



WHOLESALE MARKET SYSTEMS REVISED TECHNICAL SPECIFICATION - NOVEMBER 2016

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IMPORTANT NOTICE

Purpose & audience

This document describes the technical changes required to participant's systems for the Wholesale Market Systems Year-end Release 2016 (Release). AEMO provides this information as a service targeting business analysts and IT staff in participant organisations. It provides guidance about the changes to their market systems under the National Gas or Electricity Rules (Rules), as at the date of publication.

How to use this document

- If you have questions about the business aspects of these changes, please see Consultations on [AEMO's website](#).
- The references listed throughout this document are primary resources and take precedence over this document.
- This document is written in plain language for easy reading. Where there is a discrepancy between the Rules, and information or a term in this document, the Rules take precedence.

AEMO reference numbers

Included in each project heading is a Quality Centre Identifier (QCID) that provides useful tracking information. There may be none, one, or more QCIDs relevant to each project heading.

References to change notices are CN followed by the change notice number.

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Available to the public.

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Documents made obsolete

The release of this document changes only the version of Wholesale Market Systems Revised Technical Specification - November 2016.

Further Information

For further information, please visit AEMO's website www.aemo.com.au or contact:

AEMO Information and Support Hub	Phone: 1300 AEMO 00 (1300 236 600) and follow the prompts.
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GLOSSARY

Abbreviations

Abbreviation	Explanation
AEMC	Australian Energy Market Commission
AP	Compensation Rule Change
DBMS	Database Management System
NER	National Electricity Rules
MW	Megawatt

Special terms

Term	Definition
Data Interchange (DI)	The set of cooperating applications to replicate data between AEMO’s Wholesale Market Systems and a participant’s RDBMS conforming to the Electricity and/or Gas Data Models
Data Model	Refers to the Electricity or Gas Data Models, which is the definition of the interface to participants for data published by AEMO
Energy market systems web portal (Web Portal)	AEMO’s Wholesale Market Management System; software, hardware, network and related processes to implement the wholesale energy market
VDS System	VAr Dispatch Scheduling System; AEMO’s set of software components that provide the automated VAr dispatch schedules and electronic instructions to RPOs

1 WHOLESALE MARKET SYSTEM PROJECTS

The Wholesale Market Systems Year-end Release 2016 (Release) includes changes related to participants' IT systems. This technical specification describes the projects planned by AEMO from a participant perspective. AEMO provides this information as a service targeting business analysts and IT staff in participant organisations.

This Release contains the following projects:

(P112) Automating MVar Dispatch Scheduling System	2
(P615) AP Compensation Rule Change	11
(P813) Enhanced Reallocations (SWAP / CAP / FLOOR)	12

(P112) Automating MVar Dispatch Scheduling System

This project extends the existing VAr Dispatch Scheduling (VDS) System with the addition of Supplemental instructions and additional status fields.

1.1.1 Benefits

- Supplemental instructions allow for revocations and additions to the current instruction set.
- The Control Room can issue Supplemental instructions any time after the original instruction set of that VDS cycle.
- The additional header fields include facilities for AEMO to communicate to participants such things as events or issues. There is also more information about the solution quality and source of the instruction set, assisting RPOs to make informed decisions, see [Changes to EMMS VDS files on page 6](#).

1.1.2 Impact

- This project modifies the Electricity Data Model > Voltage Instructions package, specifically the changes extend the primary key of the **VOLTAGE_INSTRUCTIONS_Trk** and **VOLTAGE_INSTRUCTIONS** tables.
- To display the additional information fields, as well as the grouping of all original and Supplemental instructions for the cycle together on one display, RPOs may have to make minor changes to their VDS display(s). AEMO will communicate specific details in the [VAr Dispatch Specification for Participant Interfaces V2.00](#) released closer to the implementation date.
- AEMO control rooms can only send Supplemental instructions to participants who have upgraded. AEMO will maintain a list of VDS RPOs who have not upgraded to the Electricity Data Model 4.26 and cannot yet receive Supplemental instructions. Participants are encouraged to implement the upgrade at their earliest suitable time to reduce the impact on operational capability and ease of issuing voltage control instructions. AEMO's preference is to deprecate the legacy version of the VOLTAGE_INSTRUCTIONS files (Data Model 4.25) by the first release in 2017, if possible.

1.1.3 Risks

- Participants who do not upgrade will not see the new Supplemental instructions.
- Participants may not realise the primary keys on the VOLTAGE_INSTRUCTIONS tables are extended to use the new Version_DateTime column as well as the existing primary keys. The interim file version mitigates the risk of rejected files, see [Changes to EMMS VDS files on page 6](#).
- If participants upgrade their data models without updating their displays to accommodate the Supplemental instructions, there is an operational risk that:
 - RPOs may execute the same instruction twice, for example, a delta tap change.
 - The visualisation of Supplemental instructions may replace (remove from the display) the prior instructions that are still valid but not executed.

1.1.4 Definitions

Table 1 VDS terms explained

Definition	Description
Complete instruction set	Both the primary instruction file and the supplemental instruction set in one VDS cycle set .
Individual instruction	Any individual instruction contained in the complete instruction set , e.g. 1 row containing 1 instruction for 1 device.
Primary instruction file	The primary instruction file follows a signal file and contains the new primary instruction set for the VDS cycle. It also contains the complete list of VDS devices receiving no instruction for the VDS Cycle.
Primary instruction set	The primary instruction set is the first set of instructions issued in any VDS cycle. It is delivered in a primary instruction file . It may contain zero or more individual instructions .
RPO	Reactive plant operator: A participant who accepts and responds to reactive plant instructions from AEMO.
Signal file	A signal file communicates a new solution is pending and participants must cease any outstanding actions. A signal file's purpose is to terminate one VDS cycle set and start the next VDS cycle set .
Superseded instruction	The individual instruction in an earlier instruction set of the VDS cycle, replaced by a newer individual supplemental instruction for the same device.
Supplemental files	0 to 5 supplemental files may follow the primary instruction file . Each supplemental file contains a supplemental instruction set with a unique version_datetime. Each supplemental instruction set adds one or more individual instructions to the complete instruction set for that VDS cycle.
Supplemental instruction set	A supplemental instruction set is delivered in a supplemental file and contains one or more individual supplemental instructions , issued at a particular version_datetime.
VAr	Volt-ampere reactive
VDS cycle	A VDS cycle is the time between two signal files , typically 10 and 20 minutes.



1.1.5 File types explained

For Supplemental instructions, there is a new file type called Supplemental, making three file types in the VDS instruction set.

Table 2 Figure 1 VDS file types explained

File type	Details
Signal	A new primary key and additional status fields but the current functionality remains the same. See EMMS output file examples for a VAr Dispatch cycle on page 8 .
Instruction	A new primary key and additional status fields but the current functionality remains the same. See EMMS output file examples for a VAr Dispatch cycle on page 8 .
Supplemental	Supplemental files are a new VDS file type for this Release.
	AEMO can issue a Supplemental file between 0–5 times within one VDS cycle.
	Supplemental files share the same Run_DateTime as the primary instruction but have an incremented Version_DateTime, see Changes to EMMS VDS files on page 6 .
	Supplemental files can contain one or more additional supplemental instructions. They may also contain revocation of one or more previous instructions.
	Supplemental files are further files submitted in addition to the original instruction file to either, revoke or add an instruction, see EMMS output file examples for a VAr Dispatch cycle on page 8 .
	Supplemental instructions do not replace the original instruction set, although they can supersede an individual instruction from an earlier Version_DateTime.
	Supplemental instruction sets cannot edit the target value of a previous instruction in the cycle (e.g. cannot change a previously requested delta tap or delta kV analog value).
	Supplemental files only contain the additional and/or revoked instructions. They do not contain the full instruction set previously issued. For an example of the new files, see EMMS output file examples for a VAr Dispatch cycle on page 8 .
	The content of supplemental files is cumulative; it does not replace the original instruction file or previous supplemental files but adds to the primary instruction set, see EMMS output file examples for a VAr Dispatch cycle on page 8 .
	Supplemental files remain valid for execution, along with the primary instruction set, until the end of that cycle, even if issued earlier in the cycle, except if AEMO issues a revocation.
Supplemental files can only follow an instruction file or previous supplemental files; they cannot follow a signal file.	

