PJM Emergency DR
(Load Management)

PJM State & Member Training Dept.

Disclaimer:

PJM has made all efforts possible to accurately document all information in this presentation. The information seen here does not supersede the PJM Operating Agreement or the PJM Tariff both of which can be found by accessing: http://www.pjm.com/documents/agreements/pjm-agreements.aspx

For additional detailed information on any of the topics discussed, please refer to the appropriate PJM manual which can be found by accessing: http://www.pjm.com/documents/manuals.aspx

Agenda

- Reliability Pricing Model (RPM) Overview
- Planned and Existing DR
- Load Management Registration (Details)
- Load Reduction Reporting
- Load Management Event Notification
- Product Substitution
- Sub Zonal Dispatch
- Compliance & Settlements
- Load Management Tests
- Add Back Administrative Process
- Appendix
  - eLRS - Load Management Registration
  - eLRS - Notification of Load Management Tests and Retests
  - eLRS - Submission of Load Management Compliance data
  - eLRS – Submission of Emergency Energy Settlements
  - DLC Documentation

Reliability Pricing Model
- an overview

Capacity vs. Energy

Capacity

- A commitment of a resource to provide energy during PJM emergency under the capped energy price
- Capacity revenues paid to committed resource whether or not energy is produced by resource
- Daily product

Energy

- Generation of electrical power over a period of time
- Energy revenues paid to resource based on participation in PJM's Day-Ahead & Real-Time Energy Markets
- Hourly product

Capacity, energy & ancillary services revenues are expected, in the long term, to meet the fixed and variable costs of generation resources to ensure that adequate generation is maintained for reliability of the electric grid

Objectives of RPM

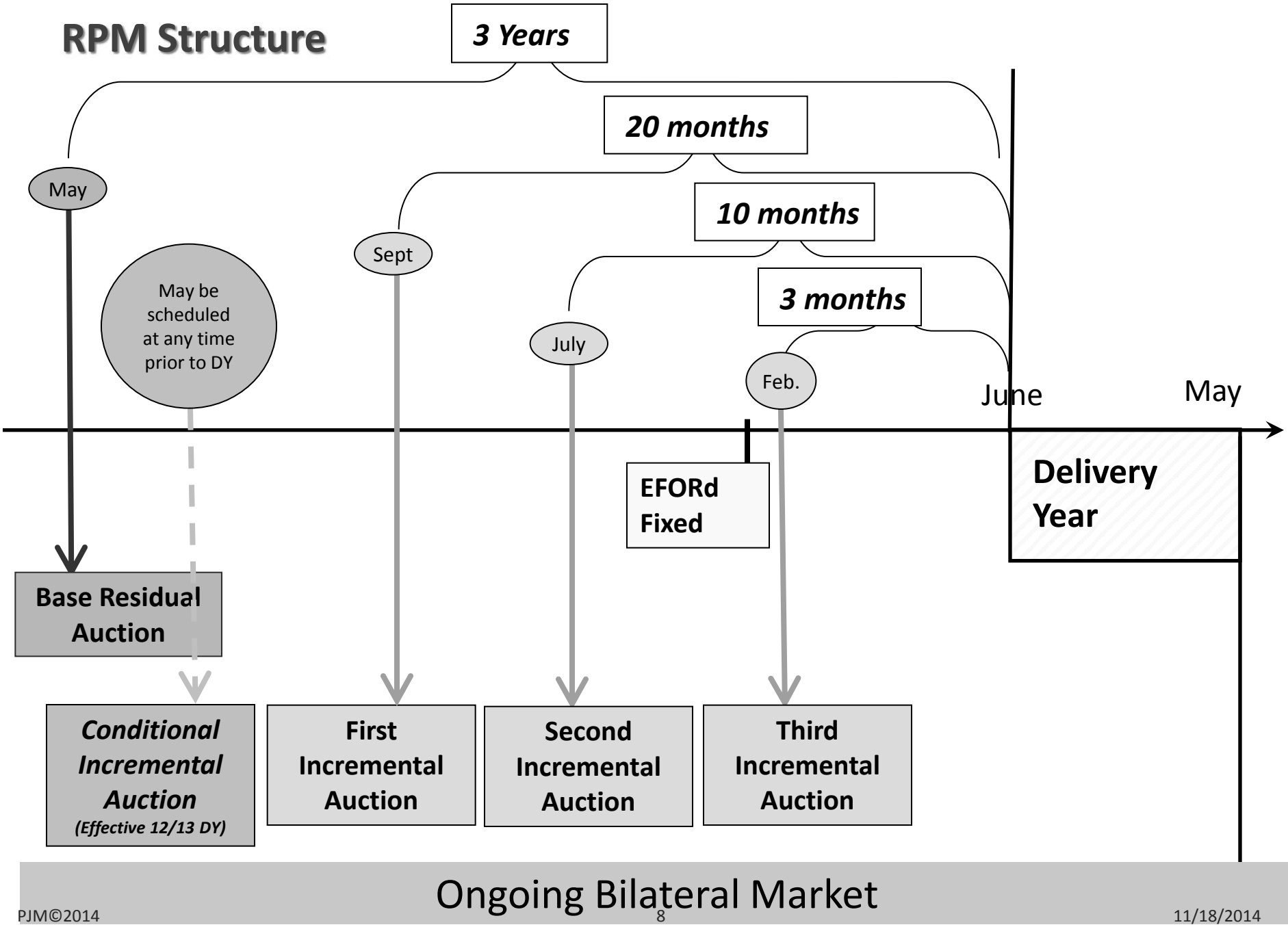
- Resource commitments to meet system peak loads three years in the future
- Three year forward pricing which is aligned with reliability requirements and which adequately values all capacity resources
- Provide transparent information to all participants far enough in advance for actionable response

Purpose of RPM is to enable PJM to obtain sufficient resources to reliably meet the needs of electric consumers within PJM

RPM Participation

- Eligible Capacity Resources:
  - Existing & planned generation in PJM
  - Existing & planned external generation
  - Load Management resources
    - Demand Resources (DR) – existing & planned
  - Energy Efficiency resources
  - Bilateral contracts for unit-specific capacity resources
  - Qualifying Transmission Upgrades

RPM Structure



RPM Auctions (Starting with 12/13 DY)

Activity	Purpose	Cost of Procurement
Base Residual Auction	Procurement of RTO Obligation less an amount reserved for short term resources, less FRR Obligation	Allocated to LSEs through Locational Reliability Charge
1st Incremental Auction	Allows for: (1) replacement resource procurement (2) increases and decreases in resource commitments due to reliability requirement adjustments; and (3) deferred short-term resource procurement	Allocated to resource providers that purchased replacement resources and LSEs through Locational Reliability Charge
2nd Incremental Auction		
3rd Incremental Auction		
Conditional Incremental Auction	Procurement of additional capacity in a LDA to address reliability problem that is caused by a significant transmission line delay	Allocated to LSEs through Locational Reliability Charge

Auctions and DR

- Base Residual Auction (BRA)
  - If DR clears, then committed to provide capacity in the corresponding delivery year
- Incremental Auctions (IA)
  - If DR does not fully clear in BRA, may offer available capacity into subsequent IA
  - If DR clears, then committed to provide capacity in corresponding delivery year
  - If DR cannot provide the committed capacity in the delivery year as expected, the CSP can participate in an incremental auction to buy replacement capacity to cover shortfall

Demand Curve

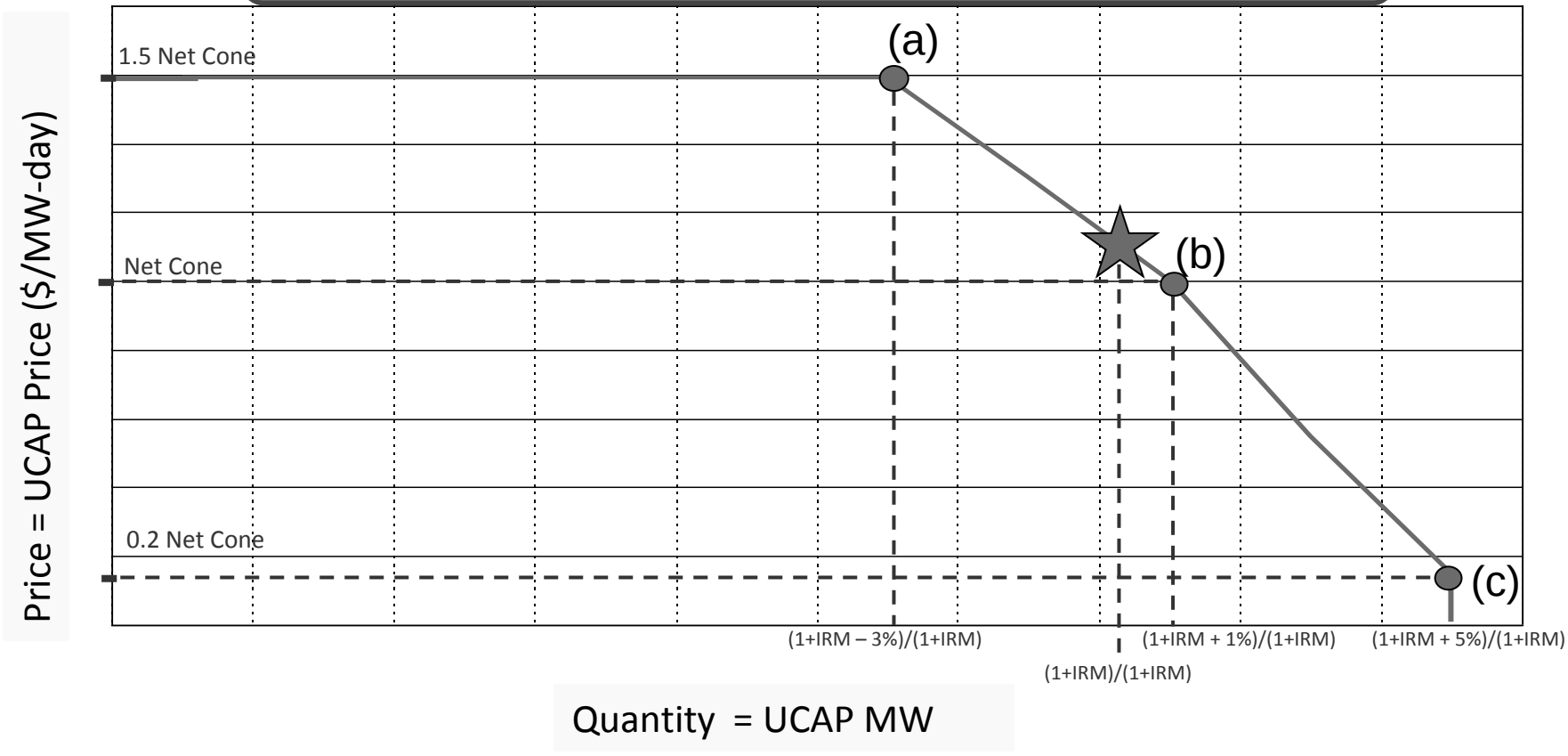
The Variable Resource Requirement (VRR) Curve is a downward sloping demand curve that relates the maximum price for a given level of capacity resource commitment relative to reliability requirements.

- The price is higher when the resources are less than the reliability requirement and lower when the resources are in excess.
- VRR Curves are defined for the PJM RTO and for each constrained Locational Deliverability Area (LDA) within the PJM region.

Illustrative Example of a VRR Curve

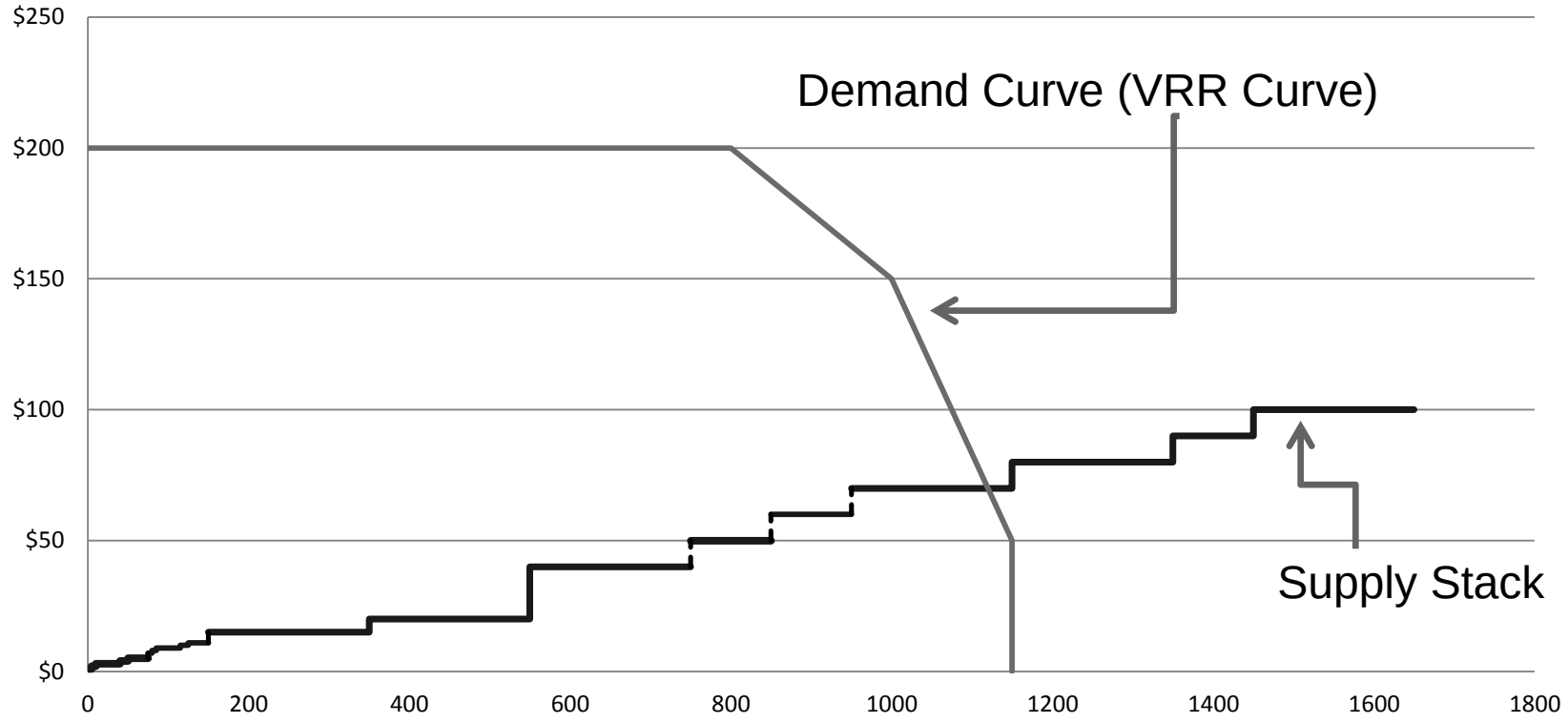
A VRR Curve is defined for the PJM Region.

Individual VRR Curves are defined for each Constrained LDA.



The UCAP quantity on the X-axis is obtained by multiplying the Reliability Requirement adjusted for FRR by the IRM ratios and then subtracting the Short-Term Resource Procurement Target

