the end of that Trading Interval. Dispatched trading participants will not be required to operate in any different fashion unless required to respond in accordance with reserve or ancillary services contract or respond to a direction by the System Operator.

11.1.3 During each trading interval, the System Operator is directed under WESM Rules Clause 3.8.2.1 to use reasonable endeavors to implement the dispatch targets determined by the Market Operator, to maintain system security consistent with the requirements of the Grid Code, and if necessary, to implement load shedding or to intervene.

11.1.4 During a trading interval and in carrying out its responsibility of maintaining system security, it can become necessary for the System Operator to issue re-dispatch instructions. Such instructions may involve re-dispatch of generating units which can result in changes to the dispatch schedules generated by the Market Operator.

11.2 PURPOSE AND SCOPE

11.2.1 This Section discusses the procedures that will be followed in the implementation of the real-time dispatch schedules for energy and reserves. It also provides for guidelines that will be followed by the System Operator in issuing re-dispatch instructions during a trading interval.

11.2.2 The procedures set out in this Section are associated with the following procedures –

- a. Procedures for the dispatch of generating units which are scheduled to start up or shut down are set out in Section 12 of this Dispatch Protocol;
- b. Designation and dispatch of must run units which are set out in a separate Market Manual on the Management of Must Run and Must Stop Units;
- c. Procedures during market intervention and suspension which are set out in a separate Section 15 of this Dispatch Protocol;
- d. Procedures during alert or emergency conditions which are set out in a separate market manual; and
- e. Management of excess generation which is set out in a separate market manual; and
- f. Management of load shedding which is set out in a separate market manual.

11.3 RESPONSIBILITIES

11.3.1 **System Operator.** The System Operator shall implement the real time dispatch schedules generated by the Market Operator and shall monitor compliance and report non-compliance with dispatch schedules and instructions by Trading Participants. It shall be responsible for assuring the security and reliability of the grid at all times in compliance with the provisions of the System Security and Reliability Guidelines, and shall issue re-dispatch instructions as it may deem necessary and in accordance with this Section.

11.3.2 **Market Operator.** The Market Operator shall be responsible for ensuring timely transmittal to the System Operator and publication to the Trading Participants of the real time dispatch schedules, for energy and reserves, and the merit order table (MOT) determined for a trading interval, in accordance with the timelines set in the WESM timetable.

11.3.3 **Trading Participants.** All Trading Participants shall comply with their respective dispatch schedules and the dispatch instructions issued to them by the System Operator. For this purpose, they shall ensure that their respective internal processes, systems and infrastructure, as well as their protocols with their counterparties, shall enable strict compliance with this Section.

11.4 ISSUANCE AND COVERAGE OF DISPATCH INSTRUCTIONS

11.4.1 **Coverage.** Dispatch instructions shall include the following –

- a. During normal condition, the MW *dispatch* of power *facilities* shall be the *dispatch schedule* for the *trading interval* submitted by the *Market Operator*.
- b. In cases when the conditions in real-time changes from the condition in the original *ex-ante* run, the *System Operator* shall redispatch according to Section 11.5 of this *Market Manual*.
- b. A *must dispatch generating unit* shall generate at its maximum available output at all times, unless the *Market Operator* or *System Operator* has instructed the *generating unit* to restrict output.
- c. If, in real-time, the available *generation* from a *must dispatch generating unit* differs from the available *generation* assumed in the *dispatch schedule* provided to the *System Operator*, the *System Operator* shall allow the *must dispatch generating unit* to generate at its maximum available output, and, if all available *frequency* regulation is exhausted during a *trading interval*, shall adjust the *dispatch* of other *generating units* to compensate as required in accordance with Section 4.1.5.1 of this *Market Manual*.
- d. The *System Operator* shall instruct a *must dispatch generating unit* or a *priority dispatch generating unit* to restrict its output or constrain its *ramp rate* to a level specified by the *System Operator*, but only while the *grid* is not operating in normal state. If the *System Operator* has instructed a *must dispatch generating unit* or a *priority dispatch generating unit* to restrict its output, the *System Operator* shall instruct the *generating unit* to remove the restriction as soon as practicable after the actual or potential *system security* issue has been resolved.

11.4.2 Review of the RTD schedule. Upon receipt from the Market Operator of the dispatch schedule determined for a trading interval, the System Operator shall review the same to determine if it shall become necessary to implement re-dispatch as provided for in this Section.

11.4.3 System Operator Clearance. Upon receipt of their respective dispatch schedules, the Trading Participants shall communicate with the System Operator and seek prior clearance before ramping up or down to their respective target loading levels. The System Operator shall provide clearance and issue dispatch instructions as it deems appropriate.

11.5 RE-DISPATCH PROCESS

11.5.1 Re-dispatch shall be carried out under the conditions set out in this Section. Re-dispatch instructions shall be issued by the System Operator.

11.5.2 In cases of the occurrence of system emergencies, a threat to system security, or an event of *force majeure*, of the nature described in Chapter 6 of the WESM Rules and in the relevant Section of this Dispatch Protocol, the System Operator shall declare market intervention in accordance with said Chapter 6 of the WESM Rules and this Dispatch Protocol. While market intervention is in effect, the System Operator shall take control of the dispatch of generating units in accordance with the procedures set out specifically for market intervention. The System Operator shall notify the Market Operator of its actions.

11.5.3 Where the results of the ex-ante or real time dispatch market runs reflect constraint violation coefficients (CVCs), the System Operator shall use all reasonable endeavors to dispatch generating units in accordance with the RTD schedules and the WESM Merit Order Table (MOT) generated and communicated by the Market Operator for the relevant trading interval. The System Operator shall, however, issue the necessary re-dispatch instructions to address the condition that gave rise to the occurrence of the CVCs.

11.5.4 In cases when normal market conditions prevail but there is an increase or decrease in system demand within the trading interval or there are forecast errors, the System Operator shall issue re-dispatch instructions. The System Operator may constrain-on or constrain-off generators based on the Merit Order Table to ensure that the supply and demand is balanced at all times.

11.5.5 **Re-Dispatch Process Based on WESM Merit Order Table.** When there is a need for the System Operator to re-dispatch generating units, the following shall be followed:

- a) Instruct generators to ramp-up (or ramp-down) following the WESM Merit Order Table. If the incremental MW as instructed by SO exceeds the block quantity in the WMOT, the excess quantity shall be settled in accordance with the Manual on the Management of Must-Run Unit and Must-Stop Unit.
- b) When the issue being addressed falls under the criteria for the designation of Must Run/Must Stop Units, the System Operator shall issue Must Run/Must Stop Units dispatch instruction.

- c) Once the issue being addressed in (a) or (b) is resolved, issue re-dispatch instruction to MRU/MSU to go back to the RTD schedule for the current interval.

11.5.6 Designation of Must-Run Unit to Address System Voltage Requirement.

- a) SO determines the need for Reactive Power Support (RPS) and identifies the generating unit/plant that can satisfy or address the problem.
- b) Inform the generating unit/plant that it will be designated as Must-Run Unit. The duration of the Must-Run Unit designation as well as the target MW loading shall also be communicated to the generating unit/plant.
- c) Submit overriding constraint limits to Market Operator containing the hourly loading of the Must-Run Unit.

11.6 COMMUNICATING AND REPORTING OF DISPATCH SCHEDULES AND INSTRUCTIONS

11.6.1 The real time dispatch schedules shall be communicated to the Trading Participants through the Market Participant Interface. The Merit Order Table (MOT) generated for a trading interval shall be published in accordance with the relevant Section of this Dispatch Protocol. Re-dispatch instructions shall be communicated by the System Operator to the Trading Participants through their respective power plant operators.

11.6.2 The System Operator shall maintain the communication facilities it needs for communicating with Trading Participants which may include telephones, fax, email, web pages and other means of communications.

11.6.3 All exchanges of information or communications between the System Operator, Market Operator, and Trading Participants shall be recorded by the parties concerned and shall be made available for audit, surveillance, investigations and enforcement actions. As appropriate, records may include, but shall not be limited to, operator logs, voice recording, electronic communications and written communications.

11.6.4 All dispatch instructions issued by the System Operator to Trading Participants shall be recorded through operator logs. The System Operator shall likewise log and report to the Market Operator all dispatch deviations from the real time dispatch schedule generated by the Market Operator. The report shall form part of the post-dispatch report required of the System Operator under this Dispatch

Protocol. Deviation reports submitted by the System Operator to the Market Operator shall be used for purposes of surveillance, audit, and market settlements.

11.6.5 The System Operator and the Market Operator shall prepare, disseminate and publish the reports referred to in the foregoing paragraph as well as other dispatch reports and information in accordance with requirements and procedures set out in this Section and other relevant Sections of this Dispatch Protocol and other relevant market manuals.

11.7 COMPLIANCE WITH DISPATCH SCHEDULES AND INSTRUCTIONS

11.7.1 All generators except must dispatch generating units shall comply with the dispatch schedules and dispatch instructions issued to them. For this purpose, Trading Participants shall ensure that their facilities adhere to a linear ramp rate over the trading interval and operate within the prescribed dispatch tolerance as well as the standards prescribed by the System Operator and as set out in the Grid Code, Distribution Code and the WESM Rules.

11.7.2 A registered trading participant that expects its registered facility, to operate in a manner that, for any reason, differs materially from the System Operator's dispatch instructions shall so notify the System Operator as soon as possible.

11.7.3 Compliance by Ancillary Services Providers with their scheduled dispatch shall be in accordance with the relevant provisions of the WESM Rules and market manual.

11.7.4 The System Operator shall continuously monitor the compliance by the Trading Participants with their respective dispatch schedules and dispatch instructions issued to them. Deviations from the dispatch instructions shall be recorded and shall be reported as part of the post-dispatch report required of the System Operator. Said information shall be used for purposes of market settlement, surveillance, and audit.

11.7.5 If the *projected output* of a *must dispatch generating unit* has been restricted due to congestion, the *must dispatch generating unit* shall ensure its output does not exceed the value included in the *dispatch schedule*.

11.7.6 If the failure by a registered facility to comply with a dispatch instruction endangers the reliability of the power system, the System Operator shall declare the registered facility to be non-conforming and shall be tagged as Must Stop Unit (MSU). The System Operator shall take any action allowed by the Grid Code, the Distribution Code and the WESM Rules to control the situation.

11.7.7 The Market Operator shall publish the dispatch tolerance standards in the Market Information Website.

SECTION 12 DISPATCH TOLERANCE

12.1 BACKGROUND

12.1.1 Dispatch tolerances define the extent to which scheduled generating units, and priority dispatch generating units may deviate from dispatch targets issued by the System Operator.³

12.1.2 A Generation Company is required to operate their scheduled generating units and/or priority dispatch generating units within the dispatch tolerances specified in this Manual.⁴

12.1.3 Prior to the registration of a Trading Participant in respect of a scheduled generating unit or a priority dispatch generating unit or scheduled load facility, an Intending WESM member may seek a ruling from the System Operator with respect to the dispatch tolerances to be applied.⁵

12.1.4 Scheduled generating units and priority dispatch generating units who are dispatched shall use reasonable endeavors to achieve a linear ramp rate over the trading interval to reach the target loading level by the end of that trading interval and within the dispatch tolerances specified in this Manual or ruling from the System Operator, and those Trading Participants will not be required to operate in any different fashion unless required to:

(a) Respond in accordance with reserve or ancillary service contracts; or

³WESM Rules Clause 3.8.7.1

⁴WESM Rules Clause 2.3.1.8

⁵WESM Rules Clause 2.3.3.5

- (b) Respond to a direction in accordance with WESM Rules Clauses 6.3 and 6.5.⁶

12.1.5 The Market Operator shall maintain and publish dispatch tolerance standards developed by the System Operator for each type of plant, and location, in accordance with WESM Rules Clause 3.8.7, the Grid Code, and the Distribution Code.⁷

12.1.6 Any Trading Participant who consistently fails to use its reasonable endeavors to act in accordance with dispatch schedules issued under WESM Rules Clause 3.8.1(g), dispatch instructions issued by the System Operator, or who breaches the dispatch tolerance standards published under WESM Rules Clause 3.8.7.2, may be liable to sanctions imposed under WESM Rules Clause 7.2.⁸

12.2 SCOPE AND PURPOSE

This Section describes the dispatch tolerance standards to be followed by scheduled and priority dispatch generating units when complying with their dispatch schedules in the WESM.

12.3 RESPONSIBILITIES

12.3.1 The System Operator is responsible for –

- a) Implementing the Real-Time Dispatch Schedules for both energy and reserves upon receipt of the same from the Market Operator.
- b) Monitoring the compliance of each generating unit registered in the WESM. This compliance monitoring report shall be submitted to the Market Operator.
- c) In consultation with the Market Operator, developing dispatch tolerance standards for each type of plant, and location, in accordance with the Grid Code and Distribution Code, and reviewing such, from time to time.