File type	Details
	<p>RPOs must execute supplemental instructions, as per current instruction set functionality. For example, a scenario where AEMO issues a first instruction to switch a capacitor out of service, then after a few minutes, a second supplemental instruction to keep the capacitor in service and the RPO has already switched it out of service. What does the RPO do? They use their discretion whether to inform AEMO or wait for the next instruction.</p> <p>Supplemental instructions are no longer valid when a new VDS cycle starts. A signal file is sent out (as per current functionality), and the previous primary instruction set becomes invalid.</p> <p>AEMO controllers add supplemental instructions manually.</p>

RPO's custom displays must display the entire VDS cycle set issued during the cycle (signal, instruction, and Supplemental). All instructions remain valid for the entire cycle except revoked instructions. AEMO will publish detailed information for RPOs in the *VAr Dispatch Specification for Participant Interfaces V2.00*: <https://link.aemo.com.au/vds/SitePages/Home.aspx>.

1.1.6 Data Model

When this Release is deployed, the current **VOLTAGE_INSTRUCTIONS** Data Subscription package is demoted to a Legacy version (**VOLTAGE_INSTRUCTIONS_LEGACY.zip**) and a new version supersedes it. Participants still on Electricity Data Model 4.25 remain subscribed to the Legacy files but do not receive the new content until they have upgraded. For technical details, see *Electricity Data Model 4.26* on page 13.

To reduce the impact on operational capability and ease of issuing voltage control instructions, RPOs are encouraged to implement the upgrade at their earliest suitable time. AEMO's preference is to deprecate the legacy version of the **VOLTAGE_INSTRUCTIONS** files (Data Model 4.25) by the first release in 2017, if possible. For information about receiving the new files, see *What RPOs need to do* on page 9.

1.1.7 Changes to EMMS VDS files and additional status fields

Current version

	A	B	C	D	E	F	G	H	I	J	K	L	M	
1	C	NEMP.WORLD	VOLTAGE_INSTR	AEMO	PUBLIC	27/09/2016	00:09:05	275343763	VOLTAGE_INSTRUCTIONS	275343759				
2	I	VOLTAGE_INSTRUCTION	TRACK	1	RUN_DATETIME	FILE_TYPE								
3	D	VOLTAGE_INSTRUCTION	TRACK	1	27/09/2016 00:08	INSTRUCTION								
4	I	VOLTAGE_INSTRUCTION	INSTRUCTION	1	RUN_DATETIME	EMS_ID	PARTICIPANTID	STATION_ID	DEVICE_ID	DEVICE_TYPE	CONTROL_TYPE	TARGET	CONFORMING	INSTRUCTION_SUMMARY
5	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	APD.REAC.A2REAC.VSWT	AEMO	APD	A2reac	REACTOR	SWITCH			1 NO INSTRUCTION
6	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	APD.REAC.A3REAC.VSWT	AEMO	APD	A3reac	REACTOR	SWITCH			1 NO INSTRUCTION
7	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	ARDN_W.CAP.CAP1.VSWT	ElectraNet SA	ARDROSSAN WEST 132/33kV SUBSTATION	132KV CAP BANK 1	CAPACITOR	SWITCH			1 NO INSTRUCTION
8	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	ARMIDALE.CAP.C1.VSWT	TransGrid	Armidale 330kV Substation	No.1 capacitor	CAPACITOR	SWITCH			1 NO INSTRUCTION

Interim version

	A	B	C	D	E	F	G	H	I	J	K	L	M		
1	C	NEMTS3.WORLD	VOLTAGE_INSTR	AEMO	PUBLIC	26/09/2016	12:57:37	1366575722	VOLTAGE_INSTRUCTIONS	1366575718					
2	I	VOLTAGE_INSTRUCTION	TRACK	1	RUN_DATETIME	VERSION_DATETIME	FILE_TYPE								
3	D	VOLTAGE_INSTRUCTION	TRACK	1	26/09/2016 12:57	26/09/2016 12:57	INSTRUCTION								
4	I	VOLTAGE_INSTRUCTION	INSTRUCTION	1	RUN_DATETIME	VERSION_DATETIME	EMS_ID	PARTICIPANTID	STATION_ID	DEVICE_ID	DEVICE_TYPE	CONTROL_TYPE	TARGET	CONFORMING	INSTRUCTION_SUMMARY
5	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	26/09/2016 12:57	26/09/2016 12:57	ARDN_W.CAP.CAP1.VSWT	ElectraNet SA	ARDROSSAN WEST 132/33kV SUBSTATION	132KV CAP BANK 1	CAPACITOR	SWITCH			1 NO INSTRUCTION
6	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	26/09/2016 12:57	26/09/2016 12:57	ARMIDALE.CAP.C1.VSWT	TransGrid	Armidale 330kV Substation	No.1 capacitor	CAPACITOR	SWITCH			0 NO INSTRUCTION
7	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	26/09/2016 12:57	26/09/2016 12:57	ARMIDALE.CAP.C2.VSWT	TransGrid	Armidale 330kV Substation	No.2 capacitor	CAPACITOR	SWITCH			1 NO INSTRUCTION

Extended to include VERSION_DATETIME: the Datetime the file was published by VDS. VERSION_DATETIME differ from RUN_DATETIME only for Supplemental runs.
As a fail-safe to handle a potential lapse between the database upgrade vs software upgrade, the new field is ignored until RPOs upgrade.

New version

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	C	NEMP.WORLD	INSTRUCTIONS	AEMO	PUBLIC	27/09/2016	00:09:05	275343763	VOLTAGE_INSTRUCTIONS	275343759							
2	I	VOLTAGE_INSTRUCTION	TRACK	1	RUN_DATETIME	VERSION_DATETIME	FILE_TYPE	SE_DATETIME	OPERATING_STATUS	EST_EXPIRY	EST_NEXT_INSTRUCTION	SOLUTION_CATEGORY	SOLUTION_STATUS	OPERATING_MODE			
3	D	VOLTAGE_INSTRUCTION	TRACK	1	27/09/2016 00:08	27/09/2016 00:08	INSTRUCTION	27/09/2016 00:08		27/09/2016 00:22	27/09/2016 00:23	SUCCESS	NOACTCNV	AUTO			INSTRUCTION
4	I	VOLTAGE_INSTRUCTION	INSTRUCTION	1	RUN_DATETIME	VERSION_DATETIME	EMS_ID	PARTICIPANTID	STATION_ID	DEVICE_ID	DEVICE_TYPE	CONTROL_TYPE	TARGET	CONFORMING	INSTRUCTION_SUMMARY	SEQUENCE	ADDITIONAL_NOTES
5	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	27/09/2016 00:08	APD.REAC.A2REAC.VSWT	AEMO	APD	A2reac	REACTOR	SWITCH			1 NO INSTRUCTION		
6	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	27/09/2016 00:08	APD.REAC.A3REAC.VSWT	AEMO	APD	A3reac	REACTOR	SWITCH			1 NO INSTRUCTION		
7	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	27/09/2016 00:08	ARDN_W.CAP.CAP1.VSWT	ElectraNet SA	ARDROSSAN WEST 132/33	132KV CAP BANK 1	CAPACITOR	SWITCH			1 NO INSTRUCTION		
8	D	VOLTAGE_INSTRUCTION	INSTRUCTION	1	27/09/2016 00:08	27/09/2016 00:08	ARMIDALE.CAP.C1.VSWT	TransGrid	Armidale 330kV Substation	No.1 capacitor	CAPACITOR	SWITCH			1 NO INSTRUCTION		