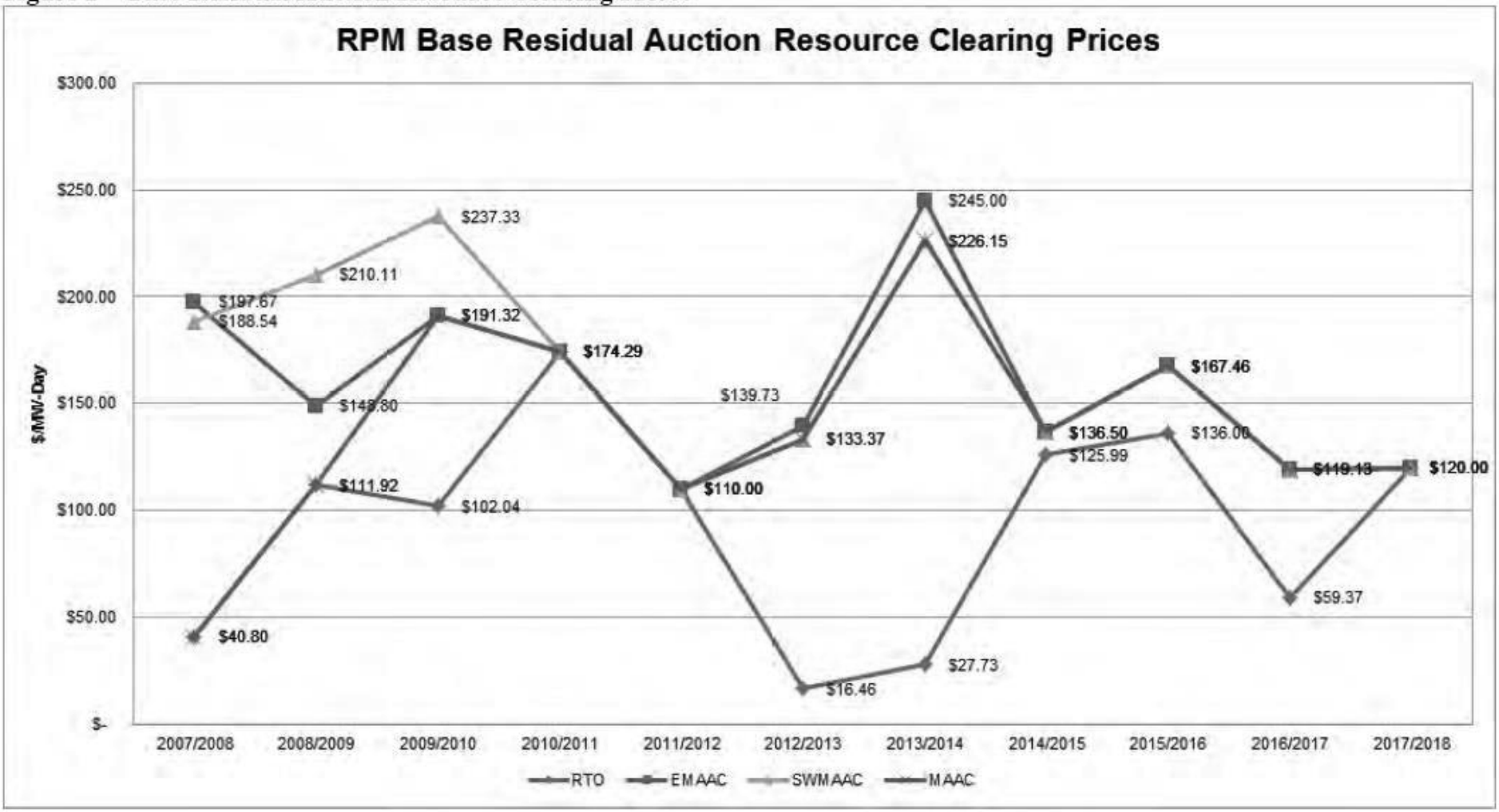
Clearing Example



Unconstrained LDA Price Of System Capacity = $70

Base Residual Auction

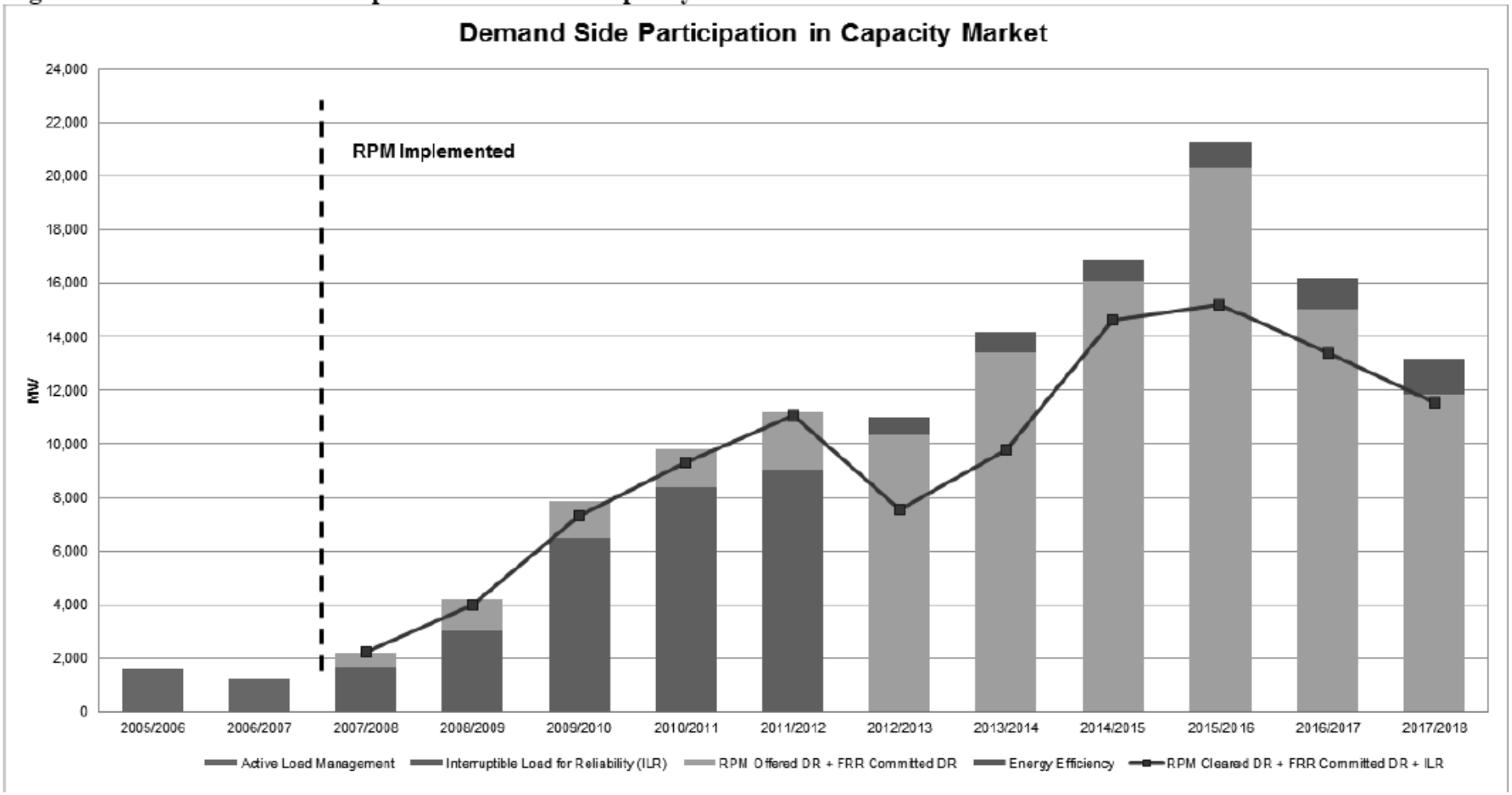
Figure 2 – Base Residual Auction Resource Clearing Prices



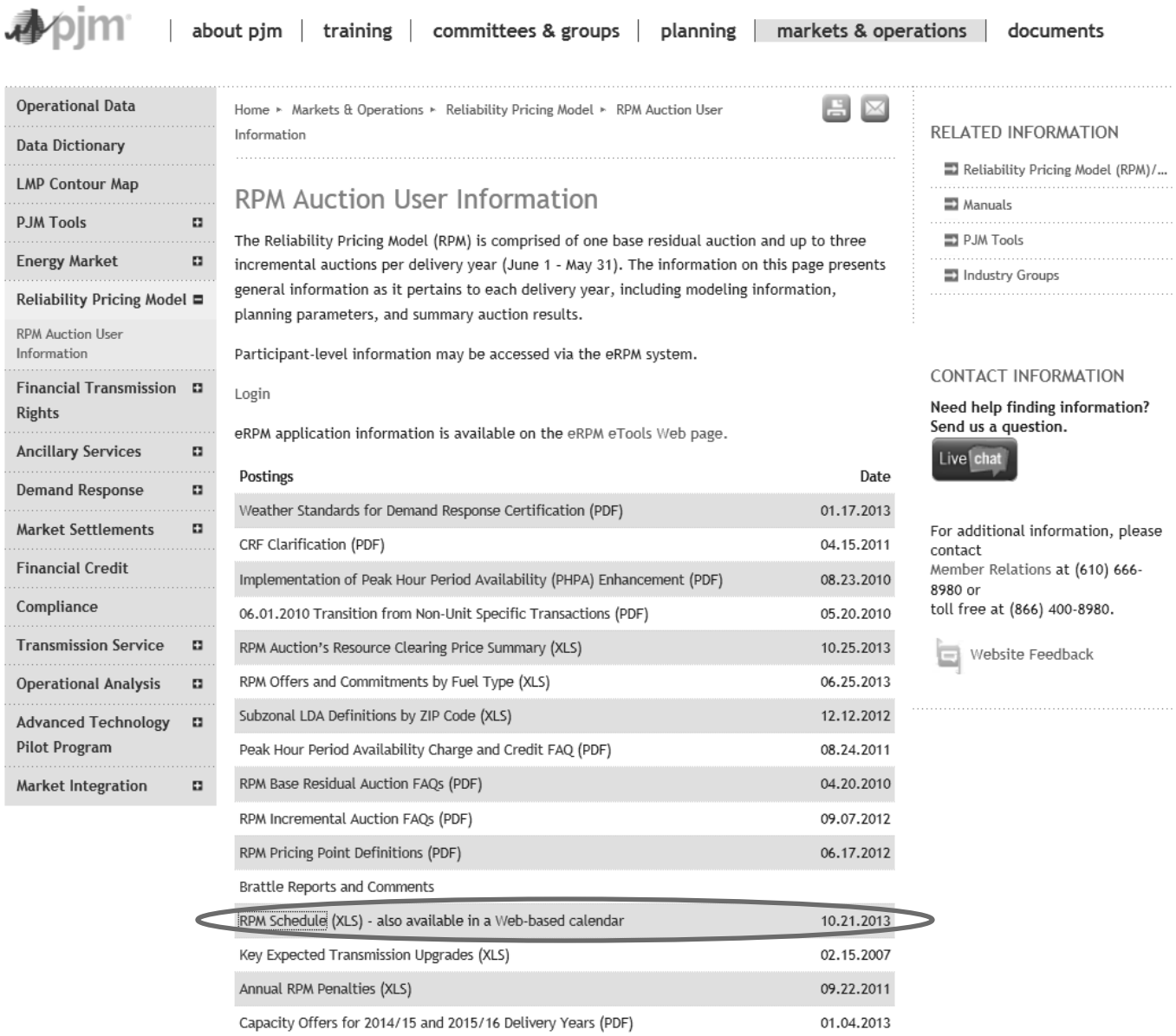
*2014/2015 through 2017/2018 Prices reflect the Annual Resource Clearing Prices.

DR Participation in RPM

Figure 1 – Demand Side Participation in the PJM Capacity Market



RPM Schedule of Activities



Three Product Types

Requirement	Limited DR	Extended Summer DR	Annual DR
Availability	Any weekday, other than NERC holidays, during June – Sept. period of DY	Any day during June-October period and following May of DY	Any day during DY (unless on an approved maintenance outage during Oct. - April)
Maximum Number of Interruptions	10 interruptions	Unlimited	Unlimited
Hours of Day Required to Respond *(Hours in EPT)*	12:00 PM – 8:00 PM	10:00 AM – 10:00 PM	Jun – Oct. and following May: 10 AM – 10 PM Nov. – April: 6 AM- 9 PM
Maximum Duration of Interruption	6 Hours	10 Hours	10 Hours
Notification	Must be able to reduce load when requested by PJM All Call system within 2 hours of notification, without additional approvals required		
Registration in eLRS	Must register sites in Emergency Load Response Program in Load Response System (eLRS)		
Event Compliance	Must provide customer-specific compliance and verification information within 45 days after the end of month in which PJM-initiated LM event occurred		
Test Compliance	In absence of the PJM-initiated LM event, CSP must test load management resources and provide customer-specific compliance and verification information		

2014/2015 Base Residual Auction Results

2015/2016 DY BRA Resource Clearing Results

PJMDOCS-#699338v2A

Resource Clearing Prices

LDA	System Marginal Price [$/MW-day]	Locational Price Adder * [$/MW-day]	Limited Resource Clearing Price [$/MW-day]	Extended Summer Resource Price Adder [$/MW-day]	Extended Summer Resource Clearing Price [$/MW-day]	Annual Resource Price Adder [$/MW-day]	Annual Resource Clearing Price [$/MW-day]
RTO	$118.54	$0.00	$118.54	$17.46	$136.00	$0.00	$136.00
MAAC	$118.54	$31.46	$150.00	$17.46	$167.46	$0.00	$167.46
EMAAC	$118.54	$0.00	$150.00	$17.46	$167.46	$0.00	$167.46
SWMAAC	$118.54	$0.00	$150.00	$17.46	$167.46	$0.00	$167.46
PS	$118.54	$0.00	$150.00	$17.46	$167.46	$0.00	$167.46
PSNORTH	$118.54	$0.00	$150.00	$17.46	$167.46	$0.00	$167.46
DPLSOUTH	$118.54	$0.00	$150.00	$17.46	$167.46	$0.00	$167.46
PEPCO	$118.54	$0.00	$150.00	$17.46	$167.46	$0.00	$167.46
ATSI	$118.54	$186.08	$304.62	$17.46	$322.08	$34.92	$357.00

* Locational Price Adder is with respect to the immediate higher level LDA.

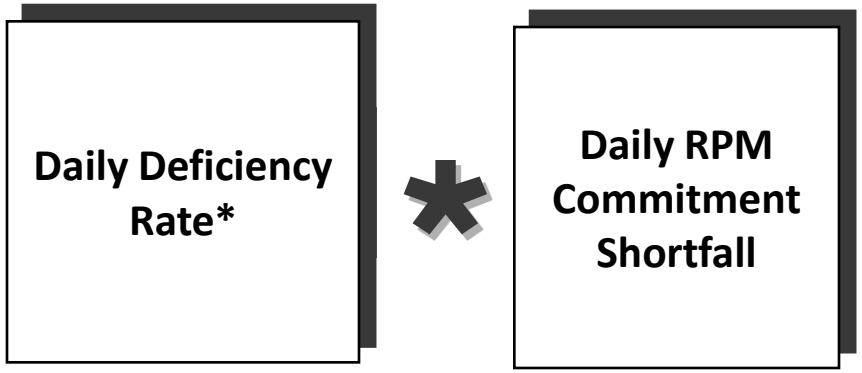
A complete list of Auction Results are located at the following link:

http://www.pjm.com/markets-and-operations/rpm/rpm-auction-user-info.aspx

Once at the RPM webpage, click the appropriate Delivery Year
and scroll to “20##/20## Base Residual Auction Results”

Capacity Resource Deficiency Charges

Daily Capacity Resource Deficiency Charge =



* Daily Deficiency Rate = Party's Weighted Average RCP + Higher of (20% * Party's Weighted Average RCP OR $20/MW-day)

- Party's Weighted Average Resource Clearing Price (WARCP) for such resource is determined by calculating the weighted average of resource clearing prices for such resource, weighted by a party's cleared and makewhole MWs for such resource
- If a Party's WARCP for such resource is $0/MW-day, a PJM WARCP in the LDA is used
- PJM WARCP is determined by calculating the weighted average resource clearing prices in the LDA across all RPM Auctions, weighted by the total cleared and make-whole MWS in the LDA
- Charges are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation
- The Resource Provider may still receive an RPM Auction Credit

Relief for Existing DR

- Existing DR that cleared in BRA, 1st IA, or 2nd IA can receive relief from Capacity Resource Deficiency Charges if they failed to meet their RPM Resource Commitments due to a decrease in Peak Load Contributions that were due to permanent departure of load from the transmission system (e.g., plant closure or efficiency gains)
- Request for relief from deficiency charges must be made via email to rpm_hotline@pjm.com no later than two weeks in advance of opening the 3rd IA
- The request for relief must provide PJM with adequate information for PJM to assess the merits of the request for relief.
- If relief is granted by PJM, the resource provider will receive a reduction in their Base Residual Auction Credits or Incremental Auction Credits

Planned and Existing DR

DR: Planned vs. Existing

Demand Resources in RPM may be classified as either Planned or Existing

Existing	Planned
I. Currently have capability to provide reduction in demand and will provide load reduction capability for DY of RPM Auction II. Existing MWs based on pre-registrations in eRPM III. No Credit Requirement	I. Do not currently have capability to provide reduction in demand, but is scheduled to be capable of providing such reduction on or before start of DY II. Planned MWs based on DR Sell Offer Plan submittal III. Credit Requirement is Pre-Clearing BRA Credit Rate * Number of Planned MWs

DR Sell Offer Plan Submittal

- DR Sell Offer Plans must be submitted via email to rpm_hotline@pjm.com
- DR Sell Offer Plan Templates are posted for each Delivery Year under the "Demand Resource Materials" section at http://pjm.com/markets-and-operations/rpm/rpm-auction-user-info.aspx
- Effective with 14/15 DY, plan must indicate product type (Annual, Extended Summer, or Limited) for each Demand Resource

Pre-Registration required for Existing Resources

- Pre-registration of a site is required to enable submission of an "Existing" Demand Resource in an RPM auction
  - Ensure sites will be available during the DY
  - Properly determine credit requirements
  - Only currently registered sites can be considered "existing"

- Pre-registration is a two step process…

See PJM Manuals 11 and 18 for more detailed information on the registration process

How to Pre-Register: Two Step Process

- **Pre-Register for 2014/2015 Third IA**
- Register (PJM will use newer of 14/15 or 13/14) and Select (for 14/15)
  - CSP registers sites as Emergency DR via eLRS:
    - PJM will use the values on the newer of 14/15 or 13/14 registration
      - 14/15 registrations must be in Confirmed status by January 17, 2014
        - Note: submit by 1/3/14 to allow for 10 business day review
      - PJM will supply CSPs with a list of their Confirmed registrations (in eRPM) by COB January 20, 2014
  - CSP (via eRPM) selects those sites that they reasonably believe they will have under contract and will reduce load in 2014/2015 DY. The selected sites form the basis of their Existing Demand Resources to offer into the 2014/2015 Third IA
    - Selections must be completed in eRPM by COB January 29, 2014

DR Registration must be in Confirmed status by January 17, 2014

CSP Switching for 2014/2015 Third IA

- Sites that are registered for 13/14 under one CSP, but plan to contract under a different CSP in 14/15, may submit documentation to have their site considered "existing" for the new CSP
  - Documentation must be submitted to PJM by January 17, 2014
    - E-mail from end-use customer notifying PJM of their switch to the new CSP
    - E-mail from end-use customer notifying both PJM and the current 13/14 CSP that they do not plan to contract with them for 14/15
  - Documentation only required if the site has not yet been confirmed in eLRS under the new CSP for 14/15

How to Pre-Register: Two Step Process

- **Pre-Register for 2017/2018 BRA**
- Register (PJM will use higher of 14/15 or 13/14) and Select (for 14/15)
  - CSP registers sites as Emergency DR via eLRS:
    - PJM will use the values on the newer of 14/15 or 13/14 registration
      - 14/15 registrations must be in Confirmed status by April 4, 2014
        - Note: submit by 3/21/14 to allow for 10 business day review
      - PJM will supply CSPs with a list of their Confirmed registrations (in eRPM) by COB April 7, 2014
  - CSP (via eRPM) selects those sites that they reasonably believe they will have under contract and will reduce load in 2017/2018 DY. The selected sites form the basis of their Existing Demand Resources to offer into the 2017/2018 BRA
    - Selections must be completed in eRPM by COB April 16, 2014

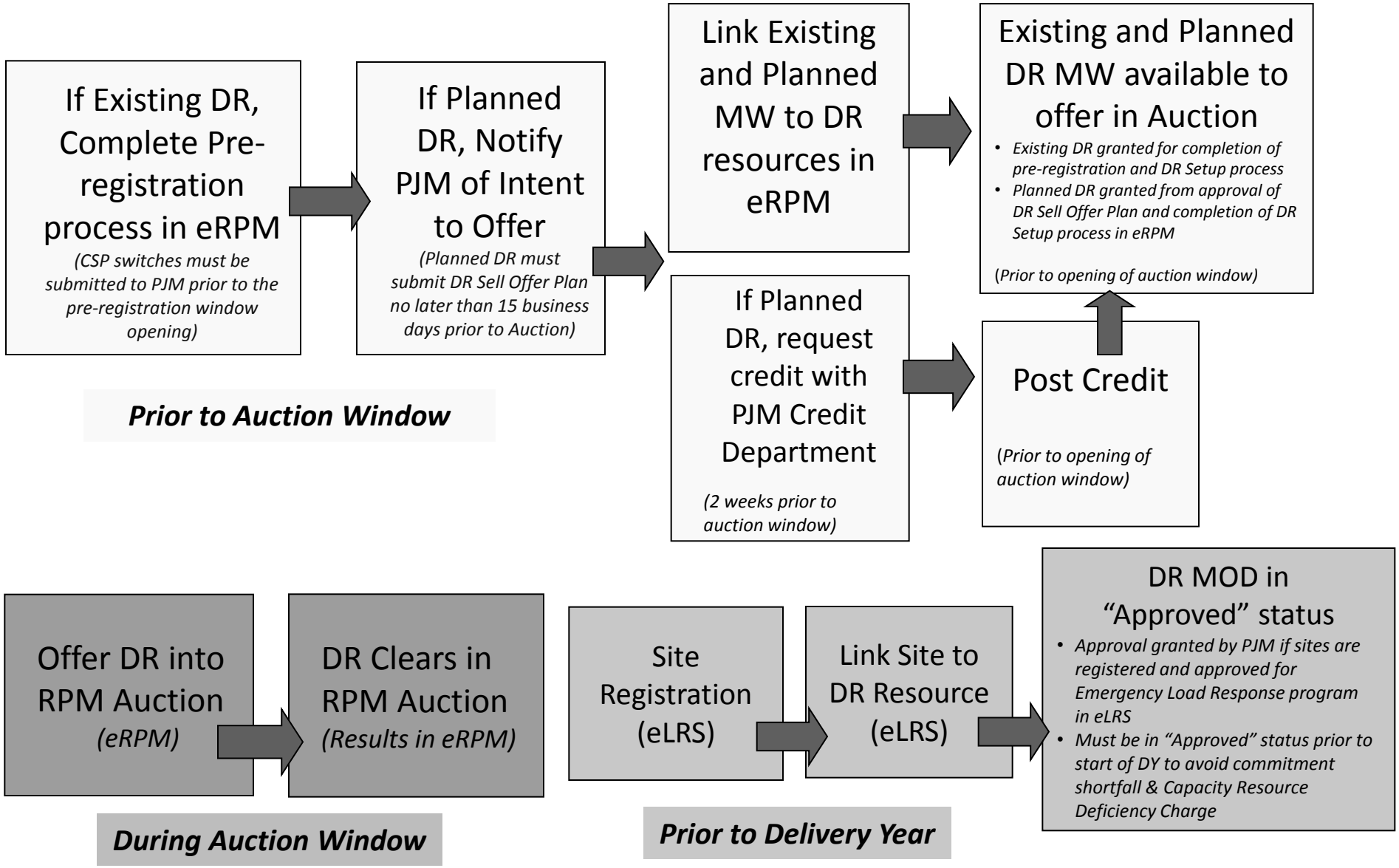
DR Registration must be in Confirmed status by April 4, 2014

