

Dispatch Variance Notification

Functionality and Registration Guideline

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Introduction

In order to assist market participants in monitoring their assets relative to their dispatch levels, the AESO implemented functionality in its Automated Dispatch and Messaging System (“ADaMS”) and the dispatch tool (“DT”) to enable market participants with dispatch rights for assets to optionally receive additional ADaMS messages for their respective assets. These Dispatch Variance Notification (“DVN”) messages provide warnings to market participants when certain aspects of an asset's behavior appear to be inconsistent with that asset's current dispatch obligations.

1. Purpose

This guideline has been developed by the AESO to provide market participants with a clear understanding of the DVN functionality and the process to subscribe to this utility.

2. Applicability

This document is intended for use by market participants who wish to understand the DVN functionality and may wish to register to make use of this optional functionality.

It is important to understand that DVN was created as an aid to market participants in maintaining compliance. As such, its use is purely optional for market participants. It is not used by the AESO to assess compliance of market participants, and it should not be solely relied upon, by market participants, to ensure compliance. Limitations in its design and operation may lead to it misidentifying the status of an asset with regards to its compliance with its dispatch. Further, the failure of DVN will not be considered a mitigating factor in any contravention of an ISO rule. The issuance of DVN messages may be impacted by internal AESO system outages. Market participants are encouraged to develop their own tools and processes in order to facilitate compliance with the ISO rules.

3. DVN Functionality

DVN is a functionality embedded in ADaMS. DVN provides several types of warnings to the market participant:

- When the asset's generation level deviates from the energy dispatch level by more than a prescribed tolerance.
- When the asset receives an advance dispatch warning for energy, or operating reserves.
- When an asset's total Operating Reserves ("OR") commitments appear to exceed its declared available capability ("AC")
- When an asset which has been dispatched for Regulating Reserve ("RR") appears not to have been set up correctly to fully respond to the dispatch.
- When a wind or solar asset has been issued a directive via SCADA

DVN frequently reviews the status of each asset and determines when a DVN condition has been triggered and a message should be sent. Tolerances for warning conditions are established by the market participant for each asset by providing asset specific values for the DVN parameters. DVN warnings are sent in two ways:

Current Message					
Ack	Message Type	Date	Time	Message	Time of Instruction
<input type="radio"/>	message	2008/11/25		Asset – Possible dispatch level deviation detected. Dispatch level 190.0 MW. Last recorded generation 178.0 MW at 11/27/2008 20:26	

- A text message displayed on the ADaMS console, and
- A sound signal (alert) generated by ADaMS in conjunction with the text message.

3.1 DVN Messages

There are seven types of DVN warning messages. Each of these are described below with reference to the relevant DVN parameters (in bold). The parameters are described in the following section of this document.

3.1.1 Dispatch Level Deviation Message

If an asset has not recently been issued a new dispatch and its generation has moved out of tolerances with its current dispatch for a prescribed period of time, the following message is sent to the market participant:

“*[Asset ID]* – Possible dispatch level deviation detected. Energy Dispatch level [*expected generation level*] MW. Last recorded generation [*current generation level*] MW at [*time of last generation change*]”.

These 'level deviation' messages may be sent when an asset is in a 'steady state', that is, only after the expected time has passed for the asset to have achieved its most recent dispatch (see next section for further detail). Once this time has passed, DVN assesses at each minute and compares the asset's generation to its dispatch level. If it is more than **MW tolerance** away from its dispatch then DVN marks this minute as 'in deviation' internally. Once **Level Time Tolerance** consecutive minutes pass with each noted as 'in deviation', DVN will generate the above warning message. Note that the condition of dispatch variance will not be reported again by DVN until the condition is resolved, in other works generation moves back within configured tolerances of dispatch. (To receive condition reminder messages see the **DVN Notification Reminders On** parameter).

3.1.2 Ramping Variance Message

If an asset has recently received a new dispatch and the asset is expected to be ramping towards its new dispatch level, then its movement towards the new level is assessed for a Ramping Variance using the selected **Ramping Calculation Formula** from 3.3.1.8. The asset's declared ramp rate together with configurable tolerances and the chosen calculation formula are used to determine when the asset is moving too slowly towards the new dispatch level. When DVN determines that this is the case, the following message is sent to the market participant:

“*[Asset ID]* – Possible ramping deviation detected. New energy dispatch level [*expected generation level*] MW. Last recorded generation [*current generation level*] MW at [*time of last generation change*]”.