1. SE_DATETIME: State Estimator start time, when a snapshot is taken of SCADA values.
2. OPERATING STATUS: A set of pre-defined text messages or "free text" message entered by an AEMO operator e.g. "(0) <Free Text>", "(1) VDS Active" or "(2) VDS Paused".
3. EST_EXPIRY: Estimated expiry time of current Instruction set.
4. EST_NEXT_INSTRUCTION: Estimated issue time of next Instruction set.
5. SOLUTION_CATEGORY: VDS solver solution category: SUCCESS [solution succeeded], WARNING [solution completed with warnings], FAILURE [solution failed].
6. SOLUTION_STATUS: VDS solver solution status: NOACTCNV [Solved with no instructions], NOVIOACT [Instructions with no violations], CONVERGE [Solved with no violations], UNMANAGE [Solved with BC violations], UNMANCTG [Solved with CTG violations], CTGDIV [1 or more CTGs diverged], SENHDIV [Failed with too many violations], BCDIV [Invalid basecase].
7. OPERATING_MODE: The current VDS operating mode: [AUTO|AUTO-VERIFIED|MANUAL].
8. INSTRUCTION_SEQUENCE: The order for execution of an instruction in relation to other instructions within the same cycle. Currently, AEMO does not intend this field to be used.
9. ADDITIONAL_NOTES: Optional additional information pertaining to a particular instruction, e.g. "Previously issued instruction revoked".

Interim file version

Before the deployment of this Release, AEMO will implement an interim version of the VOLTAGE_INSTRUCTIONS file containing the new VERSION_DATETIME field that makes up part of the primary key (see [Changes to EMMS VDS files on page 6](#)).

Without the Interim file initiative, resuming suspended files is not possible as the Version_DateTime field is now a required field when loading data to the database. It is important to follow the exact steps to apply a Data Model upgrade:

1. Suspend loading the data files.
2. Upgrade your DBMS to v4.26.
3. Resume loading the data files.
4. Upgrade file subscriptions.

For further help, see [How to apply a Data Model upgrade on page 24](#).

Participants automatically start receiving the interim file when it is released. The interim file is currently available for pre-production and participants will receive the production version when the Electricity Data Model 4.26 scripts are made available to participants, approximately Thursday 27 October 2016.

Participants do not need to change anything on their side to receive the interim version for both pre-production and production.

New file version

RPOs can only receive the new file version after they have upgraded to Electricity Data Model 4.26.

File naming

File names are the same for Signal, Instruction, or Supplemental, only the contents differ.

File_ID	Mask	Example
VOLTAGE_INSTRUCTIONS	<#VISIBILITY_ID>_<#FILE_ID>_<#RUN_DATETIME:yyyyMMddHHmmss>_<#VERSION_DATETIME:yyyyMMddHHmmss>.CSV	PUBLIC_VOLTAGE_INSTRUCTIONS_2016102600000000_2016102600000000.zip
VOLTAGE_INSTRUCTIONS_LEGACY	<#VISIBILITY_ID>_<#FILE_ID>_<#RUN_DATETIME:yyyyMMddHHmmss>_LEGACY.CSV	PUBLIC_VOLTAGE_INSTRUCTIONS_2016102600000000_LEGACY.zip

The VOLTAGE_INSTRUCTIONS Supplemental files have a later Version_DateTime value than the Run_DateTime.

Each successive supplemental file of the same VDS cycle is later than the previous. For example, a successive supplemental file one second later than the example above is named:
PUBLIC_VOLTAGE_INSTRUCTIONS_2016102600000000_2016102600000001.zip.

1.1.8 EMMS output file examples for a VAR Dispatch cycle

These examples of output files from a VAR Dispatch cycle were created from AEMO’s test systems to provide an understanding of the changes for RPOs. They do not represent the latest production version of RPO devices and the specific instructions are fictitious.

Signal file example

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	C	NEMP.WORLD	VOLTAGE_INSTRUC	AEMO PUBLIC	10/10/2016	17:15:58	0000000274927630	VOLTAGE_INSTRUC	0000000274927632					
2	I	VOLTAGE_INSTRUC	TRACK	1	RUN_DATETIME	VERSION_DATETIME	FILE_TYPE	SE DATETIME	SOLUTION_CATEGORY	SOLUTION_STATUS	OPERATING_MODE	OPERATING_STATUS	EST_EXPIRY	EST_NEXT_INSTRUCTIONS
3	D	VOLTAGE_INSTRUC	TRACK	1	10/10/2016 17:15:54	10/10/2016 17:15:54	SIGNAL				AUTO	VDS Active		10/10/2016 17:17
4	C	"END OF REPORT" A												

Instruction file example

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	
1	C	NEMTS3.WORLD	VOLTAGEAENPUBLIC		10/10/2016	17:19:35	0000000274927641	VOLTAGE_INSTRUC	0000000274927641								
2	I	VOLTAGE_INSTRUC	TRACK	1	RUN_DATETIME	VERSION_DATETIME	FILE_TYPE	SE DATETIME	SOLUTION_CATEGORY	SOLUTION_STATUS	OPERATING_MODE	OPERATING_STATUS	EST_EXPIRY	EST_NEXT_INSTRUCTIONS			
3	D	VOLTAGE_INSTRUC	TRACK	1	10/10/2016 17:18:08	10/10/2016 17:18:08	INSTRUCTION	#####	SUCCESS [solution succeeded]	NOVIOACT	[Instructions w	AUTO	VDS Active	#####		10/10/2016 17:32	
5	V	VOLTAGE_INSTRUC	INSTRI	1	RUN_DATETIME	VERSION_DATETIME	EMS_ID	PARTICIPANT	STATION_ID	DEVICE_ID	DEVICE_TV	CONTROL	TARGET	CONFORMING	INSTRUCTION_SUMMARY	INSTRUCTION_SEQUENCE	ADDITIONAL_NOTES
6	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	YPS.TRANS.3GT Energy Australi	YPS	Sydney West 330kV Substation	Ywps No.3 Generator	TRANS	TAP	-2	0	Lower taps of Tr	1	
7	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	S.VD.WEST.SVC TransGrid		SOUTH EAST SUBSTATION	No.1 Static Var Compensat	SVC	VOLTAGE	2.6	0	Raise the voltag	2	
8	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	S.EAST.SVC.SV ElectraNet SA		SOUTH EAST SUBSTATION	1	SVC	VOLTAGE	8	0	Raise the voltag	3	
9	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	S.EAST.SVC.SV ElectraNet SA		SOUTH EAST SUBSTATION	2	SVC	VOLTAGE	7.9	0	Raise the voltag	4	
10	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARDN.W.CAP. ElectraNet SA		ARDROSSAN WEST 132/33kV SI	132kV CAP BANK 1	CAPACITOR	SWITCH		1	NO INSTRUCTIO		
11	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.CAF TransGrid		Armidale 330kV Substation	No.1 capacitor	CAPACITOR	SWITCH		1	NO INSTRUCTIO		
12	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.CAF TransGrid		Armidale 330kV Substation	No.2 capacitor	CAPACITOR	SWITCH		1	NO INSTRUCTIO		
13	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.REA TransGrid		Armidale 330kV Substation	No.1 reactor	REACTOR	SWITCH		1	NO INSTRUCTIO		
14	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.REA TransGrid		Armidale 330kV Substation	No.2 reactor	REACTOR	SWITCH		1	NO INSTRUCTIO		
15	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.REA TransGrid		Armidale 330kV Substation	No.3 reactor	REACTOR	SWITCH		1	NO INSTRUCTIO		
16	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.REA TransGrid		Armidale 330kV Substation	No.4 reactor	REACTOR	SWITCH		1	NO INSTRUCTIO		
17	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARMIDALE.SVC TransGrid		Armidale 330kV Substation	No.1 SVC	SVC	VOLTAGE		1	NO INSTRUCTIO		
18	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ARTHURS.TRAN NEEDS_NOS_N	ARTHURS LAKE	T1		TRANS	TAP		1	NO INSTRUCTIO		
19	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	ATS.CAP.2CAP_SPI Networks (ATS			No 2 220kV Cap Bank *	CAPACITOR	SWITCH		1	NO INSTRUCTIO		
20	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	BANNABY.REA TransGrid		Bannaby 500kV	No.1 Reactor	REACTOR	SWITCH		1	NO INSTRUCTIO		
21	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	BANNABY.REA TransGrid		Bannaby 500kV	No.2 Reactor	REACTOR	SWITCH		1	NO INSTRUCTIO		
22	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	BATS.CAP.ICA SPI Networks (BATS			No 1 Cap Bank *	CAPACITOR	SWITCH		1	NO INSTRUCTIO		