12.3.2 The Market Operator is responsible for –

⁶ WESM Rules Clause 3.8.4.1

⁷ WESM Rules Clause 3.8.7.2

⁸ WESM Rules Clause 3.8.8.1

- a) In coordination with the System Operator, developing dispatch tolerance standards for each type of plant, and location, in accordance with the Grid Code and Distribution Code, and reviewing such, from time to time.
- b) Maintaining and publishing the dispatch tolerance standards in the Market Information Website.

12.4 DISPATCH TOLERANCE STANDARDS

- 12.4.1 All scheduled and priority dispatch generating units shall not deviate beyond the dispatch tolerance limit of +1.5% or -3% of the dispatch target or +/-1MW, whichever is higher.
- 12.4.2 The instantaneous actual MW dispatch to be evaluated for compliance shall be measured at the end of the trading interval.
- 12.4.3 The Market Operator shall coordinate with the System Operator on the dispatch discrepancies observed per dispatch interval.
- 12.4.4 The System Operator shall forward the dispatch deviation report to the Market Operator, which may include, but is not limited to, the following:
 - a. Generator Problem;
 - b. Free-Governor Response;
 - c. Ancillary Response;
 - d. Generator Problem/Trouble/Tripping;
 - e. Load Tripping;
 - f. HVDC Variance;
 - g. Constrain-on MOT Dispatch;
 - h. Constrain-off MOT Dispatch;
 - i. Generator Start-Up/Shutdown;
 - j. MRU Dispatch; and
 - k. Non-compliance to RTD.

12.5 REPORTING

The Market Operator shall consolidate the dispatch discrepancies for the week, including those from the System Operator and shall publish the consolidated dispatch discrepancy report in the Market Information Website.

SECTION 13 START UP AND SHUTDOWN OF GENERATING UNITS**13.1 SCOPE AND PURPOSE**

13.1.1 This Section sets out the principles and procedures for the start-up and shutdown of generating units included in the scheduling and dispatch processes in the WESM. These are set out in order to minimize disruption in the scheduling and dispatch processes in the WESM that may be caused by the start-up or shutdown of generating units.

13.2 RESPONSIBILITIES

13.2.1 The Market Operator shall carry out its responsibilities in accordance with the procedures and principles set out in this Section.

13.2.2 Consistent with its obligations pertaining to real-time dispatch scheduling and implementation, the System Operator shall ensure –

- a) Continuous and timely submission and updating of the outage schedules, overriding constraint limits of generating units, system snapshots, and other relevant data provided to the Market Operator;
- b) Timely notification of the Market Operator of the implementation or cancellation of start-up and shutdown of generating units;
- c) Issue clearance to Trading Participants to carry out the start-up or shutdown of their generating units; and
- d) Carry out the procedures set out in this Section.

13.2.3 The Trading Participants shall ensure their compliance with the procedures set out in this Section, and, among other responsibilities, shall ensure –

- a) Timely submission of the notices and information required of them every time they intend to start-up or shut down their generating units;
- b) Timely submission or cancellation of their energy and operating reserve offers consistent with the WESM timetable that is consistent with their scheduled start-up or shut-down;
- c) Strict compliance with their outage and dispatch schedules; and
- d) Clearance from the System Operator prior to the start-up or shutdown of their generating unit.

13.3 GENERAL PROCEDURES

13.3.1 A Trading Participant that expects its generating unit to start-up or shutdown shall request for clearance from the System Operator to start-up or shutdown and submit the start-up/shutdown profile of the generating unit to the System Operator not later than seven (7) trading days before the trading interval in which the start-up or shutdown is scheduled.

13.3.2 The System Operator shall evaluate the request and act on the same taking into consideration the WESM Security and Reliability Guidelines. If the System Operator disapproves the request and changes the date or time of implementation, it shall notify the Trading Participant citing the reasons for the disapproval. The notice of disapproval shall be made no later than five (5) days prior to the original date requested by the Trading Participant. The System Operator shall also validate the start-up/shutdown profile submitted and notify the Trading Participant of any adjustments or modification that needs to be made.

13.3.3 The dispatch scheduling of the generating unit that will start-up or shutdown can be managed in either of the following manner –

- a) Through its generation offers submitted within the WESM timetable, in which case the Trading Participant shall submit offers for the trading interval during which the unit is to start-up or shutdown making adjustments to its offers as appropriate; or
- b) Through imposition of overriding constraint limits by the System Operator for the trading interval in which the unit is to start-up or shutdown in accordance with the following paragraphs.

13.3.4 If the Trading Participant is unable to manage the start-up and shutdown of its generating units through its offers and prefers that the same is managed through imposition of overriding constraint limits, the following will apply, -

- a. The start-up or shutdown can be managed through the imposition of overriding constraint limits on the said generating unit by the System Operator, provided that the load is below the registered Pmin of the generating unit and should be accommodated if start-up/shut-down profile of said generating units is more than one (1) interval. The overriding

constraint limits shall override the operating limits registered for that generating unit, and shall be set in accordance with the submitted shutdown/start-up profile.

- b. As no offers are submitted, the transactions of the generating unit during the relevant trading intervals will be settled at the applicable WESM nodal prices.

13.3.5 If the System Operator gives clearance to the start-up or shutdown, the Trading Participant shall, within the timetable for submission of offers, –

- a. Cancel offers submitted for the generating unit to be shutdown, starting with the offers after the trading interval when the shutdown is to be implemented; or
- b. Submit offers for the generating unit that is to start-up, starting with the trading interval immediately after the trading interval in which the generating unit is scheduled to start-up.

13.3.6 If the System Operator defers or changes the schedule of start-up or shutdown to another date or time, it shall notify the Trading Participant and the Market Operator of the deferment or change of schedule. It shall also, as appropriate, update the outage schedule and the overriding constraint limit settings, within the time required in the WESM timetable. The Trading Participant, meanwhile, shall update its offers, if shutdown is deferred, or cancel offers already made, if start-up is deferred, within the timetable.

13.4 START-UP OF A GENERATING UNIT

13.4.1 Off-line units will not be included in the dispatch scheduling process. Thus, the generating unit must then be synchronized to the grid prior to the execution of the hour-ahead (RTD) dispatch or ex-ante market run consistent with the WESM timetable.

13.4.2 The System Operator shall update the outage schedule of generators with normally closed breakers as modelled in the MNM submitted to the Market Operator to remove the generating unit cleared to start-up from the outage list. Submission shall be in accordance with the WESM timetable. If the start-up will

be deferred, the System Operator shall update the outage schedule accordingly and within the WESM timetable for submission of outage schedules.

- 13.4.3 Once synchronized to the grid and scheduled for dispatch, the generating unit shall ramp-up linearly to its adjusted operating limit based on its start-up profile in the next trading interval.

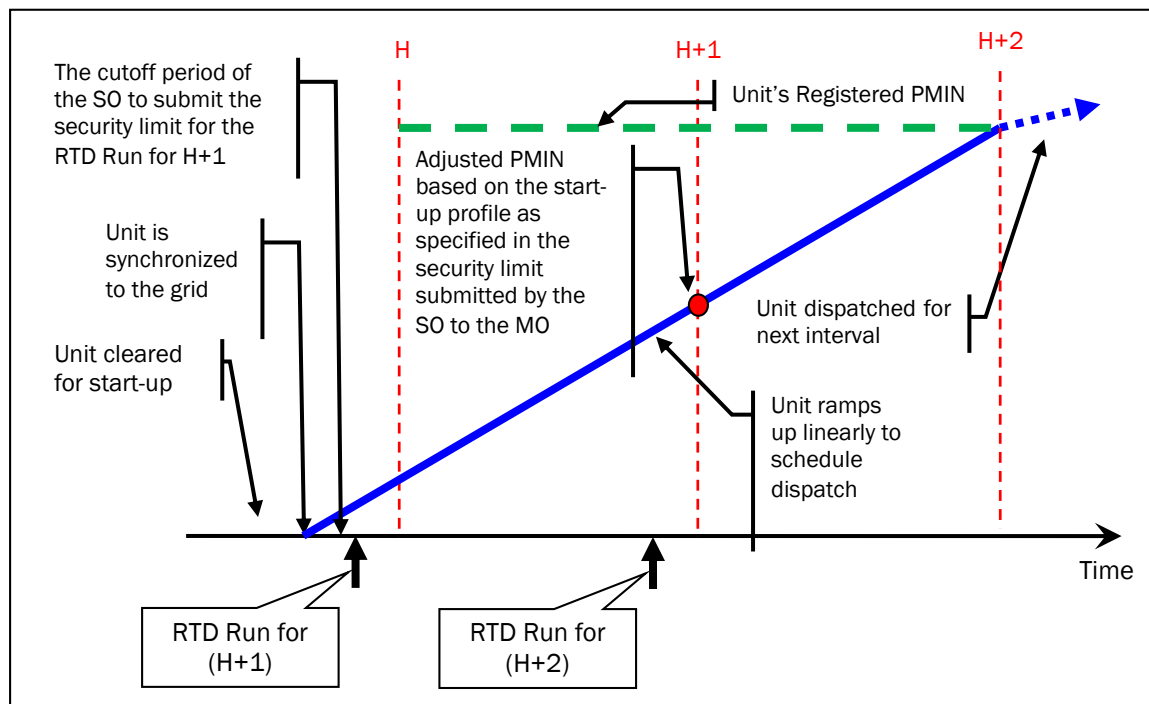


Figure 5. Start-up Sequence of a Generating Unit

13.5 SHUTDOWN OF A GENERATING UNIT

- 13.5.1 Generating units cleared and scheduled for shutdown shall be included in the approved outage schedule submitted by the System Operator to the Market Operator.

- 13.5.2 If the Trading Participant elected to manage the shutdown through its offers such that it can ramp down to zero in the next succeeding interval, it shall update its offers for the trading intervals covered in the shutdown sequence.

- 13.5.3 The Trading Participant shall also withdraw all offers already made for the trading intervals at which the generating unit is already expected to have shutdown, consistent with the WESM timetable.

13.5.4 The generating unit shall ramp-down linearly while shutting down until it is finally disconnected from the grid.

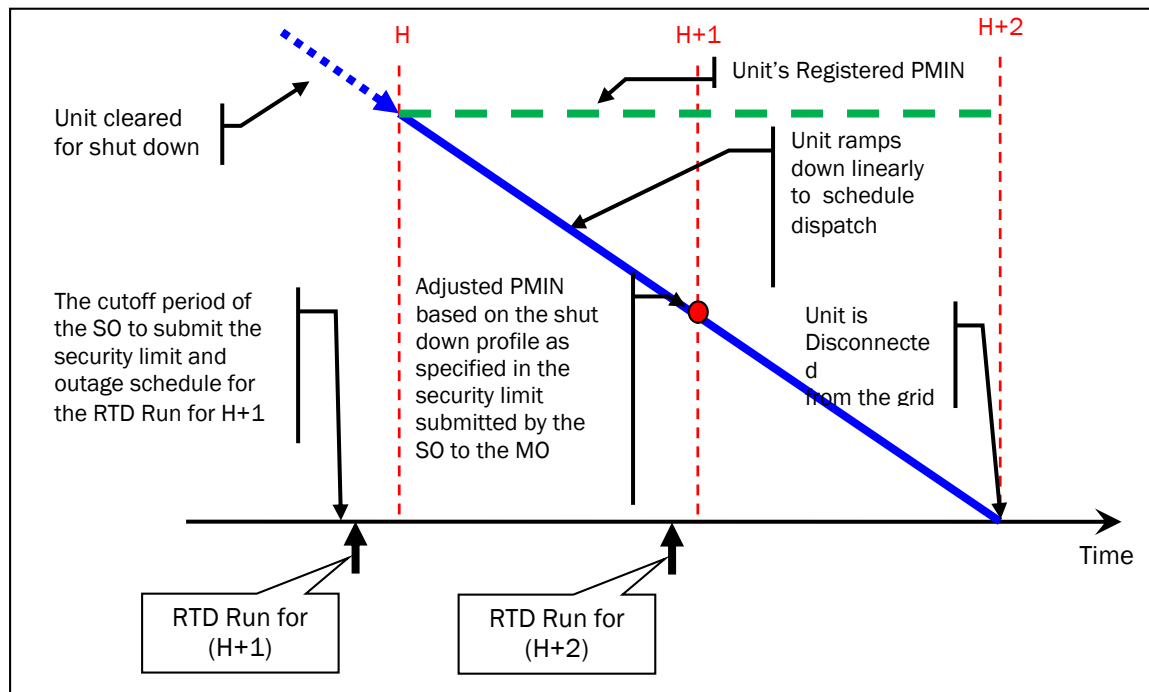


Figure 6. Shutdown Sequence of a Generating Unit

SECTION 14 POST DISPATCH DATA AND OPERATION REPORTS

14.1 BACKGROUND

14.1.1 After each trading interval, the System Operator is required under WESM Rules Clause 3.8.2 to advise the Market Operator of the occurrence of, among other information, dispatch deviations, load shedding, network constraints, binding security constraints and operational irregularities.