No assessment is done by DVN for the first **Ramping Lead Time** minutes after a new dispatch is sent. This parameter value is intended to allow for communication of the new dispatch to the operator and for the operator to initiate movement of the generator to the new level. As a result, DVN does not expect the asset to be ramping during this time period.

Once **Ramping Lead Time** has expired, DVN calculates the amount of time required for the generator to progress to its new dispatch level. There are two methods for calculating this time as explained below. However, for explanation purposes we will assume that 'Default' has been selected. In this case, DVN expects the asset to move to its new dispatch level at precisely its Energy Trading System ("ETS") declared ramp rate. Thus in each minute, DVN can assess where the asset should be between the previous dispatch level and the new dispatch level. If the asset is outside **MW tolerance** of that expected level, DVN considers the asset as 'in deviation'. When the asset has been 'in deviation' for **Ramping Time Tolerance** minutes, DVN will generate the warning above. It will not generate a new warning until the deviation has been corrected. (To receive condition reminder messages see the **DVN Notification Reminders On** parameter).

Note: If an asset receives consecutive dispatches such that a new dispatch is received prior to the completion of the previous dispatch's ramping period, the new ramping period is calculated using the previous dispatch's MW level instruction and the new dispatch's MW level instruction. Any unused time from the previous ramping period is not carried into the new ramping period. The new ramping time includes ramping lead time plus ramping calculation, beginning at the time the new dispatch is effective.

3.1.3 No Deviations Message

When DVN has previously sent a level or ramping related warning message, as described above, and the condition no longer exists, the following message is sent to the market participant:

"[Asset ID] – No Energy Dispatch deviations currently detected".

3.1.4 Advance Dispatch Warning Message

This functionality will send a message via ADaMS at the effective time of a previously sent advance dispatch which serves as a reminder that the previously accepted advance dispatch is now in effect.

The message is sent only for the service types that the asset has subscribed to. For example, if an asset has subscribed to receive advance dispatch warning for all dispatch types and there is a change in 1 (Energy) out of 6 dispatch types, the message will specify a change in levels for the 1 changing dispatch type only. The following message will be sent to the market participant:

"Asset ID – Advance Dispatch Now Effective. Energy Dispatch level [Value]; at [Timestamp MST/MDT]"

3.1.5 Operating Reserve Obligation > AC Message

This functionality is intended to warn users when an asset may have more total OR commitments than it is able to meet. DVN will send a message via ADaMS if the asset AC in the current hour is less than the total OR obligation (SR, SUP and RR, active and standby) in the current hour. The total OR obligation is the sum of all active OR plus standby OR. A warning is triggered whenever an AC restatement or OR restatement is made in which Operating Reserve obligations become greater than the current AC. In such circumstances, the following message will be sent to the market participant:

"Warning [Asset ID]: Current OR obligations of [X MW] active and [Y MW] standby exceed current AC of [Z MW]"

This functionality can also send a warning message via ADaMS if the total OR obligation (SR, SUP and RR, active and standby) is greater than the declared AC for the upcoming hour. At 20

minutes and 8 minutes prior to the start of the hour, DVN will compare the upcoming AC to upcoming OR obligations. The following message will be sent to the market participant:

“Warning [Asset ID]: Next hour [HExy] OR obligations of [X MW] active and [Y MW] standby exceed next hour declared AC of [Z MW]”

When either of the above messages has been sent and subsequently DVN determines that the condition has been corrected, the following message will be sent:

“[Asset ID] Warning Removed: [Current hour/Next hour] OR obligations are now < AC.”

This functionality can also send a warning message via ADaMS if the total OR obligation (SR, SUP and RR, active and standby) is greater than the declared AC for a future hour. At 90 minutes prior to the start of an hour, DVN will compare the upcoming AC to upcoming OR obligations. The following message will be sent to the market participant:

“Warning [Asset ID]: Future hour [HExy] OR obligations of [X MW] active and [Y MW] standby exceed future hour declared AC of [Z MW]. You may wish to review.”