Supplemental file example 1

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	
1	C	NEMP.WORLD	VOLTAGEAENPUBLIC		10/10/2016	17:21:55	0000000274927650	VOLTAGE_INSTRUC	0000000274927650								
2	I	VOLTAGE_INSTRUC	TRACK	1	RUN_DATETIME	VERSION_DATETIME	FILE_TYPE	SE DATETIME	SOLUTION_CATEGORY	SOLUTION_STATUS	OPERATING_MODE	OPERATING_STATUS	EST_EXPIRY	EST_NEXT_INSTRUCTIONS			
3	D	VOLTAGE_INSTRUC	TRACK	1	10/10/2016 17:18:08	10/10/2016 17:21:41	SUPPLEMENTAL				AUTO	VDS Active	10/10/2016 17:30	10/10/2016 17:32			
5	V	VOLTAGE_INSTRUC	INSTRI	1	RUN_DATETIME	VERSION_DATETIME	EMS_ID	PARTICIPANT	STATION	DEVICE_ID	DEVICE_TV	CONTROL	TARGET	CONFORMING	INSTRUCTION_SUMMARY	INSTRUCTION_SEQUENCE	ADDITIONAL_NOTES
6	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:21:41	SHEFIELD.BUS.22	Hydro Tasmania	SHEFFIELD	SH 220 kV A	GENGRP	VOLTAGE	2	1	Raise the voltage of SH 220 kV A Bus at SHEFFIELD by 2.0 kV	7	Added instruction

Supplemental file example 2

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	
1	C	NEMP.WORLD	VOLTAGEAENPUBLIC		10/10/2016	17:20:10	0000000274927649	VOLTAGE_INSTRUC	0000000274927652								
2	I	VOLTAGE_INSTRUC	TRACK	1	RUN_DATETIME	VERSION_DATETIME	FILE_TYPE	SE DATETIME	SOLUTION_CATEGORY	SOLUTION_STATUS	OPERATING_MODE	OPERATING_STATUS	EST_EXPIRY	EST_NEXT_INSTRUCTIONS			
3	D	VOLTAGE_INSTRUC	TRACK	1	10/10/2016 17:18:08	10/10/2016 17:19:44	SUPPLEMENTAL				AUTO	VDS Active	10/10/2016 17:30	10/10/2016 17:32			
5	V	VOLTAGE_INSTRUC	INSTRI	1	RUN_DATETIME	VERSION_DATETIME	EMS_ID	PARTICIPANT	STATION	DEVICE_ID	DEVICE_TV	CONTROL	TARGET	CONFORMING	INSTRUCTION_SUMMARY	INSTRUCTION_SEQUENCE	ADDITIONAL_NOTES
6	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:19:44	ARTHURS.TRAN NEEDS_NOS_NAM	ARTHURS LA	T1	TRANS	TAP		1	1	Raise taps of Transformer T1 at ARTHURS LAKE by 1 tap	5	Added instruction
7	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:19:44	ARMIDALE.SVC.1	TransGrid	Armidale 33 No.1 SVC	SVC	VOLTAGE		-2	1	Lower the voltage setpoint of No.1 SVC at Armidale 330kV Substation by 1.2.0 kV	6	Added instruction Rescinded - Ignore previous Instruction for this device!
8	D	VOLTAGE_INSTRUC	INSTRI	1	10/10/2016 17:18:08	10/10/2016 17:18:08	YPS.TRANS.3GTR Energy Australia Y	YPS	Ywps No.3 C TRANS	TRANS	TAP			0	NO INSTRUCTION	7	

1.1.9 Web Portal

AEMO will provide examples of the VAR Dispatch Web Portal interface in the VAR Dispatch Specification for Participant Interfaces published closer to the Release date.

1.1.10 What RPOs need to do

Before deployment of this Release

AEMO requests RPOs keep AEMO informed by email (VARproject@aemo.com.au) about:

- Their **estimated** and actual implementation dates.
- Their current and future VDS interface preference, either SCADA, Data Interchange, or Web Portal. For information about the available interfaces, see *VAR Dispatch Specification for Participant Interfaces*, available: <https://link.aemo.com.au/vds/SitePages/Home.aspx>.

RPOs using Data Interchange

To receive the new Supplemental files and additional status fields, RPOs must:

5. For the duration of the Data Model upgrade (around 20–30 minutes), ensure alternative arrangements are in place to receive instructions because they will not receive instructions until the upgrade completes.
6. Install or upgrade to data model v4.26.
Allow around 20–30 minutes to complete the Data Model upgrade because the process requires column value updates to the VOLTAGE_INSTRUCTIONS and VOLTAGE_INSTRUCTIONS_TRK tables of around 14 million rows.
7. Update your own RPO custom displays. It is very important to complete this step before subscribing to the new file so your own software is ready to display the new information.
8. **Only** after updating your custom display; update your data subscriptions from the Legacy file to the new **VOLTAGE_INSTRUCTIONS** file in the Data Interchange->Data Subscription menu in the Web Portal.
For help, see [How to apply a Data Model upgrade on page 24](#).

Important notes about the upgrade installation:

Allow around 20–30 minutes to complete the Data Model upgrade because the process requires column value updates to the VOLTAGE_INSTRUCTIONS and VOLTAGE_INSTRUCTIONS_TRK tables of around 14 million rows.

For the duration of the upgrade, RPOs using VAR Dispatch must ensure alternative arrangements such as, using the VAR Dispatch Web Portal or reverting to phone calls are in place to receive instructions because they will not receive any until the upgrade completes.

For a successful upgrade, please closely follow the steps in [How to apply a Data Model upgrade on page 24](#).