14.2 PURPOSE AND SCOPE

14.2.1 This Section sets out the requirements in respect to the post-dispatch report required of the System Operator. The requirements and procedures set out in this Section apply in the grids where the WESM is in operation. The requirements set out in this Section shall in addition to the reporting requirements and procedures set out in other Sections of this Dispatch Protocol and relevant market manuals.

14.2.2 The requirements and procedures in respect to the preparation, publication and dissemination of post-dispatch reports and information required of the Market Operator are set out in a separate market manual and in other Sections of this Dispatch Protocol.

14.3 RESPONSIBILITIES

14.3.1 The System Operator shall be responsible for the preparation, updating and submission of post-dispatch reports and information required of it under this Section and this Dispatch Protocol.

14.3.2 The Market Operator shall use and make available all reports submitted to it by the System Operator for settlements, audit, surveillance and enforcement purposes.

14.4 POST-DISPATCH REPORTS AND INFORMATION

14.4.1 **Daily Operations Report.** The System Operator shall prepare a daily report containing the summary of its hourly operations during each trading day. The System Operator shall submit to the Market Operator the Daily Operations Report not later than 0800H of the following trading day. The report shall include the following information –

- a) Total System Generation
- b) Total System Load
- c) Total System Reserve
- d) Actual Unit Generation
- e) Transmission Line and Generator Outages

14.4.2 **Dispatch Deviation Report.** For each trading day, the System Operator shall prepare a report presenting on an hourly basis all instances in which the deviation from the dispatch schedule per category occurred.

Pursuant to section 5.5 of the WESM Manual on Management of Must-Run and Must-Stop Units, the Dispatch Deviation Report shall contain the following information as the minimum:

- a. Trading Date and interval concerned
- b. Criteria used for the designation of the MRU/MSU

- c. Short description of the issue being addressed (e.g. frequency breached x Hz)
- d. Loading of scheduled Ancillary Services

14.4.3 Market Intervention Report. Pursuant to Clause 6.6.2.2, the *System Operator* (for grid-related) and *Market Operator* (for market-related) shall submit a market intervention report, as soon as practicable, to the *Market Surveillance Committee, Market Operator, DOE* and *ERC*, after the resumption of the *spot market*. Said report shall include the details of the activities done during the duration of the *market intervention* that include as follows:

- a. the reason for the declaration of *market intervention*;
- b. the number of trading intervals affected by the *intervention*;
- c. the actions done to address the threat in *system security*; and
- d. the actual *dispatch* of all *generating units* per interval affected.

14.4.4 All reports required to be prepared and submitted under this Section shall be made available by the System Operator and the Market Operator for purposes of settlements, audit, surveillance and enforcement purposes.

SECTION 15 SCHEDULING AND DISPATCH OF RESERVES

15.1 BACKGROUND

15.1.1 Upon the commencement of the trading of reserves in the WESM, the scheduling and dispatch of reserves that are traded in the WESM shall be in accordance with the requirements and procedures set out in the WESM Rules.

15.1.2 WESM Rules Clause 3.3.7.4 requires the System Operator to continuously adjust the quantum of reserve to be scheduled to meet each locationally specific reserve requirement by the Market Dispatch Optimization Model, so as to accurately reflect the grid under existing or future conditions, within the relevant market time frames.

15.2 SCOPE AND PURPOSE

15.2.1 This Section describes the criteria for determining required reserve levels by the System Operator which will be the basis of the Market Operator as input to the Market Management System.

15.2.2 The criteria, procedures and formulae set out in this Section cover only the requirements for the types of reserves that are to be traded in the WESM. Procedures for procurement, monitoring and settlement of other types of ancillary services are not within the scope of this Section or this Dispatch Protocol.

15.2.3 The criteria, procedures and formulae set out in this Section shall apply to the determination and submission of reserve requirements and monitoring and settlement of reserve providers in the reserve zones in the regions where the WESM is in operation.

15.3 RESPONSIBILITIES

15.3.1 **System Operator.** The System Operator is responsible for –

- a. Monitoring the compliance of each reserve provider in the WESM. This compliance monitoring report shall be submitted to the Market Operator for settlement purposes.

15.3.2 **Market Operator.** The Market Operator is responsible for –

- a. Determining the required reserve levels for each type of reserves that are to be traded in the WESM in accordance with the Ancillary Services Procurement Plan of the System Operator.
- b. Ensuring that the required reserve levels per System Operator are used as inputs in pre-dispatch market projections and real time dispatch scheduling processes in the WESM. It is also responsible for providing and maintaining the facility for timely receipt of submissions from the System Operator;

15.4 DETERMINATION OF RESERVE REQUIREMENTS

15.4.1 Criteria for Determining Reserve Requirements. In determining reserve requirements for each reserve type in accordance with its Ancillary Services Procurement Plan, the System Operator shall ensure compliance with the power quality and reliability performance standards set out in the Philippine Grid Code.

15.4.2 The level of reserve requirement for Regulating Reserve service shall be based on the latest ASPP duly approved by the ERC, and shall be used as reference by the Market Operator to come up with a Day Ahead or Hour Ahead Reserve dispatch schedule. The reserve requirement shall be equally distributed to provide upward and downward Regulating Reserve.

15.4.3 For Contingency reserve service, the System Operator shall determine the level of reserve requirement in accordance with the latest ASPP duly approved by the ERC.

15.4.4 For Dispatchable Reserve, the System Operator shall determine the level of reserve requirement in accordance with the latest ASPP duly approved by the ERC.

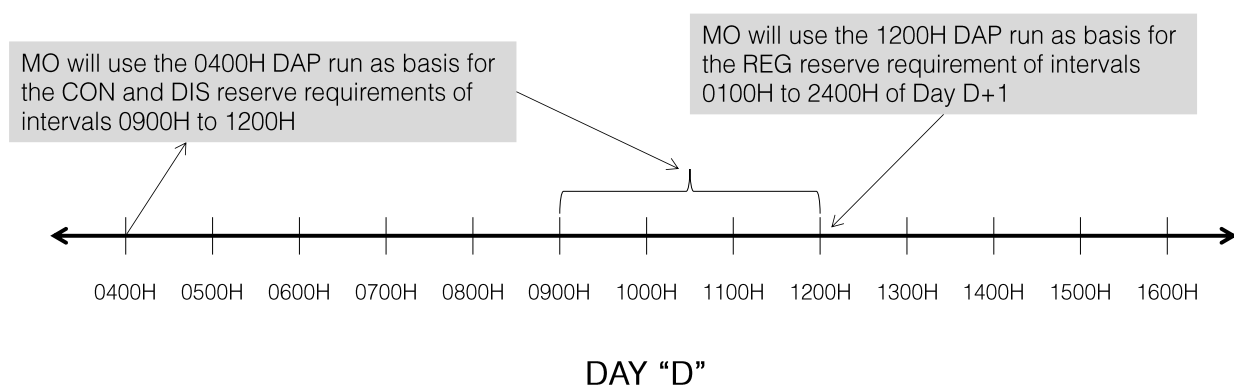
15.4.5 The System Operator, in coordination with the Market Operator, shall formulate and maintain its procedures for determining reserve requirements.

15.5 SUBMISSION OF RESERVE REQUIREMENTS

15.5.1 Reserve Levels. The reserve requirements based on the reserve levels as specified in the ASPP shall be used by the Market Operator in the preparation of the Reserve Dispatch Scheduling. The second-latest DAP results shall be used as reference by the Market Operator for the determination of the hourly reserve requirements of Contingency Reserve and Dispatchable Reserve, while the 1200H DAP of the previous day shall be used for the hourly reserve requirements of Regulating Reserve.

15.5.2 Format of Reserve Requirement. The reserve requirement data based on the reserve levels determined by the System Operator shall be inputted by the Market Operator in the format specified in Attachment 14A of this Dispatch Protocol to the Market Management System. Each data shall contain all previous data and is not an incremental update of the previous submission.

15.5.3 Schedule of submission. The reserve requirements for a trading interval or trading day shall be transmitted in accordance with the WESM Timetable set out in this Dispatch Protocol. The figure below shows the relevant timeline for the submission of reserve requirements with reference to item 15.5.1.



15.5.4 Change in timeframe for submission. The specific timeframe for submission of the reserve requirements or any revision thereof may be changed by the Market Operator without need of amending this Dispatch Protocol. Such change can be made to accommodate actual capabilities of the market infrastructure. The Market Operator shall duly notify the System Operator of the change.

15.5.5 Submission of Offers for Ancillary Services. The Submission of offers for Ancillary Services shall be based on per single unit per single type of reserve service.

16.1 BACKGROUND

- 16.1.1 When the grid is in Alert or Emergency state as established in the Grid Code arising from an emergency, a threat to system security or an event of force majeure, intervention is warranted pursuant to WESM Rules Clause 6.2.1.2. Intervention refers to the measure taken by the System Operator when the grid is in such Alert or Emergency state condition. The specific types of events or situations that can result in the grid being in an alert or emergency state condition are described in Chapter 6 of the WESM Rules.
- 16.1.2 The ERC may also suspend the operation of the WESM or declare temporary market failure under the conditions set out in Section 30 of the EPIRA, which conditions are in cases of natural calamities or following official declaration of national or international security emergency by the President of the Philippines.
- 16.1.3 Chapter 6 sets out the measures that the System Operator is expected to carry out during these events and the corresponding obligations of the Market Operator and the Trading Participants. These obligations and procedures are set out in more detail in this Section.

16.2 PURPOSE AND SCOPE

- 16.2.1 This Section establishes the guidelines and procedures that will be implemented in the WESM for declaring market intervention and for the actions that will be carried out during market intervention. It also describes the procedures to be implemented when the ERC suspends the market or declares market failure. Specifically, this Section implements relevant provisions in Chapter 6 of the WESM Rules.
- 16.2.2 This Section describes the corresponding obligations of the Market Operator, the System Operator and the Trading Participants during market intervention and suspension. The reports required of the Market Operator, the System Operator and the Market Surveillance Committee under Chapter 6 of the WESM Rules are also set out in detail in this Section.

16.3 RESPONSIBILITIES

16.3.1 Market Operator. The Market Operator is responsible for the following functions and shall carry them out in accordance with the WESM Rules and the procedures set out in this Dispatch Protocol –

- a) Notifying the System Operator of the occurrence of an emergency or force majeure event that originates in the operations of the market.
- b) Notifying the DOE and the ERC of the occurrence of an event or situation that gives rise to intervention and the declaration of market intervention by the System Operator.
- c) Notifying the System Operator and the Trading Participants of the declaration of market suspension by the ERC.
- d) Notifying the Trading Participants of the declaration of market intervention by the System Operator.
- e) Notifying the System Operator and the Trading Participants of the following
 - Nature of the intervention or suspension
 - The grid or its specific portions that are affected by the intervention or suspension
 - The expected duration of the intervention or suspension, if known.
- f) Restoring market operations as quickly as practicable, with due consideration to the safety of persons or facilities.
- g) Issuing a market resumption notice to the System Operator and all Trading Participants indicating clearly the time and trading interval at which normal market operations is to resume.
- h) Implementing the Administered Price Determination Methodology approved by the ERC to settle spot market transactions in the trading intervals under market intervention or suspension.
- i) Preparing a report detailing the situation that gave rise to market intervention, the steps taken to ensure reliable operations and remedy the causes of the intervention and any recommendations for avoiding a similar occurrence in the future.

16.3.2 System Operator. The System Operator is responsible for the following functions and shall carry them out in accordance with the WESM Rules and the procedures set out in this Dispatch Protocol –

- a) Notifying the DOE, the ERC and the Market Operator of the occurrence of an event or situation that gives rise to intervention and the declaration of market intervention.

- b) Restoring and maintaining reliable operation of the power system as quickly as practicable, with due consideration to the safety of persons and facilities.
- c) Scheduling of available generation and load in the trading intervals when the market intervention or suspension is in effect until market resumption.
- d) Provide full account of dispatch implementation to the Market Operator during market intervention or suspension.
- e) Preparing a report detailing the situation that gave rise to market intervention, the steps taken to ensure reliable operations and remedy the causes of the intervention and any recommendations for avoiding a similar occurrence in the future.

16.3.3 Market Surveillance Committee. The Market Surveillance Committee will perform an assessment and submit a report to the PEM Board, the DOE and the ERC containing the following –

- a) Adequacy of the provisions of the WESM Rules relevant to the event/s which occurred;
- b) Appropriateness of actions taken by the System Operator in relation to the event/s that occurred; and
- c) Costs incurred by the WESM members as a result to responding to the event/s.

16.4 GROUNDS FOR MARKET INTERVENTION AND SUSPENSION

16.4.1 Grounds for market suspension. Pursuant to Section 30 of the EPIRA and implemented in WESM Rules Clause 6.9.1, the ERC may suspend the operation of the WESM or declare temporary market failure in cases of –

- a) Natural calamities; or
- b) Following official declaration of national and international security emergency by the President of the Philippines.