The above message acts strictly as a reminder and once the condition has been corrected, market participants will not receive a warning removed message. If the condition has not been corrected, market participants will still receive the current and next hour warning messages.

3.1.6 *Insufficient Regulating Reserve Range Message*

DVN will monitor an asset which has been dispatched to provide RR to identify conditions where either insufficient RR range has been configured for that asset or where control has not been appropriately turned over to the AGC controller. This functionality monitors both current RR dispatches as well as whether or not an asset is set up appropriately for an advance RR dispatch.

In the case of monitoring the current RR dispatch, DVN will check each minute as to whether or not the asset appears to be configured appropriately. If **RR Range Time Tolerance** consecutive minutes pass where the asset continues not to be configured appropriately, DVN will generate the following message:

“[Asset ID] has been dispatched for [X MW] of Regulating Reserve starting EAT [HH:MM] but only [Y MW] appears to be provided”

Once DVN assesses that the Regulating Reserve range has been corrected, the following message will be sent to the market participant:

“[Asset ID] now appears to be correctly providing Regulating Reserve.”

In the case when an advance dispatch for RR has been issued, DVN can generate a warning if the asset has not been set up by **RR Range Lead Time** minutes prior to the effective time of the dispatch. A message like the following would be generated:

“[Asset ID] has been dispatched for [X MW] of Regulating Reserve starting EAT [HH:MM] but only [Y MW] appears to be provided”

However, note that after the condition has been corrected, DVN does NOT generate a message to that affect. If the situation is not corrected, DVN will follow with a second warning once the dispatch becomes current. The absence of a second warning should be taken as an indication that the problem has been fixed.

In both types of monitoring, the parameter **RR Range MW Tolerance** can be set as a tolerance on the MW difference between the dispatched RR and configured RR such that no warning will be sent unless the discrepancy is greater than the configured tolerance.

3.1.7 *Wind and Solar Directive Warning Message*

This functionality will send a message via ADaMS when a curtailment directive has been issued to a wind or solar facility via SCADA, when that curtailment limit changes, and when the curtailment is lifted.

The following message will be sent when the curtailment directive is first issued or when that curtailment limit changes:

<Asset ID> – Wind Ramping Directive Now Effective. Curtailment limit <Curtail Limit in EMS message>; at <Timestamp of EMS message: YYYY/MM/DD HH24:MI MDT/MST>

The following message will be sent when the curtailment limit is removed:

<Asset ID> – End of Wind Curtailment at <Timestamp of EMS message: YYYY/MM/DD HH24:MI MDT/MST>

3.2 DVN Configuration

3.2.1 *Important Note for Wind and Solar Facilities*

DVN allows for the generation of warning messages when SCADA directives are issued to wind or solar facilities. Please note that although in the configuration screens described below, it appears possible to enable any DVN feature for a wind or solar facility, enabling many of the DVN features for these facilities may lead to erroneous and potentially misleading warning messages. DVN has not been designed for many of the unique configurations of wind and solar at this time.

The version of ISO Rules Section 304.3, *Wind and Solar Power Ramp Up Management*, which became effective September 1, 2018, revised requirements for wind and solar ramp-up management and changed user experience with the previously developed DVN Wind Directive Warning messages communicated via ADaMS. The Wind Directive Warning function can be turned on or off according to user preferences.

3.2.2 Configuring DVN Parameters

The DVN Configuration tab is available when logged in to ADaMS. Participants with dispatch rights for an asset where DVN has been requested have the ability to change the DVN parameters for the asset. Clicking on the DVN Configuration button (outlined in red below) will open a new tab in Internet Explorer and will also keep the ADaMS Participant View tab open.

Note: do not close the Participant View tab, as doing so will cause the user to be logged out of ADaMS

Within the DVN Configuration tab, participants are able to select the desired asset and click the [UPDATE] button (see below)

This brings up a window with a detailed view of the DVN configuration for the selected asset as shown below. Each of these parameters is described in detail in the following section.