RPOs using the SCADA interface

To receive the new Supplemental instructions and additional status fields, RPOs must:

1. To discuss the best solution for their needs, contact GridModellers@aemo.com.au.
2. To check for any change from the “normal state”, set up triggers on your side for each individual VDS instruction SCADA point currently received from AEMO because RPOs cannot set up alarming or notification of Supplemental instruction arrival based on the existing timing signal. Alternatively, RPOs can request a new SCADA tag to indicate an additional timing signal for any Supplemental arrivals.
3. Add any of the new information fields you would like to receive to your SCADA definitions (including, in the case of generators, TNSP pass-through).
Note: Most of these fields are enumerated types, sent to RPO’s SCADA as an analog that RPOs must

convert to the appropriate text for display in their control rooms. On request, AEMO can convert analog types to control types to accommodate the requirements of generators SCADA communication systems.

AEMO will provide the finalised lists of enumerated type interpretations closer to the EMMS Release date.

RPO's own interfaces

To highlight Supplemental instructions and new information fields at RPO's sites:

- RPOs may have to make minor changes to their VDS display(s) to show both the original instruction set as well as any Supplemental instructions on the same display.
AEMO will communicate specific details in the [VAr Dispatch Specification for Participant Interfaces V2.00](#), available: <https://link.aemo.com.au/vds/SitePages/Home.aspx> released closer to the implementation date.
- RPOs may also want to make changes to their alarm notifications to alert on arrival of Supplemental instructions.
- Inform RPO control room staff about the new VDS features.
- If required, update operational procedures and documentation.

RPOs only using the Web Portal interface do not need to make any software changes on their side; all changes are on AEMO's side.



(P615) AP Compensation Rule Change

1.1.11 Summary

The Administered Price (AP) Compensation Rule Change project introduces changes to calculations in the Settlements and Billing system to comply with a recent NER rule change regarding the recovery methodology of compensation payments due to price limit events.

1.1.12 Benefits

Complies with the AEMC rule change.

1.1.13 Impact

Participants must apply the new Electricity Data Model to receive the new data in their systems, see [How to apply a Data Model upgrade](#) on page 24.

1.1.14 Risks

None identified.

1.1.15 Data Model

There are modifications to the Electricity Data Model, for details see [Package: BILLING_RUN](#) on page 16.

For a successful upgrade, please closely follow the steps in [How to apply a Data Model upgrade](#) on page 24.

(P813) Enhanced Reallocations (SWAP / CAP / FLOOR)

1.1.16 Summary

This project extends the Agreement Types in Electricity Reallocations in the Web Portal. The Minister, under the Corporations Act, has granted AEMO a Clearing and Settlement (CS) Facility Exemption, allowing AEMO to introduce Swap, Cap, and Floor reallocation types subject to mandatory conditions of the exemption.

1.1.17 Benefits

Additional Agreement Types in Electricity Reallocations for Reallocations Participants who have completed the Swap & Option Offset Reallocations Letter of Agreement.

1.1.18 Impact

AEMO has drafted proposed amendments to the Reallocation Procedure: Swap and Option Offset Reallocations, which is currently under consultation. If the amendments are accepted, AEMO will add Swap, Cap, and Floor Agreement Types in the Electricity Reallocations > Create Reallocation webpage in the Web Portal.

You can find Reallocation Procedures on AEMO's website: <http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Settlements-and-payments/Prudentials-and-payments/Procedures-and-guides>

Agreement Type	Interval	Quantity (MWh)	Nominated Price
Cap (CAP)	0:30	0.00	\$0.00
Floor (FLOOR)	1:00	0.00	\$0.00
Quantity (MWh)	1:30	0.00	\$0.00
Swap (SWAP)	2:00	0.00	\$0.00
	2:30	0.00	\$0.00
	3:00	0.00	\$0.00
	3:30	0.00	\$0.00
	4:00	0.00	\$0.00
	4:30	0.00	\$0.00

1.1.19 Risks

None identified.

1.1.20 Data Model

No change to the Data Model.

2 DATA INTERCHANGE

For details about the supported software versions for this Release, see [Baseline Assumptions](#) on page 25.

You can find Data Interchange software and associated documentation in the following locations:

- Releases directory on the participant file share: FTP to 146.178.211.25; Data Interchange, pdrBatcher, pdrLoader, or Replication Manager.
- Data Subscription web application in the Web Portal:
 - Production: <https://portal.prod.nemnet.net.au>
 - Pre-production: <https://portal.preprod.nemnet.net.au>
- AEMO's website: IT Systems & Change web page.

2.1 Electricity Data Model 4.26

This Release contains a new version of the Electricity Data Model 4.26. This section describes the affected packages, tables, files, reports, and interfaces.

Important notes about the upgrade installation:

Allow around 20–30 minutes to complete the Data Model upgrade because the process requires column value updates to the VOLTAGE_INSTRUCTIONS and VOLTAGE_INSTRUCTIONS_TRK tables of around 14 million rows.

For the duration of the upgrade, RPOs using VAr Dispatch must ensure alternative arrangements such as, using the VAr Dispatch Web Portal or reverting to phone calls are in place to receive instructions because they will not receive any until the upgrade completes.

For a successful upgrade, please closely follow the steps in [How to apply a Data Model upgrade](#) on page 24.

2.1.1 Definitions

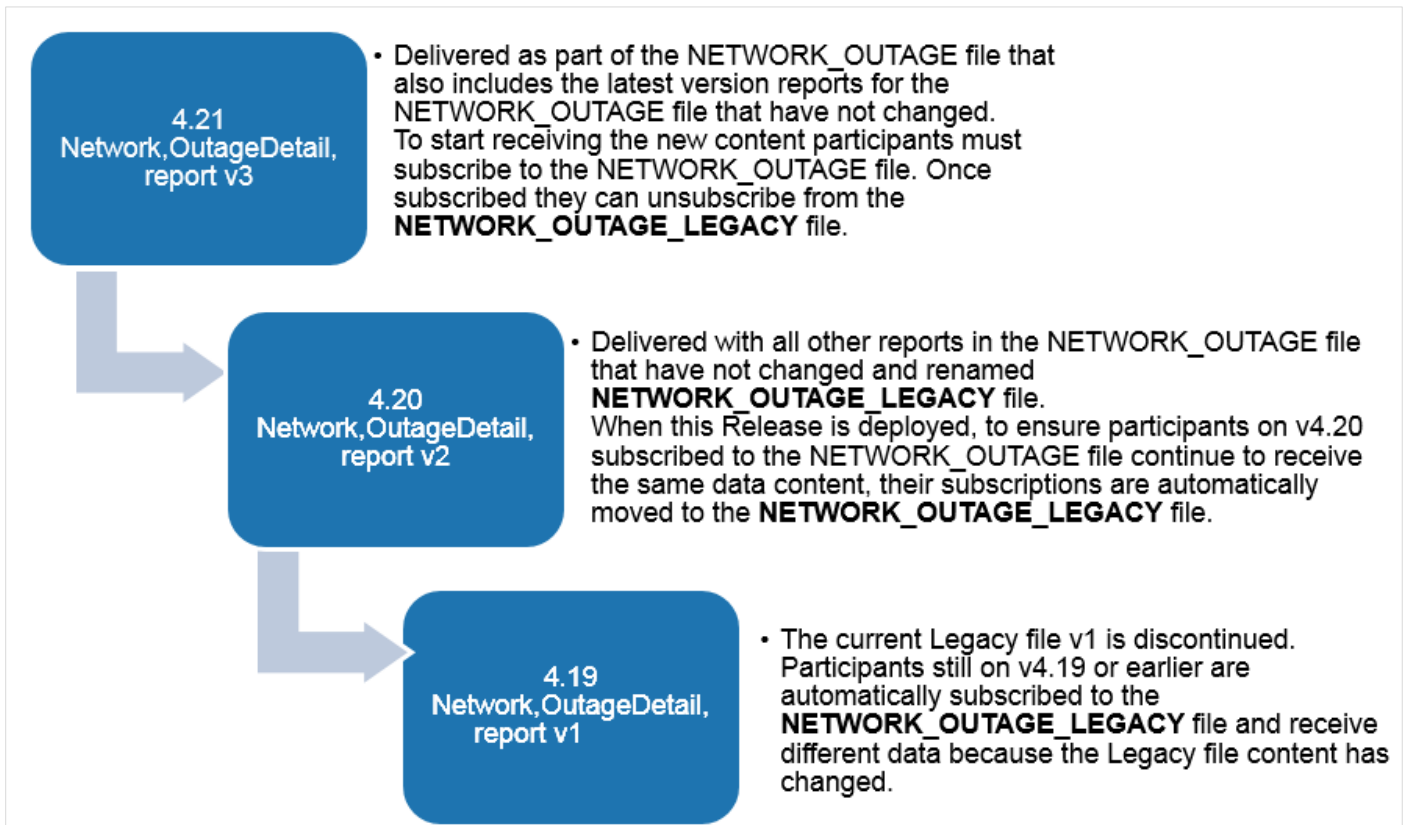
Table 3 Electricity Data Model terms used in this technical specification