16.4.2 Grounds for market intervention. Market intervention by the System Operator is permitted in WESM Rules Clause 6.2.1.2 when the grid is in Alert or Emergency state arising from (a) an emergency; or (b) a threat to system security, or (c) an event of force majeure. Market Intervention is also warranted if there is an interruption in the workflows of the Market Management System occurring during the simulation by the Market Operator of its Business Continuity Plan.

16.4.3 Emergency is defined in WESM Rules Clause 6.3.1.1 as the existence of a situation which has an adverse material effect on electricity supply or which poses a significant threat to system security. As listed in WESM Rules Clause 6.3.1.2, an emergency may include the following –

- a) A significant supply capacity shortfall, being a condition where there is insufficient generation or supply options available to securely supply in one or more regions of the power system likely to be affected by the event;
- b) A power system disturbance due to an outage in the transmission network or generating system, which poses a significant threat to system security, for which market processes are inadequate for recovery;
- c) A significant environmental phenomenon, including weather, earthquake, floods, volcanic eruptions, tsunamis, storms or fires which are likely to or are significantly affecting the power systems operation for which market processes are also inadequate for recovery;
- d) A system blackout or significant power system under-voltage condition;
- e) Material damage to a distribution system which has or is likely to adversely affect the operation of the transmission system or to render the spot market ineffective; and
- f) A situation in which the Government proclaims or declares an emergency.

16.4.4 Force majeure event is defined in WESM Rules Clause 6.7.1 as the occurrence in the grid where a trading interval of an event or events not within the reasonable control, directly or indirectly, of the Market Operator and WESM Member, to the extent that such event, despite the exercise of reasonable diligence, cannot be or be caused to be prevented, or removed and has resulted in a reduction in the normal capacity of part or all of the power transmission system during that trading interval and such reduction is likely to materially affect the operation of the spot market or materially threaten system security. Under WESM Rules Clause 6.7.2, events of force majeure shall include –

- a) Major system disturbance that caused partial or system-wide blackout;
- b) Market system hardware or software failure including that of the System Operator that makes it impossible to receive real-time status input data or process market offer/bid information to produce market schedules for real-time dispatch in accordance with the WESM Rules; and

- c) Any other event, circumstance or occurrence in nature of, or similar in effect to any of the foregoing.

16.5 DECLARATION OF MARKET SUSPENSION OR INTERVENTION

16.5.1 Declaration of market suspension. Pursuant to Section 30 of the EPIRA and its implementing rules and regulations, and WESM Rules Clause 6.9.1, only the ERC may declare suspension of the market or temporary market failure. It shall make such declaration in accordance with its own procedures.

16.5.2 Declaration of market intervention. Market intervention is declared by the System Operator, regardless of the source of the event that gave rise to such intervention.

- a. Where the event that may result to intervention originates from market operations or is due to market failure, the Market Operator shall assess the situation and immediately advise the System Operator of the need to intervene in the WESM.
- b. Where the event that may result to intervention originates from the operation of the System Operator or pertains to the grid, the System Operator shall assess the situation and immediately advise the Market Operator of the need for market intervention.
- c. The Market Operator or the System Operator shall notify the ERC and the DOE that an emergency or force majeure event has occurred that may lead to market intervention, and if possible, the notice shall indicate the expected duration of the same. The responsibility for giving such notice shall depend on the source or origin of the event.

16.5.3 Regional and local declaration of market intervention and suspension. Where the event that gives rise to the declaration of market intervention occurs in one grid and does not affect the other grid/s, the System Operator shall declare market intervention in the affected grid only (i.e., regional declaration). Where the event giving reason for the declaration of market intervention affects only a portion of a grid resulting in the islanding of such portion, the System Operator may declare market intervention in that portion of the grid that is affected by the islanding (i.e., local declaration). In the latter case, the

System Operator shall specify the market trading nodes that will be placed under market intervention.

16.6 DISPATCH SCHEDULING AND IMPLEMENTATION

- 16.6.1 The System Operator shall be responsible for dispatch scheduling and implementation for the trading intervals when the market suspension or market intervention is in effect.
- 16.6.2 Pursuant to WESM Rules Clauses 6.5.2.1 and 6.6.5.1, the actions that the System Operator may take shall include, but shall not be limited to, the following –
- a) Increase or decrease the generation or supply capability such as issuance of emergency instructions to all available but not committed generating units to start up, shutdown, cancel generating units on testing or recall transmission equipment outages;
 - b) Disconnect one or more connection points as considered by the System Operator to be necessary;
 - c) Direct a customer to take such steps as is reasonable to immediately reduce its load;
 - d) Constrain-on or constrain off a generation company; and
 - e) Require WESM participants to do any reasonable act or thing, which the System Operator believes necessary in the circumstances.

16.7 POWER SYSTEM AND MARKET RESTORATION

- 16.7.1 The Market Operator, the System Operator and the Trading Participants shall exert their best endeavors to implement the required corrective actions to restore the market and/or power system back to normal conditions at the soonest possible time.
- 16.7.2 The Market Operator and the System Operator shall coordinate their actions to restore the normal operations of the grid and the market.
- 16.7.3 Whenever necessary, the System Operator and the Market Operator shall render operations using their respective Emergency Back-up Systems (EBS) to ensure continuing operations of the System Operator Energy Management System (EMS) and the WESM Market Management System (MMS).

- 16.7.4 System status report of the significant events occurring during the restoration of the power system or the market to normal operations shall be issued to the Trading Participants.

16.8 MARKET RESUMPTION

- 16.8.1 **Market resumption after a market suspension.** When the ERC lifts the suspension of the market, the operations of the market will resume at the soonest possible time following receipt by the Market Operator from the ERC of the notice lifting the suspension. If the cause of the suspension is the occurrence of a natural calamity, the Market Operator or the System Operator may recommend to the ERC the lifting of the market suspension if the effects of the calamity on the market or the grid has already been resolved.
- 16.8.2 **Market resumption after market intervention.** Once the conditions that triggered the market intervention has been resolved, the market intervention shall be lifted by the System Operator.
- a. If the event that gave rise to the intervention pertains to market failure or market operations, the Market Operator shall immediately notify the System Operator that the condition has already been resolved and that the declaration of intervention can already be lifted. Immediately upon being notified, the System Operator shall declare the lifting of the declaration of market intervention.
 - b. If the event that gave rise to the intervention pertains to the grid or the operations of the System Operator, the System Operator shall immediately notify the Market Operator that the condition has already been resolved and that it is lifting the declaration of market intervention.
- 16.8.3 Upon being notified of the lifting of the declaration of market intervention or market suspension, the Market Operator shall immediately notify the Trading Participants of the resumption of the market and the specific trading interval at which trading in the WESM shall resume. The notice to Trading Participants shall include a notice to submit initial bids or offers.

16.9 SETTLEMENT OF MARKET TRANSACTIONS/ADMINISTERED PRICE

- 16.9.1 Spot market transactions during the trading intervals when the market suspension or market intervention is in effect shall be settled in accordance with the Administered Price Determination Methodology approved by the ERC.

16.10 REPORT ON MARKET INTERVENTION OR SUSPENSION

- 16.10.1 Upon market resumption, the System Operator and the Market Operator shall prepare and submit to the *PEM Board*, *the ERC* and *the DOE* a detailed report containing, as minimum, the following information –

- a) Description of the circumstances that gave rise to the market intervention or suspension;
- b) Steps taken to maintain operations and, in case of intervention, the steps taken to correct the situation; and
- c) Conclusions and recommendations for avoiding similar intervention in the future.

- 16.10.2 In accordance with WESM Rules Clauses.6.9.4 and 6.9.5, the Market Surveillance shall render to the PEM Board, DOE and the ERC a report on the market intervention or suspension containing its assessment of the following –

- a. The adequacy of the relevant provisions of the WESM Rules in relation to the event or events which occurred;
- b. The appropriateness of the actions taken by the System Operator and the Market Operator in relation to the event or events that occurred; and
- c. The costs incurred by the WESM members as a consequence of responding to the event or events.

16.11 COMMUNICATIONS AND NOTIFICATIONS

- 16.11.1 The Market Operator shall relay notices and advisories on emergency-related incidents and declaration of market suspension or intervention and market

resumption to the Trading Participants through any of the following means, whichever is applicable and available –

- a) Posting in the market information website;
- b) Email;
- c) Digital Telephone System;
- d) Commercial telephone lines (land lines or mobile);
- e) Microwave radio

16.11.2 All communications through the aforementioned media shall be recorded for purposes of audit and surveillance.

16.12 OTHER PROCEDURES

To complement the procedures set out in this Dispatch Protocol, the System Operator and the Market Operator shall formulate and maintain the following procedures –

- a) System Operator –
 - System Emergency and Restoration Procedures
 - EMS Disaster Recovery Procedures
- b) Market Operator –
 - MMS Disaster Recovery Procedures
 - Business Continuity Plan

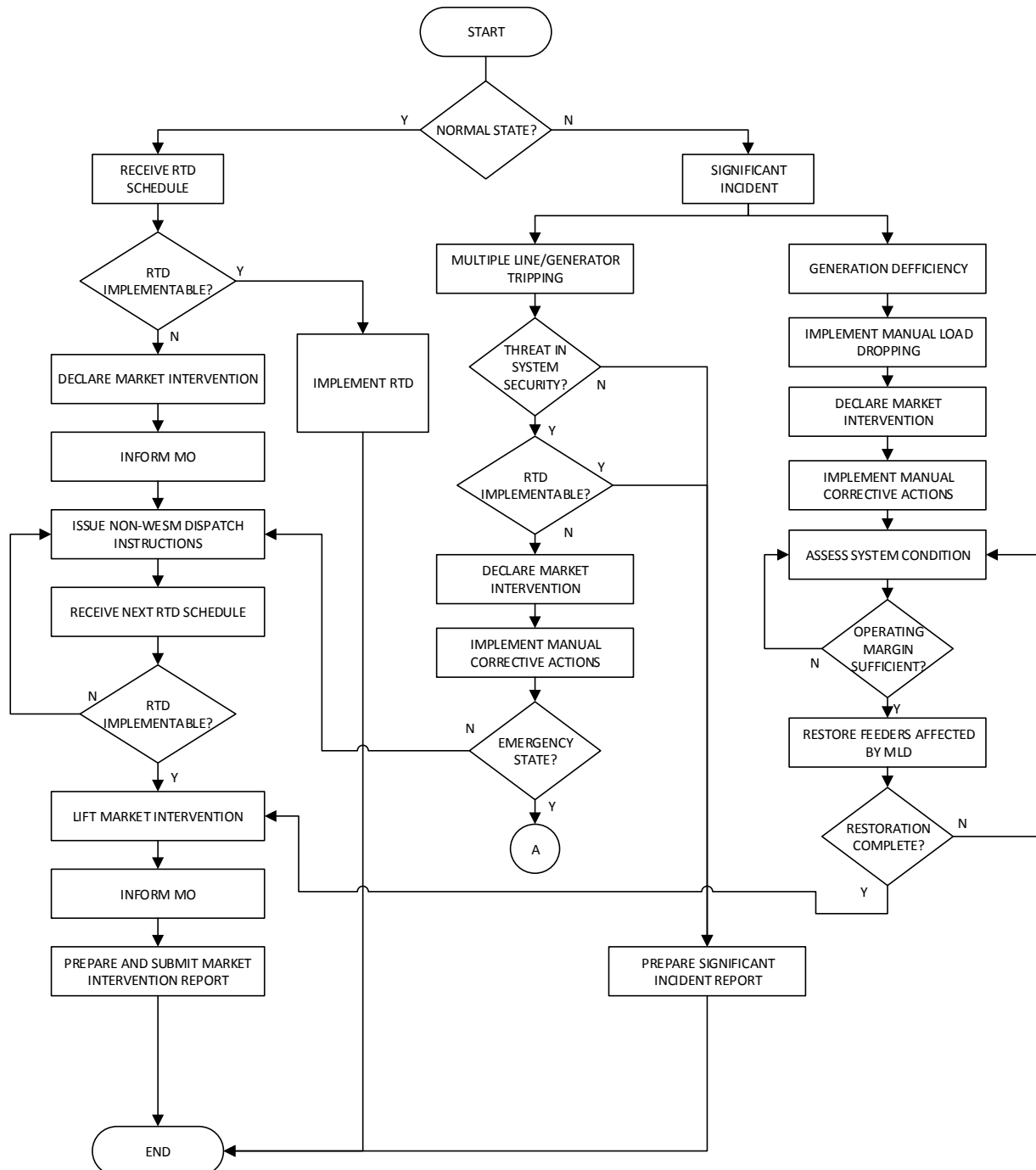
16.13 PROCESS FLOWS

16.13.1 The procedures to be carried out during emergency condition are intended to mitigate the effects of emergencies or force majeure events, facilitate restoration to normal operation and account for all actions and decisions taken during emergencies.