DR Resource Modeling in eRPM

- RPM Team will model DR resources in eRPM by request
  - Will create one resource per:
    - Zone/LDA
    - Product Type
- After DR Resource is modeled, CSP is responsible for completing the DR Setup in eRPM that links their Existing Pre-registration MW and Planned MW to specific DR resources
- The following link has further instruction on the DR Setup process in eRPM

  http://pjm.com/~/media/training/core-curriculum/ip-dsr/dr-sell-offer-plan-and-dr-auction-set-up-training.ashx

Steps for DR Participation in RPM Auctions



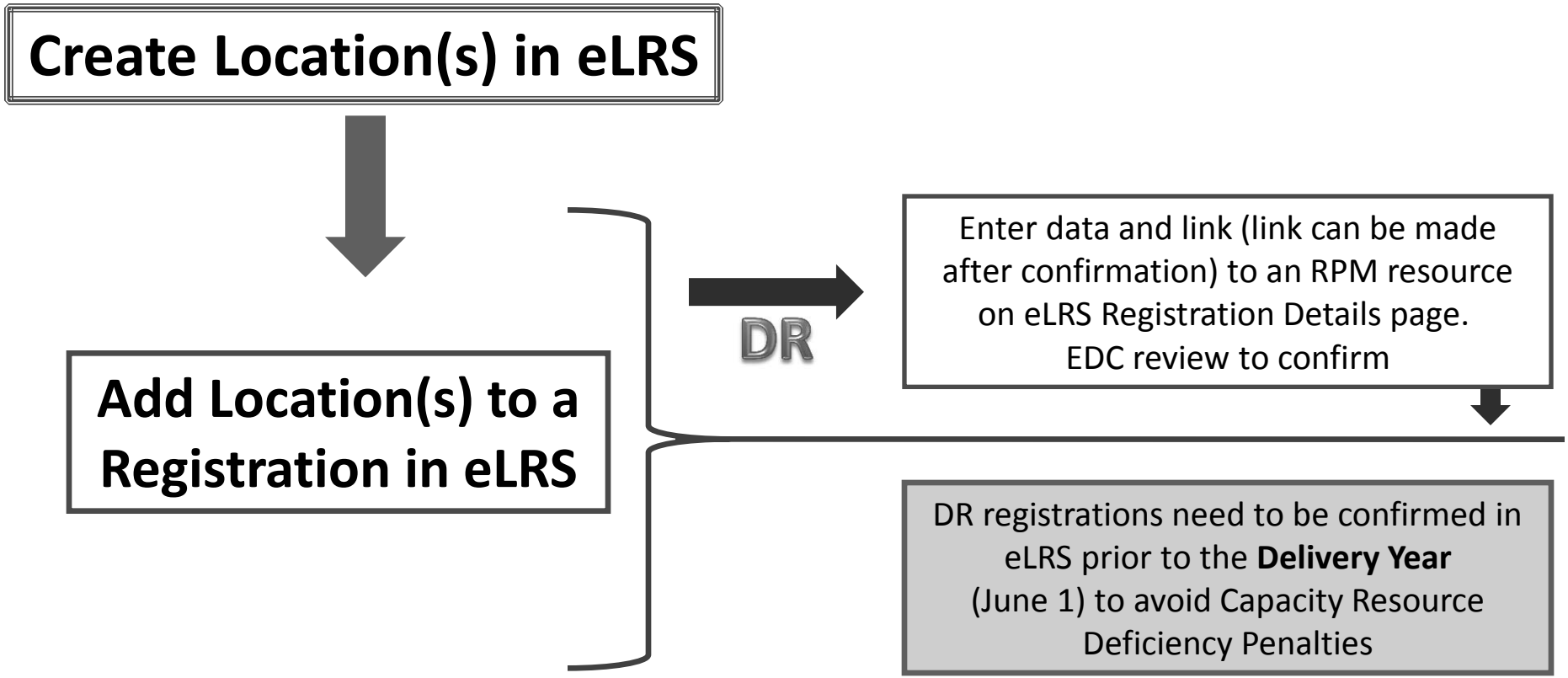
Load Management Registration (Details)

Registration Scenarios

Registration Scenarios for same location (EDC account number)

Scenario	Economic (Energy, SR, DASR, Reg)	Economic (Energy Only)	Economic Regulation Only	Emergency Capacity Only	Emergency Full (Capacity and Energy)	Emergency Energy Only
CSP1	Yes	na	na	No	Yes	No
CSP1	Yes	na	na	Yes	No	Yes
CSP1	Yes	Na	Na	No	No	Yes
CSP2	No	na	na	Yes	No	No
CSP1	No	No	Yes	No	No	No
CSP2	No	Yes	No	No	Yes	No
CSP1	No	Yes	Yes	No	No	Yes
CSP2	No	No	No	Yes	No	No
CSP1	No	No	Yes	No	No	No
CSP2	No	Yes	No	No	No	Yes
CSP3	No	No	No	Yes	No	No

LM Registration Workflow



All registrations must be initially submitted by 1 day prior to 10 business days before June 1st

Creating an Aggregate of Small (< 100 kW) Resources for LM: Business Rules

- All Locations in the aggregate must have the same EDC
- Create aggregates via the eLRS
- All registrations must total >=100kW
  - multiple Locations will need to be selected in eLRS to form one (1) single registration >= 100kW
- Only one (1) individual location in the aggregate can be >=100kW
- All Locations in the aggregate must meet all other requirements for market participation

- There is no limit to the number of Locations in an aggregate
- Cannot aggregate Pre-Emergency with Emergency on same registration

Metering Requirements

- Metering requirements shall meet:
  - 1) Electric Distribution Company requirements for accuracy or,
  - 2) Have a maximum error of two (2) percent over the full range (end- to-end) of the metering equipment (including Potential Transformers and Current Transformers)
    - For pulse data recorders (PDR), this includes the PDR error plus EDC meter error

- Metering equipment can be either:
  - 1) The metering equipment used for retail electric service
  - 2) Customer-owned metering equipment
  - 3) Metering equipment acquired by the CSP for the customer

Rules are outlined in Manual 11, section 10 –
Interval Meter Equipment and Load Data Requirements

Implementation of Metering Rules

- CSP submits quality assurance plan
  - Indicate how CSP ensures installation is correct and that meter equipment & load data remain accurate overtime.
- CSP indicates "customer owned" meter on eLRS location that is part of a registration
- CSP submits "DSR customer owned meter qualification form" to dsr_ops@pjm.com
  - http://www.pjm.com/markets-and-operations/etools/~/media/etools/elrs/20090904-dsr-customer-ownder-meter-qualification-form.ashx
- PJM reviews registration & contacts CSP as necessary
  - Registration must be approved by PJM
- CSP uploads 90 consecutive days of hourly load data on an annual basis near effective date of registration (if new) or termination date (if renewal) to eLRS
  - **Meter data is required upon PJM request**
  - Use eLRS "daily file format" for meter data upload
  - LSE / EDC may download meter data as needed for additional review

Metering FAQ's

- If I use the interval meter equipment and load data used for retail electric service do I need to complete the PJM meter qualification form?
  - No, just make sure you correctly designate the meter type as EDC meter on the location in eLRS
- What should I do if my pulse data recorder does not meet ANSI C12.1
  - You may request to do a field test that will include reconciliation of PDR load data to retail service meter and potential installation of temporary interval meter equipment (that does meet ANSI requirements)
- Do the meter rules apply to meter equipment used for synchronized reserve participation?
  - Yes
- Where should I go to learn more about meter data file formats and eLRS?
  - See eLRS Meter Data Management (non-webservices)
    - Economic Energy Example (XLS)
      http://www.pjm.com/markets-and operations/etools/elrs.aspx

Registrations

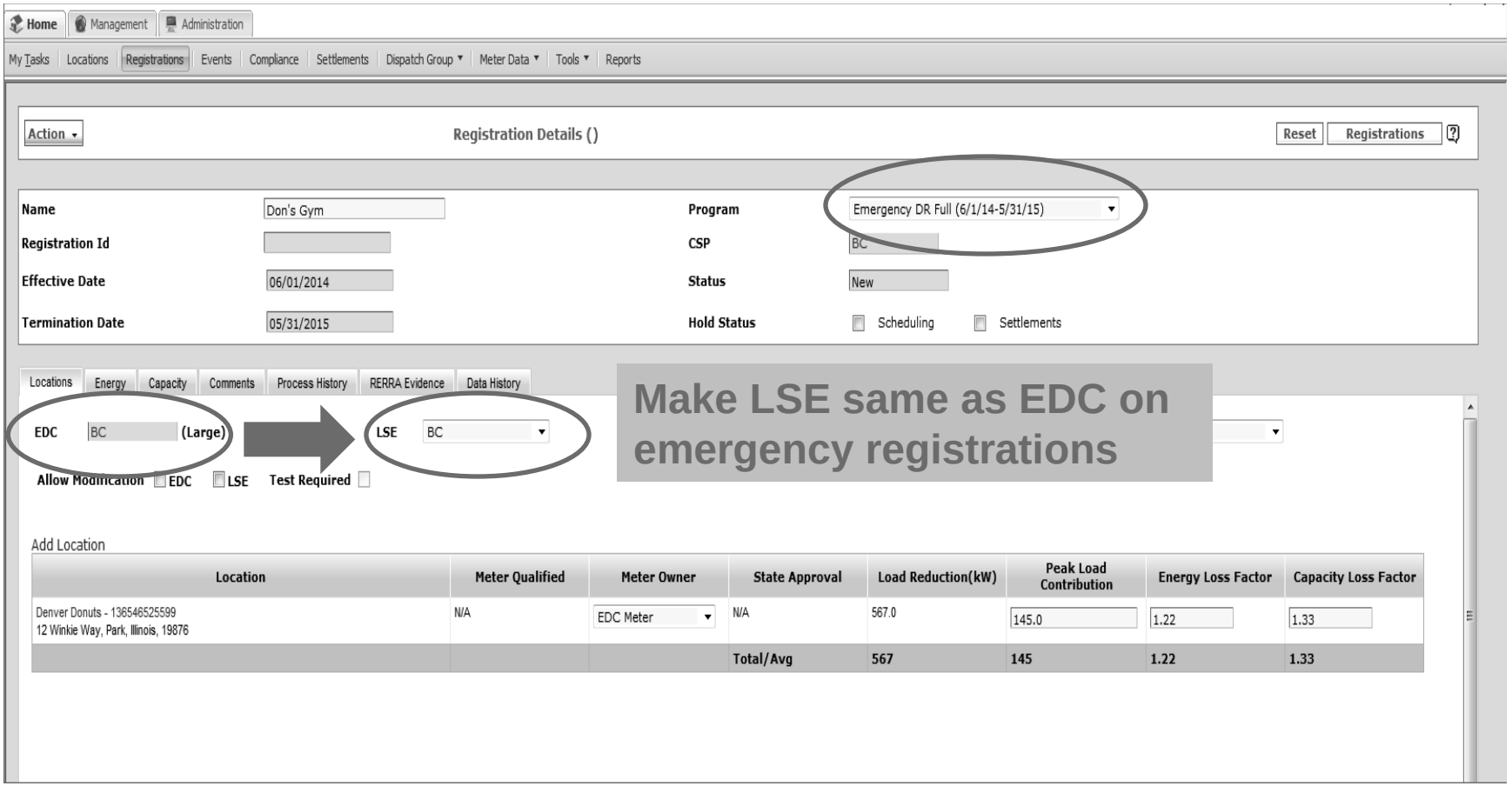
- Registrations are created by the CSP
    - Locations are used to create Registrations
    - Registrations can include multiple Locations
- Emergency Registrations are then submitted for approval (or denial) by the EDC
- Each registration must indicate:
    - Product type (Annual, Extended Summer, Limited)
    - Load Management type (FSL, GLD, DLC)
    - Lead Time (short, medium, long)
- Each registration may only be linked to a single DR Resource modeled in eRPM and the linked DR Resource must be of the same product type and zone as the registration
- The LSE is no longer in the Registration Review process

Registrations – Interim procedure

- **Emergency Registrations:**
  - CSP should enter the EDC name as the LSE
  - EDCs should not reject emergency registrations for not being the LSE for the registration
  - eLRS will be enhanced in the future to not require the LSE

Emergency Registrations: LSE = EDC to implement new rule change
EDC should not deny registration

Registrations



Registrations

- **Economic Registrations:**
  - No change. LSE still reviews registrations.
  - If you copy an emergency registration to create an economic registration, make sure you use the correct LSE

Registration – 30 Minute Lead Time

All Load Management registration are required to have 30 minute lead time unless registration does not have physical capability to respond in 30 min and needs 60 or 120 minutes. The following are the only reasons for an exception to the 30 min lead time requirement:

- The manufacturing processes for the Demand Resource require gradual reduction to avoid damaging major industrial equipment used in the manufacturing process, or damage to the product generated or feedstock used in the manufacturing process; or
- Transfer of load to back-up generation requires time-intensive manual process taking more than 30 minutes; or
- On-site safety concerns prevent location from implementing reduction plan in less than 30 minutes; or
- The Demand Resource is comprised of mass market residential customers or similarly situated mass market small commercial customers which collectively cannot be notified of a Load Management event within a 30-minute timeframe due to unavoidable communications latency, in which case the requested notification time shall be no longer than 120 minutes.

Annual DR – Maintenance Outage

- Maintenance Outages may be requested by CSP for Annual DR registrations for October through April
  - Maintenance or repair at facility on end use device or generator that will be used to reduce load
  - CSP maintenance to dispatch system subject to specific restrictions
- Facility outages may be up to 30 days
- CSP Dispatch system outage may be for 1 day, limited to Saturday or Sunday and only twice per quarter
- All outages subject to PJM approval
  - PJM may deny if needed to maintain reliability
- If PJM has an emergency event and CSP has approved outages then CSP capacity commitment used to measure compliance will be reduced based on registration's share of capacity commitment for linked DR resource

Expected reduction must still be submitted and should accurately reflect real time expected energy reductions.

Annual DR – Maintenance Outage

- Requesting an Outage
  - Email request to dsr_ops@pjm.com at least 4 business days prior to the requested outage.
  - Request template can be found here:

  Home → Markets & Operations → PJM Tools →
  eLRS → DR Annual Maintenance Outage Request Template (XLS)

  - PJM will email approvals/rejections back to sender

Strike Price and Shutdown Cost

The Strike price and shutdown cost are entered on the Emergency registration and cannot be changed during the Delivery Year.

- Shutdown Cost should represent the measurable location fixed cost for the implementation of the load reduction
- The Strike price cap is a function of the resource lead time and the Primary Reserve factor:
    - 30 minutes, Price <=$1,000 MWh plus Primary Reserve factor minus $1
    - 60 minutes, Price <=$1,000 MWh plus (Primary Reserve factor/2)
    - 120 minutes, Price <=$1,100 MWh

Dates	Primary Reserve Factor
Jun 2014 – May 2015	$550
Jun 2015 onward	$850

For 2015/2016 Delivery Year

30 minute lead time energy offer cap = $1,849 MWh
60 minute lead time energy offer cap = $1,425 MWh
120 minute lead time energy offer cap = $1,100 MWh

eLRS Registration

- Classify registration as pre-emergency or emergency resource
  - Default = Pre-emergency
  - Interim procedure to designate as Emergency
    - CSP to ensure location “Generator” load reduction capability > 0
    - CSP to ensure location Generator Permit Type = “Emergency Only”
    - CSP to include Comment in Registration = “Emergency Only”
    - PJM to follow up with CSP as necessary for any supporting information

Emergency resource = resource that uses behind the meter generation that has environmental restrictions that only allow it to run during PJM emergency conditions

Load Management Types

PJM recognizes three types of LM:

- Direct Load Control (DLC) – Emergency DR (Load Management) for non-interval metered customers which is initiated directly by a Curtailment Service Provider's (CSP) market operations center, employing a communication signal to cycle HVAC or water heating equipment. This is traditionally done for residential consumers and requires the necessary statistical studies as outlined in PJM Manual 19 or other PJM approved measurement and verification methodology.
- Firm Service Level (FSL) – Emergency DR (Load Management) achieved by a customer reducing its load to a pre-determined level upon the notification from the CSP's market operations center. The customer must be able to reduce load below the pre-determined level which must be lower than the amount of capacity reserve for the customer as represented by the peak load contribution ("PLC").
- Guaranteed Load Drop (GLD) – Emergency DR (Load Management) achieved by a customer reducing its load below the PLC when compared to what the load would have been absent the PJM emergency or test.