Edit Compliance Asset Configuration	
Asset: TEST	
Dispatch Variance Notification - Save & Validate	
Dispatch Variance Detection On:	<input checked="" type="checkbox"/>
Ramping On:	<input checked="" type="checkbox"/>
MW Tolerance:	<input type="text" value="5"/>
Ramping Time Tolerance:	<input type="text" value="1"/>
Level Time Tolerance:	<input type="text" value="10"/>
Ramping Lead Time:	<input type="text" value="5"/>
DVN Notification Reminders On:	<input type="checkbox"/> Frequency (minutes): <input type="text"/>
Ramping Calculation Formula:	<input checked="" type="radio"/> Use Default <input type="radio"/> Use Rule 203.4
Generation Type:	<input type="text" value="Gross"/>
Advance Dispatch Notification - Save & Validate	
Advance Dispatch Warning On:	<input type="checkbox"/> Energy: <input checked="" type="checkbox"/> SR: <input type="checkbox"/> SUPG: <input type="checkbox"/> SUPL: <input type="checkbox"/> RR: <input type="checkbox"/> TMR: <input type="checkbox"/>
Advance Warning Dispatch Tolerance:	<input type="text" value="5"/>
OR Obligation > AC Notification - Save & Validate	
OR Obligation > AC Notification On:	<input checked="" type="checkbox"/> Default: <input checked="" type="checkbox"/> Future(T-90): <input checked="" type="checkbox"/>
RR Range Notification - Save & Validate	
RR Range Notification On:	<input type="checkbox"/>
RR Range Lead Time:	<input type="text" value="0"/>
RR Range Time Tolerance:	<input type="text" value="0"/>
RR Range MW Tolerance:	<input type="text" value="1.0"/>
RR Range Notification Reminders On:	<input type="checkbox"/> Frequency (minutes): <input type="text"/>
<input type="button" value="Cancel"/> <input type="button" value="Save"/>	

Note that wind and solar facilities will see a slightly different version of this display which includes the ability to configure wind or solar directive warnings as seen at the bottom of the following screen:

Edit Compliance Asset Configuration	
Asset: TEST	
Dispatch Variance Notification - Save & Validate	
Dispatch Variance Detection On:	<input checked="" type="checkbox"/>
Ramping On:	<input type="checkbox"/>
MW Tolerance:	<input type="text" value="5"/>
Ramping Time Tolerance:	<input type="text" value="1"/>
Level Time Tolerance:	<input type="text" value="10"/>
Ramping Lead Time:	<input type="text" value="5"/>
DVN Notification Reminders On:	<input type="checkbox"/> Frequency (minutes): <input type="text"/>
Ramping Calculation Formula:	<input checked="" type="radio"/> Use Default <input type="radio"/> Use Rule 203.4
Generation Type:	<input type="text" value="Gross"/>
Advance Dispatch Notification - Save & Validate	
Advance Dispatch Warning On:	<input checked="" type="checkbox"/> Energy: <input checked="" type="checkbox"/> SR: <input type="checkbox"/> SUPG: <input type="checkbox"/> SUPL: <input type="checkbox"/> RR: <input type="checkbox"/> TMR: <input type="checkbox"/>
Advance Warning Dispatch Tolerance:	<input type="text" value="5"/>
OR Obligation > AC Notification - Save & Validate	
OR Obligation > AC Notification On:	<input type="checkbox"/> Default: <input checked="" type="checkbox"/> Future(T-90): <input checked="" type="checkbox"/>
RR Range Notification - Save & Validate	
RR Range Notification On:	<input type="checkbox"/>
RR Range Lead Time:	<input type="text" value="0"/>
RR Range Time Tolerance:	<input type="text" value="0"/>
RR Range MW Tolerance:	<input type="text" value="1.0"/>
RR Range Notification Reminders On:	<input type="checkbox"/> Frequency (minutes): <input type="text"/>
Wind Directive Notification - Save & Validate	
Wind Directive Notification On:	<input type="checkbox"/>
<input type="button" value="Cancel"/> <input type="button" value="Save"/>	

3.2.3 Important Note for Energy Storage Facilities

Participants who enable DVN for energy storage assets should be aware that at this time the tool is unable to point to the asset's generation data which could lead to erroneous and potentially misleading warning messages. A future update to the DVN configuration specific to energy storage assets will correct this but in the interim the Dispatch Variance Notification functionality may not provide useful messaging. The Advance Dispatch Notification, OR Obligation > AC Notification, and the RR Range Notification functionalities should not be impacted by the generation data issue.