16.13.2 The detailed procedures leading to and during market intervention are set out in the following flowcharts.

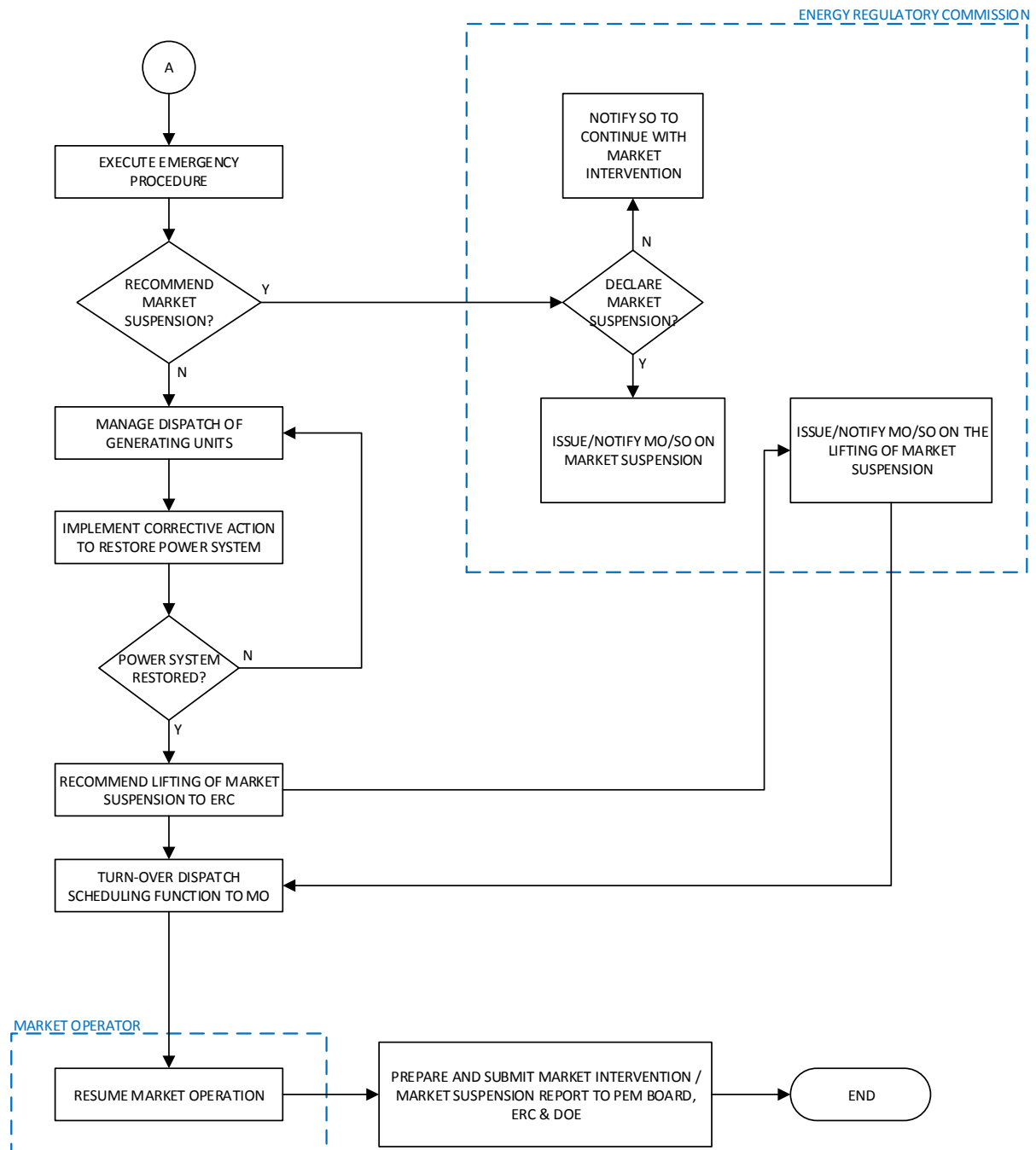
MARKET INTERVENTION AND SUSPENSION

A. SYSTEM OPERATOR PROCEDURES ON MARKET INTERVENTION



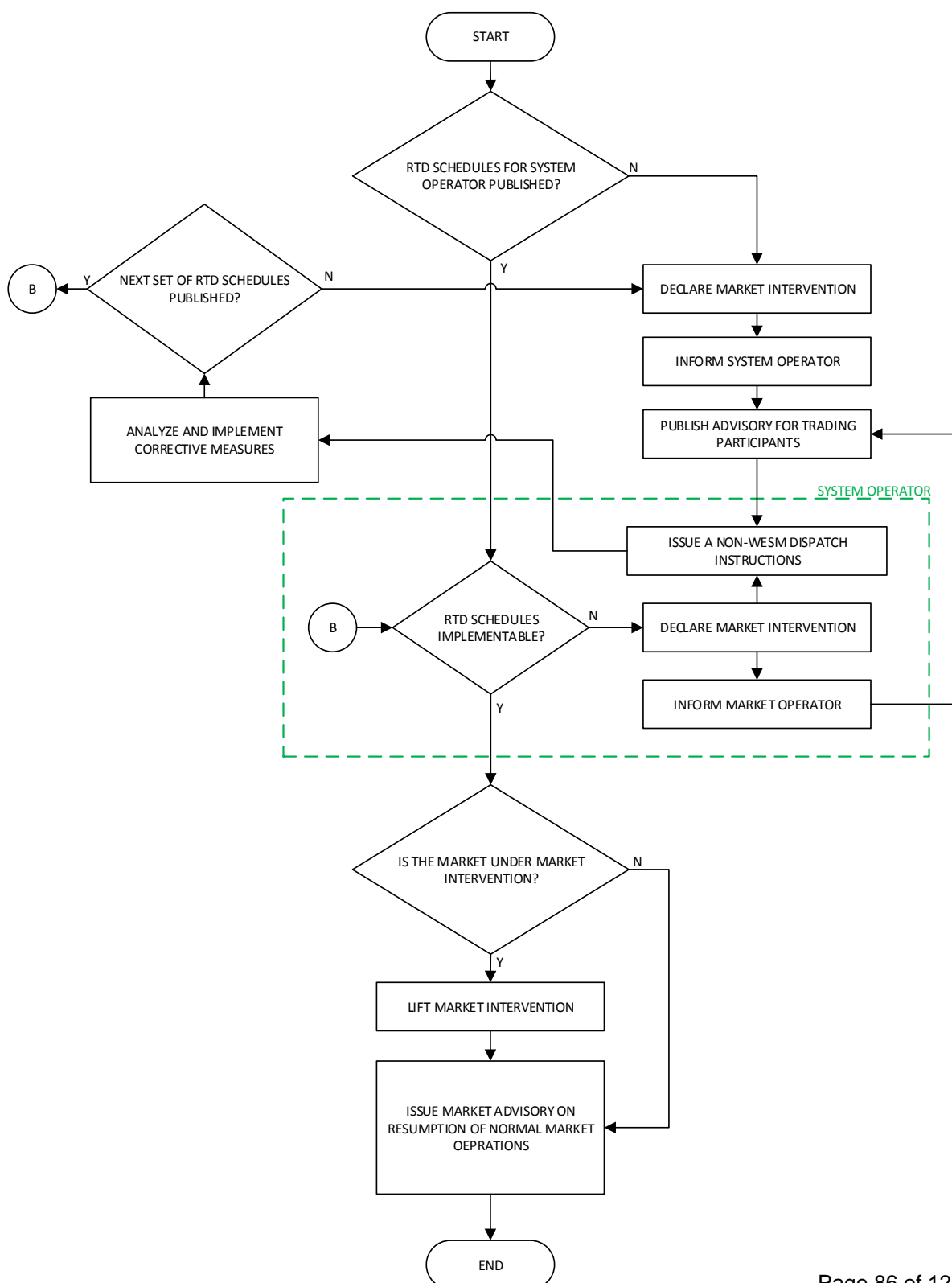
MARKET INTERVENTION AND SUSPENSION

B. SYSTEM OPERATOR PROCEDURES ON MARKET SUSPENSION



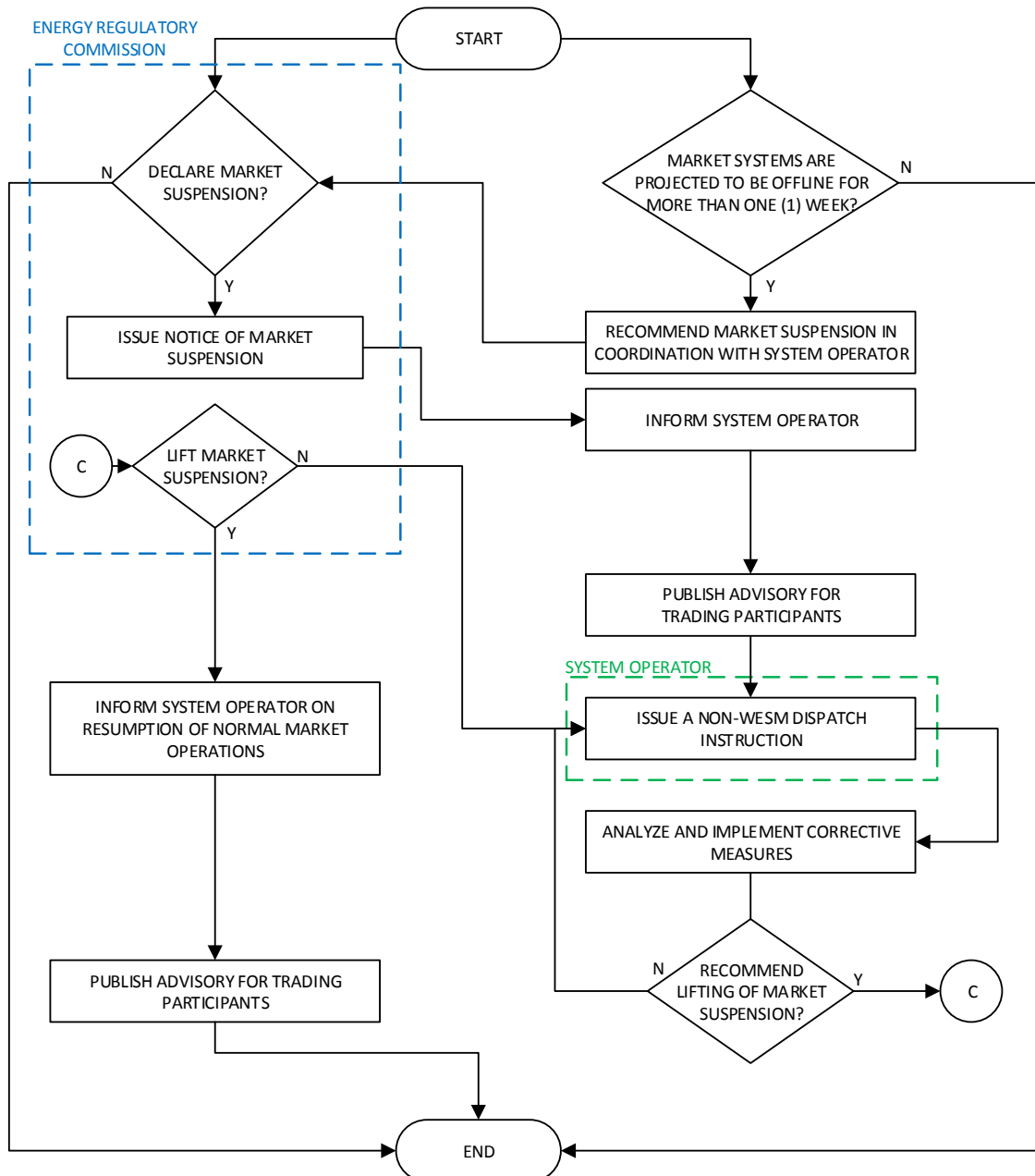
MARKET INTERVENTION AND SUSPENSION

C. MARKET OPERATOR PROCEDURES ON MARKET INTERVENTION



MARKET INTERVENTION AND SUSPENSION

D. MARKET OPERATOR PROCEDURES ON MARKET SUSPENSION



SECTION 17 AMENDMENT, PUBLICATION AND EFFECTIVITY
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17.1 AMENDMENTS

- 17.1.1 The Market Operator, the System Operator, or any WESM member, or interested entity may propose amendments to this Dispatch Protocol by submitting proposals to the WESM Rules Change Committee, following procedures for changes to market manuals set out in the WESM Rules and in the relevant market manual.
- 17.1.2 The Market Operator or the System Operator shall initiate amendments to this Dispatch Protocol as may be necessary.
- 17.1.3 Amendments to this Dispatch Protocol shall be approved by the Philippine Electricity Market Board, following the procedures for changes to market manuals set out in the WESM Rules and in the relevant market manual.