Nominated Value of Load Management = ICAP Value

- The nominated value is the maximum load reduction of an end-use customer site
- The process to determine this value is consistent with the process for the determination of the capacity obligation for the customer

Load Management Program Type	Nominated Value
Direct Load Control	# Customers * Per Participant Impact * Loss Factor Load Research and Switch Operability Study must be submitted to PJM and approved in order to determine the Participant Impact. (See DLC Documentation in the Appendix)
Firm Service Level	Peak Load Contribution – (Firm Load Level * Loss Factor)
Guaranteed Load Drop	Min (Peak Load Contribution or Customer Load Reduction Value * Loss Factor)

The maximum load reduction for each resource is adjusted to include system losses

Peak Load Contribution

- **What is a PLC and where do I get it?**
  - Peak Load Contribution is the quantity of a zone's peak load allocated to a site for a planning year. The PLC is determined by the EDC and can be attained either through the retail customer or, with the retail customer's consent, by the EDC
  - The Customer Usage Information Authorization form can submitted by the customer to the EDC to assist the CSP in obtaining the electric usage information including hourly or sub-hourly usage history (kWh/kW), EDC loss factors, and peak load contribution assignments for the current delivery year and the upcoming delivery year.
    - The form for Customer Usage Information Authorization for PJM Load Response Programs can be found in PJM Manual 11 section 10

UCAP Value of Demand Resource

Unforced Capacity (UCAP) value of a Demand Resource is calculated as:

Unforced Capacity Value Of DR X	=	**Nominated DR Value**	*	DR Factor	*	Forecast Pool Requirement (FPR)
For Example:						
10.3 MW	=	**10**	*	**0.956**	*	**1.0809**

Unforced Capacity Value For DR = 10.3 MW

DR Factor is less than 1.0 due to the risk that the actual load is greater than the 50/50 load forecast and maintain system reliability at one day in ten years

Forecast Pool Requirement: The amount equal to one plus the unforced reserve margin (stated as a decimal number) for the PJM Region

The DR Factor and Forecast Pool Requirement is not finalized until the Third IA for the DY

Calculating Load Management Revenue - Example

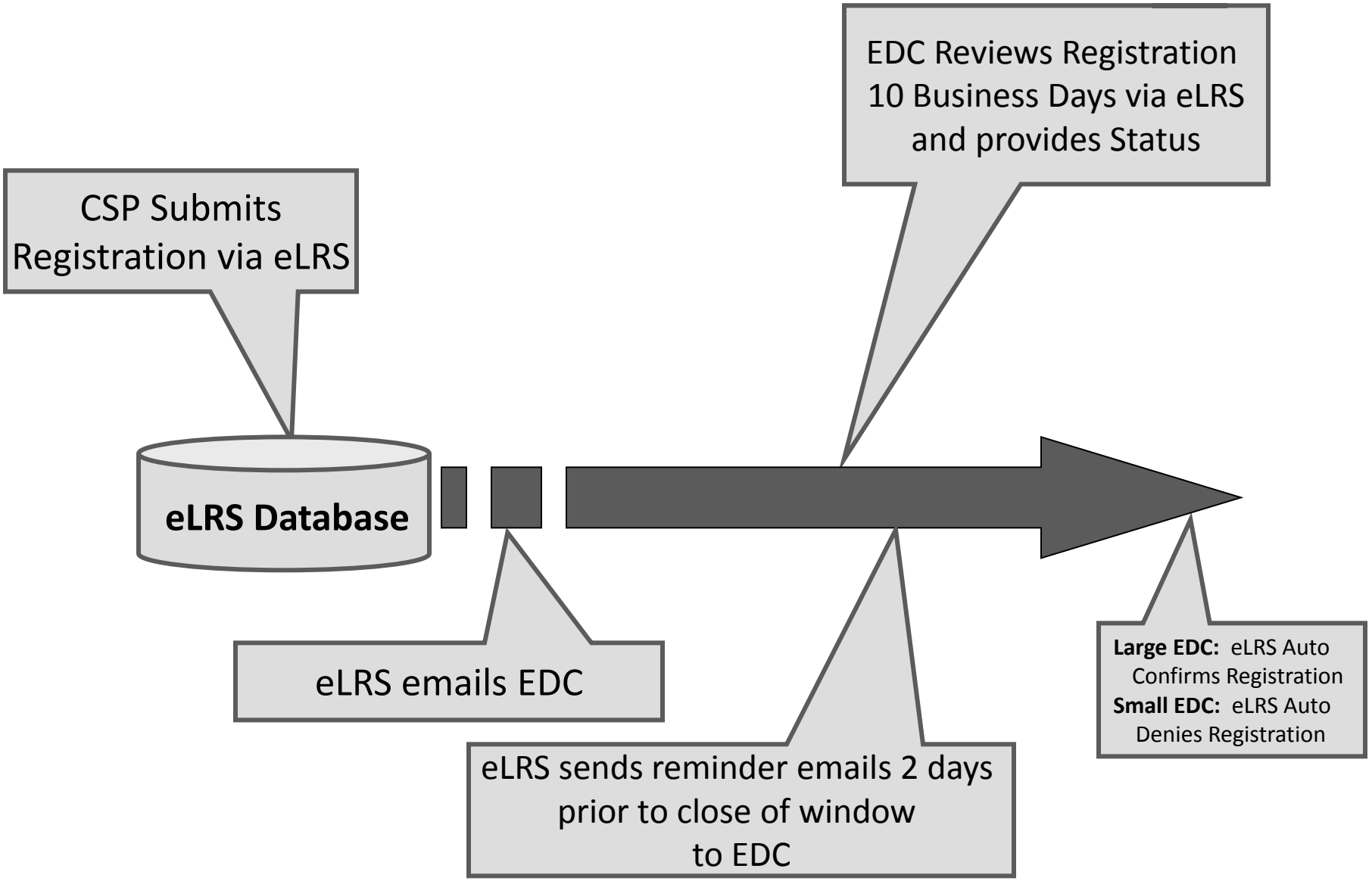
	A	B	C	D	E	F	G	H
Type	**Peak Load Contribution (MW)**	**Managed Load (MW)**	**# of Sites Multiplier**	**Capacity Loss Factor**	**Nominated ICAP (MW)**	**DR Factor**	**FPR**	**Nominated UCAP (MW)**
FSL	30	10	N/A	1.0634	19.366	0.956	1.0809	20.012
					E=A-(B*D)			H=E*F*G
GLD	25	20	N/A	1.0634	21.268	0.956	1.0809	21.977
					E=B*D, where max = A			H=E*F*G
DLC		0.002	200	1.0634	0.425	0.956	1.0809	0.440
					E=B*C*D			H=E*F*G

Total Nominated UCAP (MW)	**Limited Resource Clearing Price ($/MW-day)**	**Days/Year**	**Annual Revenue**
42.428	$125.47	365	$1,943,069.56

See PJM Web for appropriate Planning Year Parameters

Market Price for DR is the clearing price from the auction in which the DR cleared

Registration Process Timeline (Emergency Registrations)



Emergency DR Registration timeline & requirements

- **DR Registration Timeline**
  - The registration window opens the first business day in January and goes through May 14th (for 2015/2016 Delivery Year) allowing the EDC 10 business days to review the registration. Registrations that were denied prior to May 14th may be resubmitted after May 14th to correct a data errors. All registrations must be confirmed by May 31, 2015 23:50 to be included in the 2015/2016 Delivery Year
  - Load Research and Switch Operability Study must be submitted to PJM and approved prior to submitting the DLC registration
- **General Requirements**
  - Interval metering that complies with PJM standard, fully operational and tested
    - 24 hours of interval meter data required for compliance submittal
  - Full PJM member
  - CSP must have registrations that total >=100kW by registration
  - Locations may be aggregated to reach minimum registration value
  - Must set up to receive Electronic Notification

Registration Process – EDC Responsibilities

EDC Responsibilities in Registration Process (If no RERRA Restrictions)

Once a registration is submitted by the CSP, the EDC has up to 10 business days to verify the information listed below. If the information is correct, then the EDC is expected to confirm the registration. If the EDC takes no action then the registration will auto confirm after 10 business days.

1. Verify EDC Account Number(s)
   a) Corresponding to address of facility
      - addresses if an aggregate
2. Verify Loss Factors
   a) Used for Economic participation
   b) Used for Load Management participation
3. Verify the Peak Load Contribution (PLC)
4. Verify that the location has an EDC interval meter
   - Only if EDC Meter is designated on the registration
   - PJM approves Customer interval meter

RERRA Restrictions

1. **If EDC is large (>4 million MWh) then by default the Demand Resource may participate in Demand Response unless there is Relevant Electric Retail Regulatory Authority (RERRA) evidence that prohibits participation.**
   - Registration will auto confirm if EDC takes no action after (10) business days

2. **If EDC is small (=<4 million MWh) then by default the Demand Resource may not participate in Demand Response unless there is Relevant Electric Retail Regulatory Authority (RERRA) evidence that allows participation.**
   - Registration will auto deny if EDC takes no action after (10) business days

Load Reduction Reporting

Implementation Process:
Expected Load Reduction Reporting

- Expected load reductions will need to be reported by:
  - Pre Emergency vs Emergency
  - Lead time (new 30 lead time)
  - Product

eLRS software change:
Upload format for Expected Load Reductions

Organization	ResourceType	Product	Zone	Lead Time	Start Date	End Date	Type	UOM	HE1	HE2	HE3	….	HE25
ABC	Emergency	Limited DR	PECO	Quick_30	6/1/2013	6/1/2013	ExpRed	KW	4500	4500	4500		
ABC	Emergency	Limited DR	PECO	Short_60	6/8/2013	6/17/2013	ExpRed	KW	0	0	0		
ABC	Emergency	Limited DR	PECO	Long_120	6/13/2013	6/30/2013	ExpRed	KW	10000	10000	10000		
ABC	Emergency	Extended Summer DR	PECO	Quick_30	5/1/2013	5/1/2013	ExpRed	KW	4500	4500	4500		
ABC	Emergency	Extended Summer DR	PECO	Short_60	5/8/2013	5/17/2013	ExpRed	KW	0	0	0		
ABC	Emergency	Extended Summer DR	PECO	Long_120	5/13/2013	5/30/2013	ExpRed	KW	10000	10000	10000		
ABC	Emergency	Annual DR	PECO	Quick_30	12/1/2013	12/1/2013	ExpRed	KW	4500	4500	4500		
ABC	Emergency	Annual DR	PECO	Short_60	12/8/2013	12/17/2013	ExpRed	KW	0	0	0		
ABC	Emergency	Annual DR	PECO	Long_120	12/13/2013	12/30/2013	ExpRed	KW	10000	10000	10000		
ABC	Pre-Emergency	Limited DR	PECO	Quick_30	6/1/2013	6/1/2013	ExpRed	KW	50000	50000	50000		
ABC	Pre-Emergency	Limited DR	PECO	Short_60	6/8/2013	6/17/2013	ExpRed	KW	4500	4500	4500		
ABC	Pre-Emergency	Limited DR	PECO	Long_120	6/13/2013	6/30/2013	ExpRed	KW	0	0	0		
ABC	Pre-Emergency	Extended Summer DR	PECO	Quick_30	5/1/2013	5/1/2013	ExpRed	KW	10000	10000	10000		
ABC	Pre-Emergency	Extended Summer DR	PECO	Short_60	5/8/2013	5/17/2013	ExpRed	KW	4500	4500	4500		
ABC	Pre-Emergency	Extended Summer DR	PECO	Long_120	5/13/2013	5/30/2013	ExpRed	KW	0	0	0		
ABC	Pre-Emergency	Annual DR	PECO	Quick_30	12/1/2013	12/1/2013	ExpRed	KW	10000	10000	10000		
ABC	Pre-Emergency	Annual DR	PECO	Short_60	12/8/2013	12/17/2013	ExpRed	KW	4500	4500	4500		
ABC	Pre-Emergency	Annual DR	PECO	Long_120	12/13/2013	12/30/2013	ExpRed	KW	0	0	0		
ABC	Emergency	Limited DR	DUQ	Long_120	6/1/2013	6/30/2013	ExpRed	KW	10000	10000	10000		

Load Management Event Notification

Emergency Procedures

- Demand Resource Curtailment (PJM Manual 13: Section 2.3.2)
  - If PJM needs to dispatch Demand Resources during the Limited DR availability Period, then PJM will dispatch all DR products simultaneously unless all products have been dispatched frequently during the current Delivery Year. Frequent dispatch of DR during the Delivery Year is defined as:
    - 2 times prior to July 1st
    - 4 times prior to August 1st, or,
    - 7 times prior to September 1st
  - Should PJM frequently dispatch DR during a Delivery Year based on the criteria above, PJM may elect to dispatch only the Extended Summer and Annual DR, to preserve the Limited DR for the remainder of the Delivery Year.

Implementation Process: Event Notification Changes

Criteria	Load Management Event
Type	Pre-Emergency, Emergency
Lead Time	30, 60, 120 min
Product	Limited, Summer Extended, Annual
Location	Zone, Subzone

- Load Management Event Notification: eLRS, Emergency Messages, ALL CALL

Emergency resource = resource that uses behind the meter generation that has environmental restrictions that only allow it to run during PJM emergency conditions

Event Notification
Pre-Emergency and Emergency Load Management
All Call Scripts

Pre-Emergency Load Management Event Notification:

- "This is (name) with an emergency procedures message. As of (state notification time) PJM has initiated a Pre-Emergency Load Management Event for the zones, products and lead times indicated on the PJM Emergency Procedures webpage and as communicated to Curtailment Service Providers through the eLRS system. See Emergency Procedure message identification number (insert EP message ID number) for details. This is (name) that is all."

Emergency Load Management Event Notification:

- "This is (name) with an emergency procedures message. As of (state notification time) PJM has initiated an Emergency Load Management Event for the zones, products and lead times indicated on the PJM Emergency Procedures webpage and as communicated to Curtailment Service Providers through the eLRS system. See Emergency Procedure message identification number (insert EP message ID number) for details. This is (name) that is all."

Event Notification
(Emergency Procedures Messages)

Msg. ID	Msg. Type	Posting Timestamp	Region/Area	Emergency Message	Cancellation Timestamp
1873	Pre-Emergency Load Mgmt Reduction Action	03/14/2014 10:38	AEP - Control Zone AP - Control Zone	As of 10:45 hours (Notification Time), Pre-Emergency Load Management has been issued. Load reductions should be implemented by end of Notification Time plus lead time and remain in place until released by PJM. Mandatory DR reduction time periods are based on product specific requirements. CSPs should review eLRS for specific registration details. Lead time(s) dispatched: QUICK_30 and SHORT_60 . Product(s) dispatched: Limited DR . Subzone(s) dispatched: AEP_CANTON	

Msg. ID	Msg. Type	Posting Timestamp	Region/Area	Emergency Message	Cancellation Timestamp
1932	Emergency Load Mgmt Reduction Action	07/17/2014 16:04	AEP - Control Zone AP - Control Zone	As of 10:30 hours (Notification Time), a NERC level EEA2 and Emergency Load Management have been issued. Load reductions should be implemented by end of Notification Time plus lead time and remain in place until released by PJM. Mandatory DR reduction time periods are based on product specific requirements. CSPs should review eLRS for specific registration details. Lead time(s) dispatched: SHORT_60 and LONG_120 . Product(s) dispatched: Limited DR . Subzone(s) dispatched: AEP_CANTON	

All Call

The PJM All-Call is also required
Used to confirmation the Electronic Notification

- **How do I get set up for the ALL-CALL?**
  - From the PJM website, select the following:
    1. About PJM
    2. Member Services
    3. Member Forms
    4. PJM Voice and All Call Communications Request Form
- **If I am confused about my ALL-CALL message. What should I do?**
  - Go to PJM eDATA system and review posted messages
- **What do I do to repeat or acknowledge the information on the call?**
  - Press '1' to repeat message
  - Press '2' to acknowledge receipt of message

Recent Load Management Events

OPERATIONS INFORMATION

Event #	Delivery Year	Year	Date	Step(s) Invoked	Time of Notification	Start Time	Time Released	Notes	Running Total: # of Events Step 1	Running Total: # of Events Step 2	DR Capacity and Performance Committed MW	DR Capacity and Performance Reduced MW	DR Capacity and Performance Performance (%)
44	2013/14	2013	Sep 10 (Tue)	2	13:50	15:50	21:30	ATSI zone		4	**	**	**
				2	14:45	16:45	21:30	Canton portion of AEP zone only		2			
45	2013/14	2013	Sep 11 (Wed)	2	11:30	13:30	19:30	AEP zone Note: 3rd event for Canton portion of AEP zone		1			
				2	12:00	14:00	20:00	ATSI zone		5			
				2	12:30	14:30	18:30	DOM zone		1			
				2	13:00	15:00	17:00	AE, JCPL, PS, RECO zones		1			
				2	13:00	15:00	17:30	METED zone		1	**	**	**
				2	13:00	15:00	17:30	PECO, PL zones		2			
				2	13:00	15:00	18:00	BGE, DPL, PEPCO zones		1			
				2	13:00	15:00	18:30	PENLC zone		1			
				1	13:00	14:00	17:15	AE, BGE, DPL, JCPL, METED, PECO, PENLC, PEPCO, PL, PS, RECO zones	1				
				2	13:00	15:00	18:30	DLCO zone		1			

*** Prior to Event #25, all events were Mid-Atlantic only.**
**** DR compliance will not be known until after 45 days after end of month event occurred.**

LM Step Definitions:
Step 1: PJM-dispatchable, Short Lead Time (<= 1 hour)
Step 2: PJM-dispatchable, Long Lead Time (> 1 hour)
Step 3: Company-dispatchable, Short Lead Time (<= 1 hour)
Step 4: Company-dispatchable, Long Lead Time (> 1 hour)

Eastern PJM = AE, DPL, JCPL, PECO, and PS zones
LRPP: Load Response Pilot Program
Mid-Atlantic = AE, BGE, DPL, JCPL, METED, PECO, PEPCP, PENLC, PL, PS, RECO (effective 2002/03) zones

http://www.pjm.com/planning/resource-adequacy-planning/load-forecast-dev-process.aspx

Click on Historical Load Management Events

Product Substitution

DR Event Compliance: Product Substitution

- CSPs may use substitute registrations of a different Product Type to cover the commitment of under-performing registrations that are dispatched by PJM during a DR event
  - — The substitute and under-performing registration must…
  - be located in the same geographic location (dispatch area)
  - have comparable capacity commitments
  - have the same designated lead time

Tariff : Attachment DD 11.(a)
To the extent a Demand Resource cannot respond, another Demand Resource in the same geographic location defined by the PJM dispatch instruction with the same designated lead time and comparable capacity commitment may be substituted.