3.3 DVN Parameters

Each of the following sections describes parameter settings which customize DVN's functionality. The parameter descriptions are grouped based on the particular DVN functionality they pertain to.

Note that unless otherwise indicated, all parameters must be whole number values.

3.3.1 Dispatch Variance Functionality

This section describes the parameters that customize DVN's monitoring of an asset's generation relative to its current energy dispatch level.

3.3.1.1 Dispatch Variance Notification – Save & Validate

This check box should be checked if any changes that have been made are to be implemented when the 'save' button is selected. **Check this box to ensure any Dispatch Variance Notification changes are saved.**

3.3.1.2 Dispatch Variance Detection On

Leave this checkbox unchecked ONLY if you do not wish to get any dispatch variance related warnings from DVN. **For default behavior 'check' this box.**

3.3.1.3 Ramping On

If this checkbox is NOT checked then no warnings during the ramping period, for example slow progress to new dispatches, will be sent. In such a case, DVN will only send messages after it has determined that the asset should have achieved its new dispatch level.

If the previous checkbox is checked and this is also checked, then DVN will monitor the assets progress towards each new dispatch and generate warnings when it is progressing too slowly throughout the 'ramping period'. See the explanation in 3.1.2 for further details. **For default behavior 'check' this box.**

3.3.1.4 MW Tolerance

MW Tolerance is relevant in DVN's assessment of both ramping and level deviations (as discussed in 3.1.1 and 3.1.2 above). It is a tolerance band around the expected generation level that inhibits DVN warnings when the generation falls within the tolerance band.

DVN will only consider issuing warnings if the difference between generation and expected generation level exceeds this tolerance. **For default behavior set this to 5 MW for assets with MC of less than 200 MW and set it to 10 MW otherwise.**

3.3.1.5 Ramping Time Tolerance

This parameter value is taken into account by DVN when an asset is ramping slower than expected to a new dispatch level. If the asset has been dispatched down/up and the actual generation is more than **MW Tolerance** above/below the expected level for a period exceeding **Ramping Time Tolerance**, a DVN warning is issued. The expected level is determined by assuming a linear ramp to the new dispatch at the ETS declared ramp rate for the asset. **For default behavior, set this to 5 minutes.**

3.3.1.6 **Level Time Tolerance**

This parameter value is taken into account by DVN only when an asset is assumed NOT in the process of responding to a new dispatch. In such cases, if the actual generation of an asset is more than **MW Tolerance** above/below the current dispatched level for a period exceeding **Level Time Tolerance**, a DVN warning is issued. **For default behavior set this to 5 minutes.**

3.3.1.7 **Ramping Lead Time**

This parameter is used to capture the number of minutes required to convey a new dispatch to the plant. For some assets there is a formal protocol for conveying a dispatch, which is received by the trading floor, to the plant. In other cases, the dispatch is received directly by the plant. This parameter models the delay between receipt of the dispatch and changing the generator control. DVN does not begin to assess response to a new dispatch until after this period of **Ramping Lead Time** has expired.

In short, this indicates the number of minutes after a new dispatch before DVN should begin monitoring the response to the new dispatch. **For default behavior set this to 10 minutes.**

3.3.1.8 **Ramping Calculation Formula**

DVN has the ability to assess the speed with which an asset is progressing towards its new dispatch through two methods. Ramping calculations for both methods begin AFTER the **Ramping Lead Time** has expired. **For default behavior set this to 'Default'.**

Default:

After receiving a dispatch, DVN will wait for the Ramping Lead Time to expire. DVN will then calculate how many minutes the asset should take to ramp to the new level by dividing the dispatch change in MWs by the ETS declared ramp rate for the asset.

In each minute after **Ramping Lead Time** has expired, DVN will assess whether generation is within a **MW Tolerance** of the expected level. If the asset generation consecutively falls outside the expected level for **Ramping Time Tolerance** minutes, then DVN will send a **Ramping Variance Message**.