17.2 PUBLICATION

- 17.2.1 This Dispatch Protocol, as it may be amended from time to time, shall be published in the market information website maintained by the Market Operator.

17.3 EFFECTIVITY

- 17.3.1 This Dispatch Protocol or any amendments thereto shall become effective upon approval of the DOE in accordance with WESM Rules Clause 8.6.4. The date of effectivity shall be indicated in this document.

SECTION 18 GLOSSARY OF TERMS AND ABBREVIATIONS

AGC	Automatic Generation Control
Ancillary Services Provider	A person or an entity providing ancillary services and registered with the Market Operator.
Availability	The duration of time over a specified period that a plant/unit is ready to be in service or operational.
Bid	Pertains to a tender of a Load Customer in the WESM
Capability	Highest power that a specified generating unit can deliver and sustain whenever called upon.
Contingency	Any disruptive event that the market or the system are designed or planned to withstand and maintain normal operation without the need for drastic emergency actions.
Dispatch Load	A load which is able to respond to dispatch instructions and so may be treated as a scheduled load in the dispatch process.
Emergency State	The grid shall be considered in the Emergency State when: <ul style="list-style-type: none"> a. Single Outage Contingency (N-1) Criterion is not met. Imminent threat in system security would exist should a credible n-1 contingency occur that would result in the cascading outages of lines and equipment if not corrected immediately. b. There is generation deficiency <i>or Operating Margin</i> is zero; c. Grid transmission voltage is outside the limits of -10% or+10% of the nominal value; d. The loading levels of all transmission lines and substation Equipment are beyond the threshold as set by the PGC. e. The Grid Frequency is beyond the limits of 59.4Hz and 60.6Hz
Generator	Generation Company

Market Intervention	A measure taken by the <i>System Operator</i> when the <i>grid</i> is in the alert or emergency state as established in the <i>Grid Code</i> arising from a threat to system security, <i>force majeure event</i> or <i>emergency</i> , or by the <i>Market Operator</i> in relation to the simulation or implementation of the <i>business continuity</i> or <i>disaster recovery</i> procedures developed in accordance with Clause 6.8.1, or either in the event of force majeure. During such event, the <i>administered price cap</i> shall be used for <i>settlements</i> .
Manual Load Dropping	The process of manually and deliberately removing pre-selected loads from a power system in response to an abnormal condition in order to maintain the integrity of the system
Maximum available capacity	Maximum available capacity is equal to the registered maximum capacity (Pmax) of the (aggregate) unit less forced unit outages, scheduled unit outages, de-rated capacity due to weather disturbance and <i>technical constraints</i> . For co-generation systems, the maximum available capacity is equal to the registered maximum capacity (Pmax) of the (aggregate) unit less forced outages, scheduled unit outages, de-rated capacity due to thermal energy extraction by the energy host and due to <i>technical constraints</i> .
Merit Order Table (MOT)	<p>The list showing the offered capacities, arranged by offer blocks, of scheduled generating units arranged in descending order such that the lowest-priced offer block is on top of the list, and includes the list of non-scheduled generating units with the latter considered as price takers and are, therefore, included at the top of the list.</p> <p>This is not the same as the real-time dispatch schedule or dispatch targets or target loading levels as these terms are defined in the WESM Rules.</p>
MMS-Market Participant Interface (MPI)	It is a user terminal where Trading Participants can submit bids and offers as well as retrieve or receive information on WESM operations.

<i>Normal State</i>	The grid operating condition when: a. The operating margin is sufficient. b. System frequency is within the limits of 59.7Hz and 60.3Hz. c. Voltages at all connection points are within the limits of 0.95 and 1.05 of the nominal value. d. The loading levels of all transmission lines and transformers are below 90% of their maximum continuous ratings. e. The grid configuration is such that any potential fault current can be interrupted and the faulted equipment can be isolated from the grid. f. The static and dynamic stability of the power system is maintained. g. The Single Outage Contingency (N-1) Criterion is met.
<i>Offer</i>	Also refers to a Market Offer
<i>Pre-Dispatch Market Projection</i>	The Week Ahead Projection (WAP) and Day Ahead Projection (DAP)
<i>Preferential Dispatch Units</i>	Scheduled generating units and priority dispatch generating units
<i>Projected Output</i>	The loading level nominated by a generation company for its must dispatch generating units or priority dispatch generating units indicating its forecasted output of its must dispatch generating unit or priority dispatch generating unit at the end of a trading interval
<i>Projection</i>	A set of results derived in accordance with Clause 3.7 of the WESM Rules from a series of <i>market dispatch optimization model</i> runs describing projected market conditions over a <i>day-ahead or week-ahead market horizon</i> for a particular <i>scenario of net forecast load</i> , and set of assumptions with respect to availability of key system elements.
<i>Publish</i>	Means, in respect of a document or information, to place that document or information on the MO's web site, and publication shall be interpreted accordingly.
<i>Real Time Dispatch</i>	Otherwise known as RTD. It is the Hour-Ahead Dispatch Schedule which determines the target loading of facilities at the end of the trading interval. The RTD calculates the Ex-ante Nodal Prices.

<i>Real Time Energy Market</i>	Otherwise known as RTEM. It contains the bids/offers of scheduled generators/loads.
<i>Real Time Ex-post</i>	Otherwise known as RTX. It is a real time dispatch schedule process performed at the end of a trading interval utilizing actual operations data. The RTX calculates the Ex-post Nodal Prices.
<i>Shutdown</i>	The condition of the equipment when it is de-energized or disconnected from the system.
<i>System Operator System Advisories</i>	Messages issued by the System Operator depicting particular issues regarding existing or anticipated status of the power system.
<i>Start-up</i>	The synchronization of a generating unit to the grid from its outage state (closing of generator breakers).
<i>System Snapshot</i>	Otherwise known as EMS Snapshot. The system snapshot contains MW loadings of generators and loads. The system snapshot also indicates connection status of the power system.
<i>Technical Constraint</i>	Refers to plant equipment-related failure, fuel quality and ambient temperature. For hydro plants, this includes capacity limitation due to water elevation and Water Code/Rule Curve restrictions. For geothermal plants, this includes capacity limitation due to steam quality (chemical composition, condensable and non-condensable gases, steam pressure and temperature). For co-generation systems, this pertains to steam flow limitations, station load, and electricity demand of its energy host.

SECTION 19 ATTACHMENTS

ATTACHMENT 6A

DATA REQUIREMENTS & VALIDATION CRITERIA FOR REAL TIME ENERGY BIDS / OFFERS

Bid Header:

- Delivery Date
- *Bid* and *offer* Indicator [LOAD|GENERATOR]
- Resource ID
- *Standing Bid* Indicator [YES; NO]
- *Standing Bid* Day [HOL|ALL|MON|TUE|WED|THU|FRI|SAT|SUN]

Bid Submission:

- Interval
- Table A – PQ Pairs
- Table B – Ramp Rate Triplets
- Table C – Reason

Validation Criteria:

REQUEST_CATEGORY	Refers to MOS bid data category.
REQUEST_TYPE	Specifies type of MI Request type. For WESM, Use "upload".
PARTICIPANT_ID	Must be a valid participant in the Master File.
USER_ID	Must be a valid user in the Master File associated to the Participant.
MODE	The valid value for MODE is "NORMAL".
DELIVERY_DATE	Dispatch date
ACTION	Specifies the bid action to take. For WESM, use "submit" or "cancel".
DAY_TYPE	"MON" to "SUN" or "ALL" or "HOL". Exists within optional "standing" element.
VERSION_NO	The version of template and will be validated against the current version of the MOS Software. Currently set it to "1.0".
BID_TYPE	Valid values are "GEN" and "LOAD".

RESOURCE_ID	The name of resource. Must be a valid resource in the Master File associated with the participant.
HOURL	The beginning of the interval/hour and “end” will be the end of the interval/hour range specified. “end” has to be greater than the “start”.
PRICE	Prices will be non-decreasing for OFFERS. Prices will be non-increasing for BIDS. Minimum MCP \leq Prices \leq Maximum MCP Minimum 2 prices Maximum 11 prices Up to 24 sets, one for each interval of Market Data. Number of Prices = Number of Quantities.
QUANTITY	Quantities will be non-negative. Quantities are cumulative. Quantities must increase Up to 48 sets, one for each interval of market data.
RR_QUANTITY	First <RR QUANTITY> must be >0.0. Last <RR_QUANTITY> must be \geq max MWh quantity in PQ pairs. Must increase .Must be non-negative.
RR_UP	Must be \leq Max Ramp Rate for Resource.
RR_DOWN	Must be \leq Max Ramp Rate for Resource There can be a maximum of 5 sets of ‘Ramp Rates’ and ‘Ramp Break’ points. These must be submitted as a set.
REASON	This will be an optional field

Note: The Market Participant may submit ramp-up and ramp-down curves for each resource. These values must be less than the maximum sustained ramp rate value already submitted as part of the registration. The participant, as part of registration, submits the min and max generation capacities. The price and quantity curve defines the operating high limit for the current submission.

ATTACHMENT 6B

DATA REQUIREMENTS & VALIDATION CRITERIA FOR OPERATING RESERVES

Bid Header:

- Delivery Date
- *Bid and offer* Indicator [LOAD|GENERATOR]
- Reserve Class Indicator [REGULATING; CONTINGENCY; DISPATCHABLE; INTERRUPTIBLE LOADS]
- Resource ID
- *Standing Bid* Indicator [YES; NO]
- *Standing Bid* Day [HOL|ALL|MON|TUE|WED|THU|FRI|SAT|SUN]

Bid Submission:

- Operating Reserve Ramp Rate
- Interval
- Table A – PQ Pairs
- Table B – Reserve Loading Point
- Table C – Reason

Validation Criteria:

REQUEST_CATEGORY	For WESM, set to "bid". Refers to MOS bid data
REQUEST_TYPE	Specifies type of MI Request type. For WESM, Use "upload".
PARTICIPANT_ID	The name of participant. Must be a valid participant in the Master File.
USER_ID	The name of user. Must be a valid user in the Master File associated to the Participant.
MODE	The valid value for MODE is "NORMAL".
DELIVERY_DATE	The dispatch date
DAY_TYPE	"MON" to "SUN" or "ALL" or "HOL". Exists within optional "standing" element
VERSION_NO	The version of template and will be validated against the current version of the MOS Software. Currently set to "1.0".
BID_TYPE	Valid values are "GENERATOR" and "LOAD".
OPRES_RAMP_RATE	The value of Operating Reserve Ramp Rate
RESERVE_CLASS	REG – regulating reserve

	CON – contingency reserve DIS – dispatchable reserve ILD – interruptible load
RESOURCE_ID	The name of resource. Must be a valid resource in the Master File associated with the participant
HOUR	"start" will be the beginning of the interval and end will be the end of the interval range specified. "end" has to be greater than the "start".
PRICE	Not required if <CANCEL_FLAG> is set. Prices will be non-decreasing for OFFERS. Prices will be non-increasing for BIDS. Minimum Price \leq Price \leq Maximum Price Minimum one price Maximum 5 prices Up to 24 sets, one for each interval of Market Data. Number of Prices = Number of Quantities.
QUANTITY	Must be > 0 and \leq Max Generator Capacity Minimum 1 quantity Maximum 5 quantities Quantities will be non-negative. Quantities are cumulative. Quantities must increase Up to 24 sets, one for each interval of market data.
RESV_LD_PNT	REASON This will be an optional field.

Note: The min/max generating capacities are submitted as part of the registration process. The bid/offer quantities are validated against this for consistency. When a reserve bid/offer is submitted, a validation is made to verify that a corresponding energy bid exists.

ATTACHMENT 6C

DATA REQUIREMENTS FOR DEMAND BIDS / OFFERS

Bid Header:

- Delivery Date
- Schedule Type [LOAD|GENERATOR]
- Resource ID
- *Standing Bid* Indicator [YES; NO]
- *Standing Bid* Day [HOL|ALL|MON|TUE|WED|THU|FRI|SAT|SUN]

Bid Details:

- Interval
- Table A – Price
- Table B – Quantity
- Table C – Reason

ATTACHMENT 6D

DATA REQUIREMENTS & VALIDATION CRITERIA FOR NON-SCHEDULED GENERATION OFFERS

A non-scheduled generator has standing schedules of loading levels for the market time horizon.

Must dispatch generating units and priority dispatch generating units defined in WESM Market Rules are treated as non-scheduled generation. A must dispatch generating unit or priority dispatch generating unit has standing projected schedules for the market time horizon.

Workflows	Treatment for Non-Scheduled Generation
Day-Ahead Projection (DAP), Week-Ahead Projection (WAP)	Dispatches the units to their submitted generation schedule.
Real-Time Dispatch (RTD), <i>Real-Time Ex-Post (RTX)</i>	<i>Dispatches</i> the units to their submitted <i>generation</i> schedule.
	Uses the schedules from system snapshot as their schedules.

