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March 27, 2018
Webinar

Demand Response Auditing

Jim Nichols

Lead Analyst, Asset Registration & Auditing

Kory Haag

Principal Operations Analyst, Transmission Operations & Technical Studies



Acronyms

ADCR	active demand capacity resource	NCPC	Net Commitment-Period Compensation
ATT	Audit and Testing Tool	NERC	North American Electric Reliability Corporation
CAMS	Customer Asset Management System	PRD	price-responsive demand
CCA	claimed capability audit	RTU	remote terminal unit
DDE	demand-designated entity	SA	security administrator
DDP	desired dispatch point	SMD	Standard Market Design
DRA	demand response asset	TMSR	10-minute synchronized reserves
DRR	demand response resource	TMNSR	10-minute non-synchronized (nonspinning) reserves
DRMUI	Demand Response Market User Interface	TMOR	30-minute operating reserves
FRPP	forward reserve procurement period	UCM	unit control mode

Price-Responsive Demand Training

Release Date	Training Title
Oct 23, 2017	Demand Resources Working Group: Fully Integrated Price Responsive Demand Presentation
Nov 7, 2017	Price-Responsive Demand Overview
Feb 28, 2018	Energy Market Offers & Asset Management
Mar 8, 2018	Q1 Settlements Forum
Mar 22, 2018	Demand Response Registration
Mar 27, 2018	Demand Response Auditing
Mar 29, 2018	Passive Demand Resource Registration and Auditing

References

Operating Procedures

- No. 8 – [Operating Reserve and Regulation](#)
- No. 23 – [Generator Resource Auditing](#)

Manuals

- M-MVDR – [Measurement and Verification of Demand Reduction Value from Demand Resources](#)
- M-RPA – [Registration and Performance Auditing](#)

Tariff

- III.1.5.1 – [Claimed Capability Audits](#)
- III.1.7.12 – Seasonal DR Audit Value of an Active Demand Capacity Resource*

* Will be in the revised Tariff

Purpose of This Training

Prepare active demand resources for the new or changing audit requirements that will go into effect with price-responsive demand (PRD) on June 1, 2018



Topics

Seasonal DR audits for active demand response resources (DRR)

- Auditing rules and requirements
- DR Auditing and Testing Tool (ATT)
- Live software demo

Claim 10/30 DR audits for active DRR

Reserves

Claimed Capability Auditing (CCA) for Demand Response

Jim Nichols

Information About Audits in the Tariff

Specific Locations

PRD rules go into effect on June 1, 2018

Market Rule 1

- III.1.5.1 – Claimed Capability Audits
 - III.1.5.1.1 – General Audit Requirements
 - III.1.5.1.3.1 – Seasonal DR Audits
 - III.1.5.1.4 – ISO Initiated Claimed Capability Audits
- III.1.7.12 – Seasonal DR Audit Value of an Active Demand Capacity Resource

Claimed Capability Auditing for DR

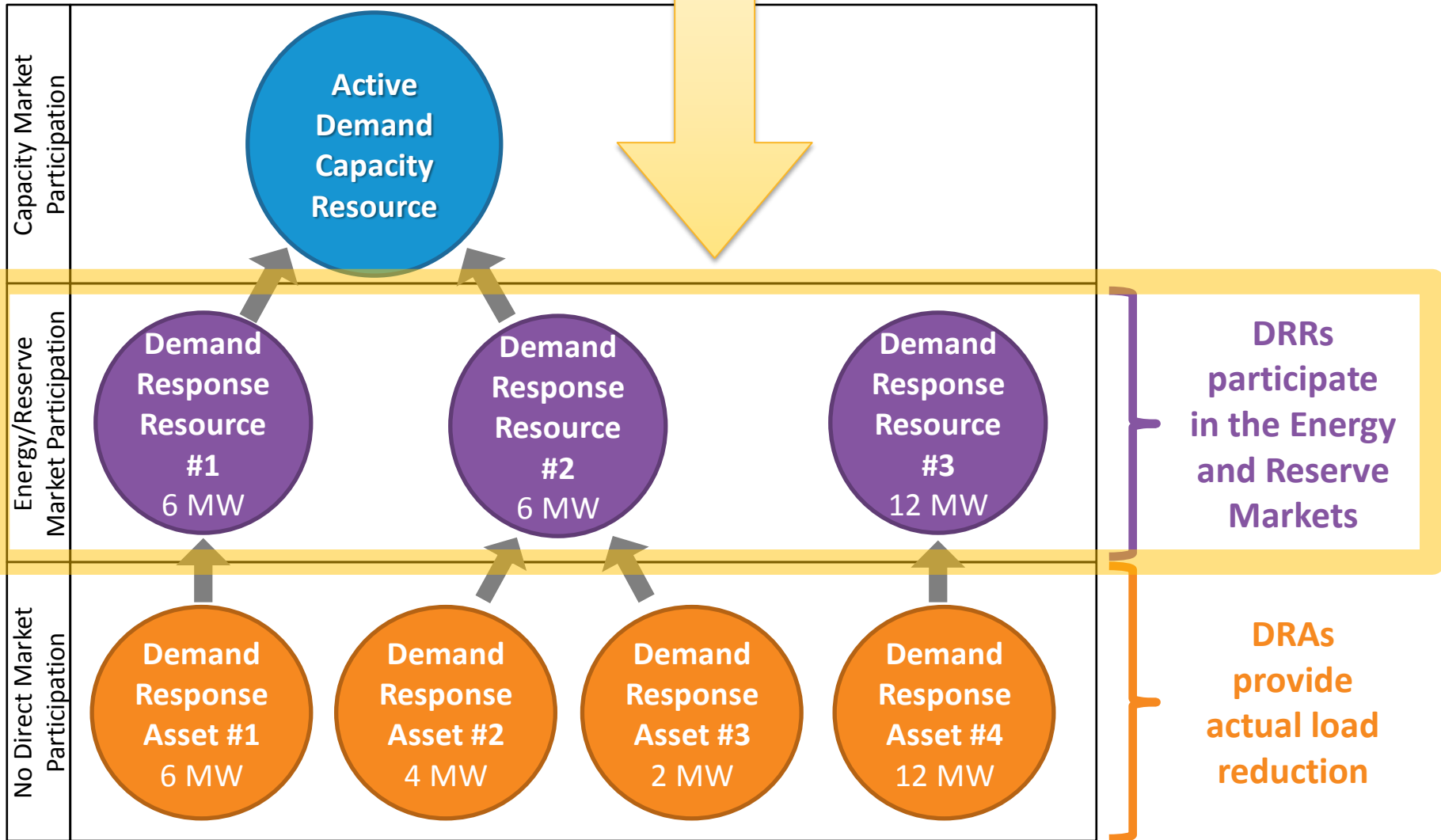
Main Topics

Auditing rules and requirements

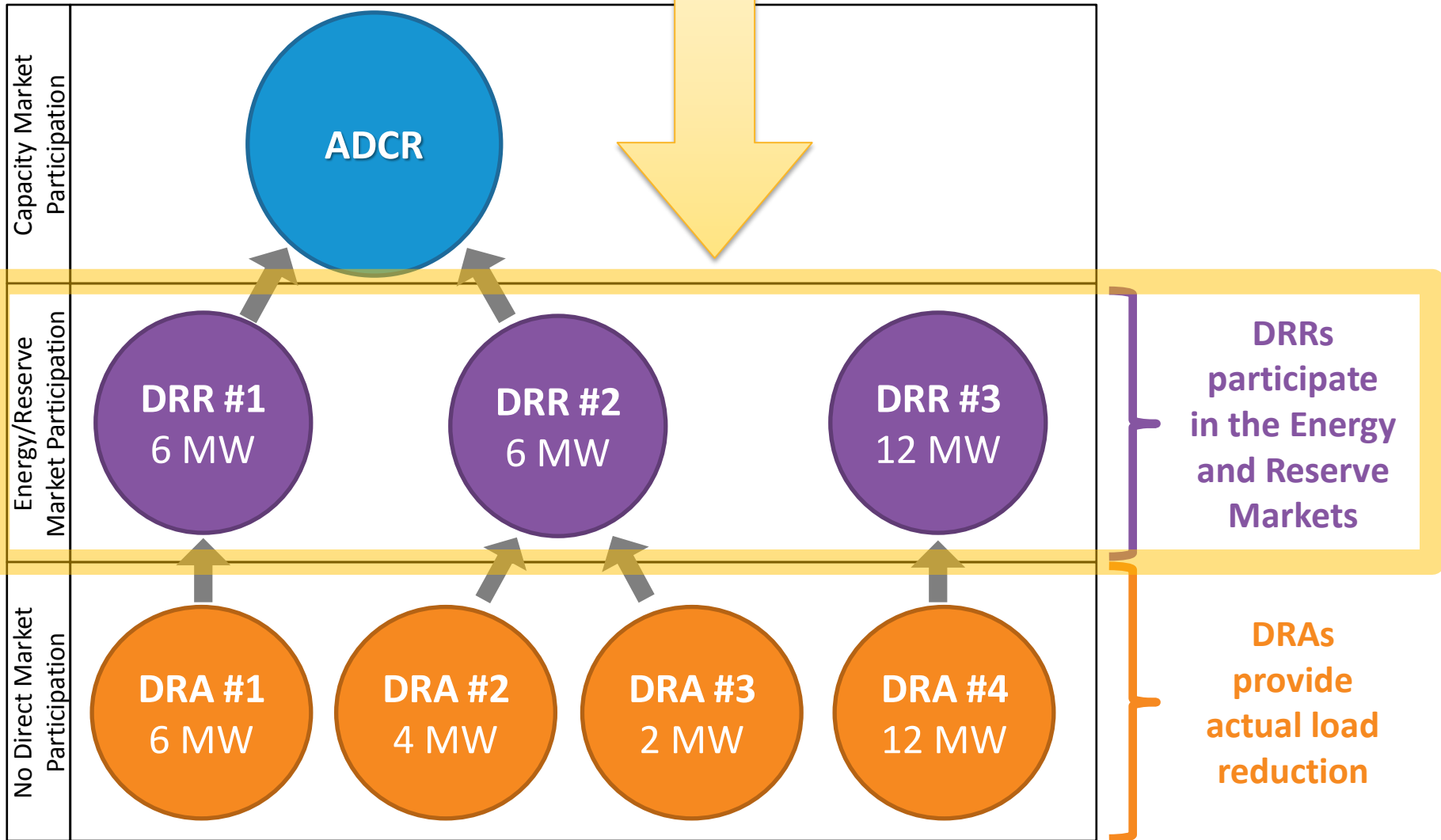
Auditing and Testing Tool (ATT)

- Including live demo

Claimed Capability Audits Are Performed by DRRs



Claimed Capability Audits Are Performed by DRRs



Types of CCAs

Seasonal DR audit

- Customer initiated
 - Request to be dispatched for an audit
 - Use a past dispatch

ISO-initiated audit

- A seasonal DR audit that is initiated by the ISO

Seasonal DR Audits

Audit Seasons

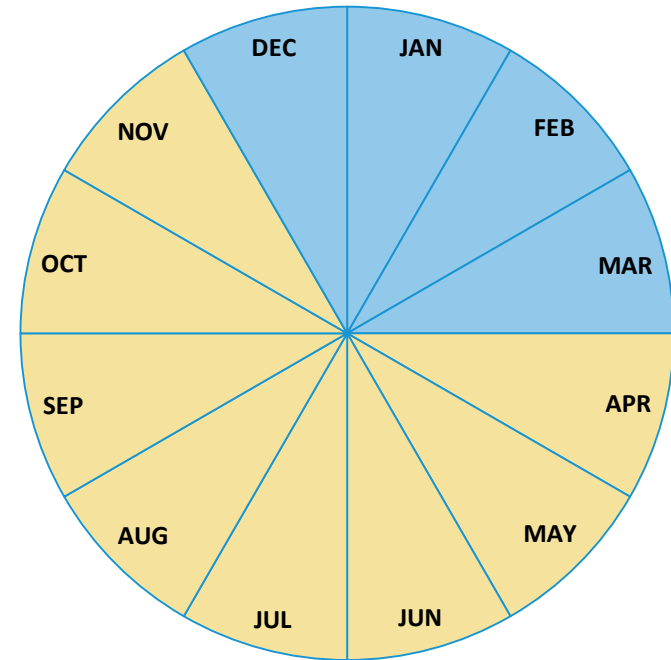
Seasonal DR audits determine the ability of a DRR to perform during specified months for a specified duration

Summer seasonal DR audit must be conducted:

- At least once every capability demonstration year
- During the months of April through November

Winter seasonal DR audit must be conducted:

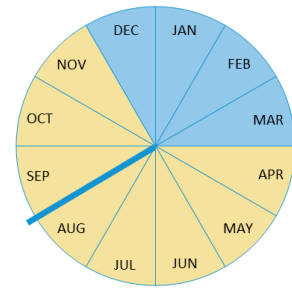
- At least once every capability demonstration year
- During the months of December through March



You can submit multiple audits for a DRR

Capability Demonstration Year

September 1 through August 31



2017/2018

2018/2019

2019/2020

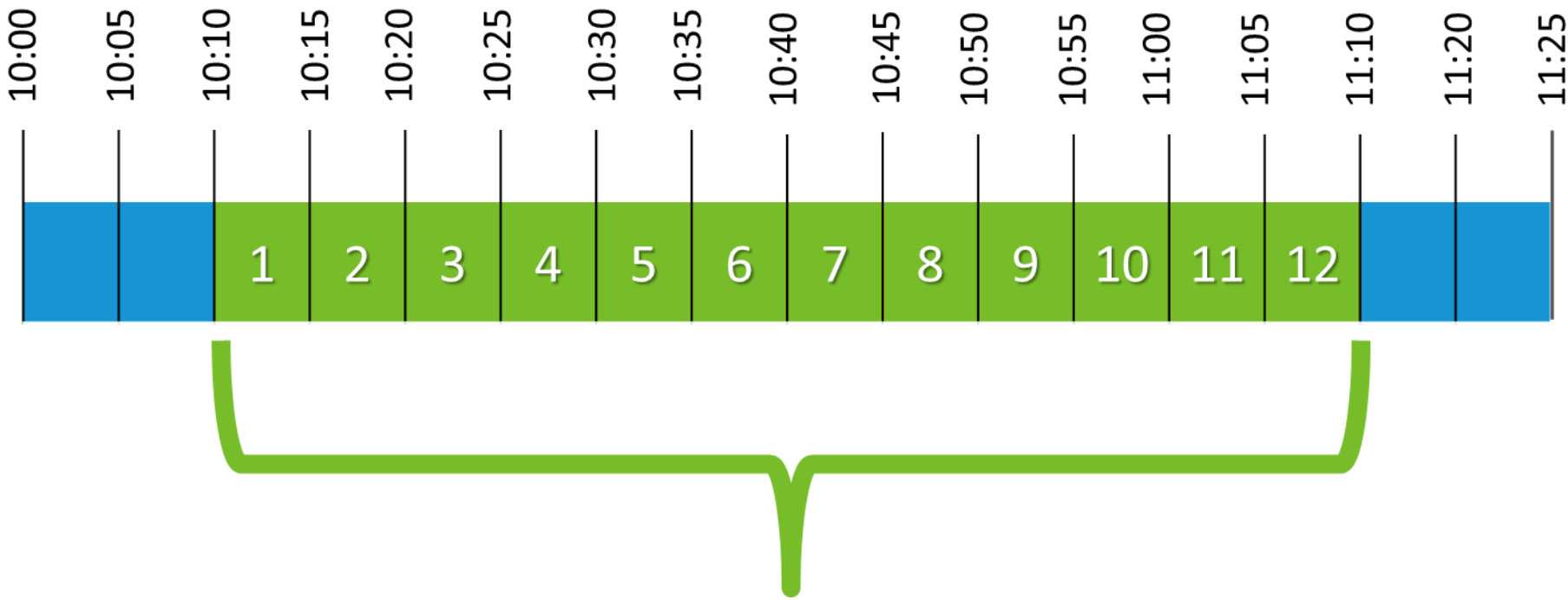
Sep-2017	Oct-2017	Nov-2017	Dec-2017	Jan-2018	Feb-2018	Mar-2018	Apr-2018	May-2018	Jun-2018	Jul-2018	Aug-2018	Sep-2018	Oct-2018	Nov-2018	Dec-2018	Jan-2019	Feb-2019	Mar-2019	Apr-2019	May-2019	Jun-2019	Jul-2019	Aug-2019	Sep-2019	Oct-2019	Nov-2019	Dec-2019	Jan-2020	Feb-2020	Mar-2020	Apr-2020	May-2020	Jun-2020	Jul-2020	Aug-2020
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Audit in Aug

Need to audit again sometime in a 2018/2019 summer month

Audit Time Requirement

Performed for 12 contiguous 5-minute intervals



12 contiguous 5-min intervals

Submitting an Audit: 2 Options

A red oval button with a white shadow, containing the text "Request Audit Dispatch" in white.