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After receiving a dispatch, DVN will wait for the **Ramping Lead Time** to expire. DVN will then calculate how many minutes the asset should take to ramp to the new level by dividing the dispatch change by the ETS declared ramp rate and then multiplying by 1.4. Using this calculation method plus a 10 minute value for **Ramping Lead Time** will replicate the time allowed in ISO rule 203.4 for achieving the new dispatch level.

In each minute after **Ramping Lead Time** has expired, DVN will assess whether generation is within a **MW Tolerance** of the estimated generation level. If the asset generation consecutively falls outside the tolerance for **Ramping Time Tolerance** minutes, then DVN will send a **Ramping Variance Message**.

3.3.1.9 **DVN Notification Reminders On**

After receiving a message identifying a DVN condition has been triggered for an asset, no further messaging for the triggered condition is issued until the deviation no longer exists and a **No Deviations Message** is issued. To receive reminders that a triggered

condition is still active, a market participant can enable the **DVN Notification Reminder On** functionality by checking the associated box on the DVN Configuration page. When this parameter is enabled, the market participant will be reminded, at a participant-specified frequency, when a DVN condition remains for a particular asset. The reminder messages will continue until the warning condition is no longer detected and the **No Deviations Message** is issued, or the market participant updates the settings of the **DVN Notification Reminders**. [Check this box to enable this parameter.](#)

Frequency (minutes)

This parameter specifies at what interval in minutes the market participant should receive the reminder messages for any triggered dispatch variance, or ramping variance conditions, starting from the time that the triggered condition was first detected. Permitted values are whole numbers ranging at or between 5 and 120 minutes. For example, if the frequency is set at 30, a reminder notification about any active dispatch variance or ramping variance condition for an asset will be issued every 30 minutes starting from the minute the condition was first triggered and continue until the condition is no longer detected on that asset. Note that the reminder messages will be sent to all of the asset's primary and CC ADaMS user(s) at the same frequency. [Enter a whole number, >=5 and <=120 minutes.](#)

3.3.2 Advance Dispatch Notification Functionality

This section describes the parameters that customize DVN's ability to inform a market participant that a previously acknowledged dispatch has become effective.

3.3.2.1 Advance Dispatch Notification – Save & Validate

This check box should be checked if any changes that have been made are to be implemented when the 'save' button is selected. [Check this box to ensure Advance Dispatch Notification changes are saved.](#)

3.3.2.2 Advance Dispatch Warning On/Off

Selecting “On” in the first checkbox indicates that Advance Dispatch Warning messages will be sent to the relevant asset.

The adjacent check boxes allow selection of which types of advance dispatches that advance warnings should be generated. There are six (6) types of services that are currently available to the participants: Energy, RR, SR, SUP and TMR services. [For default behavior, check all boxes in this section.](#)

3.3.2.3 Advance Dispatch Warning Tolerance

Warning messages will be sent when the advance dispatch is sent at least this many minutes prior to the effective time. Permitted values are whole numbers between 1 and 9 where a setting of '5 minutes' would mean that a warning would be issued at the effective time of the dispatch ONLY when the advance dispatch was sent 5 minutes or more prior to the effective time. A value of '1 minute' would cause a warning to be generated for all advance dispatches. [For default behavior, use 5 minutes for this section.](#)

Note that current hour dispatches are issued between 2 to 3 minutes in advance of the effective time. If a value of 3 or greater is entered for the “Advance Dispatch Warning

Tolerance”, then a warning will not be generated when these dispatches become effective but will still be generated for any next hour dispatches issued as an advance dispatch at least 3 minutes in advance of the top-of-the-hour effective time.

3.3.3 **OR Obligation > AC Notification Functionality**

This section describes the parameters that apply to DVN's functionality for notifying when total OR obligations exceed the declared AC of an asset.

3.3.3.1 **OR Obligation > AC Notification – Save & Validate**

This check box should be checked if any changes that have been made are to be implemented when the 'save' button is selected. **Check this box to ensure OR Obligation > AC Notification Functionality changes are saved.**

3.3.3.2 **OR Obligation > AC Notification On**

Ensure this checkbox is checked to enable DVN to issue warnings when total OR obligations appear to exceed the declared AC for an asset.