Non Schedule Generation / Validation Criteria:

REQUEST_CATEGORY	For WESM, set to "bid". Refers to MOS bid data category.
REQUEST_TYPE	Specifies type of MI Request type. For WESM, Use "upload".
PARTICIPANT_ID	The name of participant. Must be a valid participant in the Master File.
USER_ID	The name of user. Must be a valid user in the Master File associated to the Participant.
MODE	The template is used only for testing or if it has real-time data. The valid value for MODE is "NORMAL".
DELIVERY_DATE	The dispatch date.
ACTION	Specifies the bid action to take. For WESM, use "submit" or "cancel".
DAY_TYPE	"MON" to "SUN" or "ALL" or "HOL". Exists within optional "standing" element.
VERSION_NO	The version of template and will be validated against the current version of the MOS Software. Currently set it to "1.0".
SCHEDULE_TYPE	Must be "NSGN" or "NDLD".
RESOURCE_ID	The Resource ID can be any Valid Resource ID
HOURL	"start" will be the beginning of the hour interval and "end" will be the end of the our/interval range specified. "end" has to be greater than the "start".
QUANTITY	Will be the quantity allocated for the hour

ATTACHMENT 7A

DATA FORMAT FOR OUTAGE SCHEDULES

Title	<i>Outage Schedules</i>
Data flow	From EMS to MMS
Description	In MMS, the data is used for decommissioning (or commissioning) of network elements like generators and transmission lines.
Time coverage	Shall cover at least eight days (including the current day and the next 7 days) to reflect power system condition. <i>[Important]: Note that newly received Outage Schedules data is not an incremental update of the previous data. Rather, it is a complete replacement (re-definition) of the data.</i>
Transfer frequency	Whenever such system constraints are overridden by the SO.
Transfer method	FTP
Data name	File <i>outage_schedule_YYYY-MM-DD_HHMISS.dat</i> File <i>outage_schedule_rem_YYYY-MM-DD_HHMISS.csv</i>
Data format	ASCII file in CSV format

Outage Schedules...

Data Format	
Equipment ID, Station ID, Equipment type, Start time, End time, Status, De-rated	MW
Equipment ID, Station ID, Equipment type, Start time, End time, Status, De-rated MW	
<p>Descriptions for the data fields:</p> <p>Data column 1: Equipment ID (32 characters). The unique name of the equipment.</p> <p>Data column 2: Station ID (12 characters). Station that the equipment is associated with, where applicable.</p> <p>Data column 3: Equipment type (2 characters).</p> <p>UN – Generating Unit</p> <p>SC – Synchronous Condenser</p> <p>LN – Line</p> <p>X2 – 2-Winding Transformer</p> <p>X3 – 3-Winding Transformer</p> <p>SD – Series Device</p> <p>RS – Regulated Shunt</p> <p>FS – Fixed Shunt</p> <p>CB – Circuit Breaker</p> <p>Data column 4: Start time (MM-DD-YYYY HR:MI, e.g. 08-22-2004 13:45)</p> <p>Data column 5: End time (MM-DD-YYYY HR:MI, e.g. 08-23-2004 12:00)</p> <p>Data column 6: Equipment status (one character)</p> <p>One of the following values;</p> <p>O – Outage, i.e. out of service</p> <p>I – In service</p> <p>D – De-rate (applicable for generators only)</p> <p>Data column 7: De-rated maximum MW. Maximum MW value of operation for the equipment. For example, a generator de-rated operating maximum MW</p>	

ATTACHMENT 7B

DATA FORMAT FOR CONTINGENCY LIST

Title	<i>Contingency List</i>
Data flow	From EMS to MMS
Description	<p>A <i>Contingency List</i> includes a list of pre-defined outage scenarios that are most likely to occur in the system in faulty conditions.</p> <p>Contingency definition is relatively static with a given network model. This data does not change frequently. A default contingency definition is loaded into the MMS database upon database build.</p> <p>In MMS, the data is used in contingency analysis in SCED to evaluate the system operating condition when any of the outage scenarios happen.</p>
Time coverage	<p>Shall cover at least eight days (including the current day and the next 7 days) to reflect power system condition.</p> <p><i>[Important]:</i> <i>Note that newly received Contingency List is not an incremental update of the previous data. Rather, it is a complete replacement (re-definition) of the data.</i></p>
Transfer frequency	Whenever such system constraints are overridden by the SO.
Transfer method	FTP
Data name	File <i>contingency_list_YYYY-MM-DD_HHMISS.dat</i> File <i>region_contingency_list_YYYY-MM-DD_HHMISS.csv</i>
Data format	ASCII file in CSV format

Contingency List...

Data Format	
Sequence number, Contingency title, Station name, Equipment ID, Type, Priority	
Sequence number, Contingency title, Station name, Equipment ID, Type, Priority	
<u>Descriptions for the data fields:</u>	
Data column 1:	Sequence number (unique for each contingency). Up to 5 digits
Data column 2:	Contingency title (unique for each contingency). Up to 30 characters
Data column 3:	Station name. Up to 12 characters
Data column 4:	Equipment ID. Up to 32 characters
Data column 5:	Type of equipment: (integer, up to 2 digits). 1 – Line 2 – Series Device 3 – Phase Shifter 4 – Two-Winding Transformers 5 – Three-Winding Transformers 6 – NOT USED 7 – Synchronous Condenser 8 – Unit 9 – NOT USED 10 – Load 11 – Fixed Shunt Capacitor/Reactor 12 – Regulating Shunt Capacitor/reactor
Data column 6:	Priority - Integer value 1 to 9. Highest priority is 1.
Data column 7:	Remarks. Up to 100 characters

ATTACHMENT 7C DATA FORMAT FOR SYSTEM SNAPSHOT

System Snapshot represents the power system status at a certain time point. It is used as the initial loading point of real-time dispatch and is used as the basis to determine the current network topology. For the Pre-Dispatch Market Projection, It is used as the initial load of the SDLF demand forecast process.

System Snapshots are generated by the State Estimator (SE) in EMS. A system snapshot includes the following data:

- Unit MW and MVar (analog measurements),
- Load MW and MVar (analog measurements) and
- Breaker Status (digital indications)

Data flow	From EMS to MMS
Description	<p>A <i>System Snapshot</i> represents the current status of a power system. In MMS, the <i>System Snapshot</i> data are used as follows:</p> <ul style="list-style-type: none"> • Generator data are used to determine the starting points of MW ramping up/down. The sum of generator loading is also used to estimate system demands, which are used for by <i>Load Predictor</i> (LDP) and <i>Similar Day Load Forecast</i> (SDLF) for load forecasting. • Individual loads are used as a pattern by the <i>Real-Time Dispatch</i> (RTD) workflow to compute near-term nodal load forecast. The actual load data is also used directly by the <i>Real-Time Ex-Post</i> (RTX) workflow. • Breaker status is used to determine network model based on bus-oriented topology.
Time coverage	Real-time for the current dispatch interval
Transfer frequency	Every five minutes
Transfer method	FTP

Data name	File <i>emsout_YYYY-MM-DD_HHMISS.dat</i>
Data format	ASCII file in CSV format

System Snapshot...

Data Format	
Real-Time Dispatch (RTD) interval ID	
Number of generators, Sum of generation MW	
Generator ID, Station ID, MW, MVar, Quality flag, Connection status	
Number of loads, Sum of load MW	
Load ID, Station ID, MW, MVar, Quality flag, Connection status	
Number of breakers	
Breaker ID, Station ID, Quality flag, Connection status	

ATTACHMENT 7D

DATA FORMAT FOR SO-SYSTEM ADVISORIES

Title	<i>SO System Advisories</i>
Data flow	From EMS to MMS
Description	<i>SO System Advisories</i> are messages issued by the <i>System Operator</i> (SO) depicting particular issues regarding existing or anticipated status of the power system.
Time coverage	Near real-time
Transfer frequency	At anytime
Transfer method	FTP
Data name	File <i>so_advisories_YYYY-MM-DD_HHMISS.dat</i>
Data format	ASCII file in CSV format

Data Format			
Timestamp,	Audience,	Severity,	Message
Timestamp, Audience, Severity, Message			
<u>Descriptions for the data fields:</u>			
Data column 1:	Timestamp (YYYY-MM-DD HH:MI:SS)		
Data column 2:	Audience (ALL, MO or MPxxxx; the latter being up to 12 characters)		
Data column 2:	Severity (1 character):		
	I – Information (i.e. Normal)		
	W – Warning (i.e. Urgent)		
	E – Error (i.e. Emergency)		
Data column 3:	Message (up to 80 characters, enclosed in double-quotes)		

ATTACHMENT 7E

DATA FORMAT FOR TRANSMISSION LIMITS

The *Transmission Limits* data are for individual equipment like transmission lines and transformers. The limits are predominately thermal limits, whose values do not change frequently and significantly. Thus, it may not be often for EMS to transfer such data from to MMS.

The *Transmission Limits* transferred from EMS to MMS can be a subset of limits for all transmission facilities. The values are used to update the default limits values in the network model database.

Title	<i>Transmission Limits</i>
Data flow	From EMS to MMS
Description	<p>The <i>Transmission Limits</i> are limits for individual transmission lines and transformers.</p> <p>At network database build, a default set of <i>Transmission Limits</i> are loaded into the database.</p> <p>In MMS, <i>Transmission Limits</i> are used to update the default limits in the database. The <i>Transmission Limits</i> are used in security analysis application in SCED to check constraint violations.</p>
Time coverage	<p>Shall cover at least eight days (including the current day and the next 7 days) to reflect power system condition.</p> <p><i>[Important]:</i> Note that newly received limit data is an incremental update of the previous data. It is not a replacement (redefinition) of the data.</p>
Transfer frequency	Whenever such system constraints are overridden by the SO.
Transfer method	FTP
Data name	File <i>limit_trans_YYYY-MM-DD_HHMISS.dat</i>
Data format	ASCII file in CSV format

Transmission Limits...

Data Format	
Equipment ID, Rated voltage, Type, Normal limit, Emergency Limit, Warning Limit	Equipment ID, Rated voltage, Type, Normal limit, Emergency Limit, Warning Limit
<u>Descriptions for the data fields:</u>	
Data column 1:	Equipment ID (up to 32 characters). The unique name of the equipment, i.e. a transmission line or transformer
Data column 2:	Rated voltage (floating number). Rated voltage. Used for information.
Data column 3:	Type of equipment: (integer, up to two digits) 1 – Line 2 – Phase Shifter 3 – Two Winding Transformers 4 – Three Winding Transformers 5 – DC Line
Data column 4:	Normal limit (MW)
Data column 5:	Emergency limit (MW)
Data column 6:	Warning limit (MW)

ATTACHMENT 7F DATA FORMAT FOR SECURITY LIMITS

Title	Security limits
Data flow	From EMS to MMS
Description	<p><i>Security Limits</i> for generator and transmission network due to system stability reasons. These limits may vary under different operating conditions.</p> <p>At network database build, a default set of <i>Security Limits</i> are populated into the database.</p> <p>In MMS, <i>Security Limits</i> are used in security analysis application in SCED application to check constraint violations.</p>
Time coverage	<p>Shall cover at least eight days (including the current day and the next 7 days) to reflect power system condition.</p> <p><i>[Important]:</i> <i>Note that newly received Security Limits data is not an incremental update of the previous data. Rather, it is a complete replacement (re-definition) of the data.</i></p>
Transfer frequency	Whenever such system constraints are overridden by the SO.
Transfer method	FTP
Data name	File limit_security_YYYY-MM-DD_HHMISS.dat File limit_security_rem_YYYY-MM-DD_HHMISS.csv
Data format	ASCII file in CSV format

Security Limits...