**Request Audit
Dispatch**

A blue oval button with a white shadow, containing the text "Use Past Dispatch" in white.

**Use Past
Dispatch**

Option: Request Audit Dispatch

Request
Audit
Dispatch

- You enter your request via ATT
- ISO will dispatch between 0800 and 2200
 - Non-NERC holiday weekday
 - Within 5 business days following the request
 - Specific date and time unannounced
- Dispatch instruction will contain an audit flag and will order DRR to its offered max reduction
 - Audit start will be the first 5-minute interval after sufficient time has been allowed for your resource to ramp
 - Based on its demand reduction offer parameters in eMarket
 - You don't qualify for Net Commitment-Period Compensation (NCPC) if you request a dispatch for an audit

Cancelling an Audit – 2 Steps

Request
Audit
Dispatch

Lead market participant may cancel an audit request

prior to issuance of the audit dispatch instruction

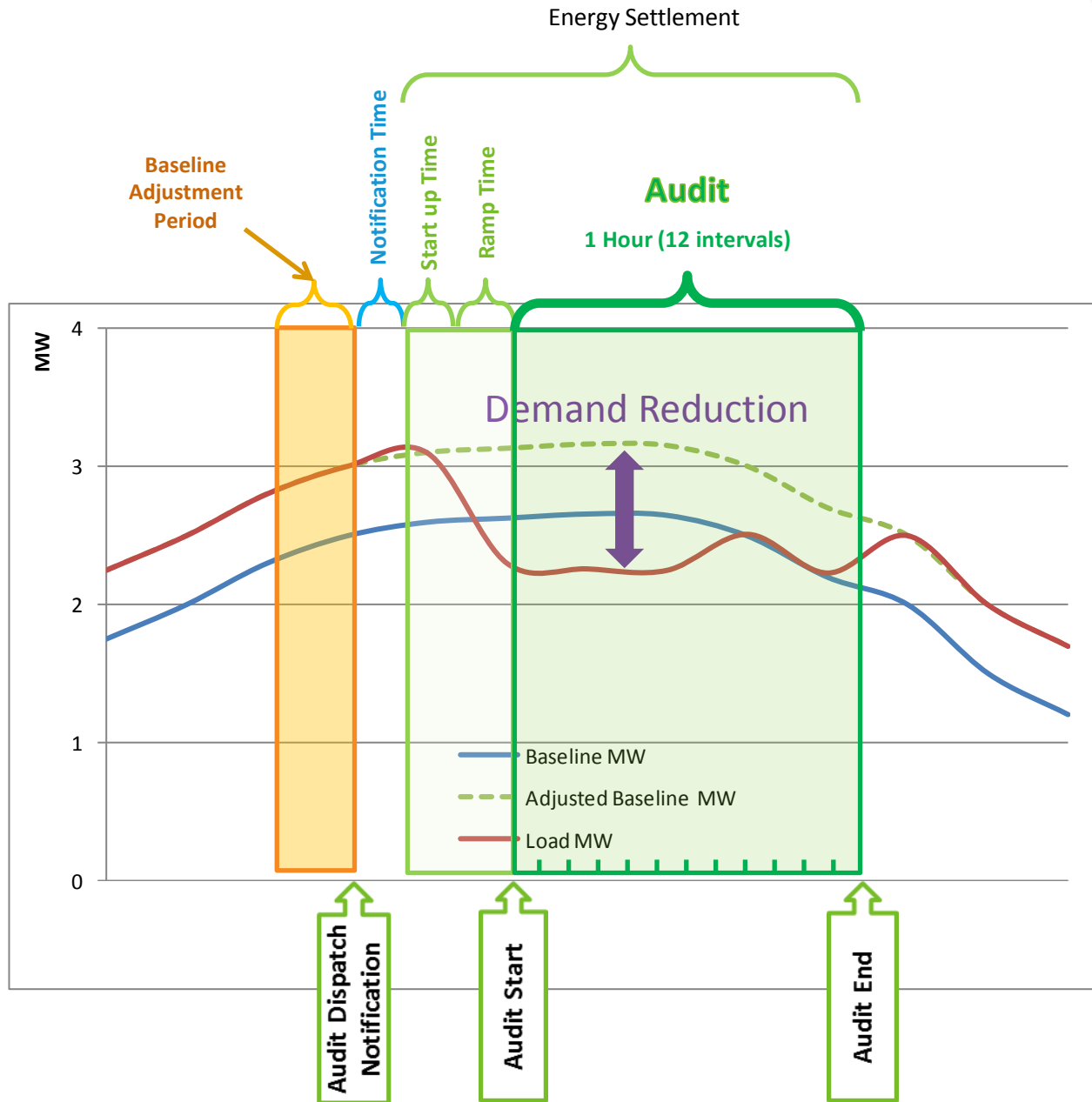
Perform *both* of these actions to ensure DRR is not dispatched:

1. Demand-designated entity (DDE) call ISO control room
2. Cancel audit request in ATT (person with lead market participant access)



Audit Period for ISO Dispatch - Fixed

Request
Audit
Dispatch



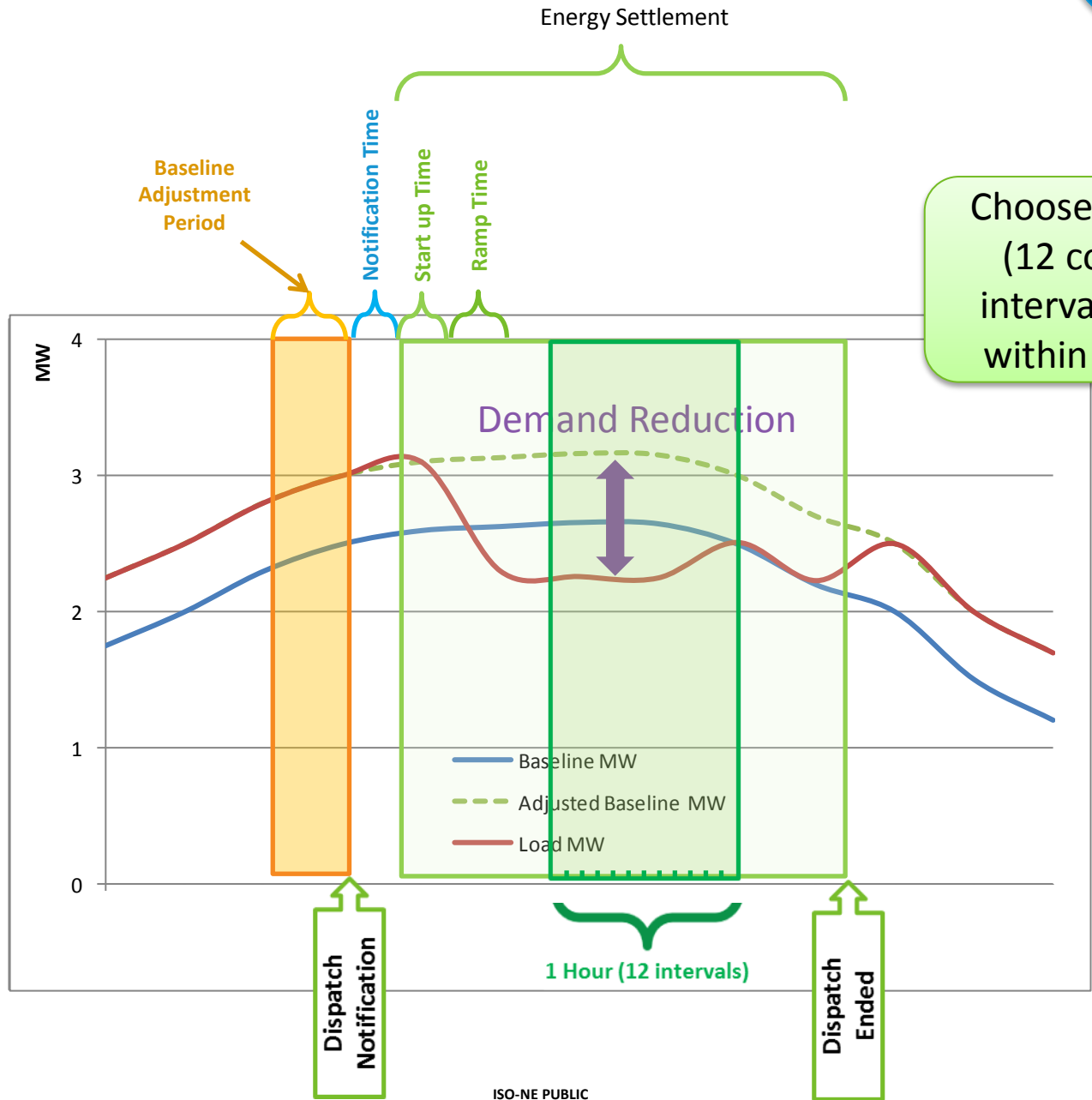
Option: Use a Past Dispatch

Use Past
Dispatch

- Can choose 12 contiguous 5-minute intervals during a past dispatch
 - Starting with any 5-minute interval after the completion of notification time
 - Performance information can be accessed via demand response market user interface (DRMUI)
- Lead market participant must notify the ISO
 - Via ATT
 - By 5:00 p.m. on the fifth business day following the dispatch
 - Enter the date and start time
- Request cannot be cancelled
 - If submission has less than 12 valid 5-min intervals → cancelled

Audit Period for a Past Dispatch – You Choose

Use Past Dispatch



Choose any 1 hour (12 contiguous intervals) that fall within a dispatch

Seasonal Audit Value of a DRR

Sum of the average demand reductions demonstrated during the audit by each of the DRAs associated with it

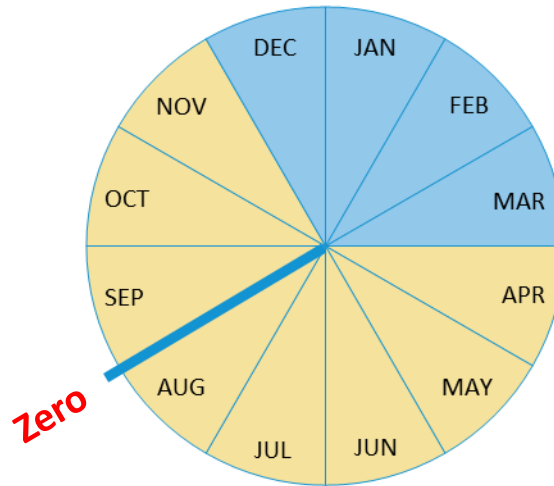
- A DRA must be operational to contribute to the audit
- Any DRA on a forced or scheduled curtailment is assessed a zero contribution

Results effective one day following processing of the audit results by the ISO

Effect of DRA **Not** Performing an Audit

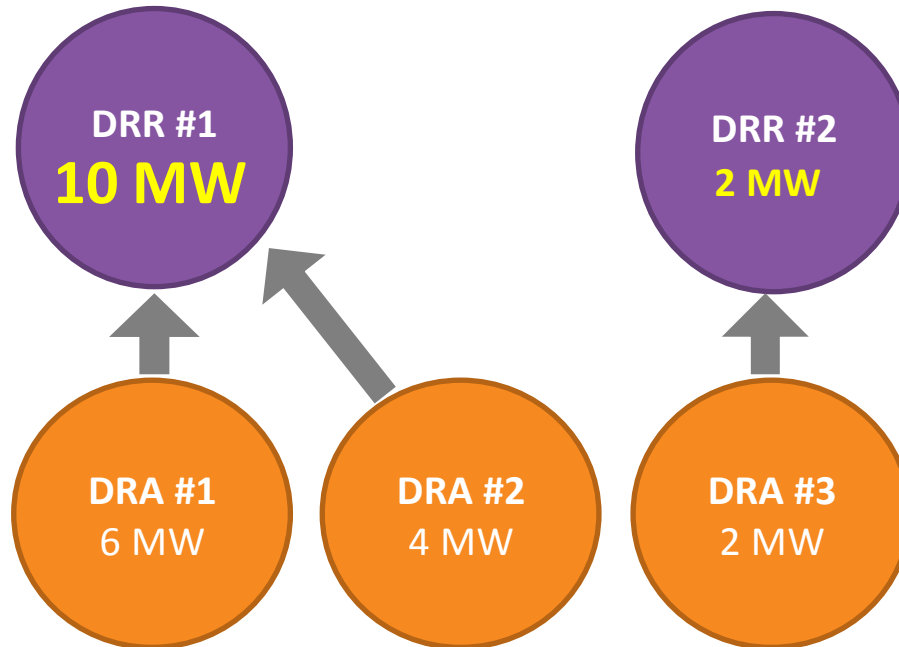
As Part of a DRR During a Demonstration Year

Its audit contribution for the missed season will be set to zero at end of demonstration year



Effect of Adding or Removing DRAs from a DRR

DRR's seasonal DR audit value is updated to match new configuration



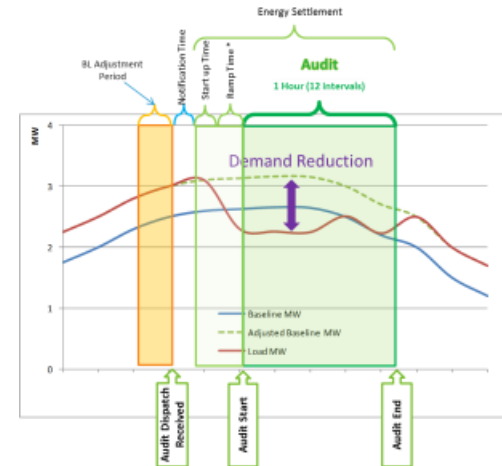
ISO-Initiated CCA

ISO-Initiated CCA

- ISO may call on a DRR to perform at any time
- Audit is unannounced
- Results replace either summer or winter seasonal DR audit value
- Fulfills the seasonal DR audit obligation of a DRR