If the Default checkbox is checked, DVN will issue warning messages at 20 minutes and 8 minutes prior to next hour as well as during the current hour. If the Future(T-90) box is checked then DVN will issue warning messages at 90 minutes prior to the start of an hour.

3.3.4 **RR Range Notification Functionality**

This section describes the parameters that DVN uses to monitor the RR provided by an asset that is subject to an RR dispatch.

3.3.4.1 **RR Range Notification – Save & Validate**

This check box should be checked if any changes that have been made are to be implemented when the 'save' button is selected. **Check this box to ensure RR Range Notification changes are saved.**

3.3.4.2 **RR Range Notification – On/Off**

This check box should be checked to enable DVN warnings regarding an asset's appropriate configuration to respond to a current RR dispatch. The following 3 parameters are only relevant if this check box is set to 'On'.

3.3.4.3 **RR Range Lead Time**

This parameter value is taken into account by DVN when an asset is advance dispatched to provide Regulating Reserve. It is a negative value (in minutes) that when added to the effective time of the advance dispatch yields the time by which DVN will consider the asset for appropriate set up to provide the RR. If the value is 0, then DVN will not check until the effective time of the dispatch. If the value is -2, then DVN will check the setup of the asset 2 minutes prior to the effective time of the dispatch. **Suggested value: 0 minutes**

Note that a warning will only be generated after also taking into account the value of **RR Range MW Tolerance**.

3.3.4.4 **RR Range Time Tolerance**

This parameter is relevant when an asset is currently dispatched to provide Regulating Reserve. DVN will identify where the asset does not appear set up correctly to provide that RR but will not issue a message unless the state continues for **RR Range Time Tolerance** consecutive minutes after first being detected. **Suggested value: 3 minutes.**

Note that a warning will only be generated after also taking into account the value of **RR Range MW Tolerance**.

3.3.4.5 **RR Range MW Tolerance**

When DVN is comparing the dispatched amount of RR to the amount the asset appears to have been configured to provide, DVN will ignore any discrepancies of magnitude less than this parameter. That is, warnings will only be generated when the discrepancy is larger than this tolerance. Note that to calculate the amount of RR that the asset appears to be providing, the functionality uses the integer value of the asset's High and Low Automatic Generation Control setting, it does not round or consider decimals.

Enter a whole number, ≥ 0 and ≤ 5 MW. Suggested value: 0 or 1 MW.

3.3.4.6 **RR Range Notification Reminders On**

After receiving a message identifying a RR Range Notification condition has been triggered for an asset, no further messaging for the triggered condition is issued until the deviation no longer exists. To receive reminders that a triggered condition is still active, a market participant can enable the **RR Range Notification Reminder On** functionality by checking the associated box on the DVN configuration page. When this parameter is enabled the market participant will be reminded, at a participant-specified frequency, when a DVN condition remains for a particular asset. The reminder messages will continue until the warning condition is no longer detected, or the market participant updates the settings of the **RR Range Notification Reminder On**. **Check this box to enable the parameter.**

Frequency (minutes)

This parameter specifies at what interval in minutes the market participant should receive the reminder messages for any triggered RR Range conditions, starting from the time that the triggered deviation condition was first detected. Permitted values are whole numbers ranging at or between 5 and 120 minutes. For example, if the frequency is set at 30, a reminder notification about any active RR Range condition for an asset will be issued every 30 minutes starting from the minute the condition was first triggered and continue until the condition is no longer detected on that asset. Note that the reminder messages will be sent to all of the asset's primary and CC ADaMS user(s) at the same frequency. **Enter a whole number, ≥ 5 and ≤ 120 minutes.**

3.3.5 Wind and Solar Directive Warning Functionality

The following functionality is only available for wind and solar assets.

[Important: see note in Section 3.2.1]

3.3.5.1 Wind Directive Notification – Save & Validate

This check box should be checked if any changes that have been made are to be implemented when the 'save' button is selected. **Check this box to ensure Wind Directive Warning changes are saved.**

3.3.5.2 Wind Directive – On/Off

This check box should be checked to enable issuing DVN warnings when a SCADA curtailment directive is issued to a wind or solar facility. The nature of DVN operation is such that it may be a minute or two delay after a wind or solar curtailment directive is issued via SCADA before the corresponding DVN warning is issued.