Definition	Version	Description
Discontinued Report	4.24 or earlier	When a Legacy version of a file replaces an existing Legacy file, some versions of the included reports may change. The replaced report versions are referred to as discontinued. Important note: Participants on Electricity Data Model versions prior to 4.25 may be impacted if a report is discontinued in a Legacy file they are receiving.
Discontinued version	4.24	Refers to the tables, files, and reports deployed in the EMMS Midyear Release May 2015.
File	n/a	Logically groups one or more reports delivered as a physical file, for example BILLING. Participants subscribe to files using the Data Interchange->Data Subscription menu in the Web Portal.
Latest version	4.26	Refers to the tables, files, and reports deployed for the Wholesale Market Systems Year-end Release 2016.

Definition	Version	Description
Legacy file	4.25 or earlier	Currently supported but no longer updated. If a report is changed in a release then the previous version of the report (and the latest version of other reports in the file) is delivered from the Legacy file. For an example, see Figure 2 below .
Previous version	4.25	Refers to the tables, files, and reports deployed in the previous Data Model release 4.25.
Report	n/a	A data report that loads into a data model table. Identified by its type, subtype, and version. For example BILLING,BILLINGASPAYMENTS,2

Figure 2 Legacy file example

The design of the data model supports the latest and previous version of a file. AEMO refers to the previous version as the Legacy version, for example NETWORK_OUTAGE_LEGACY. The example below describes what happens to an existing Legacy file in v4.19 when AEMO releases a new Data Model version, 4.21.



2.1.2 Modified packages and tables

After deployment of this Release:

- To receive the new data in the modified packages and tables, participants must upgrade to 4.26. For help, see [How to apply a Data Model upgrade on page 24](#).
- Versions of these tables in the Electricity Data Model 4.25 are moved to Legacy versions.

- Participants' subscriptions are automatically moved to the Legacy file. This ensures that participants on Electricity Data Model 4.25 subscribed to files that change, will continue to receive the same data.
- Participants still on Electricity Data Model 4.24 or earlier remain on any subscribed Legacy files but may receive different content if the Legacy file content has changed.
- Once subscribed, and the new data is received, you can unsubscribe from the Legacy files.

Table 4 Electricity Data Model 4.26 modified packages and tables summary

Package	Table name	Change	Details	PK or FK
BILLING_RUN	BILLING_APC_COMPENSATION	New fields	EVENT_TYPE COMPENSATION_TYPE LASTCHANGED	No change
	BILLING_APC_RECOVERY	New fields	ELIGIBILITY_START_INTERVAL ELIGIBILITY_END_INTERVAL PARTICIPANT_DEMAND REGION_DEMAND LASTCHANGED	No change
VOLTAGE_INSTRUCTIONS	VOLTAGE_INSTRUCTIONS_TRACK	New fields	VERSION_DATETIME SE_DATETIME SOLUTION_CATEGORY SOLUTION_STATUS OPERATING_MODE OPERATING_STATUS EST_EXPIRY EST_NEXT_INSTRUCTION	Changes for this release to include the new column: <ul style="list-style-type: none"> ▪ VERSION_DATETIME (new) ▪ RUN_DATETIME, (existing)
	VOLTAGE_INSTRUCTIONS	New fields	VERSION_DATETIME INSTRUCTION_SEQUENCE ADDITIONAL_NOTES	Changes for this release to include the new column: <ul style="list-style-type: none"> ▪ VERSION_DATETIME (new) ▪ RUN_DATETIME, (existing) ▪ EMS_ID (existing)

Package: BILLING_RUN

Instructions for MVar Dispatch

Modified table: BILLING_APC_COMPENSATION

Name	BILLING_APC_COMPENSATION
Comment	Billing results for payment of APC compensation amount.
Visibility	Private
Trigger	Generated when a Billing Run is posted
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	CONTRACTYEAR, WEEKNO, BILLRUNNO, APPEVENTID, CLAIMID

Added columns

Field Name	Data type	Comment
EVENT_TYPE	VARCHAR2(20)	The Administered Price Event Type, either ENERGY or FCAS or BOTH
COMPENSATION_TYPE	VARCHAR2(20)	The Type of Administered Price Compensation Claim. Values are DIRECT_COST or OTHER_COST
LASTCHANGED	Date	The date and time of last changed record

Modified table: BILLING_APC_RECOVERY

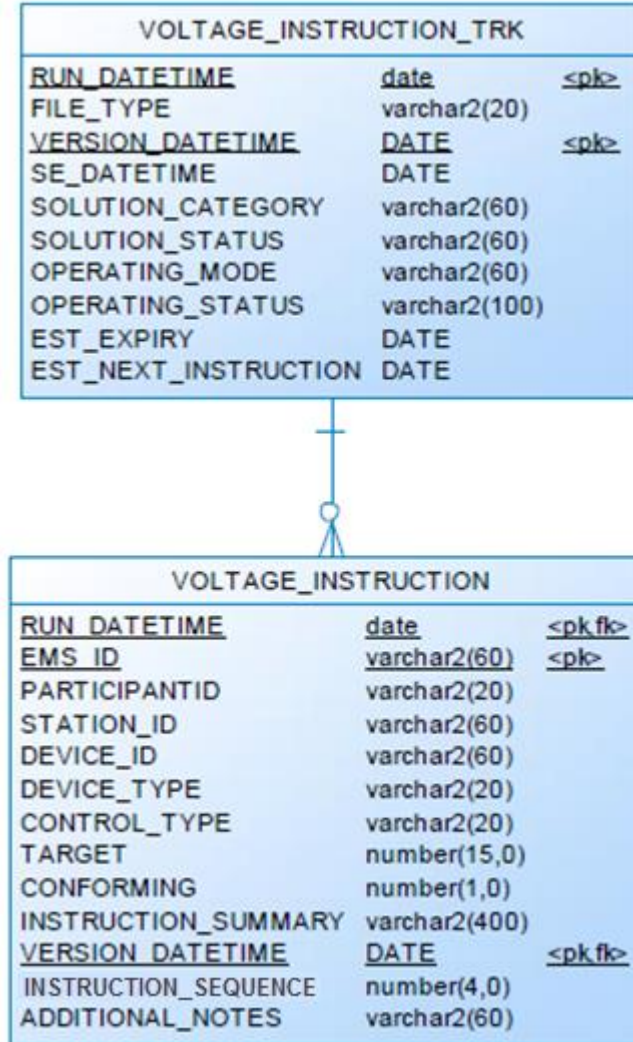
Name	BILLING_APC_RECOVERY
Comment	Billing results for recovery of APC compensation payments
Visibility	Private
Trigger	Generated when a Billing Run is posted
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	CONTRACTYEAR, WEEKNO, BILLRUNNO, APEVENTID, CLAIMID, PARTICIPANTID, REGIONID