DR Event Compliance: Product Substitution Details

- One or more substitute registrations may be used to cover the commitment of one or more under-performing registrations
  - CSPs must map the substitute registration(s) being used as replacement to their corresponding under-performing registration(s)
  - The sum of nominated values for substitute registration(s) must be comparable (within ±25% or ±0.5 MW) to the total nominated value of their corresponding under-performing registration(s)
- The list of under-performing registrations and their corresponding substitutes must be provided to PJM by the end of the event day (23:59:59)
  - All substitute registrations provided to PJM must submit compliance data for that event
- The reduction values of substitute registrations are used when calculating compliance on the corresponding under-performing registration(s)
  - Substitute reduction values will not be capped to prevent over-performance on their corresponding under-performing registration(s)
  - If one or more substitute registrations are mapped to multiple under-performing registrations, the reduction value(s) of the substitute registrations will be distributed pro rata using the under-performing registrations' nominated values

DR Event Compliance: Product Substitution Example

- PJM calls a DR event for Long, Medium and Short Lead time for the Annual Product Type in the PECO zone on December 15th
- CSP has the following sites registered in the PECO zone, three of which are Annual and must respond to the DR event (Total Annual commitment = 4.6 MW ICAP)

PECO Registrations					
Registration ID	Location	Product Type	Lead Time	Nominated MW (ICAP)	Registration Commitment Share (ICAP)
10000001	PECO	Annual	Long	0.5	0.5
10000002	PECO	Annual	Long	1.0	1.0
10000003	PECO	Annual	Short	3.1	3.1
10000004	PECO	Limited	Long	0.8	-
10000005	PECO	Limited	Short	1.4	-
10000006	PECO	Limited	Short	1.1	-

- During preparation for the event, CSP discovers that two of their Annual registrations (10000001 and 10000003) cannot respond, and therefore self-dispatches their Limited registrations as substitutes

DR Event Compliance: Product Substitution Example

- CSP provides the following substitution data to PJM by the end of the event day

Substitute Registrations							
Under-Performing Registration ID	Product Type	Lead Time	Nominated MW (ICAP)	Substitute Registration IDs	Substitute Product Type	Substitute Lead Time	Substitute Nominated MW (ICAP)
10000001	Annual	Long	0.5	10000004	Limited	Long	0.8
10000003	Annual	Short	3.1	10000005	Limited	Short	1.4
				10000006	Limited	Short	1.1

- PJM reviews the submitted data to ensure that the under-performing registrations and their corresponding substitutes are valid
  - Substitutes are within same dispatch area
    - PECO
  - Substitutes are of the same lead type
    - 10000001 and 10000004 have Long Lead Times
    - 10000003, 10000005, and 10000006 have Short Lead Time
  - Substitutes have comparable capacity commitments
    - 10000001 (0.5 MW) and 10000004 (0.8 MW) fall within 0.5 MW tolerance
    - 10000003 (3.1 MW) and [10000005 (1.4 MW) + 10000006 (1.1 MW)] fall within 25% tolerance

DR Event Compliance: Product Substitution Example

- CSP submits reduction data in eLRS for all dispatched registrations (including substitutions) for the DR event

Submitted Event Reduction				
Registration ID	Location	Product Type	Lead Time	Reduction MW (ICAP)
10000001	PECO	Annual	Long	-
10000002	PECO	Annual	Long	1.1
10000003	PECO	Annual	Short	-
10000004	PECO	Limited	Long	0.8
10000005	PECO	Limited	Short	1.2
10000006	PECO	Limited	Short	1.1

- PJM calculates shortfall using the substituted reduction MW values
  - Shortfall MW = Committed MW Share – Adjusted Reduction MW

Substitute Registrations								
PJM Dispatched Registration ID	Product Type	Lead Time	Nominated MW (ICAP)	Committed MW Share (ICAP)	Reduction MW (ICAP)	Substitute Registration IDs	Adjusted Reduction MW (ICAP)	Shortfall MW (ICAP)
10000001	Annual	Long	0.5	0.5	-	10000004	0.8	-0.3
10000002	Annual	Long	1.0	1.0	1.1		1.1	-0.1
10000003	Annual	Short	3.1	3.1	-	10000005 10000006	2.3	0.8

- PECO Net Shortfall = (-.03 + (-0.1) + (0.8) **= 0.4 MW (ICAP)**
  - Net Shortfall MW without substitution = (0.5) + (-0.1) + (3.1) = 3.5 MW

Sub Zonal Dispatch

Sub Zonal Dispatch
(change back to mandatory approach)

- Beginning with 2014/2015 Delivery Year, response to transmission sub-zonal dispatch is mandatory (penalty charges assessed for non-performance) if sub-zone is defined and publicly posted the day before the event.
  - If DR is dispatched it must respond or receive emergency event penalty
  - If DR is not dispatched it must test
- Event penalty only applies if PJM establishes subzone prior to operating day for (2014/2015 DY)

From pjm.com select:

1. markets & operations
2. Demand Response
3. Demand Response Capacity Market
4. Subzone Definition Workbook

Load Management Compliance

Calculations

Compliance Changes

- Capacity compliance done at CAA level:
- “Compliance Aggregation Area” or “CAA” shall mean a geographic area of Zones or sub-Zones that are electrically-contiguous and experience for the relevant Delivery Year, based on Resource Clearing Prices of Annual Resources, the same locational price separation in the Base Residual Auction, the same locational price separation in the First Incremental Auction, the same locational price separation in the Second Incremental Auction, or the same locational price separation in the Third Incremental Auction

Compliance Changes
Aggregation Areas for 2014/2015 Delivery Year

	Resource Clearing Price ($/MW-day) for Annual Product							
Auction	Rest of RTO	Rest of MAAC	Rest of EMAAC	Rest of SWMAAC	Rest of PS	PS North	DPL South	PEPCO
BRA	125.99	136.50	136.50	136.50	136.50	225.00	136.50	136.50
1st IA	5.54	16.56	16.56	16.56	16.56	410.95	16.56	16.56
2nd IA	25.00	56.94	56.94	56.94	56.94	310.00	56.94	56.94
3rd IA	25.51	132.20	132.20	132.20	132.20	256.76	132.20	132.20

3 Aggregation Areas for 2014/2015 Delivery Year

Aggregation Area	Zones
Rest of RTO	AEP, APS, ATSI, COMED, DAY, DEOK, DLCO, DOM, EKPC
MAAC (excluding PS North)	AE, DPL, JCPL, PECO, Rest of PS, RECO, BGE, PEPCO, PENLC, METED, PPL
PS North	PS North sub-zone

LM Event Compliance

- Resource Providers that have demand resources with RPM Resource Commitments or FRR Capacity Plan Commitments are subject to compliance check performed after each PJM-initiated Load Management event.

- Compliance will be checked for on-peak period (all hours in definition of Limited DR) and for off-peak period (all hours specified in definition of Extended Summer DR or Annual DR, excluding on-peak period)

- CSP compliance is determined by event and is aggregated by CAA

LM Event Compliance Penalty Rate (Effective 2014/2015 DY)

LM Compliance Penalty Rate depends on the time period in which the event is called.

On Peak: Any weekday, other than NERC holidays, during June-Sept period of DY from 12 PM to 8 PM

Off Peak: All days and hours outside of the above defined On Peak period

LM Event Compliance Penalty Rate (Effective 2014/2015 DY)

- On-Peak LM Compliance Penalty Rate ($/MW-day) =

  [Lesser of (1/actual number of on-peak events during the delivery year, or 50%)] * Party's Weighted Daily Revenue Rate ($/MW-day)

- Off-Peak LM Compliance Penalty Rate ($/MW-day) =

  1/52 * Party's Weighted Daily Revenue Rate ($/MW-day)

Compliance Changes

- Load management compliance aggregated for time contiguous dispatches across operating day for all Zones (or sub-Zones) located in electrically-contiguous geographic areas with the same RPM auction Resource Clearing Prices for the Delivery Year.
- If registration is dispatched twice in operating day then compliance will be aggregated based on above rule
  - if compliance is aggregated across each dispatch it will be considered 1 load management event
  - If compliance is NOT aggregated across each dispatch then it will be considered 2 load management events.

Example – Zonal Aggregation summer

	Annual & Extended Summer DR - 10 hours (10am to 10pm - summer, 6am to 9pm non summer)																	
	Limited - 6 hours 12 to 8pm																	
	LDR Compliance window (8 hours) - onpeak hours																	
	XDR/ADR Compliance window (12 hours summer, 14 hours non summer) - offpeak hours																	
						Summer availability window												
scenario	Resource Type	product	Lead Time	Zone	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22		
1	Pre-Emergency	LDR/XDR/ADR	30	PECO														
1	Pre-Emergency	LDR/XDR/ADR	30	PECO														

Compliance aggregated for all registration dispatched

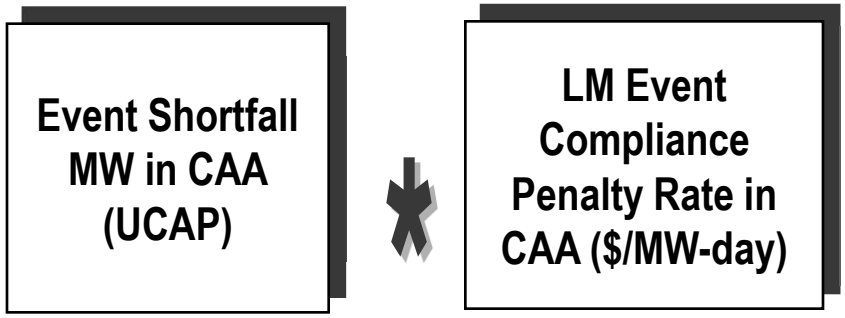
Example – Zonal Aggregation winter same registration dispatched twice in one day

					XDR/ADR - NonSummer Availability Window - all considered offpeak														
scenario	Resource Type	product	Lead Time	Zone	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
1	Pre-Emergency	LDR/XDR/ADR	30	PECO															
1	Pre-Emergency	LDR/XDR/ADR	30	PECO															

Compliance NOT aggregated for registrations (under response in morning dispatch can not be offset by over response in afternoon dispatch.

Note – since this is offpeak period the # of events does not matter

Load Management Event Compliance Penalty Charge



- Load Management Compliance Penalty charges are assessed to those CSP that under-complied during an event.
- **Charges for Limited DR** event to be assessed on an event basis after conclusion of On-Peak Period.
  - Initial charges reflect charges due from June 1 to last day reflected in initial monthly billing. Remaining charges for such event assessed and billed monthly for remainder of year.
- **Charges for Extended Summer DR & Annual DR** to be assessed on an event basis after conclusion of DY. Assessed later of (1) June following the DY or (2) third billing month following the last event
- Total Charges assessed for all events will be capped at Annual Revenues received by provider in DY.

Example: LM Event Compliance Penalty Charge

Resource	# of On-Peak events during DY	# of Off-Peak events during DY	Factor for On-Peak Penalty Rate	Factor for Off-Peak Penalty Rate
Limited	3	0	1/3	Not Applicable
Extended Summer	3	5	1/3	1/52
Annual	3	5	1/3	1/52

Resource	On-Peak Penalty Rate ($/MW-day)	Off-Peak Penalty Rate ($/MW-day)	On-Peak Penalty Charges ($/year) (total charges for 3 events)	Off-Peak Penalty Charges ($/year) (total charges for 5 events)	Annual Penalty Charges ($/year)
Limited	$33.33	Not Applicable	$18,250	Not Applicable	$18,250
Extended Summer	$33.33	$1.92	$18,250	$1,754.81	$20,004.81
Annual	$33.33	$1.92	$18,250	$1,754.81	$20,004.81

Example assumes:
- No single event comprised of both on-peak and off-peak period
- Each resource was committed for 1 MW and a shortfall of 0.5 MW for each event
- Weighted Daily Revenue Rate for each resource = $100/MW-Day (Annual revenues = $36,500/year)

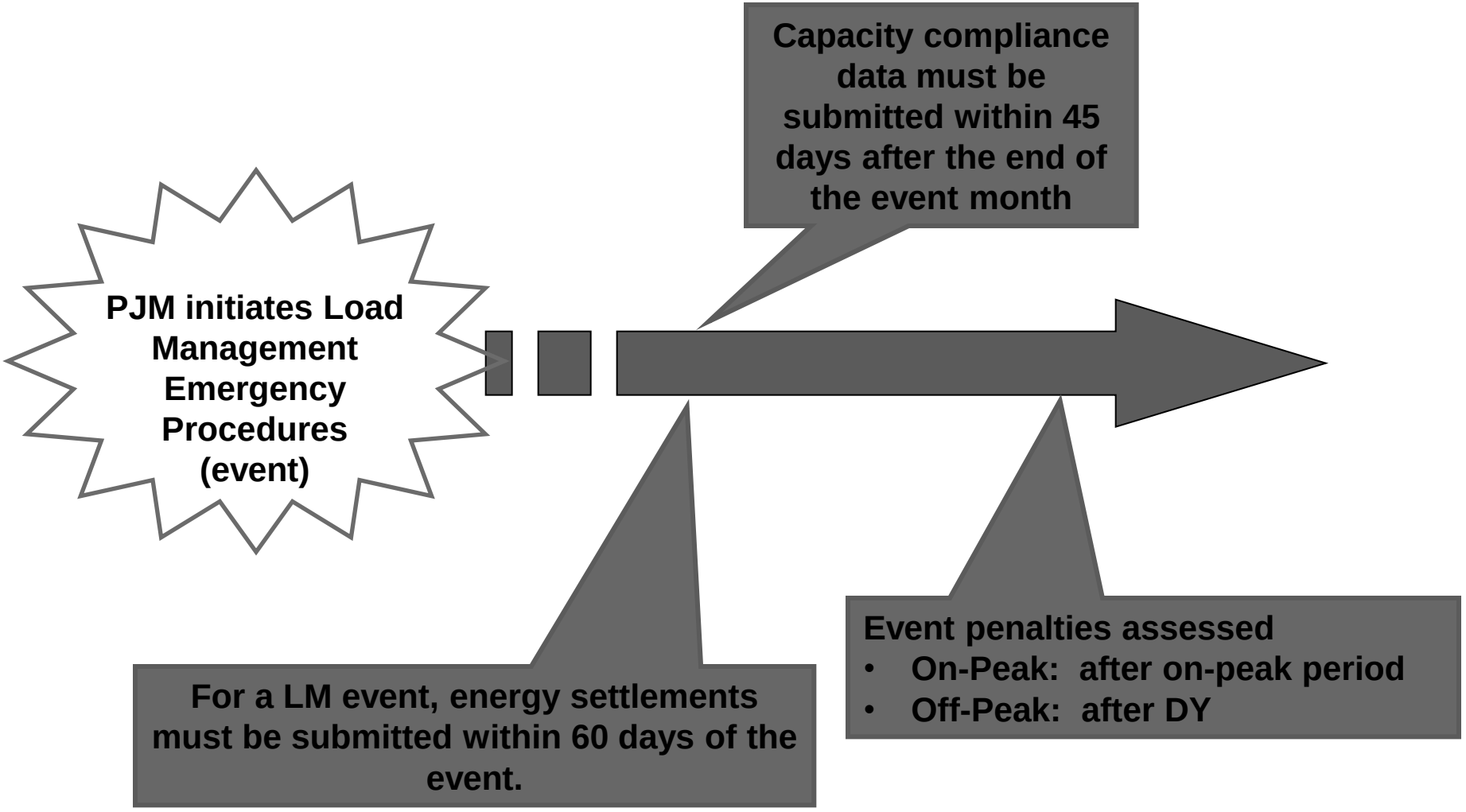
Sub Zonal Dispatch – (On-Peak)
Compliance Process 14/15 DY and Beyond

- Number of events used to determine event multiplier based on number of events the registration has been dispatched
  - PEPCO DC dispatched twice
  - PEPCO zone dispatched once
  - 33% for PEPCO DC registrations (since they were actually dispatched 3 times) and 50% for non DC PEPCO resources (since they were actually only dispatched once and need to take min of 50% or 1/# events)
- Sub-zonal commitment based on registrations that were dispatched:
  - CSP **may not** use other zonal registrations to substitute sub-zonal registrations that are dispatched
  - Registrations dispatched based on information submitted by CSP for location in eLRS
    - PJM will use zip codes in eLRS to determine exactly which registrations are required to respond

Allocation of LM Event Compliance Penalty Charges

- Charges for an event are allocated on a pro-rata basis to those CSPs that committed DR and provided load reductions in excess of the amount that they were obligated to provide for such event.
- Allocation to each over-performing CSP shall not exceed the volume of excess MWs provided during a single event times 0.2 times the Weighted Daily Revenue Rate.
- Remaining Penalty Charges not allocated to over performing providers are allocated to LSEs based on LSE's Daily UCAP Obligation.
- LM Event Compliance Penalty Credits for an event are allocated when charges are assessed and will have the same bill timing.

Compliance Data and Settlement Timeline



Load Management Compliance

- CSP compliance is determined by event and is aggregated by CAA
- PJM will measure compliance for partial dispatch clock hours based on prorated commitment based on number of minutes dispatched in hour where PJM dispatched for at least 30 minute of clock hour.
- CSP must submit Event Compliance data within 45 days from the end of the month in which the event took place
- No compliance credit will be given for the incremental load drop below zero (i.e. exported energy)
- Missing interval meter data results in a 0 MW reduction for the location

Load Reductions and Shortfall for Compliance

FSL, GLD and DLC

Load Reductions and Shortfall for Compliance

- **Compliance Shortfall = Committed Capacity – Average Reduction during the compliance hours**

- Firm Service Level (FSL) – The hourly Load Reduction = Add Back = (PLC – (Actual load * capacity loss factor)
    - CSPs must submit 24 hours of actual load data for the Load Management Event

- Guaranteed Load Drop (GLD) – The hourly Load Reduction = Add Back = min(CBL Reduction or PLC Reduction)
    - CSPs must submit 24 hours of actual load and comparison load data for the Load Management Event. Comparison loads must be developed from the guidelines included in Attachment A of Manual 19, and note which method was employed

- Direct Load Control (DLC) – reduction based on timing of control signal
    - CSPs must submit the Start and Stop times of the Load Management Event

Load Reduction - Comparison Loads for GLD

Event Compliance for Guaranteed Load Drop (GLD) Customers

- For purposes of determining compliance with a PJM-initiated Load Management event or test for Guaranteed Load Drop customers, several options are available to estimate comparison loads. The method used should result in the best possible estimate of what load level would have occurred in the absence of an emergency or test event

- The CSP will be responsible for supplying all necessary load data to PJM in order to calculate the load reduction for each registered end use customer. PJM will calculate the load drop amount unless otherwise indicated below or approved by PJM. The amount of load data required will depend on the GLD method selected where the minimum amount shall be 24 hours for one full calendar day

Load Reduction - Comparison Loads for GLD

- Comparable Day (GLD-CompareDay): The customer's actual hourly loads on one of the prior 10 calendar days before the test or emergency event day selected by the CSP which best represents what the load level would have been absent the emergency or test event . The CSP may request use of an alternative day for extenuating circumstances with supporting documentation that clarifies why the alternative day should be utilized. PJM must approve the use of any alternative day. CSP must provide usage data for all 10 days such that PJM may validate an appropriate day was selected

- Same Day- Before/After Event (GLD-SameDay): The customer's average hourly integrated consumption for two full hours prior to notification of an emergency event or prior to one full hour before a test and for two full hours after skipping first full hour after the event or test. This option is appropriate for high load factor customers with no weather sensitivity

Load Reduction - Comparison Loads for GLD

- Customer Baseline (GLD-SimilarDay): The Customer's estimated baseline used to calculate load drops for PJM economic demand resources as defined on the applicable PJM economic registration

- Regression Analysis (GLD-Regression): The customer's estimated hourly loads from a regression analysis of the customer's actual loads versus weather. This option is appropriate for customers with significant weather sensitivity. The CSP will perform the regression analysis and provide results including supporting information to PJM. The information should include all load and weather data and associated regression statistics used to estimate the load impact on the event or test day