3.4 DVN Sound Alert

DVN warnings have associated sounds. In the ADaMS participant view, these can be enabled/disabled as follows.

- The “DVN Variance Audible” functionality allows the market participant to receive an audible alert when a level deviation occurs (as described above).
- The “DVN Ramp Audible” functionality allows the market participant to receive an audible alert when an asset has not ramped to the appropriate dispatch level in the specified time as described above.
- The “DVN Advance Warning Audible” functionality allows the market participant to receive an audible alert when an asset receives an advance dispatch warning notification. The checkbox is checked by default.

In the case of all three audible parameters, the sound alarm (alert) feature can be turned on and off by the market participants themselves by unchecking the appropriate checkbox for any of the three audible features.

4. DVN Registration Form Instructions

The DVN utility is available only to a market participant who subscribes to it by submitting a completed “ADaMS Dispatch Variance Notifications – Asset Request and Acknowledgement Form” (“DVN registration form”) to the AESO.

The DVN registration form can be found under Additional Resources on the ISO Rules Compliance Monitoring portion of AESO website (www.aeso.ca > Rules, Standards and Tariff > Compliance Monitoring > ISO Rules > Additional Resources).

4.1 Participant Information

The information required in this section of the form is both mandatory and self-explanatory.

4.2 Agent Information

When an authorized agent of a market participant (in accordance with the ISO rules) wishes to receive the DVN warning messages, both sections of the DVN registration form - “Participant Information” and

“Agent Information”, must be completed. The agreement and consent of both the market participant and agent is required in order for the AESO to process this request. The information required in this section of the form is both mandatory and self-explanatory.

4.3 Asset Configuration Information

All fields below are mandatory.

4.3.1 Asset Name (or names)(as assigned by the AESO)

List the asset name (or names) as assigned by the AESO and presented in ETS. It is mandatory information.

4.3.2 Asset ID(s)

List the asset ID (or asset ids) as assigned by the AESO and presented in ETS. It is mandatory information.

The configuration indicated in the following fields is applicable to all assets included in the “Asset Name (or names)” field.

4.3.3 Requested Effective Date

List the date on which the DVN monitoring is requested to be effective. The AESO will make reasonable efforts to commence DVN monitoring within 2 business days of the requested date.

4.4 Participant Agreement and Consent

The information required in this section of the form is mandatory and self-explanatory.

4.5 Agent Agreement and Consent

The information required in this section of the form is mandatory and self-explanatory.

4.6 DVN Registration Form Submission Method

The completed form must be submitted to the AESO through email to info@aeso.ca.

5. Revision History

Revision	Date	Effective Date	
Version 1.0	May 5, 2010	May 5, 2010	Posted on the AESO's website.
Version 2.0	April 18, 2012	April 24, 2012	Updates for Advance Dispatch Warning functionality
Version 3.0	February 11, 2015	February 17, 2015	Updates for DVN Configuration and additional Ramp Rate Calculation
Version 3.1	April 21, 2015	April 28, 2015	Updates for DVN Operating Reserve functionality and Messages
Version 3.2	November 28, 2016	November 28, 2016	Updates for DVN warnings to wind assets
Version 3.3	December 14, 2016	December 14, 2016	Added warning re use of DVN for wind
Version 3.4	January 25, 2018	January 25, 2018	Added DVN Notification Reminders and RR Range Notification Reminders. Formatting and minor edits.
Version 3.5	November 27, 2018	November 27, 2018	Added clarification to ramping calculation with consecutive dispatches, OR > AC, and Wind Directive Warning messages. Formatting and minor edits.
Version 3.6	July 9, 2019	July 9, 2019	Updates for Advance Dispatch Warning Tolerance. Updated template. Minor formatting edits.
Version 4.0	October 20, 2020	October 20, 2020	Updates to Applicability, Operating Reserve Obligation > AC Message, OR Obligation > AC Notification On, RR Range MW Tolerance and DVN Registration Form Instructions. Updated screenshots.
Version 4.1	March 10, 2021	March 10, 2021	Added Important Note for Energy Storage Facilities. Formatting and minor edits.