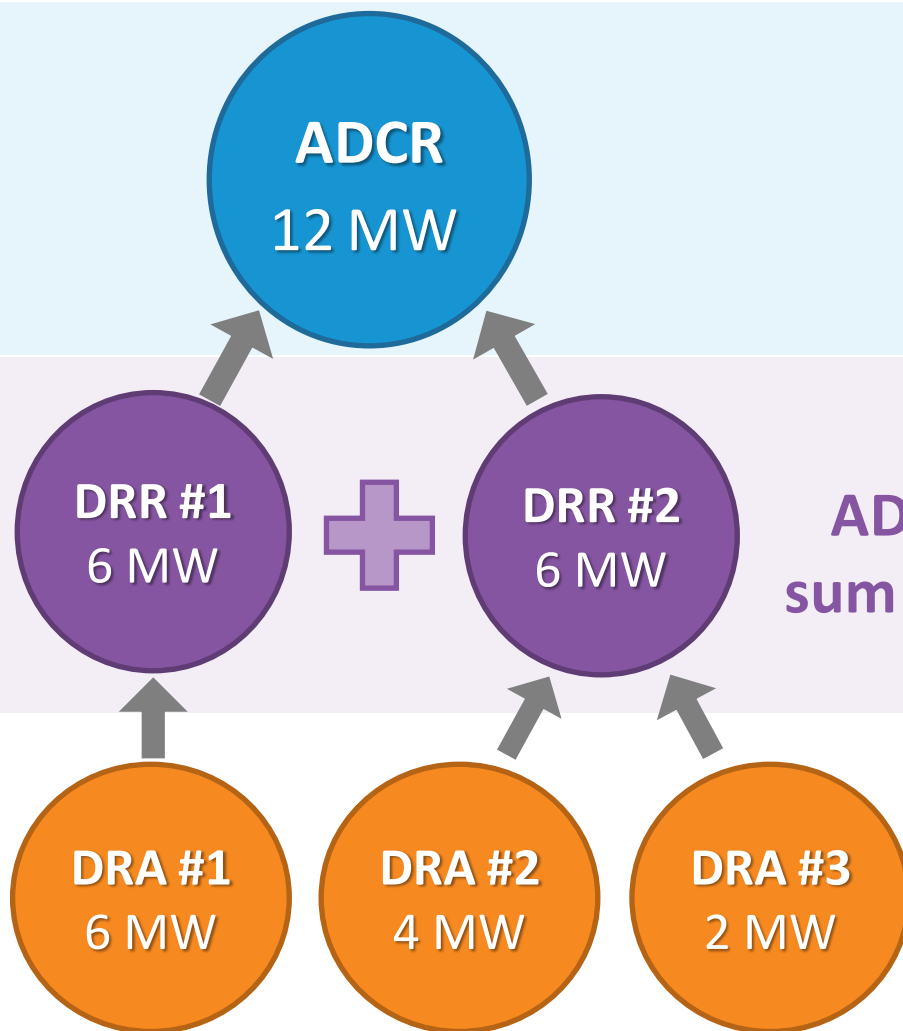
How an ISO-Initiated Audit Works

- Dispatch instruction will order DRR to its offered max reduction
- Audit is 1 hour and will start with the first five-minute interval after sufficient time has been allowed for the resource to ramp (based on its demand reduction offer parameters)
- These audits are evaluated for NCPC compensation
 - In accordance with Market Rule 1, Appendix F - Net Commitment-Period Compensation (NCPC) Accounting



Active Demand Capacity Resource (ADCR)

Seasonal DR Audit Value of an ADCR



Seasonal DR audit values are maintained for all ADCRs

ADCR seasonal DR audit value is sum of its DRRs' seasonal DR audits

Impacts of Audits on FCM

As of June 1, 2018: audit results will not be used for FCM settlement

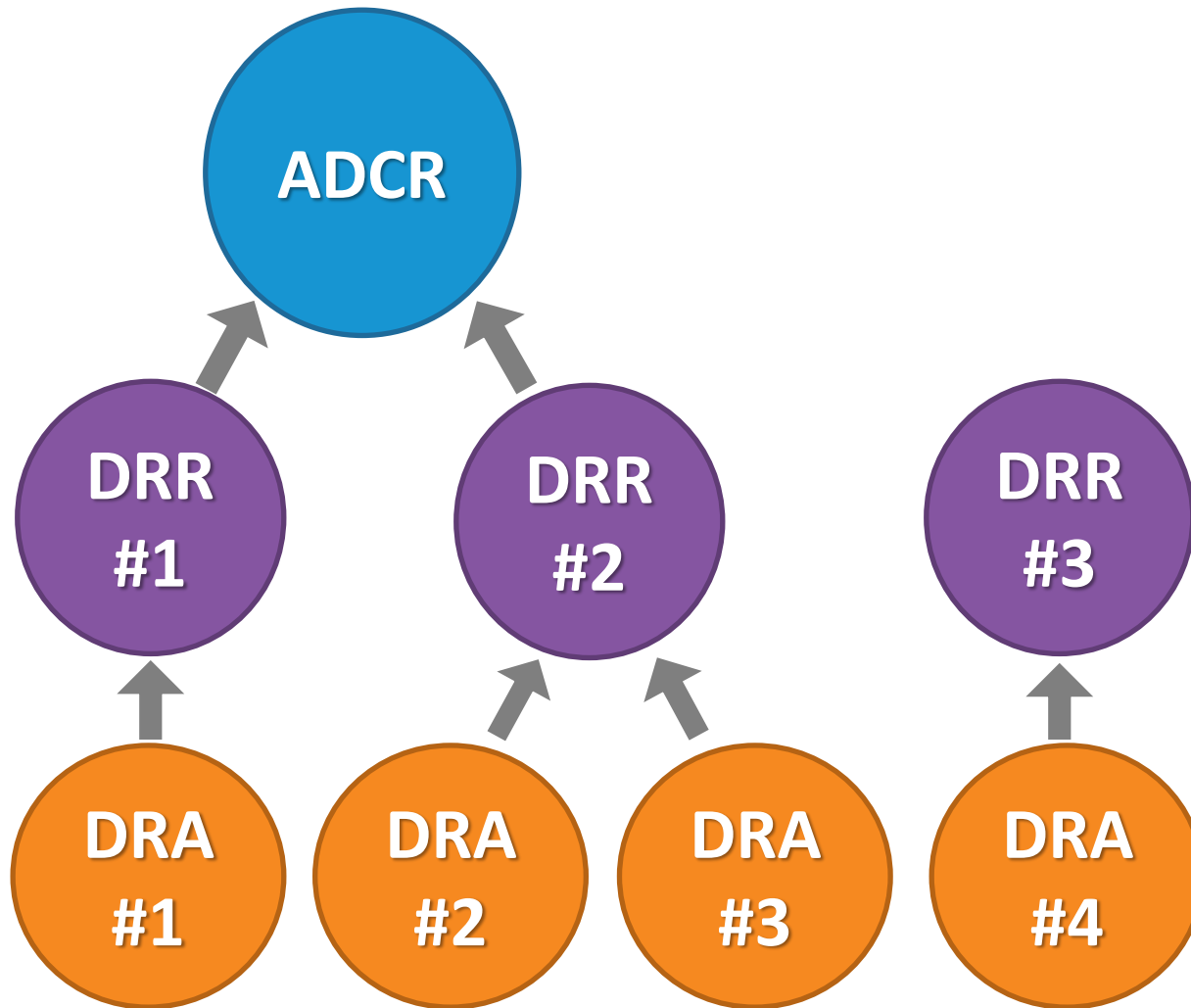
- Pay-for-performance will be in effect

Other impacts of audit values remain and will not be covered as part of this presentation

Data Conversion

Record Seeding in ATT

Names and IDs – What Changes? What Stays the Same?



Existing capacity resources become ADCRs:
same name
same ID

New!!
System-generated name & ID

Existing DR assets converted:
same name
new ID

ATT Will be Seeded

Audit records for audits previously performed by demand capacity resources

- Showing the asset results that were associated with it

Summer conversion audit record to introduce the DRR

- Reflecting most recent audit results as of end of summer 2017
- Summer 2017 audits will expire August 31, 2018
 - Need to audit between June 1st and August 31st 2018

Winter conversion audit record to introduce the DRR

- Reflecting most recent winter audit results as of end of January 2018
- Winter 2017/2018 audits will expire August 31, 2019
 - Need to audit between December 1st 2018 and end of March 31st 2019

Seeded Audit Record

Actual Audit

Audit Request Details

Request ID	Requestor Name (ID)	Audit Type	Comment
688	ATT Test Customer 1, Test User 1 (999999691)	Seasonal	
Audit Status	Audit Source	Post Dispatch Audit	
COMPLETE	CUSTOMER	No	

Resource

Capacity Resource Type	CSO MW	Net CSO MW	Demand Response Resource Name (ID)	Audit Results	Load Zone Name (ID)
ACTIVE				4.226	SEMA (4006)
Capacity Resource Name (ID)	Designated Entity Name (ID)		Aggregation Zone Name (ID)		
Demand Capacity Resource 2 (60'930)			DR.MA_SEMA (7613)		

Dates

Submitted	Audit Window Start	Audit Window End	Actual Audit Start	Actual Audit End	Earliest Audit Expiration
06/30/2017 15:06	07/05/2017	08/02/2017	07/19/2017 16:30	07/19/2017 17:35	08/31/2018
Actual Audit Month					
07/19/2017					

[Audit Results](#) [Status History](#) [Dispatch Info](#)

Asset ID	Asset Name	MW	Status
60401		1.539	APPROVED
60403		0.203	APPROVED
60413		0.359	APPROVED
60443		0.496	APPROVED
60444			APPROVED

Seeded Audit Record

Summer Conversion Audit Record to Introduce DRR

Audit Request Details

Request ID	Requestor Name (ID)	Audit Type	Comment
88984	MDE	Seasonal	Initial data population, not an actual audit
Audit Status	Audit Source	Post Dispatch Audit	
COMPLETE	CUSTOMER	No	

Resource

Capacity Resource Type	CSO MW	Net CSO MW	Demand Response Resource Name (ID)	Audit Results	Load Zone Name (ID)
ACTIVE			ZSEMA088 (61059)	4.226	SEMA (4006)
Capacity Resource Name (ID)	Designated Entity Name (ID)		Aggregation Zone Name (ID)		
Demand Capacity Resource 2 (60930)	Testing Customer (128728)		DR.MA_SEMA (7613)		

Dates

Submitted	Audit Window Start	Audit Window End	Actual Audit Start	Actual Audit End	Earliest Audit Expiration
08/30/2017 00:00	08/31/2017	09/05/2017	08/31/2017 15:30	08/31/2017 16:30	08/31/2018

Audit Results Status History Dispatch Info

Asset ID	Asset Name	MW	Status
60516		1.539	APPROVED
60525		0.203	APPROVED
60540		0.359	APPROVED
60551		0.496	APPROVED
60552		0.400	APPROVED

New Asset IDs

DR Audit and Testing Tool

Seasonal DR Audits

Purpose of ATT

- Submit active seasonal DRR audits and view results
- Submit claim 10/30 audit requests for active DR
 - Only for submissions - not results
 - Claim 10/claim 30 is covered later in this presentation
- Submit passive (on-peak and seasonal peak) DR audits and view results
 - Covered in March 29, 2018 webinar

Single Sign-On (SSO) Requires a Digital Certificate

- Digital certificate is issued to your company's security administrator (SA) by ISO
- Your company's SA assigns your access
- Standard Market Design (SMD) Applications Home Page
 - <https://smd.iso-ne.com>



Don't know who your company's SA is?
Call ISO Customer Support and we'll help you find out.



Informational Links

[Transmission System Information](#)

[Satellite Information](#)

[LCC CMS](#)

[LCC Vision Learning](#)

External Systems

[JESS at NYISO](#)

Internal Transactions

**Bids & Offers
(Registered Users)**

**Financial Transmission Rights
(Registered Users)**

Submit Meter Reading

Submit Peak Contribution

Submit Monthly Regional Network Load

**Financial Assurance
Management**

Forward Capacity Market CSO Bilateral Contracts

**Demand Resource
Market User Interface**

Claimed Capability Auditing Tool

Energy Efficiency Measure Database

Dynamic Data Management System

External Transactions

**Customer and Asset
Management System**

**Forward Reserve Market
Auction**

**CROW
Outage Scheduler**

Forward Reserve Assignment

Forward Capacity Tracking System

**Forward Capacity Market
Reconfiguration Auction**

Supplemental Availability Designation

DR Audit and Testing Tool

**NX Application
(NX-9, NX-12D and One-Line Diagrams)**

Ask ISO

User Roles

Sandbox/Production

- A&TT / Lead Participant Maintainer
- A&TT / Lead Participant Read Only
- A&TT / Demand Designated Entity Read Only