- Generation (GLD-Generation): The hourly integrated output from a generator used to provide Guaranteed Load Drop. This method may only be utilized if the generation would not have otherwise been deployed on the emergency event or test day and must comply with the provisions contained in the PJM Manuals

Example: Comparison Load for GLD-Same Day (Event)

The GLD-Same Day load used for a Load Management Event is the average of:

- Load for two full hours prior to the notification of the event
- Load for two full hours after skipping first full hour after the event

Example of hours used for GLD Same Day CBL Method for the July 22, 2011 Load Management Events:

July 22, 2011 LM Event Key Times and Hours										
		Implement				Conclude		Compliance Hours	Same Day CBL hours	
		Notice		Start		End			Before	After
Zone	Lead Time	EPT	HE	EPT	HE	EPT	HE	HE	HE	HE
BGE	Long	10:00	11	12:00	13	18:00	18	13,14,15,16,17,18	9,10	20,21
BGE	Short	11:00	12	12:00	13	17:30	18	13,14,15,16,17	10,11	20,21
JCPL	Long	11:30	12	13:30	14	18:30	19	15,16,17,18	10,11	21,22
METED	Long	11:30	12	13:30	14	18:30	19	15,16,17,18	10,11	21,22
PECO	Long	11:30	12	13:30	14	19:00	19	15,16,17,18,19	10,11	21,22
DPL	Long	11:30	12	13:30	14	19:30	20	15,16,17,18,19	10,11	22,23
DUQ	Long	11:30	12	13:30	14	19:30	20	15,16,17,18,19	10,11	22,23

Example: Comparison Load for GLD-Same Day (Test)

The GLD-Same Day load used for a Load Management Test is the average of:

- Load for two full hours prior to one full hour before a test
- Load for two full hours after skipping first full hour after the test

Examples of hours used for GLD Same Day CBL Method for Test:

Load Management Test Times and Hours								
		Implement		Conclude		Compliance Hours	Same Day CBL hours	
		Start		End			Before	After
Zone	Lead Time	EPT	HE	EPT	HE	HE	HE	HE
DOM	Long	13:00	14	14:00	14	N/A	11,12	16,17
DOM	Short	13:00	14	14:00	14	N/A	11,12	16,17

Reduction and Shortfall Examples

The following three slides are examples of how PJM calculates the Reduction MW for a Load Management event. An example is shown for each type of Load Management (FSL, GLD, DLC)…

Note:
The examples assume that no replacement or capacity transactions exist (Committed ICAP = Nominated ICAP)

Reduction MW Example - FSL

	Hour Ending14	Hour Ending15	Hour Ending16	Hour Ending17	Hour Ending18	Average Across Event
Nominated ICAP (MW)	5.2	5.2	5.2	5.2	5.2	
Committed ICAP (MW)	5.2	5.2	5.2	5.2	5.2	
Firm Service Level (MW)	0.5	0.5	0.5	0.5	0.5	
Metered Load (MW)	1	1	0.7	0.5	0	
Peak Load Contribution (MW)	5.7	5.7	5.7	5.7	5.7	
DR Factor	0.957	0.957	0.957	0.957	0.957	
Forecast Pool Requirement	1.0795	1.0795	1.0795	1.0795	1.0795	
Capacity Loss Factor	1.0403	1.0403	1.0403	1.0403	1.0403	
Reduction (MW)	4.660	4.660	4.972	5.180	5.700	5.034

Reduction is calculated hourly and then averaged across all hours of the Event

Reduction (MW) = Peak Load Contribution – (Metered Load * Capacity Loss Factor)

Positive shortfall represents under compliance

Shortfall (ICAP) = Committed ICAP – Reduction (MW)

Shortfall (ICAP) = 5.2 – 5.034 = 0.166 MW

Shortfall (UCAP) = Shortfall (ICAP) * DR Factor * Forecast Pool Requirement

Shortfall (UCAP) = 0.166 MW * 0.957 * 1.0795 = 0.171 MW

Reduction MW Example – GLD

	Hour Ending14	Hour Ending15	Hour Ending16	Hour Ending17	Hour Ending18	Average Across Event
Nominated ICAP (MW)	10	10	10	10	10	
Committed ICAP (MW)	10	10	10	10	10	
Metered Load (MW)	18	17	10	6	2	
Peak Load Contribution (MW)	15	15	15	15	15	
DR Factor	0.957	0.957	0.957	0.957	0.957	
Forecast Pool Requirement	1.0795	1.0795	1.0795	1.0795	1.0795	
Capacity Profile (MW)	20	22	20	15	15	
Capacity Loss Factor	1.0403	1.0403	1.0403	1.0403	1.0403	
CBL Reduction	2.081	5.202	10.403	9.363	13.524	
PLC Reduction	-3.7254	-2.6851	4.597	8.7582	12.9194	
Reduction (MW)	0.000	0.000	4.597	8.758	12.919	5.255

Reduction = Add Back = min(CBL Reduction or PLC Reduction)

Reduction = min(((Capacity Profile - Metered Load)* Capacity Loss Factor) or (PLC – (Metered Load * Capacity Loss Factor))**)**

Positive shortfall represents under compliance.

Shortfall (ICAP) = Committed ICAP – Reduction (MW)

Shortfall (ICAP) = 10 – 5.255 = 4.745 MW

Shortfall (UCAP) = Shortfall (ICAP) * DR Factor * Forecast Pool Requirement

Shortfall (UCAP) = 4.745 MW * 0.957 * 1.0795 = 4.902 MW

Reduction MW Example – GLD Gen

	Hour Ending14	Hour Ending15	Hour Ending16	Hour Ending17	Hour Ending18	Average Across Event
Nominated ICAP (MW)	1.5	1.5	1.5	1.5	1.5	
Committed ICAP (MW)	1.5	1.5	1.5	1.5	1.5	
Metered Load (MW)	18	17	10	6	2	
Peak Load Contribution (MW)	15	15	15	15	15	
DR Factor	0.957	0.957	0.957	0.957	0.957	
Forecast Pool Requirement	1.0795	1.0795	1.0795	1.0795	1.0795	
Capacity Profile (MW)	1	1	1	1	1	
Capacity Loss Factor	1.0403	1.0403	1.0403	1.0403	1.0403	
Generation Reduction	1.040	1.040	1.040	1.040	1.040	
PLC Reduction	-3.7254	-2.6851	4.597	8.7582	12.9194	
Reduction (MW)	0.000	0.000	1.040	1.040	1.040	0.624

Reduction = Add Back = min(Generation Reduction or PLC Reduction)

Reduction = min((Capacity Profile * Capacity Loss Factor) or (PLC – (Metered Load * Capacity Loss Factor))**)**

Positive shortfall represents under compliance.

Shortfall (ICAP) = Committed ICAP – Reduction (MW)

Shortfall (ICAP) = 1.5 – 0.624 = 0.876 MW

Shortfall (UCAP) = Shortfall (ICAP) * DR Factor * Forecast Pool Requirement

Shortfall (UCAP) = 0.876 MW * 0.957 * 1.0795 = 0.905 MW

Reduction MW Example – DLC

Reduction for DLC considers only the transmission of the control signal.

	Hour Ending14	Hour Ending15	Hour Ending16	Hour Ending17	Hour Ending18	Average Across Event
Nominated ICAP (MW)	10	10	10	10	10	
Committed ICAP (MW)	10	10	10	10	10	
Compliance review	Signal not sent until 14:30	Signal not sent until 14:30	Signal sent for entire hour	Signal sent for entire hour	Signal sent until 19:30	
DR Factor	0.957	0.957	0.957	0.957	0.957	
Forecast Pool Requirement	1.0795	1.0795	1.0795	1.0795	1.0795	
Reduction MW						7.000

Reduction (MW) = Number of minutes curtailed during the Event / Total number of minutes in Event * Nominated ICAP (MW)

Reduction MW = (210 minutes of signal during event / 300 total event minutes) * 10 MW = 7 MW

Positive shortfall represents under compliance.

Shortfall (ICAP) = Committed ICAP – Reduction (MW)

Shortfall (ICAP) = 10 – 7.00 = 3.000 MW

Shortfall (UCAP) = Shortfall (ICAP) * DR Factor * Forecast Pool Requirement

Shortfall (UCAP) = 3.000 MW * 0.957 * 1.0795 = 3.099 MW

Capacity Compliance calculation for Partial Dispatch clock hour

Capacity compliance calculation for Partial Dispatch clock hour (FSL)

Committed Capacity = 4.5 MW									
M&V Type	**FSL**				**Lead time**	**60**			
Dispatch Start	**13:20**				**Notify time**	**12:20**			
Dispatch End	**17:20**								
				Hourly compliance calculation					
Reference	**Variable**	**Registration (summary)**		**HE14**	**HE15**	**HE16**	**HE17**	**HE18**	**Event Compliance (MW)**
1	Minutes Dispatched			40	60	60	60	20	
2 = 1/60	% hour dispatched			67%	100%	100%	100%	33%	
3	compliance hour?			partial	full	full	full	na	
4	PLC (MW)	10.0		10.0	10.0	10.0	10.0	na	
5	FSL (MW)	5.0		5.0	5.0	5.0	5.0	na	
6	Load (MW)			9.0	11.0	6.0	5.0	na	
7	Line loss factor	1.10		1.10	1.10	1.10	1.10	na	
8 = 4 - (6*7), floor at 0	Load Reduction (MW) grossed up for losses			0.10	0.00	3.40	4.50	na	
9 = 8/2	Load Reduction (MW) (adjusted for full hour)			0.15	0.00	3.40	4.50	na	
10 = 1 /sum (partial + full) dispatch minutes	Event period weight			0.18	0.27	0.27	0.27		
11 = 9 * 10	Load Reduction (MW) weighted for dispatch time			0.03	0.00	0.93	1.23		2.2
12 = 4 - (5*7)	Nominated ICAP (MW)	4.5							4.5
13	Committed Capacity ICAP (MW)								4.5
14 = 13 - 11	Event Shortfall Icap (MW)								**2.3**

Capacity compliance calculation for Partial Dispatch clock hour (FSL)

Notes:									
A	*Compliance hour - if dispatched for =>30 but less than 60 then partial dispatch hour, if less than 30 = "na", 60 = full*								
B	*Load Reduction (MW) (adjusted for full hour) - load reduction adjusted up (divided by % of hour dispatched) to normalize to full hour*								
C	*Registration hourly Load Reduction cannot be negative*								
D	*Capacity commitment Icap (MW) - final capacity commitment prorated to registration for day.*								
E	*Event Shortfall ICAP (MW) = average Hourly compliance, Positive = undercomply, Negative = overcomply*								
F	*Numbers in Icap - Ucap conversation includes DR Factor and FPR factor*								
G	*na - not applicable*								
H	*GLD done same way except Load Reduction (MW) is lessor of FSL Reduction and reported reduction.*								
I	*DLC done similar way except use start and stop time of DLC dispatch signal.*								

Emergency Energy Settlements

Calculations

Emergency Energy Settlements

- Emergency Energy Settlements
  - Use **Economic CBL calculation** if same locations are on approved Economic registrations when Emergency Energy settlements are submitted.
    - If CSP has emergency registration aggregation (more than 1 location on registration) then use economic CBL only if locations on economic aggregation are same
  - If no approved economic registration when emergency energy settlements are submitted then use **hour before event method**.

Emergency Energy Settlements – CBL Calculation Method

- Emergency and Economic Settlements **(same locations)**
  - Adjust SAA period so it occurs before emergency and economic event.
  - Exclude emergency event days from CBL selection
  - Overlapping emergency/economic settlement hours are settled based on Emergency rules
  - Overlapping emergency/economic settlement hours use economic shutdown cost
    - no balancing operating reserve charges will be assessed for deviations from real time dispatch amount or from cleared Day-Ahead amount

Emergency Energy Settlements – Hour Before Event Method

The Hour Before Method uses the meter load prior to the start of the reduction (bounded by the start of the event) as the CBL

1. The registration may begin to reduce anytime from the time of the notification until the Load Management Event start time
2. The first Emergency Energy Settlement hour in the eLRS is the hour ending of the Load Management Event notification
3. If the registration did not begin to reduce within the first or second Settlement hour, then the CSP must deselect the first and/or second settlement hour as appropriate so long as it is not the hour ending of the start of the Load Management event.

Long Lead LM Event	Time	Hour Ending
Notification Time and 1st Settlement hour:	12:40	13
Start of Reduction:	14:00	15
Start of LM Event:	14:40	15
End of LM Event	19:00	19

In the above example, the CSP would deselect the 1st and 2nd settlement hours ending
See Emergency Energy Settlements in the Appendix for more details

Settlement – Full Emergency

				Event Period					Event Hours									
	Registration			Economic		Emergency			HE12		HE13		HE14		HE15		HE16	
Scenario	Economic	Emergency		First HE	Last HE	First HE	Last HE		kw	$	kw	$	kw	$	kw	$	kw	$
1	N	Y		na	na	HE14	HE16		na	na	na	na	HB	emerg	HB	emerg	HB	emerg
2	Y	Y		HE12	HE16	HE14	HE16		CBL	econ	CBL	econ	CBL	emerg	CBL	emerg	CBL	emerg

- HB = hour before (emergency M&V)
- CBL = CBL on economic registration

Emergency Energy Settlements

- Emergency and Economic Settlements **(not the same locations)**
  - Overlapping dispatch hours for aggregate registrations (multiple locations on same registration) or Dispatch Groups where locations on emergency registration **are not the same as locations** on the economic registration will have hourly economic energy load reduction with associated cleared Day-Ahead or real time dispatch amount and/or hourly emergency energy load reduction prorated based on load reduction capability provided by the Curtailment Service Provider for the location to avoid duplicative energy payment and appropriate balancing operating reserve charges, as applicable.

Settlement – Full Emergency

- **PJM pays Zonal LMP**
  - **Resource is made whole to its offer value, which includes:**
    - **Strike Price**
    - **Shutdown costs**

	HE 14	HE 15	HE 16	HE 17	HE 18	Total
Nominated MWs	10	10	10	10	10	
Actual Reduction (MW)	10	10	10	10	10	
Real-Time LMP ($/MWh)	300	350	500	300	200	
Strike Price	$1,100	$1,100	$1,100	$1,100	$1,100	
Load Response Emergency Credits	$3,000	$3,500	$5,000	$3,000	$2,000	$16,500
Emergency Bid	$11,000	$11,000	$11,000	$11,000	$11,000	$55,000

Shutdown Costs = $1000

Resources will be paid Daily Load Response Emergency Credits + Emergency Load Response Make Whole Credit

- Load Response Emergency Credits = **$16,500**
- Emergency Load Response Make Whole Credit = Emer. Bid + Shutdown cost – Daily Load Response Emergency Credits
  - $55,000 + $1,000 - $16,500 = **$39,500**

Load Management Tests

Testing Requirement Details

- All of CSP's registrations for the same product type in the same zone are required to test at the same time for a 1 hour period during any hour when a PJM-initiated LM event for such product type would be called
    - Limited DR: 12:00 PM – 8:00 PM
    - Extended Summer DR/Annual DR: 10:00 AM – 10:00 PM
- Test must be conducted on a non-holiday weekday during the following testing periods:
    - Limited DR: June – September of DY
    - Extended Summer DR/Annual DR: June – October, May of DY
- Notify PJM of intent to test 48 hours in advance
    - Test and retest notifications must be submitted in eLRs
- No limit on the number of tests a CSP can perform
    - Only submit data for specific test that you want PJM to measure compliance

Testing Requirements – Limited DR

- CSP is required to simultaneously test all their sites registered as Limited DR in a zone if PJM has not called an event for Limited DR in that zone by August 15 of DY
  - If PJM initiated a LM event for Limited DR in zone for long lead time resources only, CSP is required to test sites registered as quick and short lead times, Limited DR in zone.
  - If PJM initiated a LM event for Limited DR in sub-zone only, CSP only required to test sites registered as Limited DR in rest of zone.
- If a PJM-initiated LM event for Limited DR is called between August 16 and September 30 of DY, no test will be required
- If a PJM-initiated LM event for Limited DR is called between June 1 and September 30 of DY, LM test compliance will not be evaluated and LM Test Failure Charges will not be assessed for Limited DR.

Test required only if there is no PJM-initiated LM event for Limited DR in that zone for lead time type (i.e., long, medium or short lead times).

Testing Requirements – Annual DR

- CSP is required to simultaneously test all their sites registered as Annual DR in a zone if PJM has not called an event for Annual DR in that zone during the Delivery Year
  - If PJM initiated a LM event for Annual DR in zone for long lead time resources only, CSP is required to test sites registered as quick and short lead times, Annual DR resources in zone.
  - If PJM initiated a LM event for Annual DR in sub-zone only, CSP required to test sites registered as Annual DR in rest of zone.
- If a PJM-initiated LM event for Annual DR is called during Delivery Year, no test will be required

Test required only if there is no PJM-initiated LM event for Annual DR in that zone for lead time type (i.e., long, medium or short lead times).