Added columns

Field Name	Data type	Comment
ELIGIBILITY_START_INTERVAL	DATE	The starting half hourly interval for the eligibility period for recovery of APC Payment
ELIGIBILITY_END_INTERVAL	DATE	The ending half hourly interval for the eligibility period for recovery of APC Payment
PARTICIPANT_DEMAND	NUMBER(18,8)	The participant demand in the cost recovery region
REGION_DEMAND	NUMBER(18,8)	The sum of demand of all participants in the cost recovery region (Region Sum)
LASTCHANGED	Date	The date and time of last changed record

Package: VOLTAGE_INSTRUCTIONS

Instructions for MVar Dispatch



Modified table: VOLTAGE_INSTRUCTIONS_TRK

Name	VOLTAGE_INSTRUCTIONS_TRK
Comment	Parent record for Voltage Instructions (MVar Dispatch). "SIGNAL" records have no children; "INSTRUCTION" records have children for all devices; "SUPPLEMENTAL" records have children for devices that have Supplemental instructions
Visibility	Public
Trigger	Instructions issued
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key	Run_DateTime, Version_DateTime

Primary key change

Primary key	Comment
Version_DateTime	Extended to include this new column from this release
Run_DateTime	Existing

Added columns

Field Name	Data type	Comment
VERSION_DATETIME	DATE	Date and time the file was published by VDS - Versions differ from Run_DateTime only for Supplemental runs (see note 1)
SE_DATETIME	DATE	State Estimator start time, when a snapshot is taken of SCADA values
SOLUTION_CATEGORY	VARCHAR2(60)	VDS solver solution category: SUCCESS [solution succeeded], WARNING [solution completed with warnings], FAILURE [solution failed] (see note 2)
SOLUTION_STATUS	VARCHAR2(60)	VDS solver solution status: NOACTCNV [Solved with no instructions], NOVIOACT [Instructions with no violations], CONVERGE [Solved with no violations], UNMANAGE [Solved with BC violations], UNMANCTG [Solved with CTG violations], CTGDIV [1 or more CTGs diverged], SENHDIV [Failed with too many violations], BCDIV [Invalid basecase] (see note 2 & 3)
OPERATING_MODE	VARCHAR2(60)	The current VDS operating mode: [AUTO AUTO-VERIFIED MANUAL] (see note 4)
OPERATING_STATUS	VARCHAR2(100)	A set of pre-defined text messages or "free text" message entered by an AEMO operator e.g. "(0) <Free Text>", "(1) VDS Active" or "(2) VDS Paused" (see note 5)
EST_EXPIRY	DATE	Estimated expiry time of current Instruction set (see note 6)
EST_NEXT_INSTRUCTION	DATE	Estimated issue time of next Instruction set (see note 7)

Notes:

1. The Run_DateTime remains constant for all instructions issued within one VDS cycle (time of first instruction set in the cycle).

2. **Solution_Category** and **Solution_Status**, both relate to the level of success of the overall mathematical solution of the VDS run, where **Solution_Category** is the high-level summary. The solution includes the following sequence of algorithms:
 - a. The State Estimator (power flow) solution, sometimes also referred to as the Base Case.
 - b. Contingency analysis (potential loss of power system components applied to the grid and an additional power flow determining the follow-on effects on the voltage).
 - c. Linear programming solution for finding the most appropriate actions to either correct or maintain the voltage (the VDS portion of the solution).
 - d. Additional contingency analysis after applying the VDS recommendations.

Solution Category is the high-level summary.

3. **Solution Status** (subsets of **Solution_Category**) is the classification of the solutions pertaining to the results of all of the above steps. "Violations" refer to exceedance of limit rating definitions of equipment or nodes (going outside of their allowable bands of values). For example, ["NOACTCNV [Solved with no instructions]", "SENHDIV [Failed with too many violations]] "
4. Indication of the level of human intervention in instruction set and potential deviation from typical 15-minute cycle.
5. Informs participant control rooms of the operational condition of VDS through a set of pre-defined text messages or "free text" message entered by an AEMO operator. A number prefix is added for easy cross-referencing and software interpretation. Not limited to these examples ["(0) <Free Text>", "(1) VDS Active" or "(2) VDS Paused"]
6. Estimated end time of the allowable execution period for the current instruction set. This is when a new grid snapshot is taken from SCADA for VDS to process.
7. Estimated time when the next instruction set is issued to RPOs.

Modified table: VOLTAGE_INSTRUCTIONS

Name	VOLTAGE_INSTRUCTIONS
Comment	Child record for Voltage Instructions (MVar Dispatch)
Visibility	Public
Trigger	Signal or instructions issued
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key	Run_DateTime, Version_DateTime, EMS_ID

Primary key change

Primary key	Comment
Version_DateTime	Extended to include this new column from this release
Run_DateTime	Existing
EMS_ID	Existing

Added columns

Field Name	Data type	Comment
VERSION_ DATETIME	DATE	Datetime the file was published by VDS - Versions differ from Run_DateTime only for Supplemental runs
INSTRUCTION_SEQUENCE	NUMBER(4,0)	Order for execution of Instruction (see note 1)
ADDITIONAL_ NOTES	VARCHAR2(60)	Optional additional information pertaining to a particular instruction, e.g. Previously issued instruction revoked. This field is not an instruction.

Notes

1. The order for execution of an instruction in relation to other instructions within the same cycle. To be interpreted as a recommendation only. This functionality requires further development on AEMO's side.

2.1.3 Participant interfaces changes

Package Name	Data Model table	File ID	CSV report type	Change
BILLING_RUN	BILLING_APC_COMPENSATION	BILLING	APC_COMPENSATION, 2	Modified
	BILLING_APC_RECOVERY	BILLING	APC_RECOVERY, 2	Modified
VOLTAGE_INSTRUCTIONS	VOLTAGE_INSTRUCTIONS_TRK	VOLTAGE_INSTRUCTIONS	VOLTAGE_INSTRUCTIONS, TRACK,2	Modified
	VOLTAGE_INSTRUCTIONS	VOLTAGE_INSTRUCTIONS	VOLTAGE_INSTRUCTIONS,INSTRUCTION,2	Modified

2.1.4 File interface changes

Package ID	File ID	Description	Batcher file masks	Frequency	Change	Auto-subscription
BILLING_RUN	BILLING	Billing results for a contract year and week number	*_BILLING_*.CSV	On posting of Billing Run – Prelim or Final or Revise	Modified reports	No
VOLTAGE_INSTRUCTIONS	VOLTAGE_INSTRUCTIONS	MVar Dispatch voltage instructions	*_VOLTAGE_INSTRUCTIONS_*.CSV	Approx. every 15 mins and as required	Modified reports	No

2.1.5 Discontinued reports

Participants must ensure they remove all dependencies on these tables prior to the deployment of this Release; otherwise, participant processes may be impacted.