Request these roles from your company's SA

Sandbox available on April 2, 2018

ATT DRR Audit Types

Seasonal

- Request dispatch, or
- Use past dispatch

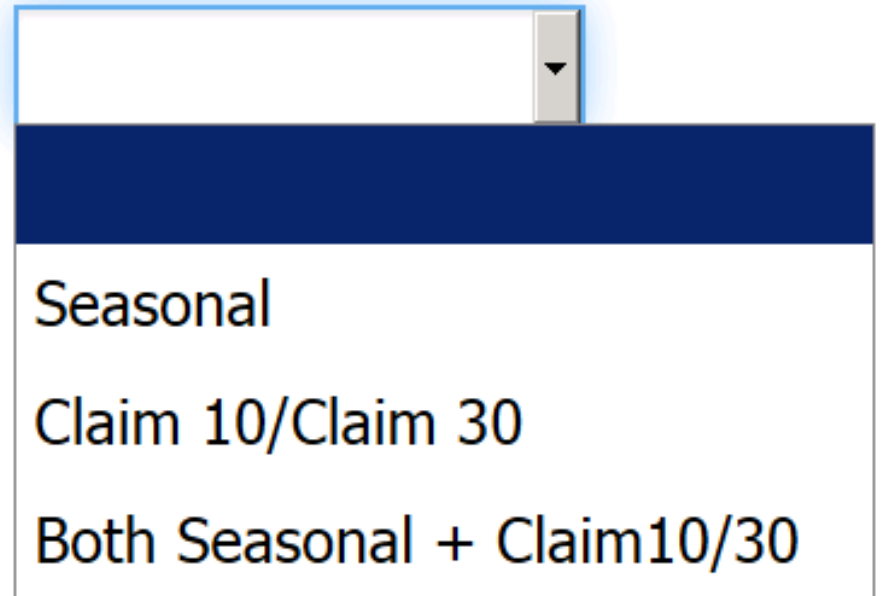
Claim 10/Claim 30

- Request dispatch

Both Seasonal + Claim10/30

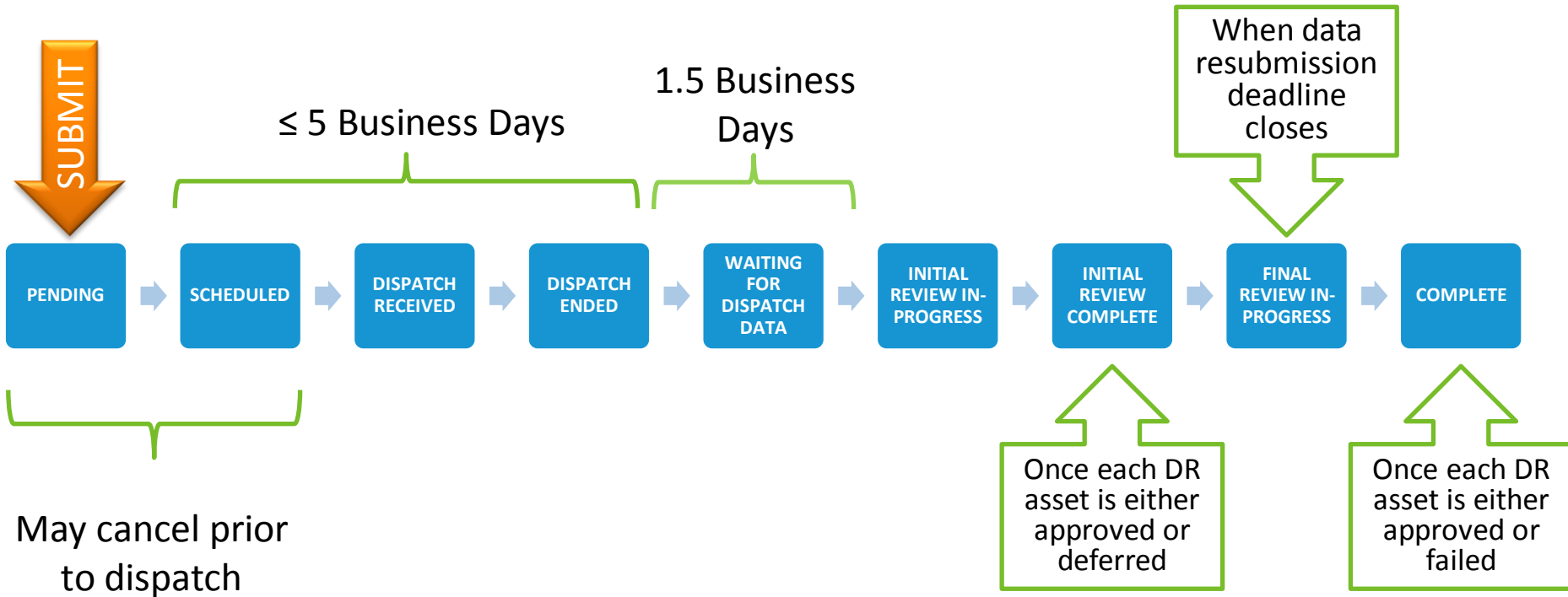
- Request dispatch

Audit Type*



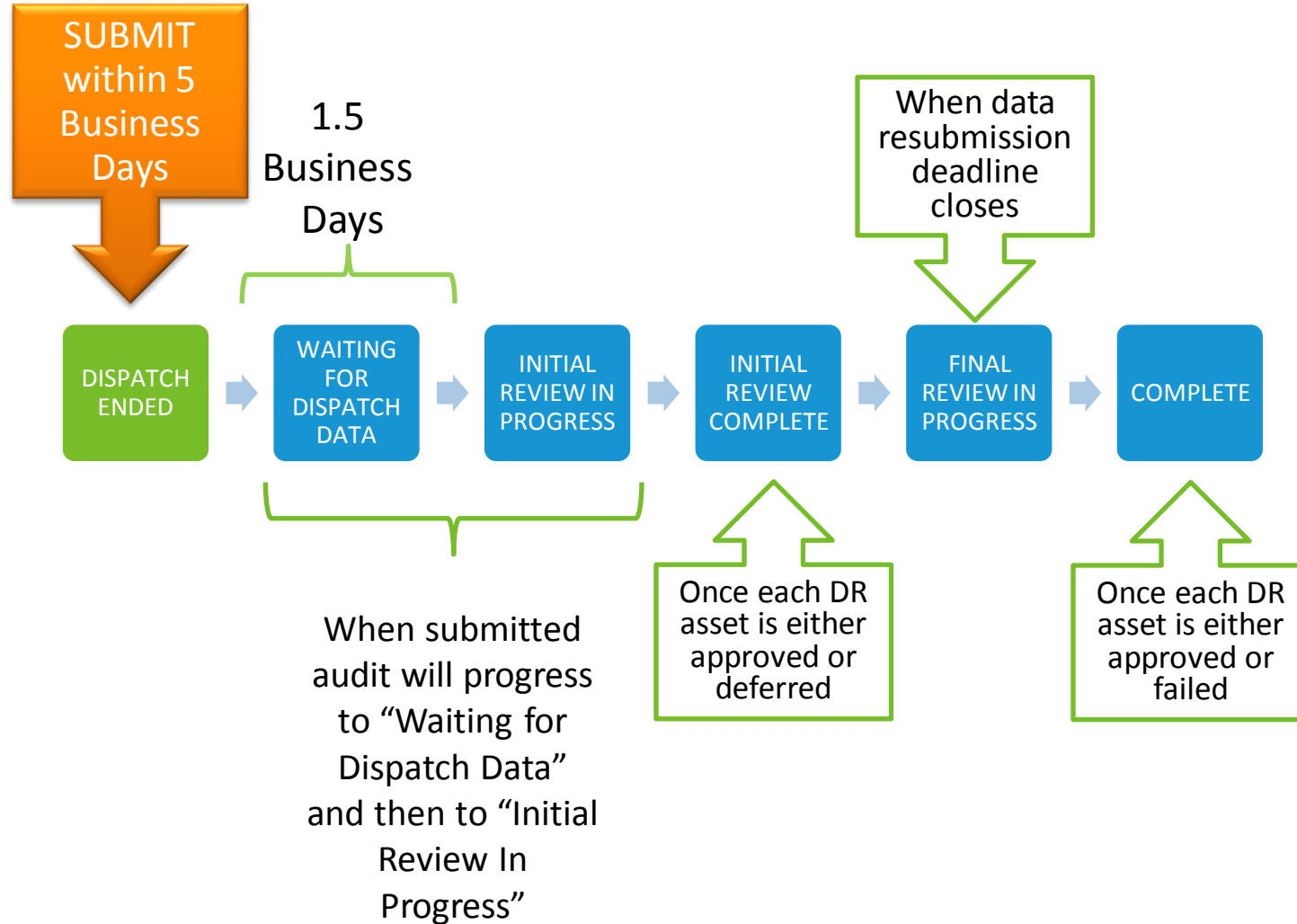
A screenshot of a web form showing a dropdown menu for 'Audit Type*'. The dropdown is open, displaying three options: 'Seasonal', 'Claim 10/Claim 30', and 'Both Seasonal + Claim10/30'. The dropdown menu has a dark blue header bar and a white body with a thin border. The selected option is not visible in the screenshot.

Process Flow: Scheduled Seasonal Audit

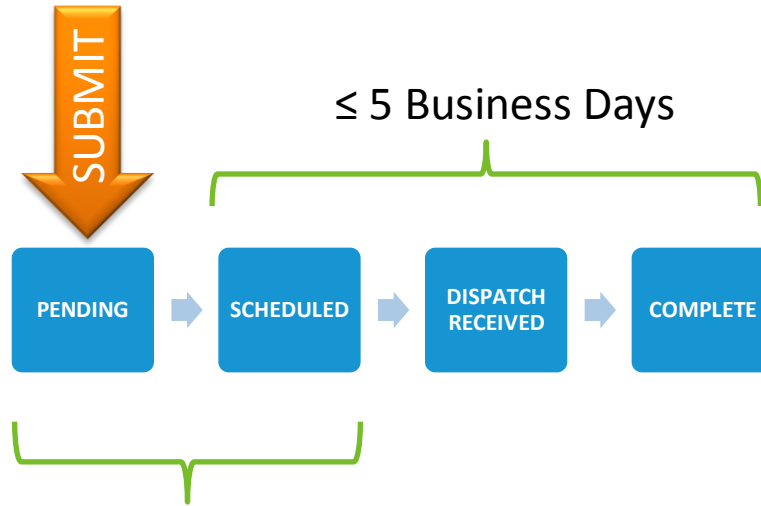


- DRR: Cannot request audits with overlapping windows unless prior audit(s) already dispatched
- If ISO ends the dispatch with less than 12 intervals completed, audit status goes to
 - **Seasonal**: cancelled
 - **Seasonal + claim 10/30**: partially completed

Process Flow: Using a Past Dispatch as a Seasonal Audit



Process Flow: Claim10/Claim30 Audit



May cancel prior
to dispatch



Auditing and Testing Tool Demonstration

Operating Reserves

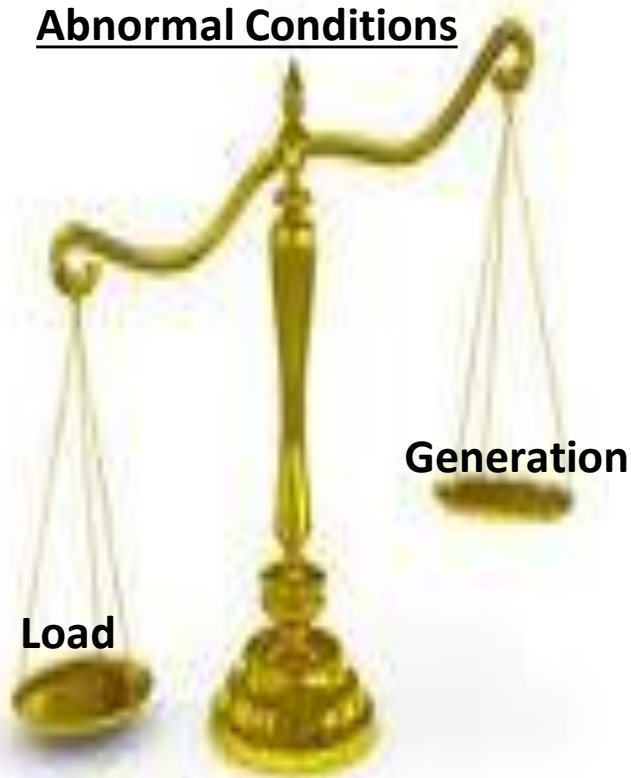
Kory Haag

Reserve Definitions – 10 Minutes

Ten Minute Spinning Reserve (TMSR) – can be provided from DRR that is dispatched and has no controllable generation

Ten Minute Non-Spinning Reserve (TMNSR) – can be provided by DRR that is currently not dispatched but can be dispatched in 10 minutes or less

Converting Reserves to Energy – Time Requirements (**TMSR** and **TMNSR**)



Resources providing **TMSR** and **TMNSR** are dispatched up by the ISO in real time in response to a loss of supply

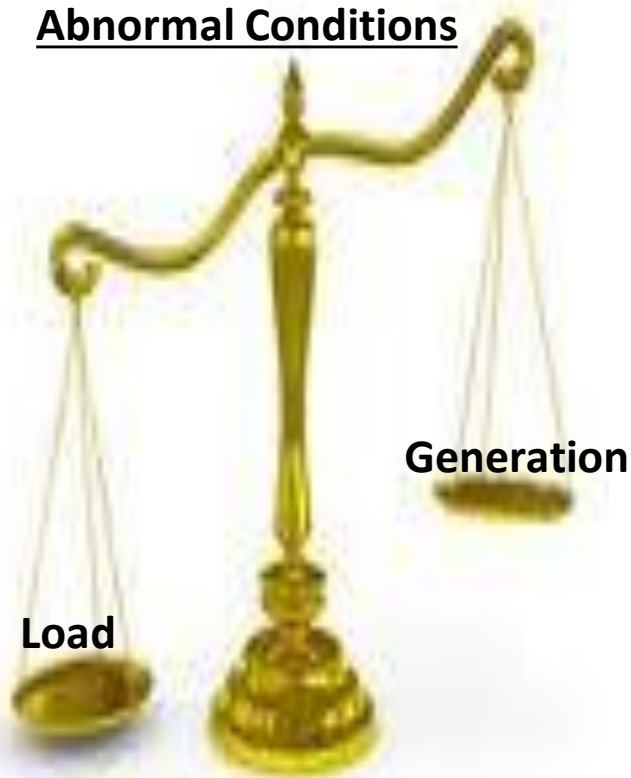
- Under NERC standard BAL-002-1 (R4.1), the ISO must ensure that the lost supply is replaced within **15 minutes** of the occurrence of the contingency
- ISO uses Ten Minute Reserve (TMR) in order to provide operators time to react to the supply loss and meet the NERC Standard

Reserve Definitions – Thirty Minutes

Thirty Minute Operating Reserve (TMOR) – can be provided by dispatched or not dispatched DRR that can be dispatched within 30 minutes

Converting Reserves to Energy – Time Requirements

TMOR



Resources providing **TMOR** are dispatched up by the ISO in real-time when the available **TMSR** and **TMNSR** is below or is expected to be below the total system TMR requirement

- Under NERC standard BAL-002-1 (R4.1), the ISO must restore its total system TMR requirement either:
 1. Within 115 minutes if the deficiency was caused by a NERC-reportable supply loss or
 2. Within 90 minutes from the time when there was insufficient resources providing the TMR product to meet the total system TMR requirement (if the deficiency was not caused by a NERC-reportable supply loss)

Measuring DRR Performance

Determining Reserves

DRR Performance Audits

3-Types

1. ISO-initiated
2. Participant requested
3. Normal dispatch



Audit Periodicity Requirement

Once every forward reserve procurement period (FRPP)



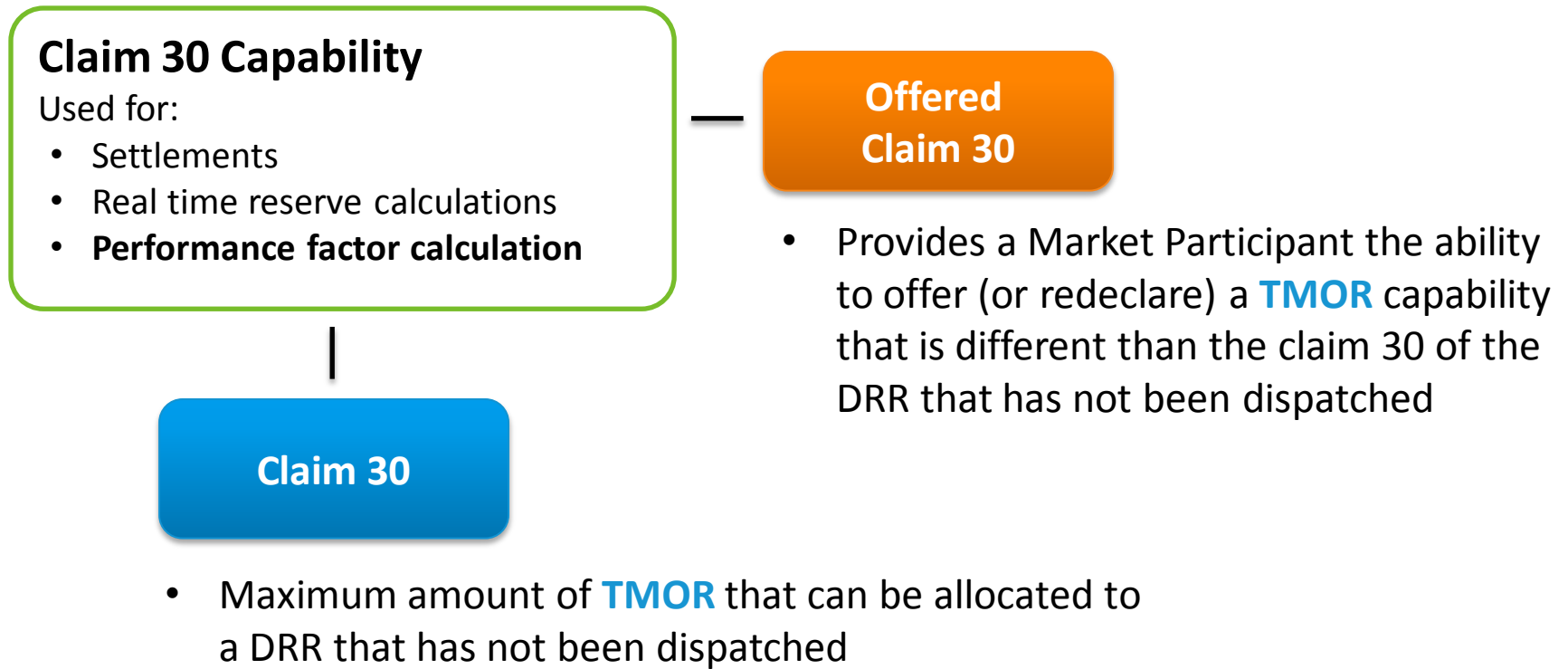
Performance is Measured at the DRR Level

- Only uses real-time telemetry
 - No corrections are used
- DRA performance is aggregated to the DRR performance
- If a DRA is added to or removed from a DRR the claim 10/30 value is not affected
- Participant's responsibility to maintain claim 10/30 offer to reflect actual capability
- Performance factor will be affected if offers are not accurate
 - More on performance factor later in this presentation

Claim 30 Capability

Calculated weekly, effective for the next Monday-Sunday

ISO calculates the **TMOR** capability of a DRR that has not been dispatched as the lower of the **claim 30** value or the **offered claim 30**.