Testing Requirements – Extended Summer DR

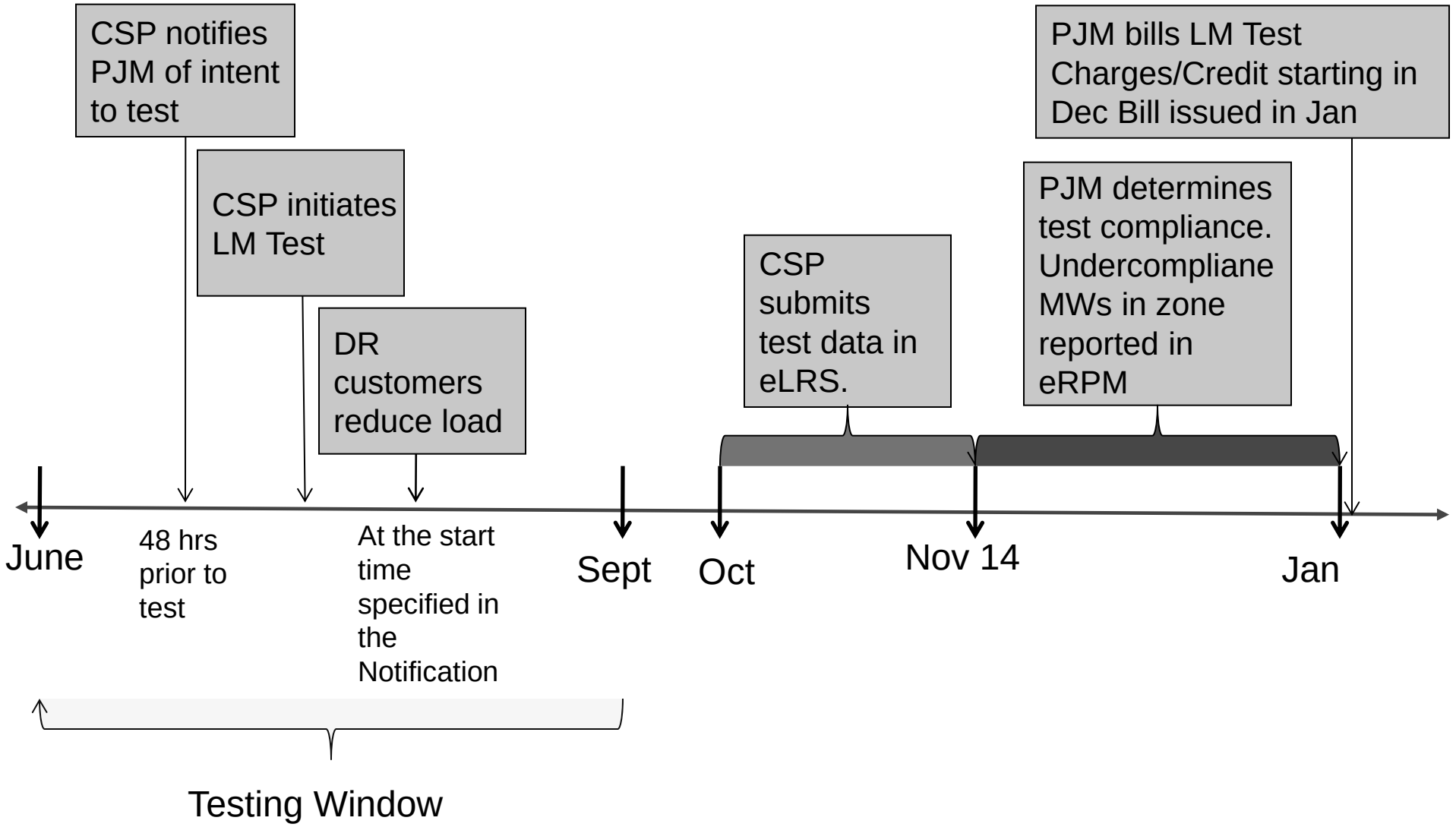
- CSP is required to simultaneously test all their sites registered as Extended Summer DR in a zone if PJM has not called an event for Extended Summer DR in that zone during June – October or May of the Delivery Year
  - If PJM initiated a LM event for Extended Summer DR in zone for long lead time resources only, CSP is required to test sites registered as quick and short lead times, Extended Summer DR resources in zone.
  - If PJM initiated a LM event for Extended Summer DR in sub-zone only, CSP required to test sites registered as Extended Summer DR in rest of zone.
- If a PJM-initiated LM event for Extended Summer DR is called during Delivery Year, no test will be required

Test required only if there is no PJM-initiated LM event for Extended Summer DR in that zone for lead time type (i.e., long, medium or short lead times).

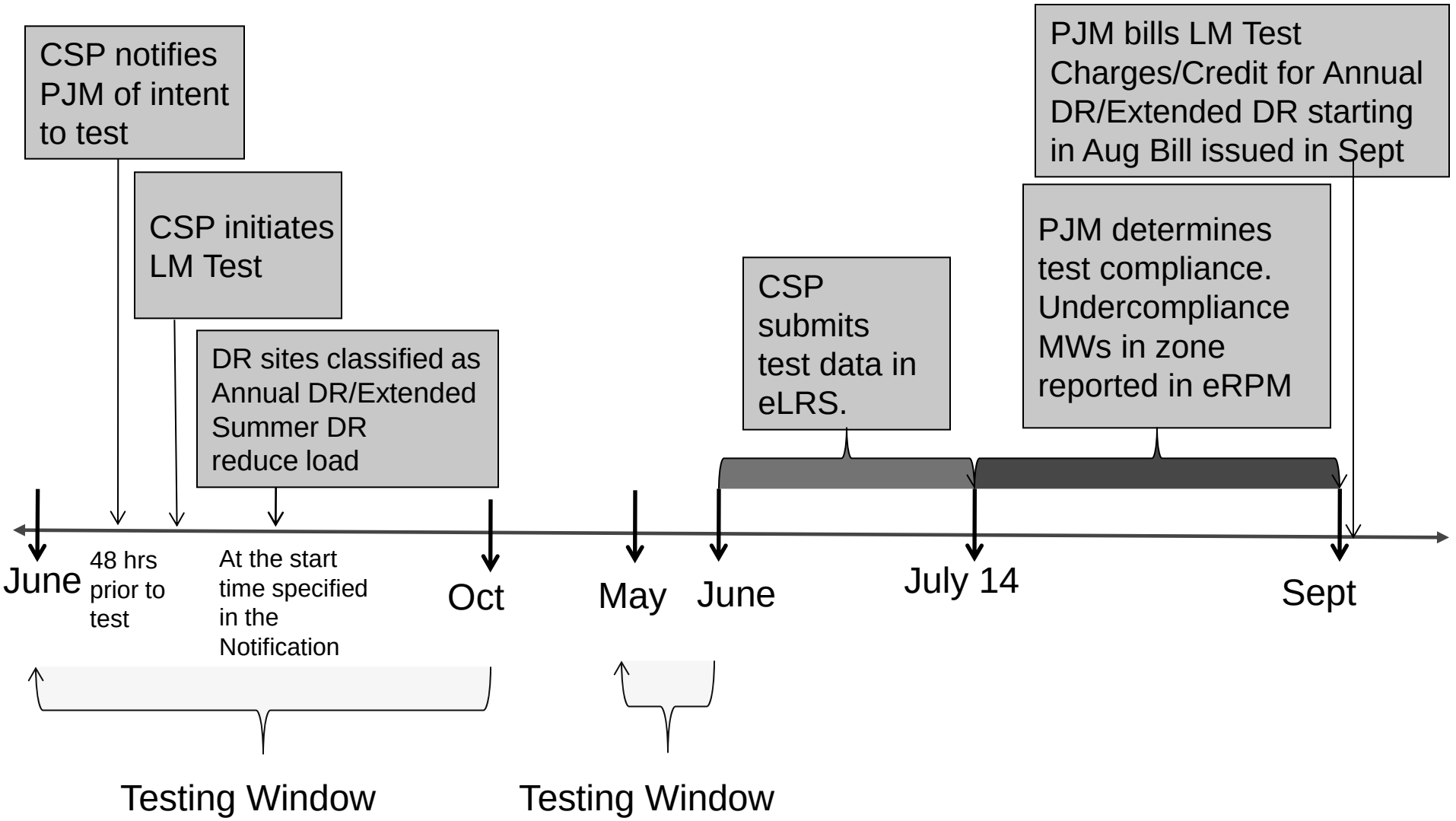
Sub Zonal Dispatch
Test Process 14/15 DY and Beyond

- Sub-zonal commitment based on registrations that were NOT dispatched:
  - CSP **may not** use other zonal registrations that were dispatched to substitute registrations that are required to test

LM Resource Test Timeline – Limited DR



LM Resource Test Timeline – Annual/Extended Summer DR



Notification of Load Management Tests and Retests in eLRS

- A CSP qualifies for an optional retest if the MW reduction by product type in the zone is greater than 75% of their Summer average RPM Commitment in the zone
  - Only registrations that have a test reduction less than its Nominated ICAP are eligible to participate in the retest
    - Retest notifications are submitted in eLRS 48 hours in advance for the selected registrations. Failed registrations that are not selected for the retest will maintain the original test reduction values
    - Any resource affiliated with a failed resource must also participate in the retest, even if it passed the in the overall test
      - Affiliated means resources that have any ability to shift load and are owned or controlled by the same entity
    - Retest must be performed on comparable day (weather, time) of original test
    - No limit on the number of retests a CSP can perform
      - Only submit data for the retest which PJM will use to determine the Test Failure Charge

Under Compliance Example Re-Test Eligibility

Resource in eLRS	Resource in eRPM	Product Type	Nominated Load Reduction (MW)	Initial Test Reduction (MW)	Pass/Fail Initial Test	Retest Reduction (MW)	Final Reduction (MW)
FSL1*	CSP1 PEPCO LDR1	Limited	5	4.7	Fail	4.8	4.8
FSL2	CSP1 PEPCO LDR1	Limited	8	8.3	Pass		8.3
FSL3	CSP1 PEPCO LDR1	Limited	2	1.5	Fail	1.6	1.6
FSL4*	CSP1 PEPCO LDR1	Limited	10	10	Pass	11	11
GLD1	CSP1 PEPCO LDR2	Limited	15	8	Fail	10	10
GLD2	CSP1 PEPCO LDR2	Limited	3	2	Fail	0	0
GLD3	CSP1 PEPCO LDR2	Limited	7	0 (no data submitted)	Fail	7.3	7.3
DLC1	CSP1 PEPCO LDR2	Limited	50	50	Pass		50
	Zonal Total		100	84.5			93

Resource	Product Type	Summer Average RPM Commitment (ICAP MWs)
CSP1 PEPCO LDR1	Limited	25
CSP1 PEPCO LDR2	Limited	73
Zonal Total	Limited	98

No LM event for Limited DR in PEPCO zone

*FSL1 & FSL4 are affiliated resources, and, as such, must perform together in any re-test

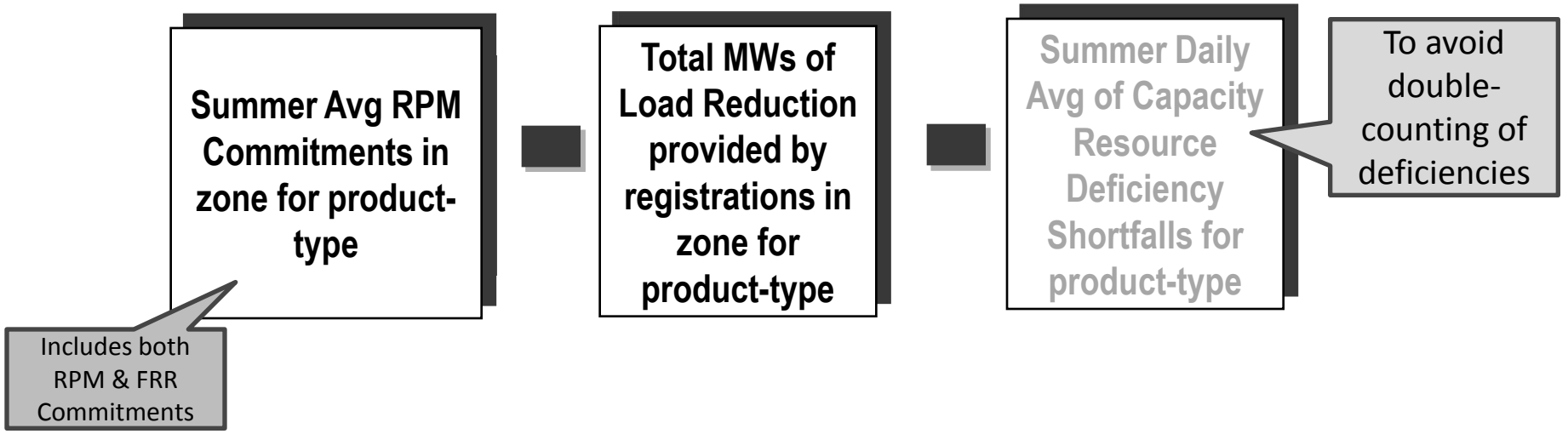
Since Zonal Initial Test Reduction MW > 0.75 * Zonal Summer Average RPM Commitment (i.e., 73.5 MWs), CSP qualifies for re-test provision

Load Management Test Compliance

- Methods to measure test compliance for FSL, GLD, or DLC registrations are the same methods used to measure event compliance; however, in measuring test compliance, the Nominated Load Reduction Value in eLRs is capped at Summer Average RPM Commitment as opposed to RPM Commitment on day of event
- LM Test Compliance is measured over the hour of the test
- No compliance credit will be given for the incremental load drop below zero (i.e. exported energy).
- If CSP is eligible for re-test provision and re-test data is submitted for a subset of failed registrations in zone, re-test data will be used in determining final reduction for such registrations
- CSP test compliance is aggregated by Zone and product-type
- Net shortfall by zone and product type is determined by comparing the total zonal load reduction provided by registrations of the product-type to the Summer Average of Commitments for such zone and product-type
- Performance review of submitted test results will be completed by PJM between November 15 and December 31 during the DY for Limited DR and between July 15 and August 30 after the DY for Annual DR and Extended Summer DR

Net Testing Shortfall

Net Testing Shortfall in zone for product-type =

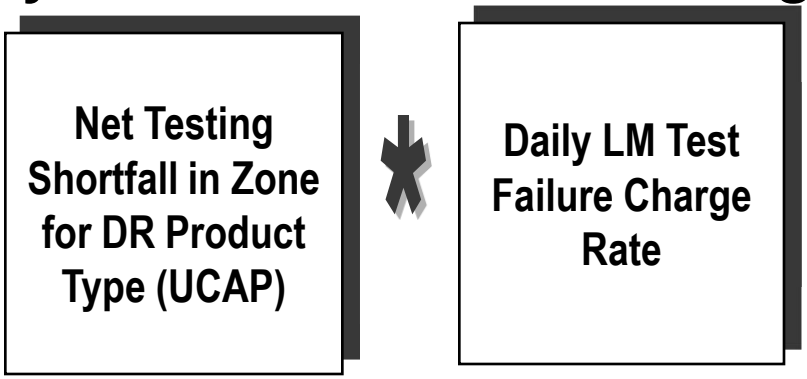


Shortfalls in ICAP will be converted to UCAP using final DR Factor and FPR for DY.

- **A positive number indicates a shortfall**
- **A negative number indicates an excess**

Daily LM Test Failure Charge

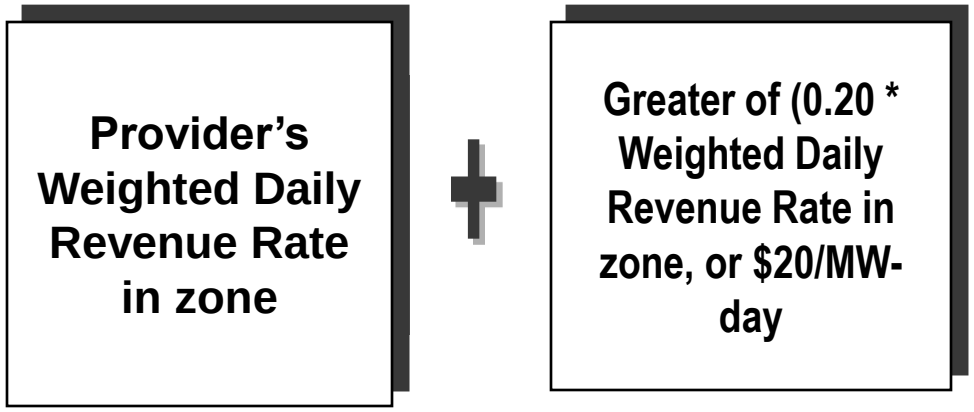
Daily LM Test Failure Charge =



- Load Management Test Failure Charges are assessed to a provider that under-complied in a zone for DR product type during a test.
- For Limited DR: Assessed daily and billed monthly; provided, however that a lump sum payment may be required to reflect amounts due, as a result of the testing failure, from the start of the DY to the day the charges are reflected in regular billing (December bill issued in January)
- For Annual DR/Extended Summer DR: Assessed daily and charged as a lump sum payment to reflect amounts due for the entire DY in the August bill issued in September after conclusion of the DY.
- Charges are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation

Daily LM Test Failure Charge Rate

Daily LM Test Failure Charge Rate =



- Provider's Weighted Daily Revenue Rate in a zone is determined by calculating the weighted average of resource clearing prices received across all RPM auctions by zonal DR resource, weighted by a MWs cleared (including any makewhole MWs).
- Resource Provider still receives Daily RPM Auction Credit for DR resources cleared.

Add Back Administrative Process

Add Back Calculation

- Load Drop used to determine capacity compliance also used to determine add back
- Guaranteed Load Drop or Economic Load Reduction (where applicable):
  - Minimum of {(comparison load – Load) * LF, PLC – (Load * LF)}
- Firm Service Level:
  - PLC – (Load * LF)
- Direct Load Control (no interval metering)
  - Load study, switch operability, etc.
- Small Generator (customer PLC < 0.5MW) where load interval metering is not installed
  - Generation output

Economic example

- Customer is both capacity resource (DR) and economic resource
- PLC = 5 MW
- LF = 1.05
- Economic event during summer
  - CBL ("Comparison Load") = 12 MW
  - Load = 2 MW
  - Add-back = min[(12 MW – 2 MW) * 1.05, 5 MW – (2 MW *1.05)] = min(10.5 MW, 2.9 MW) = 2.9 MW

Emergency example (FSL)

- Customer is both capacity resource (DR) and economic resource
- PLC = 5 MW
- LF = 1.05
- Emergency event during summer
  - Load = 6 MW
  - Add-back = 5 MW – (6 MW *1.05)] = -1.3 MW and therefore 0 MW add back

Add Back – Administrative Process

- Emergency Event
  - CSP submits customer specific compliance data up to 45 days after start of month after the event was called
- Economic Event
  - CSP submits settlement data up to 60 days after the event
- PJM calculates add backs and uses for Forecast
- PJM posts customer specific add backs for 5 CP in eLRS for CSP, EDC and LSE
- EDC downloads add backs for customer specific PLC determination which is due by 1/1

Questions?