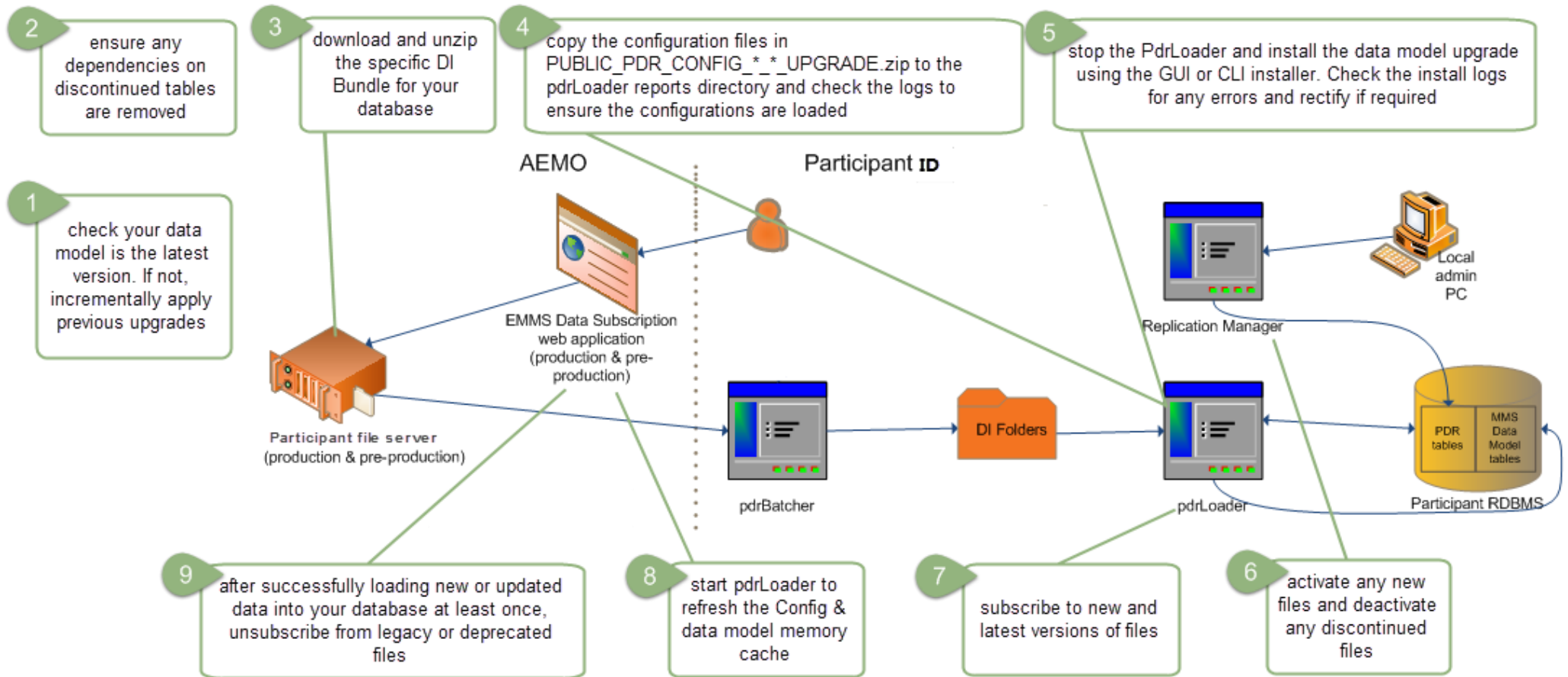
MMS Data Model table	File ID	Delivered in file	CSV report type	Replaced by
BILLINGASPAYMENTS	BILLING_LEGACY	BILLING*_LEGACY.CSV	BILLING, ASPAYMENTS,5	ASPAYMENTS,6
BILLINGASRECOVERY	BILLING_LEGACY	BILLING*_LEGACY.CSV	BILLING, ASRECOVERY,6	ASRECOVERY,7

2.1.6 Non-functional changes

Data Model Report updates

- To improve documentation quality and accuracy, this Release has various table and field comments updated in the [Data Model Report](#).
- A new guide is available in the DI bundles to assist participants with their DI upgrade: [Guide to Upgrading a Standard Data Interchange Environment](#).
- To assist with applying Data Model upgrades, a diagram with upgrade steps is included on [page 24](#) of this technical specification.

2.2 How to apply a Data Model upgrade





2.3 Baseline Assumptions

AEMO works to the assumption that participants' systems are compliant with the minimum supported configuration of the following software and systems.

2.3.1 Software

The current software versions are:

	Current version	Release
Web Services	1.04	June 2013
Java	7	AEMO expects this software will run on later Java releases. A future project will complete certification against Java 8
Windows service	64 bit JRE	32 bit JRE still supported

2.3.2 Data Interchange

The current DI software versions are:

	Current version	Still supported
Electricity Data Model	4.26 changes for this release	4.25
PDR Loader	7.3	7.3
PDR Batchter	7.3	7.3

	Current version	Still supported
Replication Manager	v3.0.16	v3.0.16

2.3.3 Database management systems

	Current	Still supported
Microsoft SQL Server	2012	2008
Oracle	12c	11g

You can find Data Interchange software and associated documentation in the following locations:

- Releases directory on the participant file share: FTP to 146.178.211.25; Data Interchange, pdrBatchter, pdrLoader, or Replication Manager.
- Data Subscription web application in the Web Portal:
 - Production: <https://portal.prod.nemnet.net.au>
 - Pre-production: <https://portal.preprod.nemnet.net.au>
- AEMO's website: IT Systems & Change web page.



3 IMPLEMENTATION

3.1 Approval or agreement to change

AEMO requests approval to proceed from all participant change controllers. For approval dates, see Release Schedule 936D.

3.2 Transition

There is no transition required for this release.

3.3 Implications

To maintain systems in-line with AEMO's market systems, participants need to:

- Review and assess the impact on their market systems with respect to the changes implemented as part of this Release.
- Change their systems prior to the implementation of this Release.
- Schedule staff and resources to upgrade their market systems for the production implementation of this Release.
- AEMO encourages participants to make use of the four-week pre-production period, to assess and test any impact to their market systems and business processes. Participants using data replication products critical to their business are strongly advised to participate in the pre-production rollout and testing period.

3.4 Upgrade options

From a wholesale energy market system's focus, participants need to:

1. Review and assess the impact on their market systems with respect to the changes implemented as part of this Release.
2. Plan to upgrade their Data Interchange installations to the latest versions to realise benefits from the new functionality, operate against newly supported platforms, and to maintain ongoing support from AEMO. For help, see [How to apply a Data Model upgrade on page 24](#).
3. Schedule staff and resources to upgrade their market systems from the implementation of this Release. To maintain systems in-line with AEMO's market systems, AEMO recommends upgrading within six months of the implementation date.
4. Change their systems prior to the deployment of this Release to ensure they are up-to-date. AEMO recommends participants' wholesale market systems are compliant with the latest Data Interchange software versions, see [Baseline Assumptions on page 25](#).



3.5 What happens if I do not upgrade?

If participants' systems are compliant with AEMO's supported configuration defined in the [Baseline Assumptions](#) on page 25, this Release does not impact Data Interchange systems immediately. Depending on participant's systems, not upgrading may result in the following issues:

- New data is not received to the new fields or tables because the data model elements are not created on the participant's database.
- Participants not subscribed to the latest versions of files, using the Data Subscriptions web application, will not receive the new data.
- Content in Legacy files may change after deployment of this Release.
- If participants have a system dependency on the formats of the non-Electricity or -Gas Data Model reports they need to manage these dependencies using the detail provided in this technical specification. Participants need to review and assess the impact on their market systems with respect to the changes implemented as part of this Release.

Participant systems incorrectly configured and not compliant with the [Baseline Assumptions](#) on page 25 may suffer data loss.