Claim 30 Value

Claim 30 Capability

Used for:

- Settlements
- Real time reserve calculations
- **Performance factor calculation**

Offered
Claim 30

Claim 30

=

*Maximum
Reduction Level*

×

*Performance
Factor*

Claim 30 Value Upon Full Integration of PRD

On June 1, 2018, and October 1, 2018:

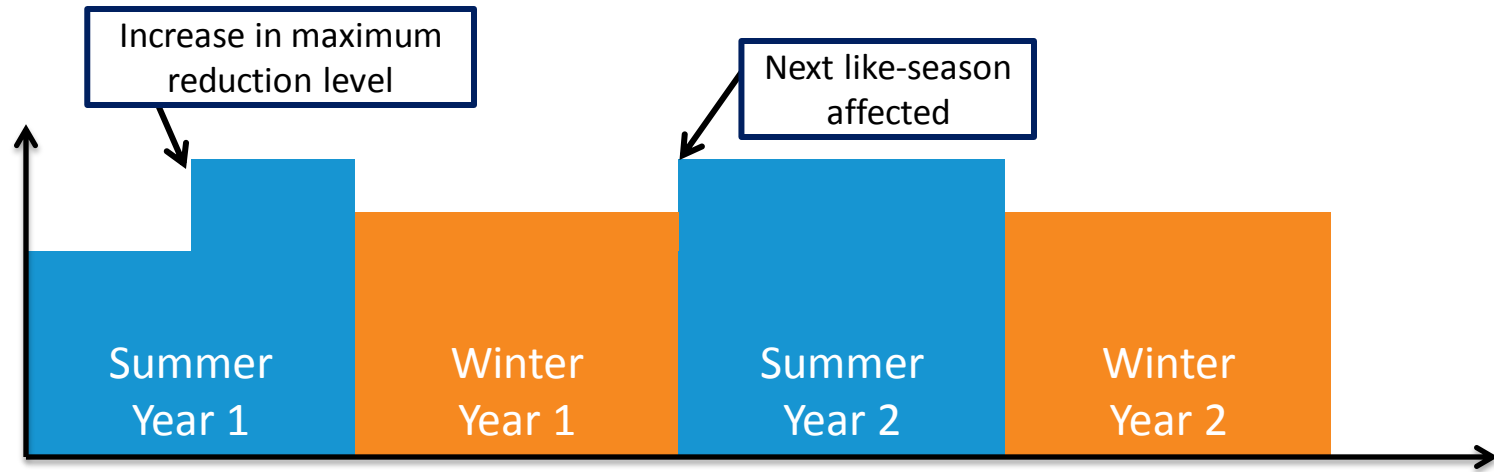
- Maximum reduction level for DRR will equal 30 minute performance for DRAs that were active in Summer 2017 and Winter 2017-2018
 - Value will be removed ~ 4 weeks after the start of each FRPP in 2018
- Performance factor will equal 1.0 until first startup dispatch

Maximum Reduction Level



- Highest reduction a resource has reached at **30 minutes** in the current or previous like FRPP

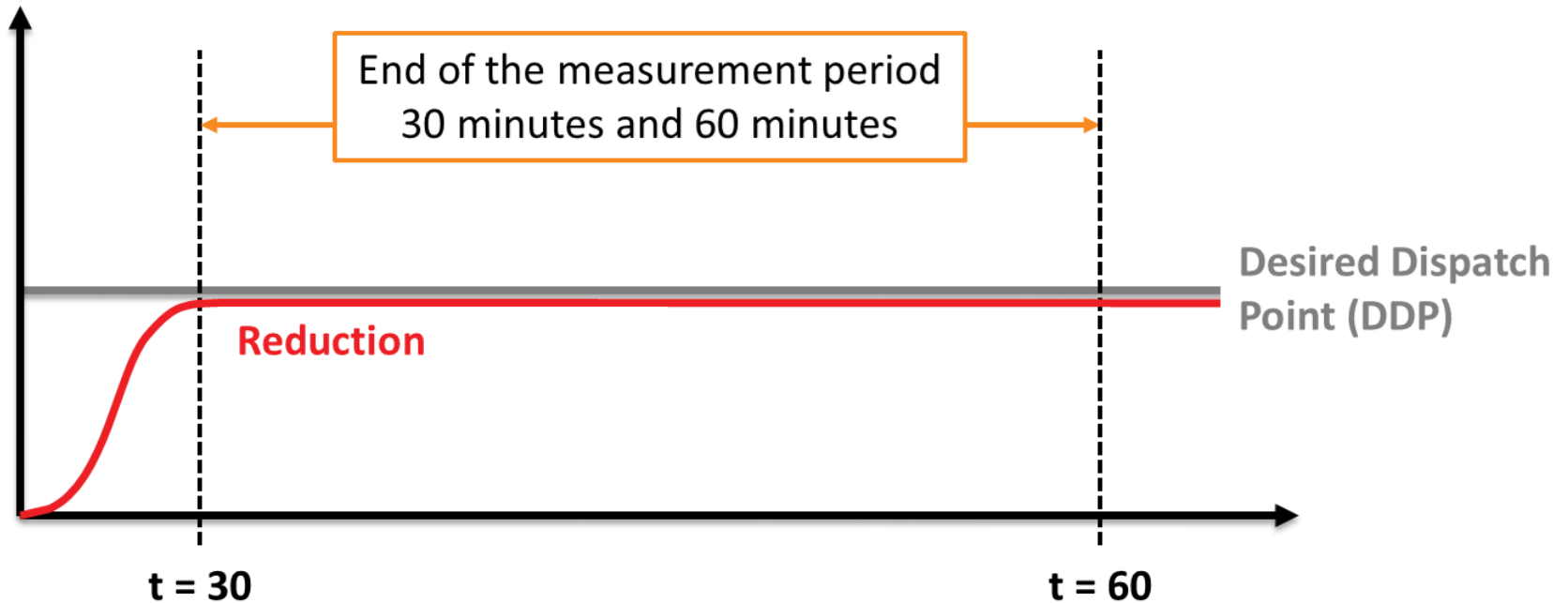
Maximum Reduction Level Carryover



- Becomes effective from the week of the increase and going forward for the current FRPP
- Carries forward to the next like FRPP

Measuring DRR Reduction

- Use real-time telemetry values
 - 5 minute data for TMOR
- Measure at 30 minutes from dispatch time
 - Interpolate between data points



Increasing a Resource's Maximum Reduction Level

Economic Dispatch

1. Normal economic dispatch
2. Reduction at 30 minutes greater than current maximum reduction level
3. The maximum reduction level is raised prospectively (limited by DDP)

Formal Audit

1. Market participant requests an audit
2. Requested DDP is sent on unannounced dispatch
3. Reduction at 30 minutes is greater than current maximum reduction level
4. The maximum reduction level is raised prospectively

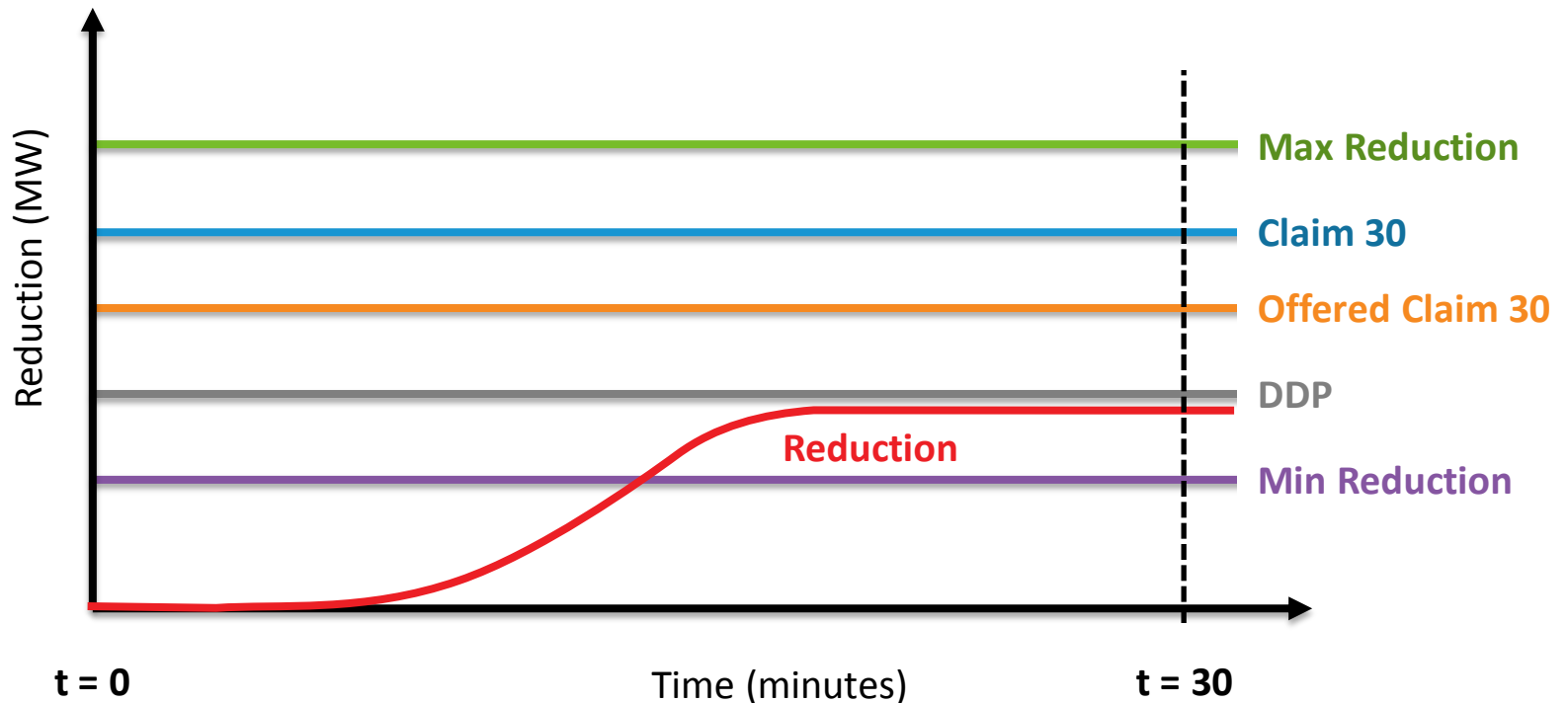
Performance Factor Overview



- A **performance factor** allows ISO to model a resource's historical ability to achieve **target value** from a not dispatched state
- Calculated for each resource based on the performance in its previous **ten** startups (limited by 3 years)
- Uses weighted average calculation

Performance Factor and Target Value

Each time a fast-start DRR is dispatched from a not dispatched state its performance is evaluated based upon its reduction at 30 minutes, in relation to its target value.



Target Value

- Minimum expected reduction the resource should meet at 30 minutes based upon offered parameters
- Compared to actual resource reduction at 30 minutes to determine whether the resource met expectations
- Directly affected by participant supply offer parameters:
 - DDP (dependent upon startup time, notification time, response rate)
 - Claim 30 capability
 - Maximum reduction / minimum reduction

Determining the Target Value

Target Value is the
minimum of these values



Find the **minimum** of
these two numbers

Find the **maximum** of
these two numbers

Claim 30	Offered Claim 30	Desired Dispatch Point (DDP)	Min Reduction
48	50	60	30

Next Start:

48

50

60

30

The **minimum**
value is 48 MW

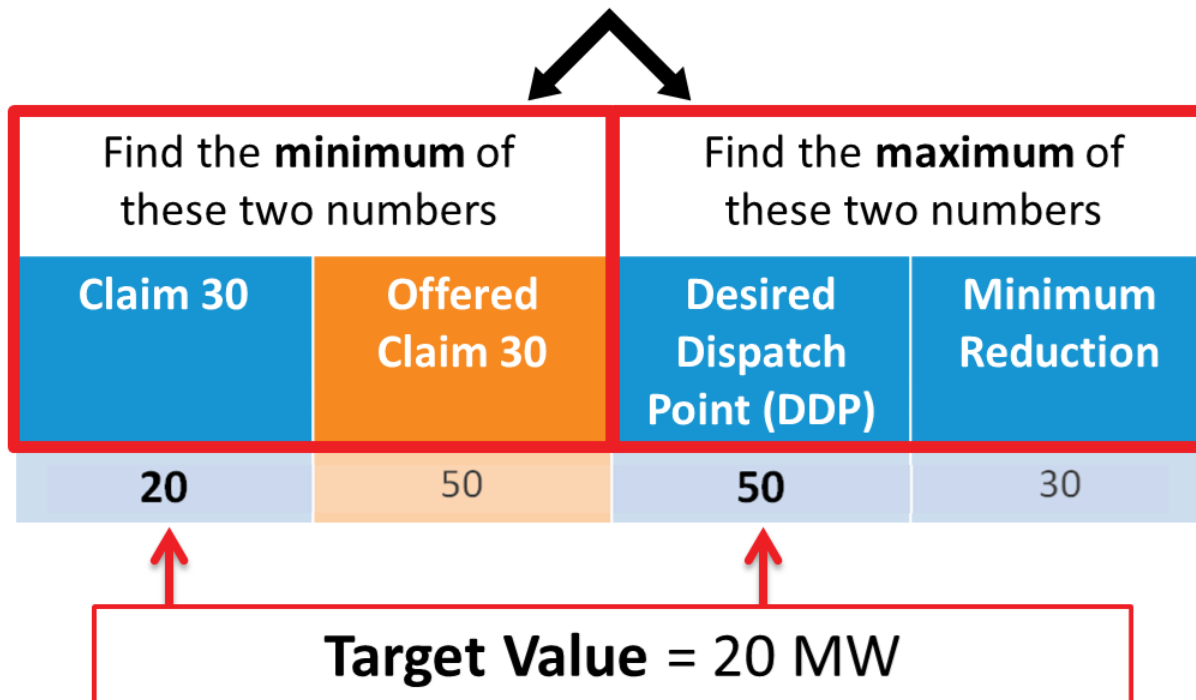
The **Target Value**
is **48 MW**

The **maximum**
value is 60 MW

Target Value Scenarios

The **Target Value** is compared to actual resource reduction to calculate the performance factor.

The **Target Value** is the **minimum** of these values



Calculating Performance Factor

Finding the Dispatch Performance

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value										
Actual Output										
Dispatch Performance <i>(Actual Output / Target Output)</i>										
Weighted Dispatch Performance <i>(Dispatch Performance x Weighting Factor)</i>										

Dispatch Performance is limited to 1.0

$$\text{Performance Factor} = \frac{\sum_{n=1}^{10} \left(\frac{\text{Actual Reduction at 30 minutes}}{\text{Target Value}} * n \right)}{\sum_{n=1}^{10} n}$$

Calculating Performance Factor

Weighting Factor / Start Number	← 10 ← 9 →	Add these numbers together	→ 2 → 1 →
Target Value			
Actual Output			
Dispatch Performance (Actual Output / Target Output)			
Weighted Dispatch Performance (Dispatch Performance x Weighting Factor)	← Add these numbers together →		

Sum of weighted dispatch performance.