Data Format
Equipment ID, Equipment Type, Start time, Maximum limit, Minimum limit Equipment ID, Equipment Type, Start time, Maximum limit, Minimum limit
<u>Descriptions for the data fields:</u> Data column 1: Equipment ID (32 characters: The unique name of the equipment. Data column 2: Equipment Type (2 characters):

	UN – Generating unit; BG – Branch group DC – HVDC link.
Data column 3:	Start Time: YYYY-MM-DD HH:MI (e.g. 2004-01-22 13:45)
Data column 4:	Maximum limit (MW)
Data column 5:	Minimum limit (MW)
Data column 6:	End Date (Date)
Data column 7:	Category (50 characters)
Data column 8:	Remarks (300 characters)

ATTACHMENT 7G EMS-MMS NAMING CONVERSION

LOOK-UP TABLE & CONVERSION	
MMS	EMS
EQUIPMENT ID	POINT NAME / POINT ID
STATION NAME	STATION ID
GENERATOR / LOAD (MW / MVAR)	POINT VALUE
QUALITY FLAG	REFER TO QUALITY FLAG LOGIC TABLE (Attachment A.22)
BREAKER CONNECTION STATUS	REFER TO BREAKER CONNECTION STATUS (Attachment A.22)

ATTACHMENT 7H

TRUTH TABLE / EMS - SYSTEM SNAPSHOT VALIDATION

QUALITY FLAG LOGIC TABLE		
EMS		MMS
ENTRY FLAG	UPDATE FLAG	QUALITY FLAG
0 = NORMAL	0 = UPDATING	0 = AUTO
1 = OUT OF SCAN	0 = UPDATING	1 = MANUAL
1 = OUT OF SCAN	1 = NON UPDATING	1 = MANUAL
0 = NORMAL	1 = NON UPDATING	2 = BAD

BREAKER CONNECTION STATUS	
MMS	EMS
CONNECTION STATUS	POINT VALUE
0 = CLOSE	1 = CLOSE
1 = OPEN	0 = OPEN
LOAD / GENERATOR DEFAULT = 0	

ATTACHMENT 7I

EXISTING EMS-SCADA FORMAT FOR SYSTEM SNAPSHOT

PT NO	S/S ID	PT NAME	PT VALUE	SCAN INHIBIT FLAG	ENTRY FLAG	UPDATE FLAG
BREAKERS						
13300	101	BKR 80CD4	1	0	0	0
13301	101	BKR 80CD124	1	0	0	0
13302	101	BKR 80CD8	1	0	0	0
13303	101	BKR 81CD4	1	0	0	0
13304	101	BKR 81CD124	1	0	0	0
13305	101	BKR 81CD8	1	0	0	0
13306	101	BKR 50CD4	1	0	0	0
13307	101	BKR 51CD4	0	0	0	0
GENERATORS						
24626	371	Strita Unit 1 MW	181.57	0	0	0
24627	371	Strita Unit 1 MVAR	49.45	0	0	0
24642	371	Strita Unit 2 MW	183.03	0	0	0
24643	371	Strita Unit 2 MVAR	71.24	0	0	0
24644	371	Strita Unit 3 MW	183.03	0	0	0
24645	371	Strita Unit 3 MVAR	34.57	0	0	0
LOADS						
22091	373	StRosa Xformer 2 MW	98.57	0	0	1
22092	373	StRosa Xformer 2 MVAR	42.38	0	0	1
22094	373	StRosa Xformer 1 MW	14.86	0	0	1
22095	373	StRosa Xformer 1 MVAR	5.14	0	0	1
22106	373	StRosa Xformer 3 MW	-14.94	0	0	1
22107	373	StRosa Xformer 3 MVAR	-14.94	0	0	1

ATTACHMENT 8A DATA FORMAT FOR DISPATCH TARGETS

Title	Dispatch targets
Data flow	From MMS to EMS
Description	Schedules determined by SCED. These are target-operating points for TP units for the end of real-time dispatch period. In EMS, the dispatch targets are loaded to the SO Merit Order Dispatch Tables. The dispatch schedules are subject to SO approval.
Time coverage	For the current real-time market interval
Transfer frequency	Every real-time execution interval
Transfer method	FTP
Data name	File <i>rtd_targets.dat</i>
Data format	ASCII file in CSV format

Market interval ID

Descriptions of "Dispatch Targets" file header:

Header column 1: Market interval ID in date (YYYY-MM-DD HH:MI:SS)

Generator ID, Trading participant ID, Dispatch target, Low reg. limit, High reg. Limit

Generator ID, Trading participant ID, Dispatch target, Low reg. limit, High reg. limit

.....

Descriptions of "Dispatch Targets" data:

Data column 1: Generator ID (up to 32 characters)

Data column 2: Trading participant ID (up to 32 characters)

Data column 3: Dispatch target (MW)

Data column 4: Low regulation limit (MW)

Data column 5: High regulation limit (MW)

ATTACHMENT 8B
DATA FORMAT FOR MO-MARKET ADVISORIES

Title	Market advisories
Data flow	From MMS to EMS
Description	Messages issued by the <i>Market Operator</i> (MO) depicting particular issues concerning the status of the market. In EMS, market advisories are used for information by <i>System Operator</i> (SO).
Time coverage	For the current trading day
Transfer frequency	On a needed basis
Transfer method	HTTP (web interface)
Data name	N/A
Data format	Text messages in HTML format

ATTACHMENT 10A MERIT ORDER TABLE

SAMPLE MERIT ORDER TABLE

	A	B	C	D	E
1	1/21/2012 2:00				
2	Resource ID	MW	Block	Running Total	
3	***** Offers Not Scheduled For Dispatch *****				
4	BAUANG_G01	180	1	1504.8	
5	BAUANG_G01	0	Pmin	1324.8	
6	SROQUE_G01	50	10	1324.8	
7	SROQUE_G01	50	9	1274.8	
8	SROQUE_G01	50	8	1224.8	
9	SROQUE_G01	40	7	1174.8	
10	SROQUE_G01	10	6	1134.8	
11	SROQUE_G01	20	5	1124.8	
12	SROQUE_G01	50	4	1104.8	
13	SROQUE_G01	35	3	1054.8	
14	S_ENRO_G01	110	1	1019.8	
15	S_ENRO_G01	0	Pmin	909.8	
16	T_ASIA_G01	5	2	909.8	
17	AMBUK_G01	104.6	1	904.8	
18	AMBUK_G01	0	Pmin	800.2	
19	ILIJAN_G01	10	10	800.2	
52	***** Offers Scheduled For Dispatch *****				
53	SUAL_G02	3.8	4	3.8	
54	SUAL_G02	21	3	24.8	
55	MSINLO_G01	15	8	39.8	
56	MSINLO_G01	20	7	59.8	
57	PAGBIL_G01	18	3	77.8	
58	SUAL_G02	9	2	86.8	
59	SUAL_G01	43.5	2	130.3	
60	PAGBIL_G01	44	2	174.3	
61	MSINLO_G01	30	6	204.3	
62	SUAL_G01	62.5	1	266.8	
63	MSINLO_G01	50	5	316.8	
64	PAGBIL_G01	200	1	516.8	

rtd_smerit_201201210200

SAMPLE CREATION OF MERIT ORDER TABLE

This example uses the following data -

Resource ID	Price1	Quantity1	Price2	Quantity2	Price3	Quantity3
A	4	5	4	15	8	25
B	1	10	1	25	19.1	19.2
C	7	15	7	30	19.3	19.4

Note: The first block quantity (Quantity1) is the Pmin or minimum registered capacity of the generating unit. It is a price taker and the price at this first block (Price1) is not considered in the stacking of the MOT.

Assuming that the demand is 50 MW, the resulting energy schedules shall be.

Resource ID	Schedule
A	10
B	25
C	15

The marginal plant is Generator A with a clearing price of PhP4.00/MWh.

1. Fetch the *generator ex-ante* schedules, nomination of *loading levels*, *projected outputs*, and the *generator energy offers*.

Energy Offer

Resource ID	Price1	Quantity1	Price2	Quantity2	Price3	Quantity3
A	4	5	4	15	8	25
B	1	10	1	25	19.5	19.6
C	7	15	7	30	19.7	19.8

Ex-ante Schedules

Resource ID	Schedule
A	10
B	25
C	15

2. Exclude generating units that are unavailable based from either the outage schedule or from the network configuration captured at ex-ante. *For this example, this step is not illustrated and all generating units included are scheduled.*
3. Sort the offers by energy offer blocks for each generating unit as follows -
 - 3.a. If possible, split the ex-ante schedule of each generating unit based on its energy offer blocks. These blocks shall belong to the list of **“OFFERS DISPATCHED”**. The list should contain the Resource ID, MW, block, and price. For generators scheduled with no offers, these shall be included in the MOT as price takers.

Resource ID	MW	Block	Price
A	5	1	Price_Taker
A	5	2	4
B	10	1	Price_Taker
B	15	2	1
C	15	1	Price_Taker

- 3.b. If there is a remaining offered quantity for a generating unit that is not scheduled, split this to the extent possible based on its energy offer blocks. These blocks shall belong to the list of **“OFFERS NOT DISPATCHED”**, and the list should contain the Resource ID, MW, block, and price.

Resource ID	MW	Block	Price
A	5	2	4
A	10	3	8
C	15	2	7

4. Create the **OFFERS DISPATCHED** MOT as follows –
 - a. Sort the list of energy offer blocks in the list starting with the lowest priced offer block at the bottom to the highest-priced offer block at the top, i.e., sorting using data on the Price column.

Resource ID	MW	Block	Price
-------------	----	-------	-------

A	5	2	4
B	15	2	1
C	15	1	Price_Taker
B	10	1	Price_Taker
A	5	1	Price_Taker

- b. For dissemination purposes, the price column is deleted in the **OFFERS DISPATCHED** list, so that the MOT to be disseminated will contain the following information only -

Resource ID	MW	Block
A	5	2
B	15	2
C	15	1
B	10	1
A	5	1

- c. Add the scheduled offer blocks in MW and indicate the running total in the "Running Total" column. The running total is simply the incremental value based on the MW column and should start from the top of this list.

Resource ID	MW	Block	Running Total
A	5	2	5
B	15	2	20
C	15	1	35
B	10	1	45
A	5	1	50

5. Create the **OFFERS NOT DISPATCHED MOT** as follows –

- a. Sort the list of energy offer blocks in **OFFERS NOT SCHEDULED FOR DISPATCH** from the cheapest at the bottom to the most expensive at the top based on the Price column.

Resource ID	MW	Block	Price
A	10	3	8
C	15	2	7
A	5	2	4

- b. Remove the price column in the MOT that will be disseminated and published.

Resource ID	MW	Block
A	10	3
C	15	2
A	5	2

- c. Indicate the “Running Total” which is the incremental value based on the MW column and should start from the bottom of this list.

Resource ID	MW	Block	Running Total
A	10	3	30
C	15	2	20
A	5	2	5

6. Place the **OFFERS NOT SCHEDULED FOR DISPATCH** list on top of the **OFFERS SCHEDULED FOR DISPATCH** list.

Resource ID	MW	Block	Running Total
*****Offers Not Scheduled for Dispatch*****			
A	10	3	30
C	15	2	20
A	5	2	5
*****Offers Scheduled for Dispatch*****			
A	5	2	5
B	15	2	20
C	15	1	35
B	10	1	45

A	5	1	50
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7. Place the trading interval date and hour at the top-most part of the file

10/4/2011 2:00:00 PM			
Resource ID	MW	Block	Running Total
*****Offers Not Scheduled for Dispatch*****			
A	10	3	30
C	15	2	20
A	5	2	5
*****Offers Scheduled for Dispatch*****			
A	5	2	5
B	15	2	20
C	15	1	35
B	10	1	45
A	5	1	50

ATTACHMENT 14A

DATA FORMAT FOR RESERVE REQUIREMENTS

Title	<i>Reserve Requirements</i>
Data flow	From EMS to MMS
Description	<p><i>Reserve Requirements</i> are determined in EMS based on system loading, maximum generator tripping and other considerations.</p> <p><i>Reserve Requirements</i> are used by all the following dispatch processes in MMS:</p> <ul style="list-style-type: none"> • WAP (<i>Weak-Ahead Projection</i>) needs <i>Reserve Requirements</i> that cover 7 days ahead for every all study hours. That is in total 168 reserve requirements for all study hours in WAP. • DAP (<i>Day-Ahead Projection</i>) needs <i>Reserve Requirements</i> that cover 1.5 days ahead for every all hours starting from 12:00 of the current day till 23:00 of the next day. That is in total 36 reserve requirements for all study hours in DAP. • RTD (<i>Real-Time Dispatch</i>) needs <i>Reserve Requirements</i> that cover at least an hour ahead (till the end of RTD dispatch target time). • RTX (<i>Real-Time Ex-Post</i>) needs <i>Reserve Requirements</i> in a similar way as RTD.
Time coverage	<p><i>Shall cover at least eight days (including the current day and the next 7 days) to reflect power system condition.</i></p> <p><i>Note also the Reserve Requirements shall cover all types of reserves and all reserve areas.</i></p> <p><i>[Important]:</i></p> <p><i>Note that newly received Reserve Requirements data is not an incremental update of the previous data. Rather, it is a complete replacement (re-definition) of the data.</i></p>
Transfer frequency	Whenever such system constraints are overridden by the SO.
Transfer method	FTP
Data name	File <i>reserve_req_YYYY-MM-DD_HHMISS.dat</i> File <i>so_reserve_req_region_YYYY-MM-DD_HHMISS.csv</i>
Data format	ASCII file in CSV format

System Reserve Requirements...

Data Format	
Reserve area ID, Reserve type, Start time, Reserve requirement	Reserve area ID, Reserve type, Start time, Reserve requirement
<u>Descriptions for the data fields:</u> Data column 1: Reserve area ID (up to 12 characters) Data column 2: Reserve type (up to 3 characters) REG – <i>Regulation Reserve</i> (REG); CON – <i>Contingency Reserve</i> (CON); DIS – <i>Dispatchable Reserve</i> (DIS); ITL – <i>Interruptible Load</i> (ITL) Data column 3: Start time (MM-DD-YYYY HH:MI) Data column 4: Reserve requirement (MW)	