Performance Factor =

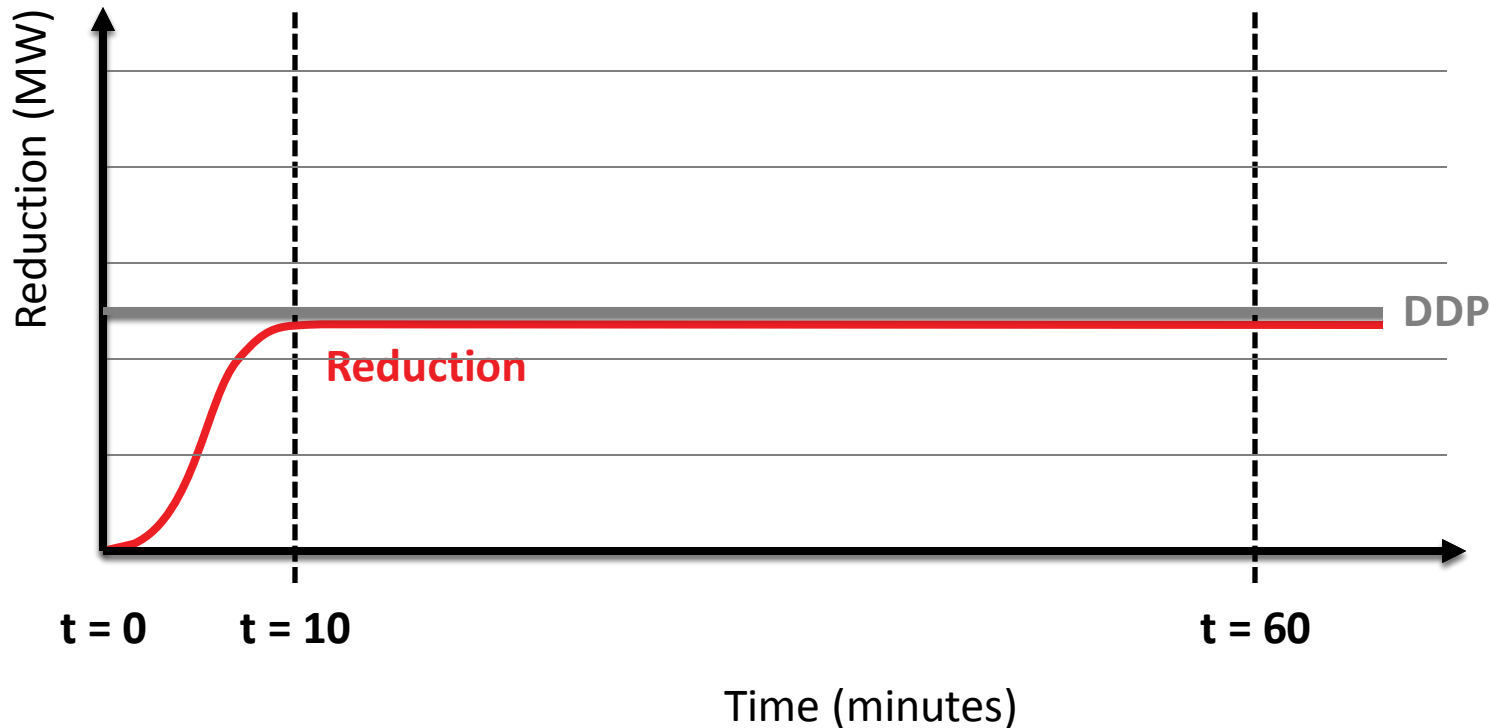
$$\sum_{n=1}^{10} \left(\frac{\text{Actual Output at 10 minutes}}{\text{Target Value}} * n \right)$$

Sum of weighting factor

$$\sum_{n=1}^{10} n$$

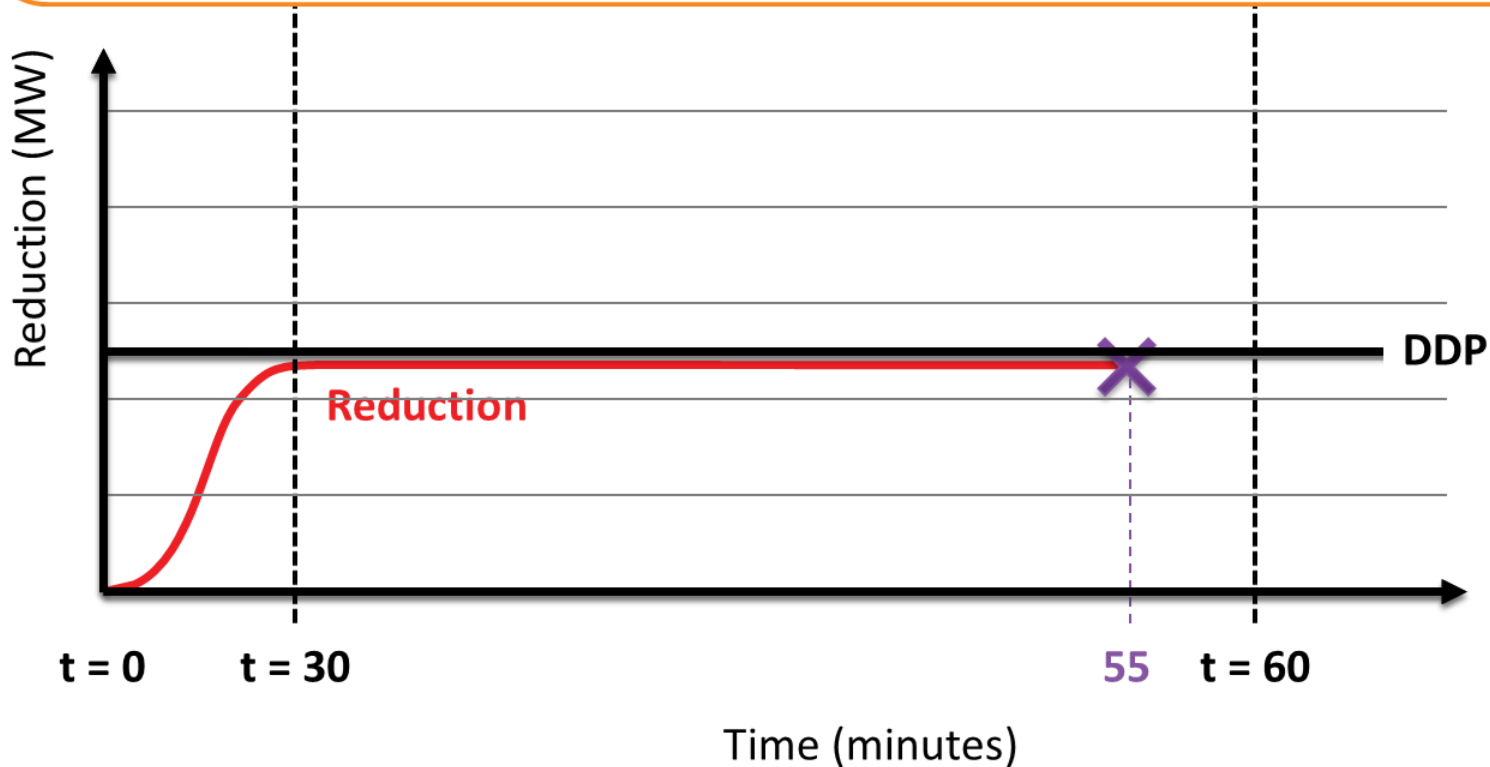
DRR Sustainability Caveat

- DRR must remain in service for **60 minutes** following the initial dispatch
 - Unit control mode (UCM) of 2 or higher
- Does not require the DRR to be dispatched for 60 minutes.
 - May have a minimum reduction time of less than 60 minutes



DRR Sustainability

1. DRR meets target at 30 minutes
 2. DRR goes out of service at 55 minutes after the dispatch
- Result:** DRR will receive a reduction of zero (0) MW at 30 minutes in performance factor calculation.



Questions?

$$\text{Claim 30} = \text{Maximum Reduction Level} \times \text{Performance Factor}$$

Next:

- *Examples of calculating performance factor*
- *Specific scenarios which affect claim 30*



Performance Factor Example 1



Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value	48	48	48	48	48	48	48	48	48	48
Actual Reduction	48	48	48	48	48	48	48	48	48	48
Dispatch Performance (<i>Actual Reduction / Target Reduction</i>)	1	1	1	1	1	1	1	1	1	1
Weighted Dispatch Performance (<i>Dispatch Performance x Weighting Factor</i>)	10	9	8	7	6	5	4	3	2	1

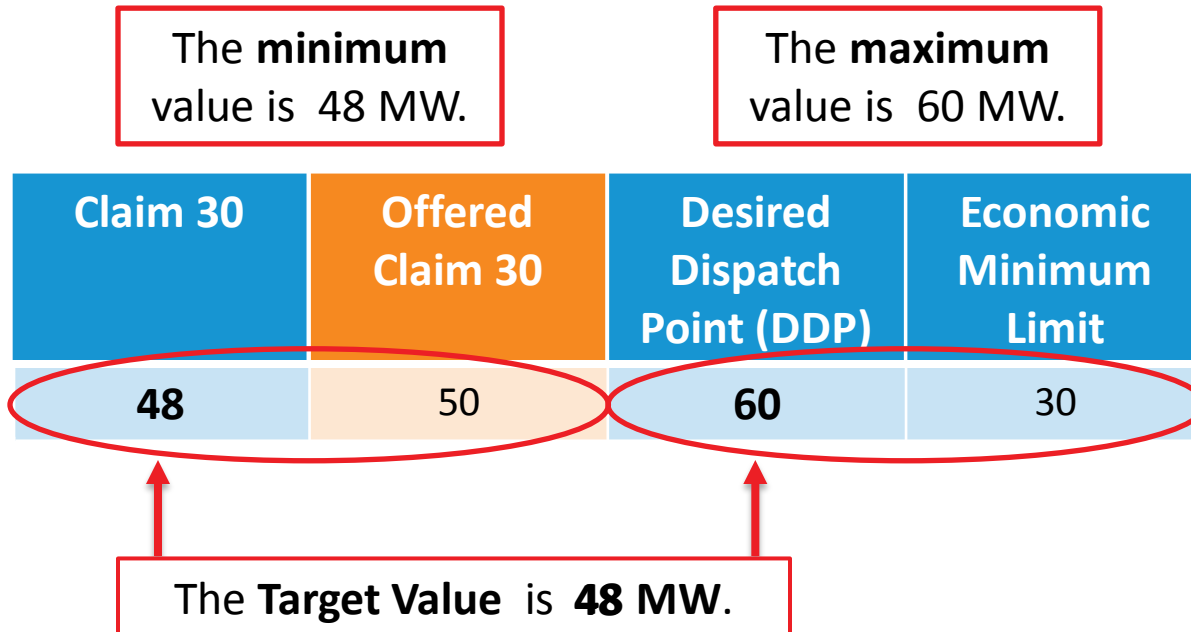
- DRR has a starting performance factor = 1.0
 - 10 starts in last 3 years
 - DRR reached target value during each start
- DRR receives a startup DDP

Example 1

Step 1. Find the Target Value

Results from the most recent start:

DDP	60
Target Value	48
Actual Reduction	40
Dispatch Performance (Actual Reduction ÷ Target Reduction)	40/48
Weighted Dispatch Performance (Dispatch Performance × Weighting Factor)	8.3



Example 1

Step 2. Calculate Performance Factor

Results from the most recent start:

DDP	60
Target Value	48
Actual Reduction	40
Dispatch Performance (Actual Reduction ÷ Target Reduction)	40/48
Weighted Dispatch Performance (Dispatch Performance × Weighting Factor)	8.3

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value	48	48	48	48	48	48	48	48	48	48
Actual Reduction	40	48	48	48	48	48	48	48	48	48
Dispatch Performance (Actual Reduction ÷ Target Reduction)	40/48	1	1	1	1	1	1	1	1	1
Weighted Dispatch Performance (Dispatch Performance × Weighting Factor)	8.3	9	8	7	6	5	4	3	2	1

↑
This becomes the most recent start

Example 1

Step 2. Calculate Performance Factor

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value	48	48	48	48	48	48	48	48	48	48
Actual Output	40	48	48	48	48	48	48	48	48	48
Dispatch Performance (Actual Output / Target Output)	40/48	1	1	1	1	1	1	1	1	1
Weighted Dispatch Performance (Dispatch Performance x Weighting Factor)	8.3	9	8	7	6	5	4	3	2	1

$$\text{Performance Factor} = \frac{8.3 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1}{10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1} = \frac{53.3}{55} = 0.969$$

Performance Factor Example 2

- Using the same target value as the previous example
- Assume that same DRR has had only 3 previous starts in last 3 years and each one the resource has reached target value
 - Starting Performance Factor is 1.0
- DRR receives startup DDP

Results from the most recent start:

DDP	60
Target Value	48
Actual Reduction	40
Dispatch Performance (Actual Reduction ÷ Target Reduction)	40/48
Weighted Dispatch Performance (Dispatch Performance × Weighting Factor	8.3

Example 2

Calculate Performance Factor

Results from the most recent start:

DDP	60
Target Value	48
Actual Reduction	40
Dispatch Performance (Actual Reduction ÷ Target Reduction)	40/48
Weighted Dispatch Performance (Dispatch Performance × Weighting Factor)	8.3

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value	48	48	48	48						
Actual Reduction	40	48	48	48						
Dispatch Performance (Actual Reduction ÷ Target Reduction)	40/48	1	1	1						
Weighted Dispatch Performance (Dispatch Performance × Weighting Factor)	8.3	9	8	7						

Example 2

Calculate Performance Factor

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value	48	48	48	48						
Actual Output	40	48	48	48						
Dispatch Performance (Actual Output / Target Output)	40/48	1	1	1						
Weighted Dispatch Performance (Dispatch Performance x Weighting Factor)	8.3	9	8	7						

$$\text{Performance Factor} = \frac{8.3 + 9 + 8 + 7}{10 + 9 + 8 + 7} = 0.95$$

Specific Scenarios Which Affect Claim 30

- How a resource can increase their maximum reduction level and claim 30
- How a resource can control the amount of reserves it offers to ensure that it can achieve its target value
- How a resource that underperforms gets a reduced claim 30
- How a resource that meets its target value increases its claim 30



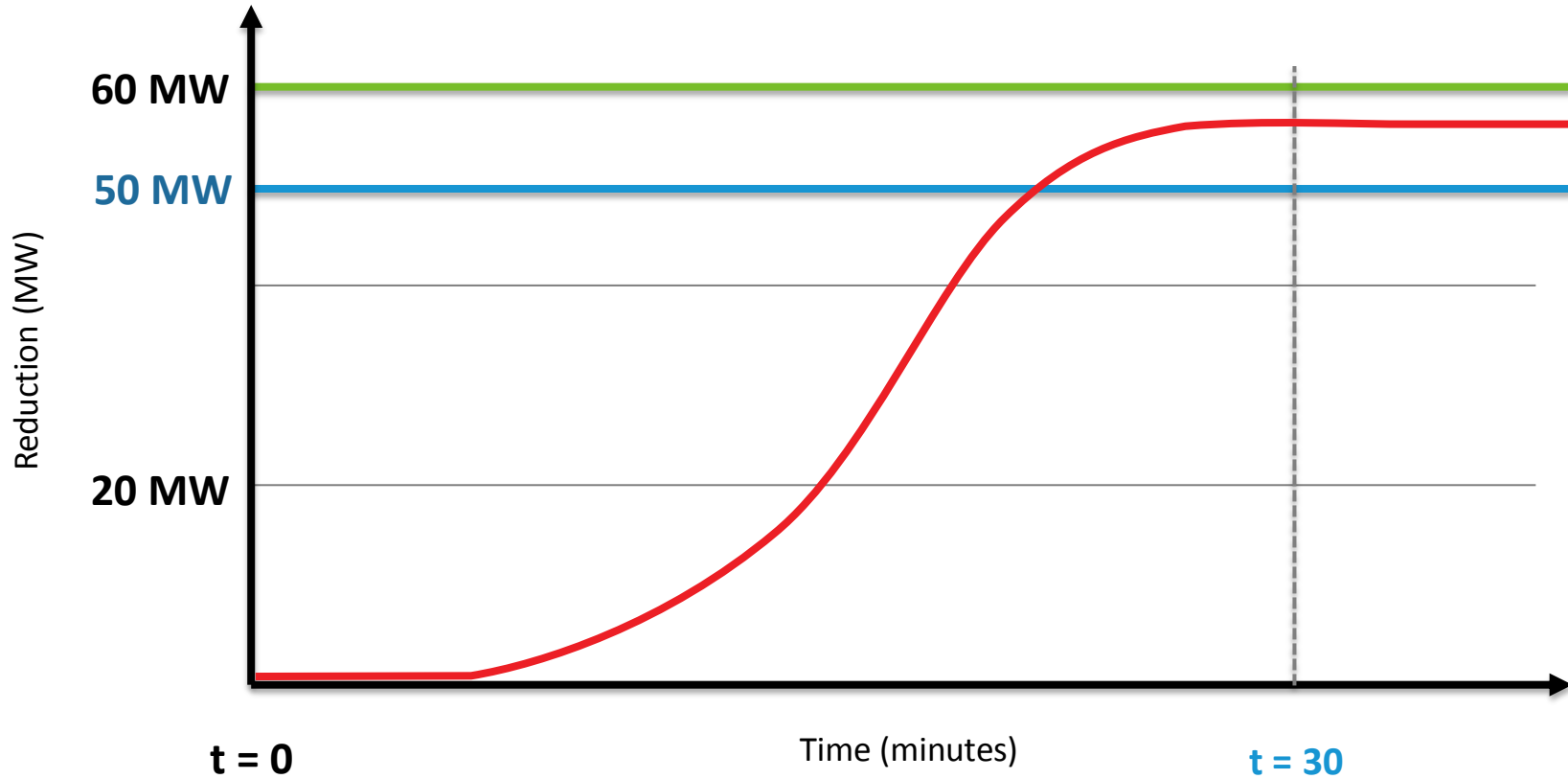
Increasing Claim 30

WEEK 1:

Min Reduction / DDP = 60 MW

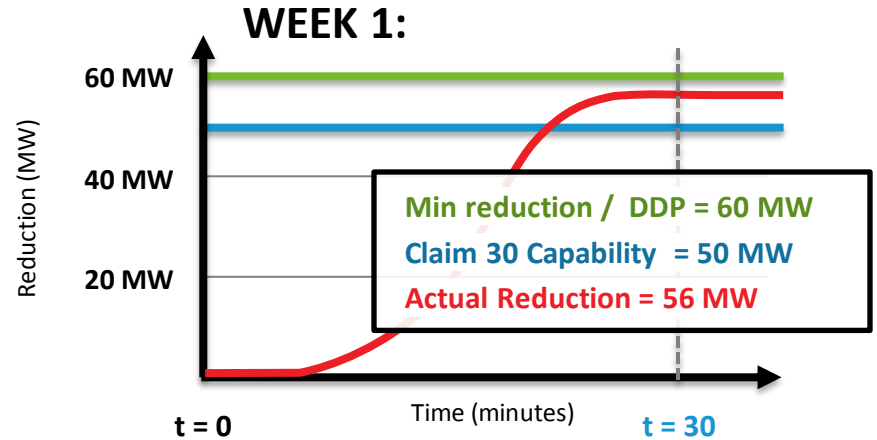
Claim 30 Capability = 50 MW

Actual Reduction = 56 MW



Increasing Claim 30

Increasing the maximum reduction level will increase the Claim 30 of a resource.



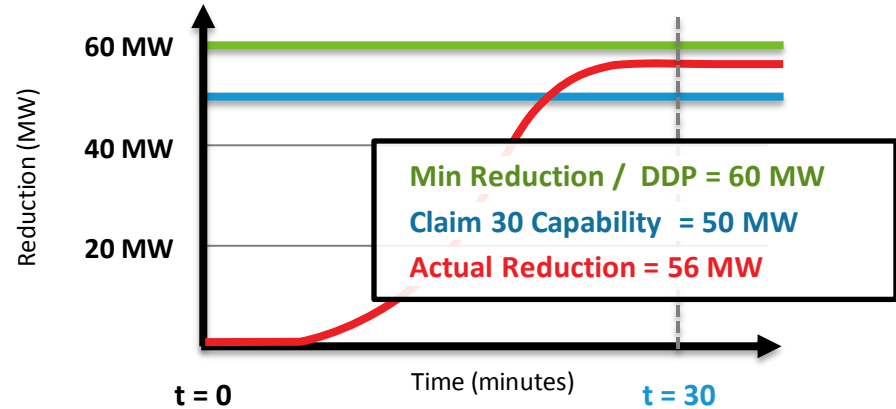
Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
3	56	1.0			60	60		
4	56	0.909						

ISO honors minimum reduction constraint and sends a DDP of **60 MW**

Resource produces **56 MW** at 30 minutes

Increasing Claim 30

Assuming no additional dispatches in Week 1, the maximum reduction level in Week 2 will increase to 56 MW since it demonstrated the ability to reach 56 MW.



Week	Maximum Output Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56

3	50						20	10
4	56							

The resource performed up to its target value, so the **performance factor** remains at **1.0**.

1. How Maximum Reduction Affects Claim 30

$$\begin{aligned} \text{Claim 30} &= \text{Maximum Reduction Level} \times \text{Performance Factor} \\ &= 56 \text{ MW} \times 1.0 \\ &= 56 \text{ MW} \end{aligned}$$

Week	Maximum reduction level	Performance factor	Claim 30 value	Offered Claim 30	Minimum Reduction	DDP	Target value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
2	56	1.0						

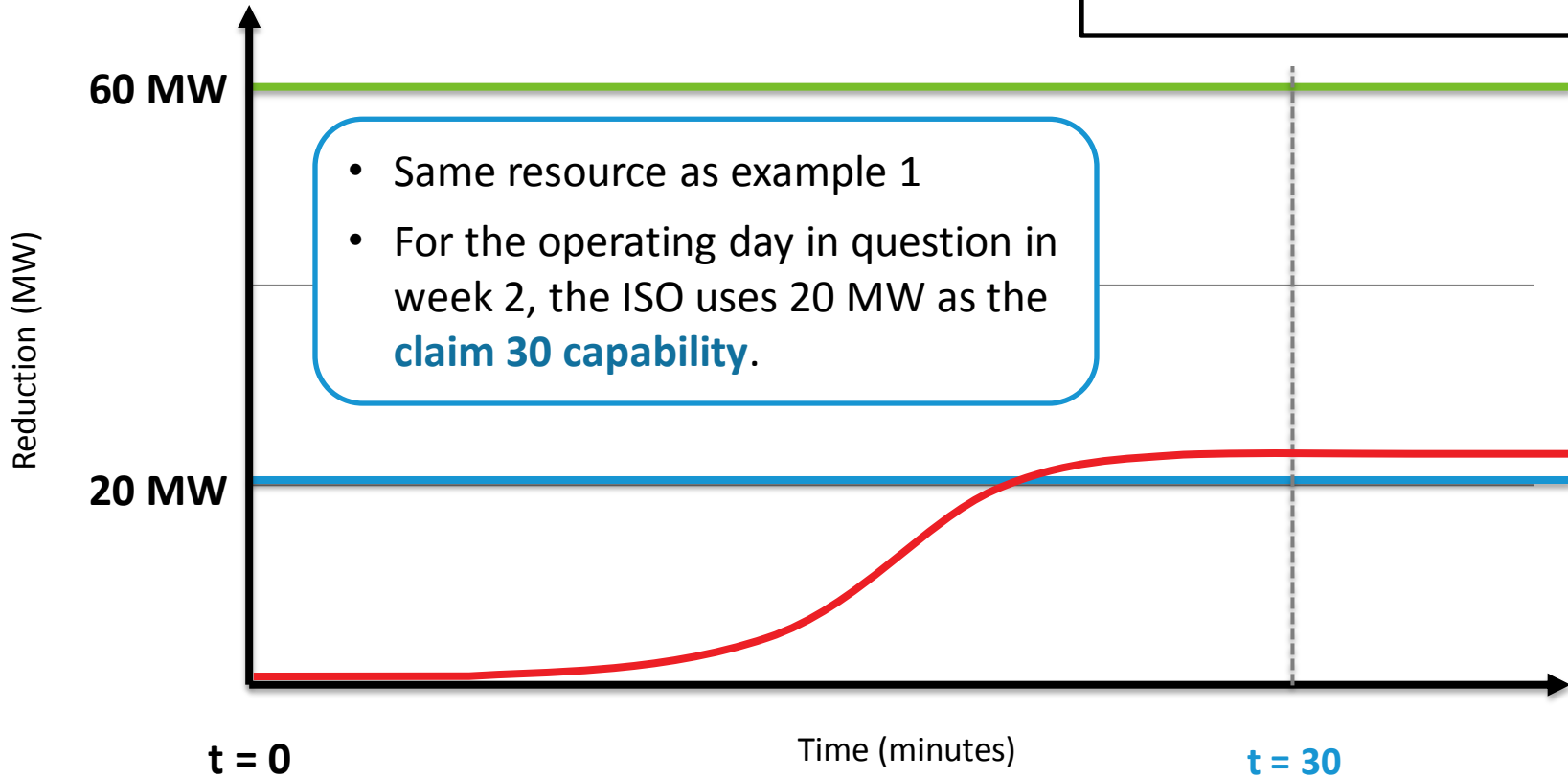
2. Achieve Target Value by Controlling Reserves

WEEK 2:

Min Reduction / DDP = 60 MW

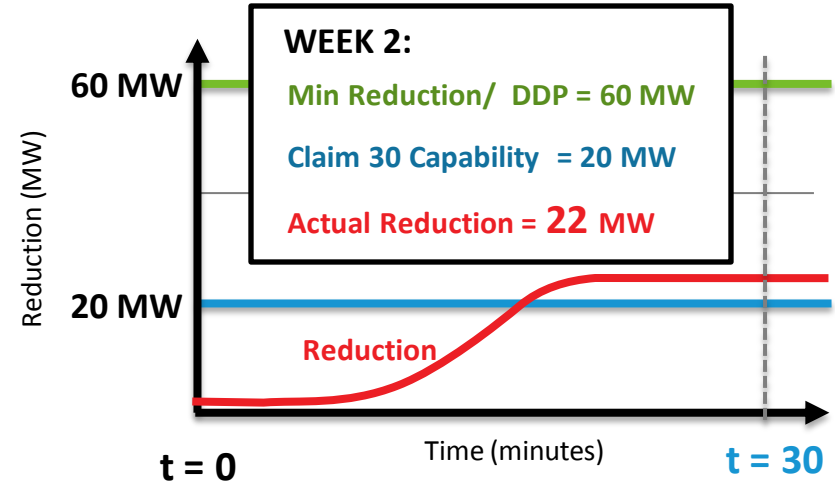
Claim 30 Capability = 20 MW

Actual Reduction = 22 MW



2. Achieve Target Value by Controlling Reserves

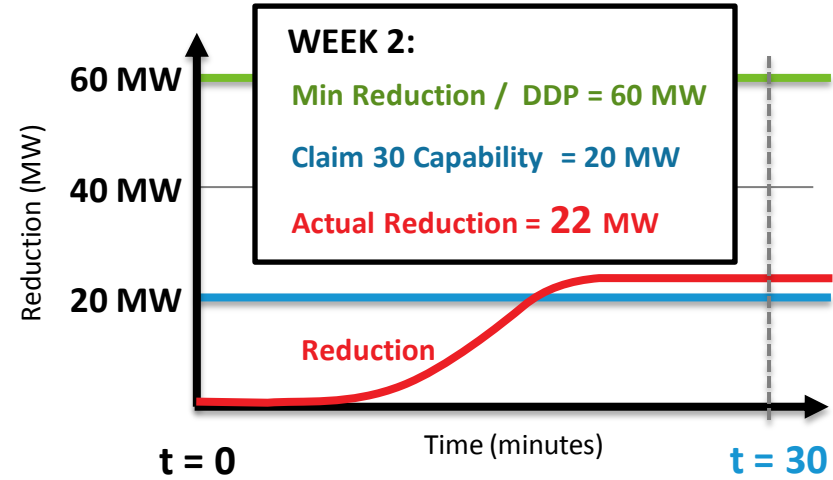
If the minimum reduction of the resource continues to be 60 MW, ISO will send a DDP of 60MW.



Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
2	56	1.0	56	20				

2. Achieve Target Value by Controlling Reserves

The resource reached the Target Value in 30 minutes, so Week 3 performance factor remains at 1.0 and the claim 30 remains at 56 MW.



ISO dispatches a resource from a not dispatched state with these assumptions:

Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
2	56	1.0	56	20	60	60	20	22
3	56	1.0	56					

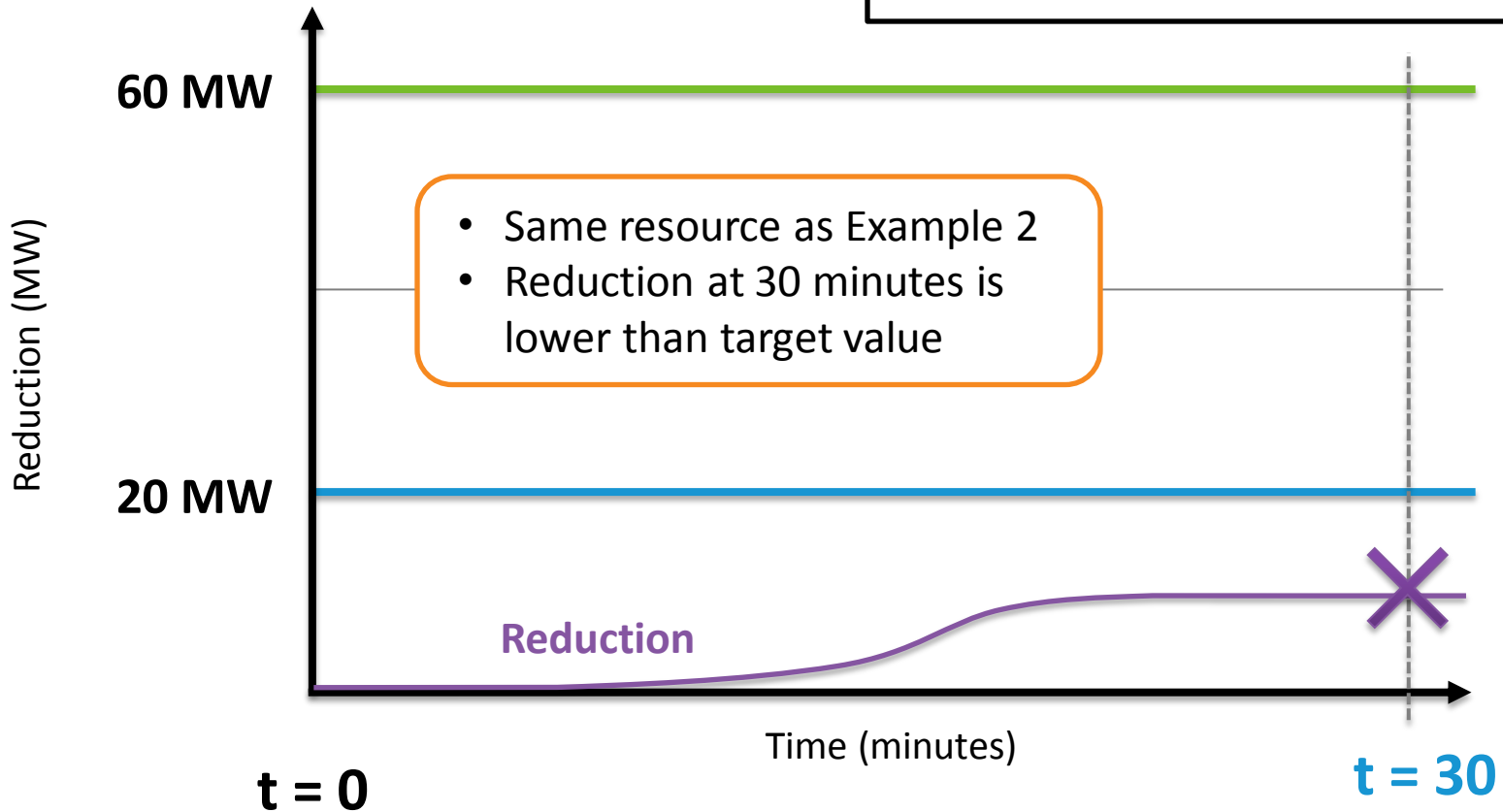
3. Effect on Claim 30 When a Resource Does Not Reach Target Value

WEEK 3:

Min Reduction / DDP = 60 MW

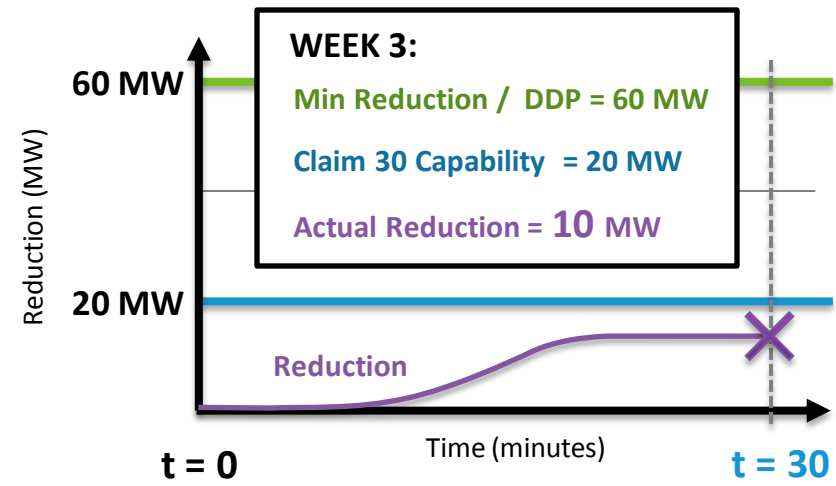
Claim 30 Capability = 20 MW

Actual Reduction = 10 MW



3. Effect on Claim 30 When a Resource Does Not Reach Target Value

A Market Participant offers a claim 30 of 20 MW for the resource from Example 2, but the resource does not meet its target value.



ISO dispatches a resource from a not dispatched state with these assumptions:

Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
2	56	1.0	56	20	60	60	20	22
3	56	1.0	56	20	60	60	20	10

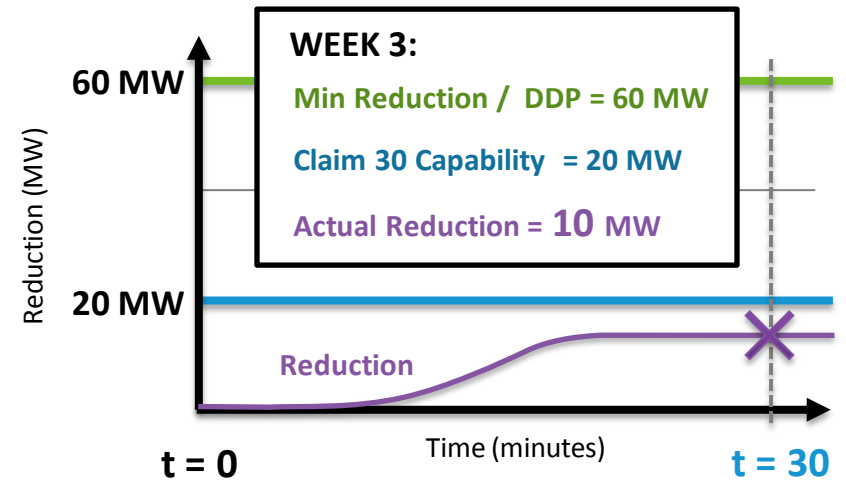
3. Effect on Claim 30 When Resource Does Not Reach Target Value

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
Target Value	20	20	50	50	50	50	50	50	50	50
Actual Reduction	10	22	56	50	50	50	50	50	50	50
Dispatch Performance (Actual Reduction / Target Reduction)	10/20	1	1	1	1	1	1	1	1	1
Weighted Dispatch Performance (Dispatch Performance x Weighting Factor)	5	9	8	7	6	5	4	3	2	1

$$\text{Performance Factor} = \frac{5 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1}{10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1} = 0.909$$

3. Effect on Claim 30 When a Resource Does Not Reach Target Value

When performance factor decreases in Week 3, it causes the Claim 30 to decrease in Week 4.



ISO dispatches a resource from a not dispatched state with these assumptions:

Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct
1	50	1.0	50	50	60	60	50	56
2	56	1.0	56	20	60	60	20	22
3	56	1.0	56	20	60	60	20	10
4	56	0.909	50.9					

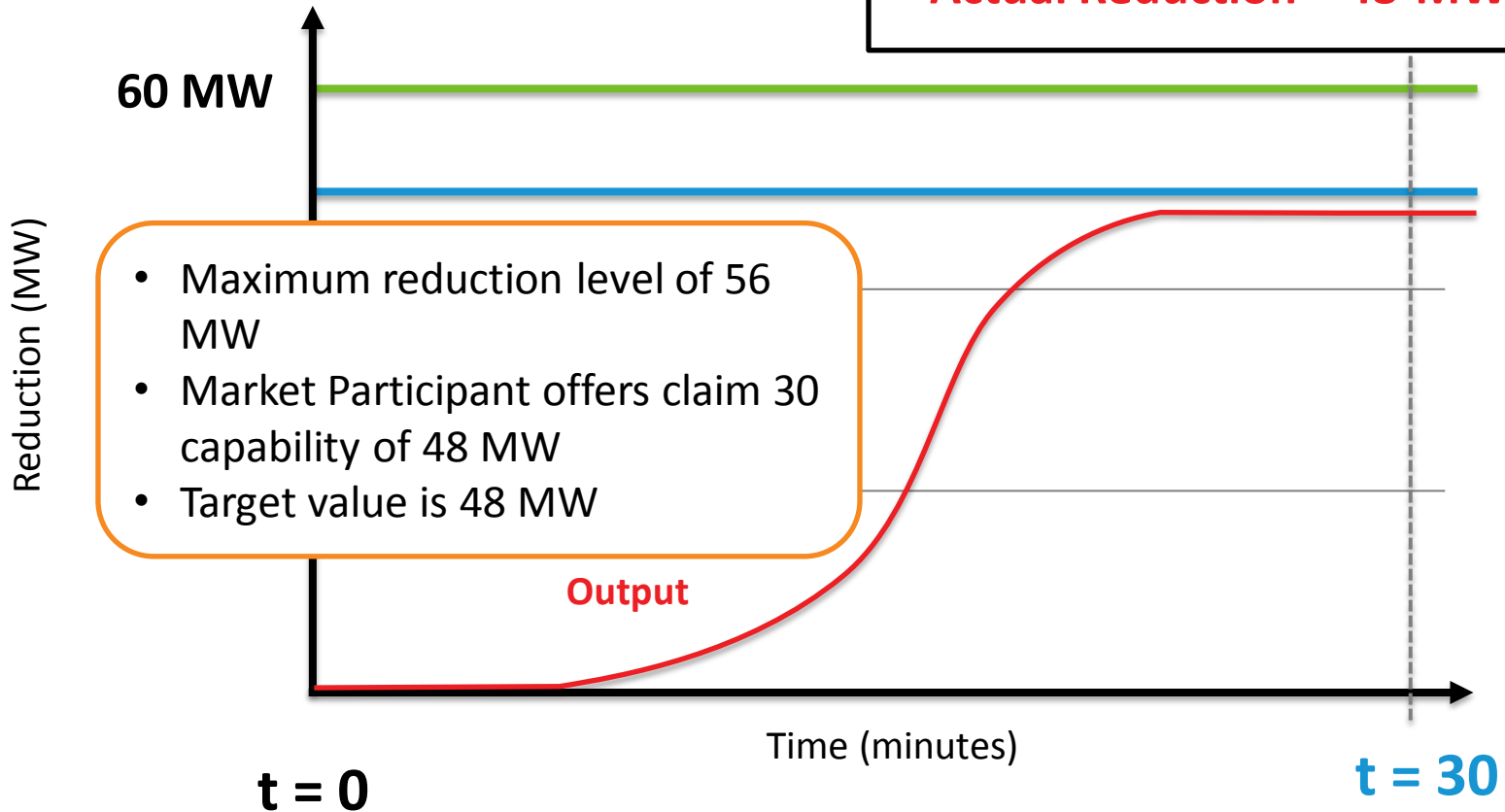
Actual Reduction \geq Target Value

WEEK 4:

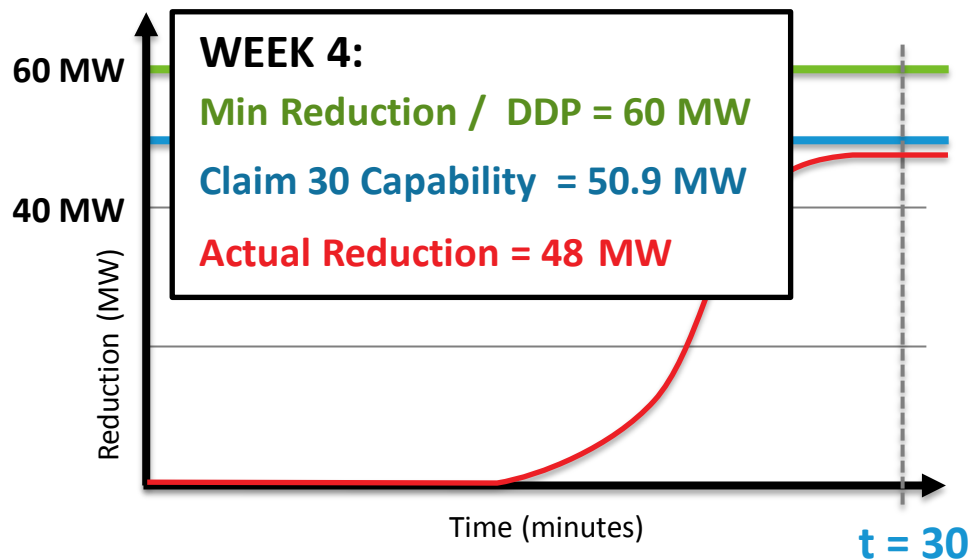
Min Reduction / DDP = 60 MW

Claim 30 Capability = 50.9 MW

Actual Reduction = 48 MW



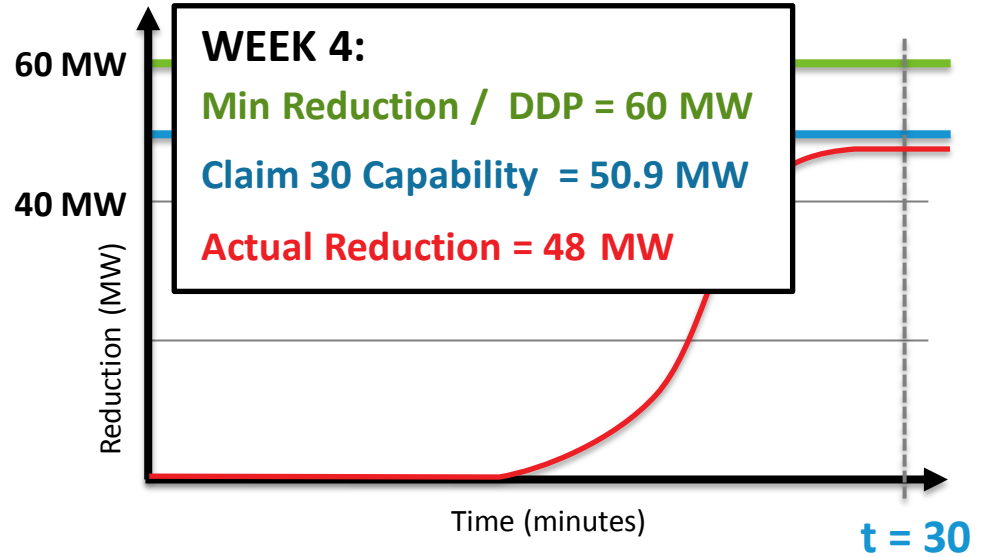
4. Actual Reduction \geq Target value



Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
2	56	1.0	56	20	60	60	20	22
3	56	1.0	56	20	60	60	20	10
4	56	0.909	50.9					

4. Actual Reduction \geq Target Value

- Performance factor will increase because, for this dispatch, a value of 1 will be utilized in calculating the performance factor.
- Claim 30 will increase because the performance factor increased.



Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
1	50	1.0	50	50	60	60	50	56
2	56	1.0	56	20	60	60	20	22
3	56	1.0	56	20	60	60	20	10
4	56	0.909	50.9	48	60	60	48	48
5	56							

Example 4: Actual Reduction ≥ Target Value

Weighting Factor / Start Number	10	9	8	7	6	5	4	3	2	1
DDP	60	60	60	60	60	60	60	60	60	60
Target Value	48	20	20	50	50	50	50	50	50	50
Actual Reduction	48	10	22	56	50	50	50	50	50	50
Dispatch Performance <i>(Actual Reduction / Target Reduction)</i>	48/48	.5	1	1	1	1	1	1	1	1
Weighted Dispatch Performance <i>(Dispatch Performance x Weighting Factor)</i>	10	4.5	8	7	6	5	4	3	2	1

$$\text{Performance Factor} = \frac{10 + 4.5 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1}{10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1} = 0.918$$

Example 4: Actual Reduction \geq Target value (cont.)

$$\begin{aligned} \text{Claim 30} &= \text{Maximum Reduction Level} \times \text{Performance Factor} \\ 56 \text{ MW} &\times .918 \\ &= 51.4 \text{ MW} \end{aligned}$$

Week	Maximum Reduction Level	Performance Factor	Claim 30	Offered Claim 30	Minimum Reduction	DDP	Target Value	Actual Reduct.
...								
4	56	0.909	50.9	48	60	60	48	48
5	56	0.918	51.4					

Questions?

Next:

- *Performance factor cure*
- *Reports*



Performance Factor Cure

- May be requested if unit has:
 - Chronic problem that meets criteria in Market Rule
 - Major overhaul
- Submit plan to ISO
- Perform maintenance
- Perform audit
- Following audit:
 - All prior history is removed
 - Performance factor set to 1



Claim10/30 Notification of Starts

Claim 10/30 Notification of Starts

OI_CLAIM1030STARTNOTIFICATION_LP_0220201813561200.xls

Lead_Participant

Market Day: 02/16/2018 and Version: 02/20/2018 13:56:12 GMT

Asset Data		Startup Information												
Asset Short Name	Asset ID	Date of Start	10-Minute Target	10-Minute Output	30-Minute Target	30-Minute Output	60 Min In-service Flag	10-Minute Requested Audit Flag	30-Minute Requested Audit Flag	10-Minute Cure Audit Flag	30-Minute Cure Audit Flag	10-Minute Exclude	30-Minute Exclude	Contingency Flag
String	Number	Date	MW	MW	MW	MW	Flag	Flag	Flag	Flag	Flag	Flag	Flag	Flag
UNIT1	12345	2/16/2018 17:24:48					Y	N	N	N	N	N	N	N
UNIT1	12345	2/16/2018 15:53:21					Y	N	N	N	N	N	Y	N
UNIT1	12345	2/16/2018 10:08:02					Y	N	N	N	N	N	N	N
UNIT1	12345	2/16/2018 6:34:20					Y	N	N	N	N	N	N	N

Weekly Claim10/30 Report

Weekly Claim 10/30 Report

OI_WEEKLYCLAIM1030_LP_0215201813535100.xls

Lead_Participant

Market Day: 02/19/2018 and Version: 02/15/2018 13:53:51 GMT

Asset Data		Daily Information										
Asset Short Name	Asset ID	Market Date	Claim 10	Claim 30	Claim 10 Maximum Reduction	Claim 30 Maximum Reduction	10-Minute Maximum Reduction	30-Minute Maximum Reduction	Upcoming Forward Reserve Procurement Period Claim 10 Seasonal Baseline	Upcoming Forward Reserve Procurement Period Claim 30 Seasonal Baseline	10-Minute Performance Factor	30-Minute Performance Factor
String	Number	Date	MW	MW	MW	MW	MW	MW	MW	MW	Number	Number
UNIT1	12345	2/19/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT1	12345	2/20/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT1	12345	2/21/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT1	12345	2/22/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT1	12345	2/23/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT1	12345	2/24/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT1	12345	2/25/2018	295.0	295.0	295	295	295	295	0	0	0.9985	0.9952
UNIT2	54321	2/19/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995
UNIT2	54321	2/20/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995
UNIT2	54321	2/21/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995
UNIT2	54321	2/22/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995
UNIT2	54321	2/23/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995
UNIT2	54321	2/24/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995
UNIT2	54321	2/25/2018	295.0	295.0	295	294	295.3	279	295	295	0.9954	0.9995

Note: The 10-Minute and 30-Minute Maximum Output values will be used for Claim 10 and Claim 30 calculations in the next like Forward Reserve Procurement Period, unless the unit reaches a higher output prior to the end of this Forward Reserve Procurement Period through either an audit or economic dispatch.

Summary

Do what you offer.

Offer what you do.





Questions?

Customer Support Information



Ask ISO (preferred)

- Self-service interface for submitting inquiries
- Accessible through the SMD Applications Homepage
- Requires a valid digital certificate with the role of Ask ISO/External User (Contact your security administrator for assistance)

Other Methods of Contacting Customer Support

Method	Contact Information	Availability
Email	custserv@iso-ne.com	Anytime
Phone*	(413) 540-4220	Monday through Friday 8:00 a.m. to 5:00 p.m. (EST)
Pager (emergency inquiries)	(877) 226-4814	Outside of regular business hours

* Recorded/monitored conversations

Appendix



DRA Operational Status Requirements

DRA

- It is in the Monthly Communications Model (*registration process*)
 - ‘Approved’ by ISO in CAMS
 - Telemetry is installed & operational
 - Mapped to an operational **DRR**
- It has a baseline built for the day-type (*only done once*)
- Meter issue flag is set to ‘No’ in CAMS
- Has no scheduled curtailments in CAMS for the operating day



If any of these criteria are not met the **DRA**'s status is **automatically non-operational** and it **will not** contribute to **DRR** reduction values