Appendix

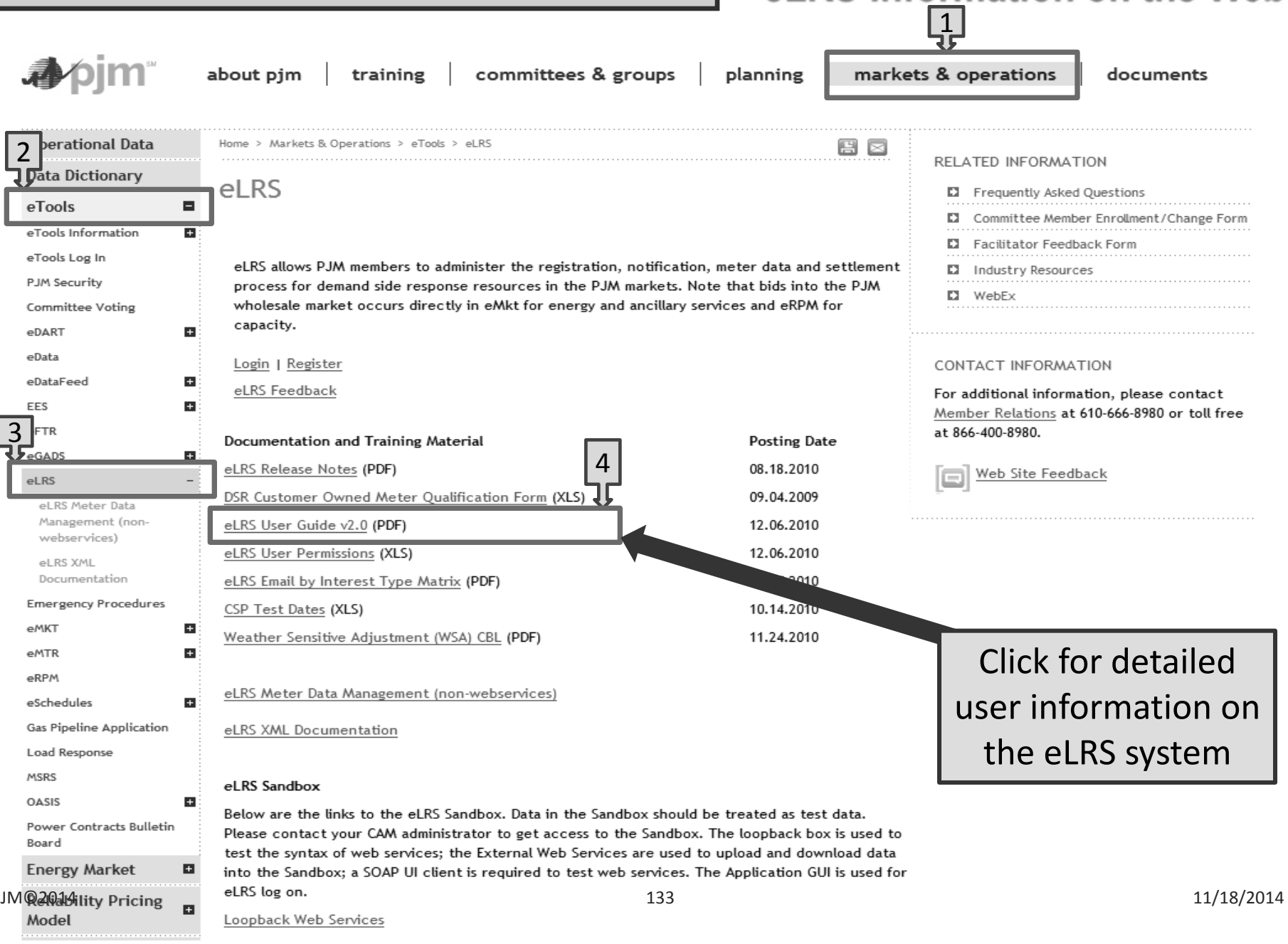
Appendix

- Appendix
  - eLRS - Load Management Registration
  - eLRS - Notification of Load Management Tests and Retests
  - eLRS - Submission of Load Management Compliance data
  - eLRS – Submission of Emergency Energy Settlements
  - DLC Documentation
  - Resources

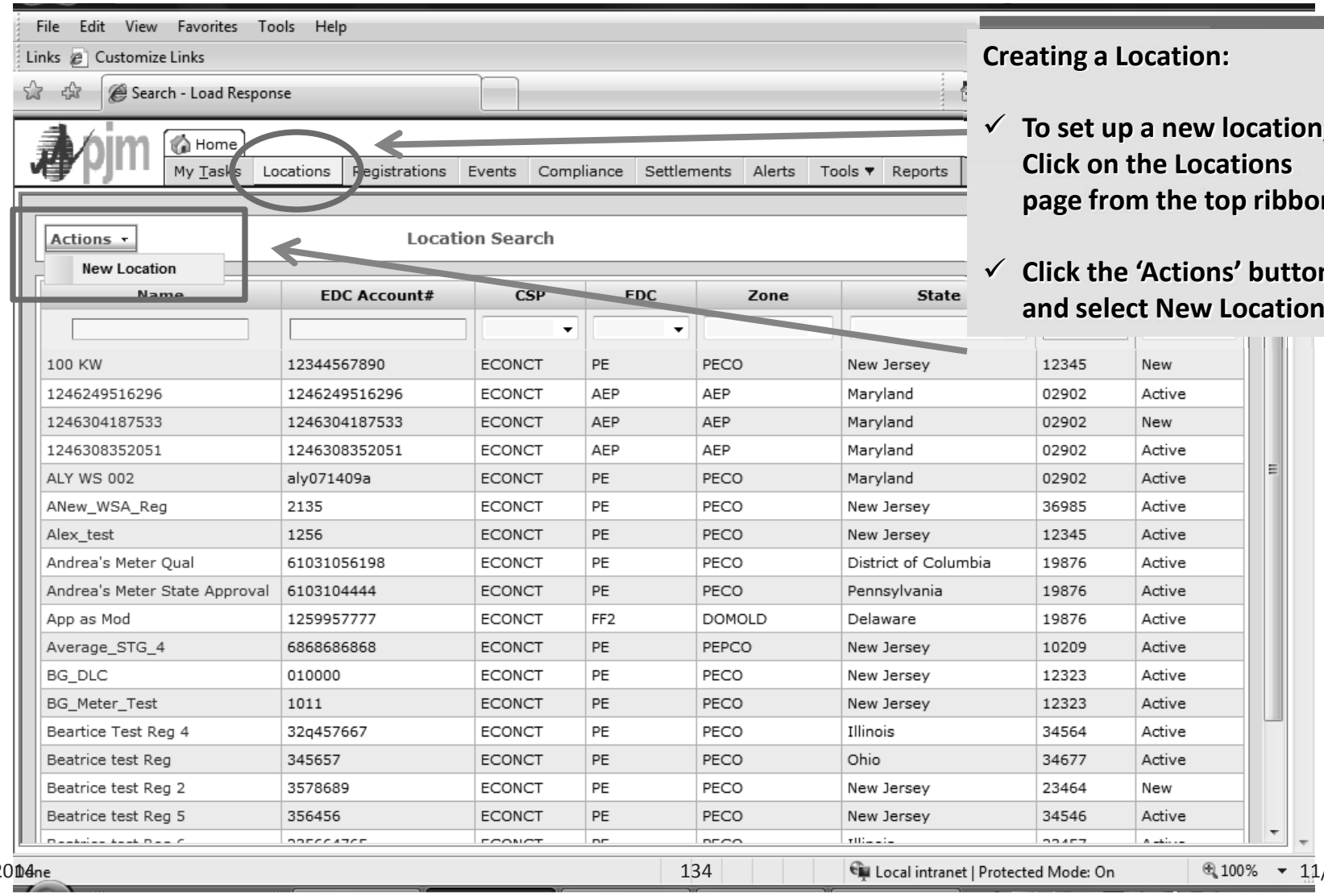
Load Response System
"eLRS"
(Specific to Load Management)

http://www.pjm.com/markets-andoperations/etools/elrs.aspx

eLRS Information on the Web



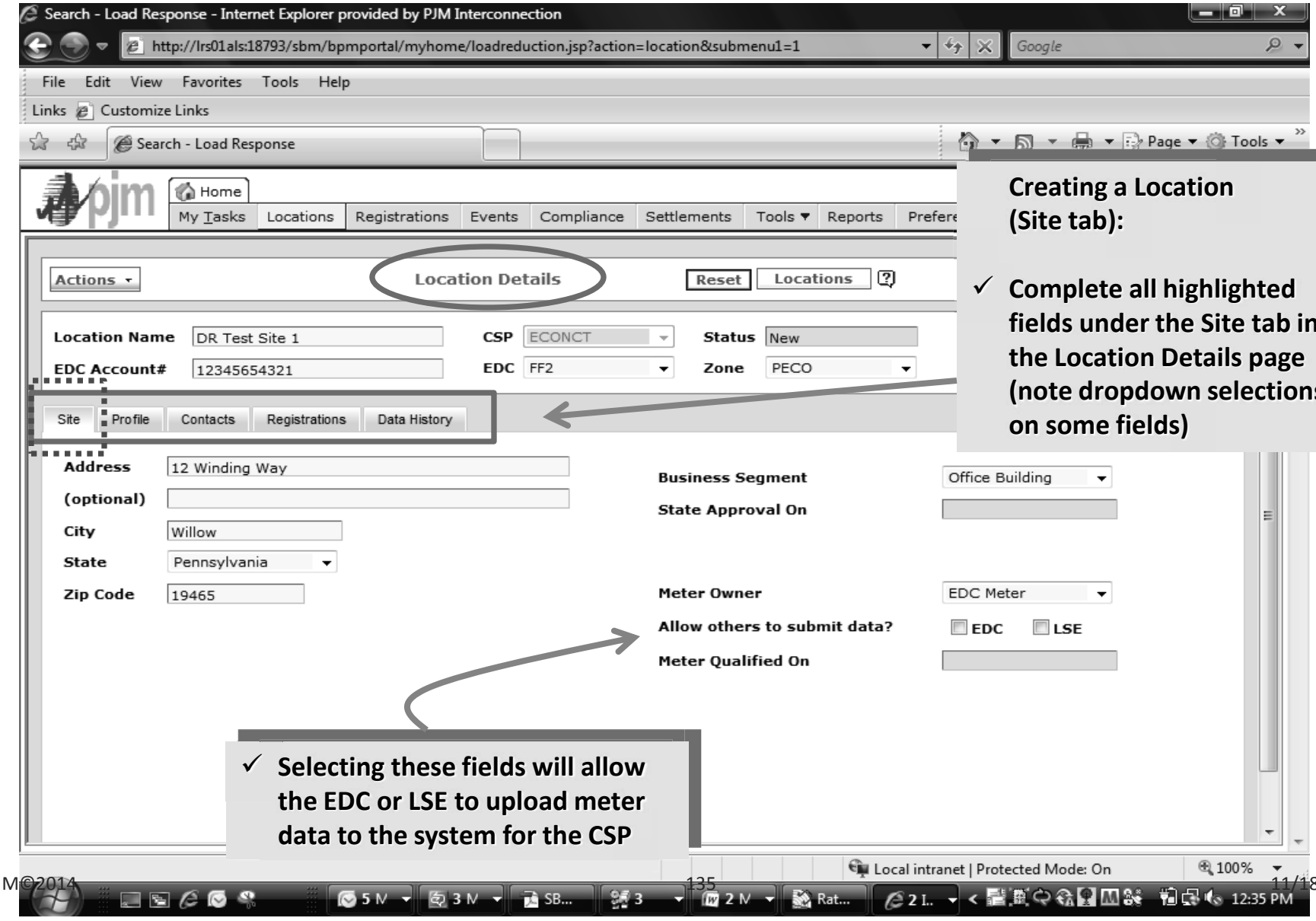
Locations (CSP perspective)



Creating a Location:

- ✓ **To set up a new location, Click on the Locations page from the top ribbon**
- ✓ **Click the 'Actions' button and select New Location**

Locations (CSP perspective)

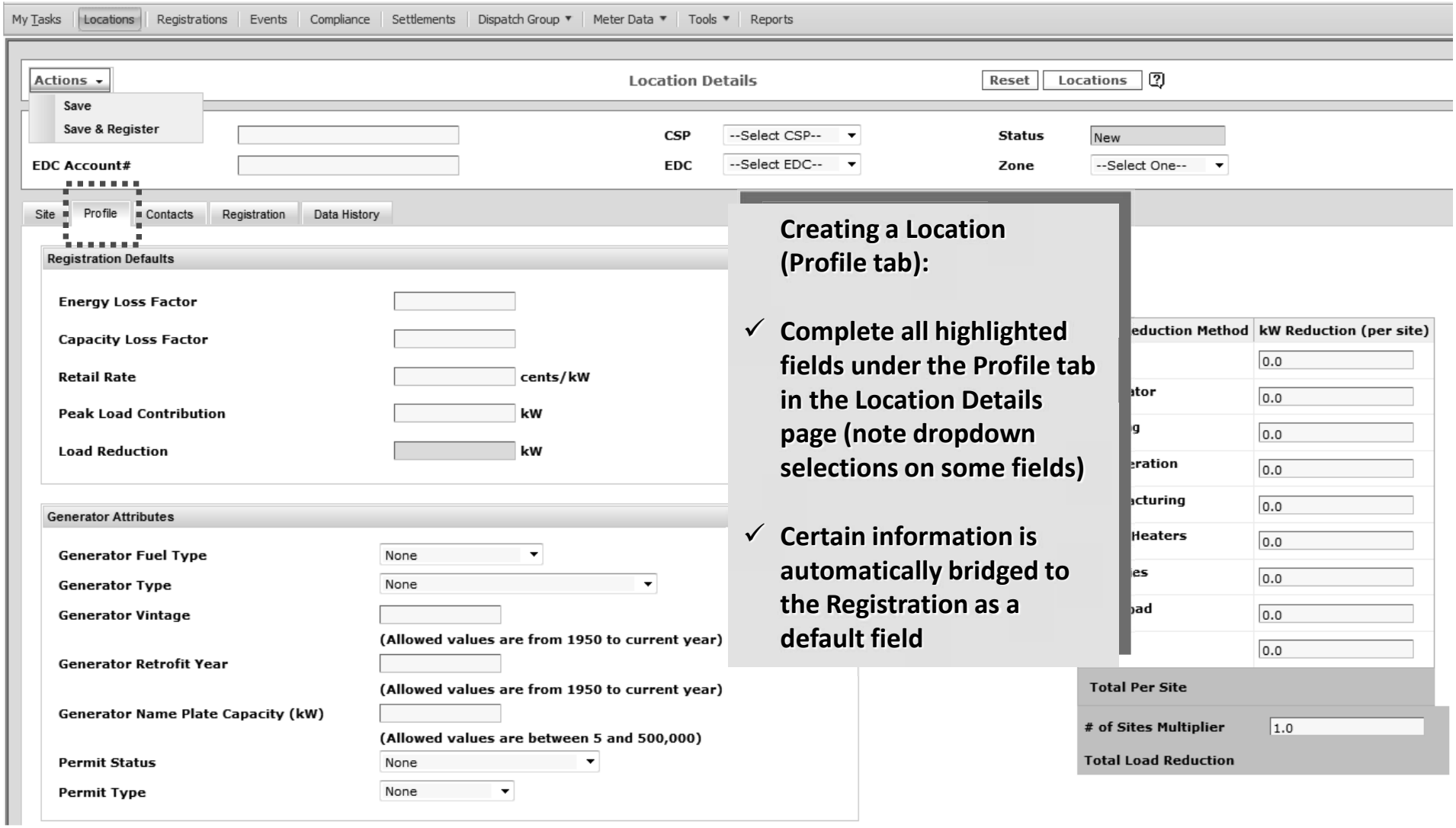


Creating a Location (Site tab):

- ✓ **Complete all highlighted fields under the Site tab in the Location Details page (note dropdown selections on some fields)**

- ✓ **Selecting these fields will allow the EDC or LSE to upload meter data to the system for the CSP**

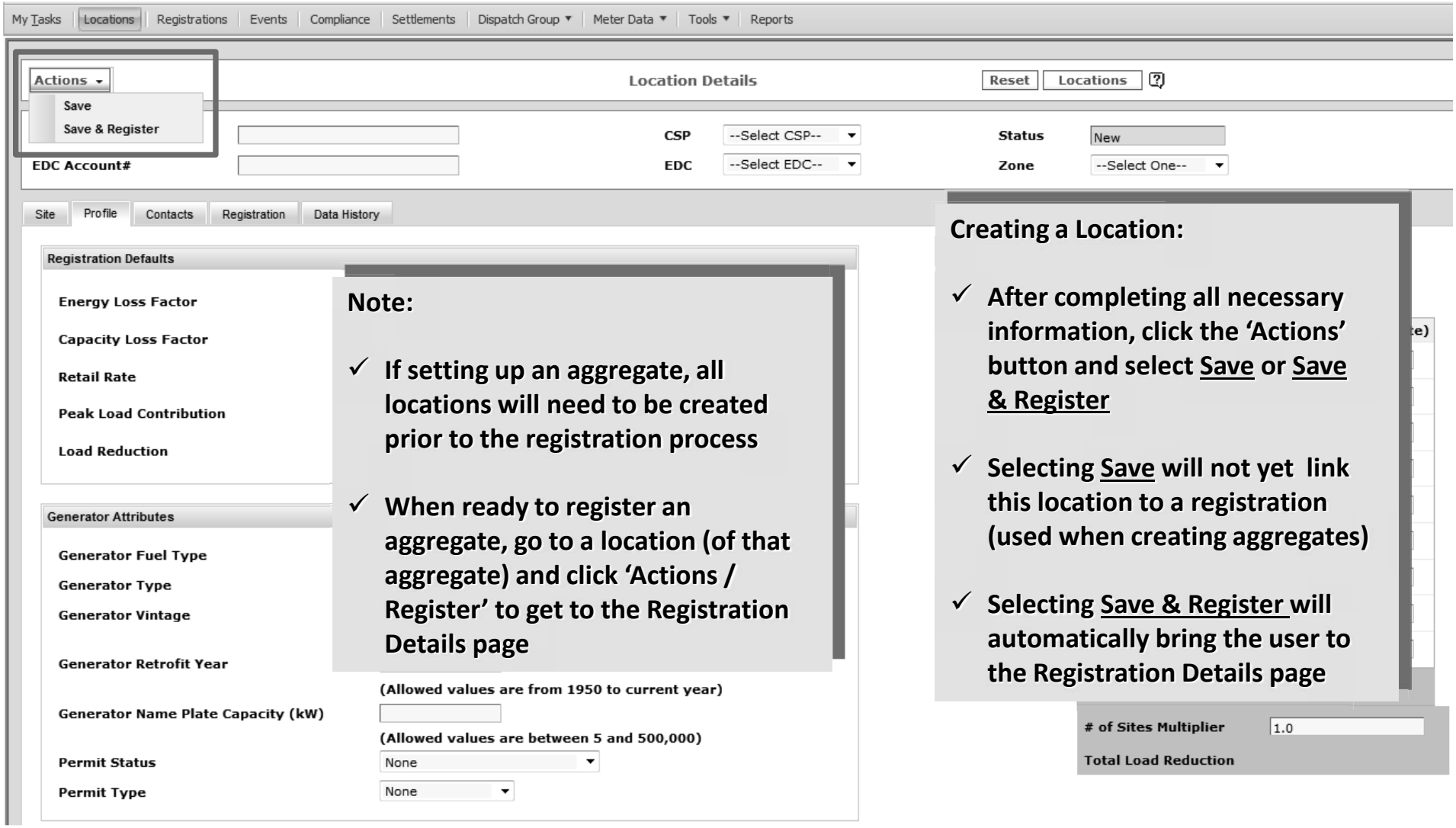
Locations (CSP perspective)



Creating a Location (Profile tab):

- ✓ **Complete all highlighted fields under the Profile tab in the Location Details page (note dropdown selections on some fields)**
- ✓ **Certain information is automatically bridged to the Registration as a default field**

Locations (CSP perspective)



Note:

- ✓ If setting up an aggregate, all locations will need to be created prior to the registration process
- ✓ When ready to register an aggregate, go to a location (of that aggregate) and click 'Actions / Register' to get to the Registration Details page

Creating a Location:

- ✓ After completing all necessary information, click the 'Actions' button and select Save or Save & Register
- ✓ Selecting Save will not yet link this location to a registration (used when creating aggregates)
- ✓ Selecting Save & Register will automatically bring the user to the Registration Details page

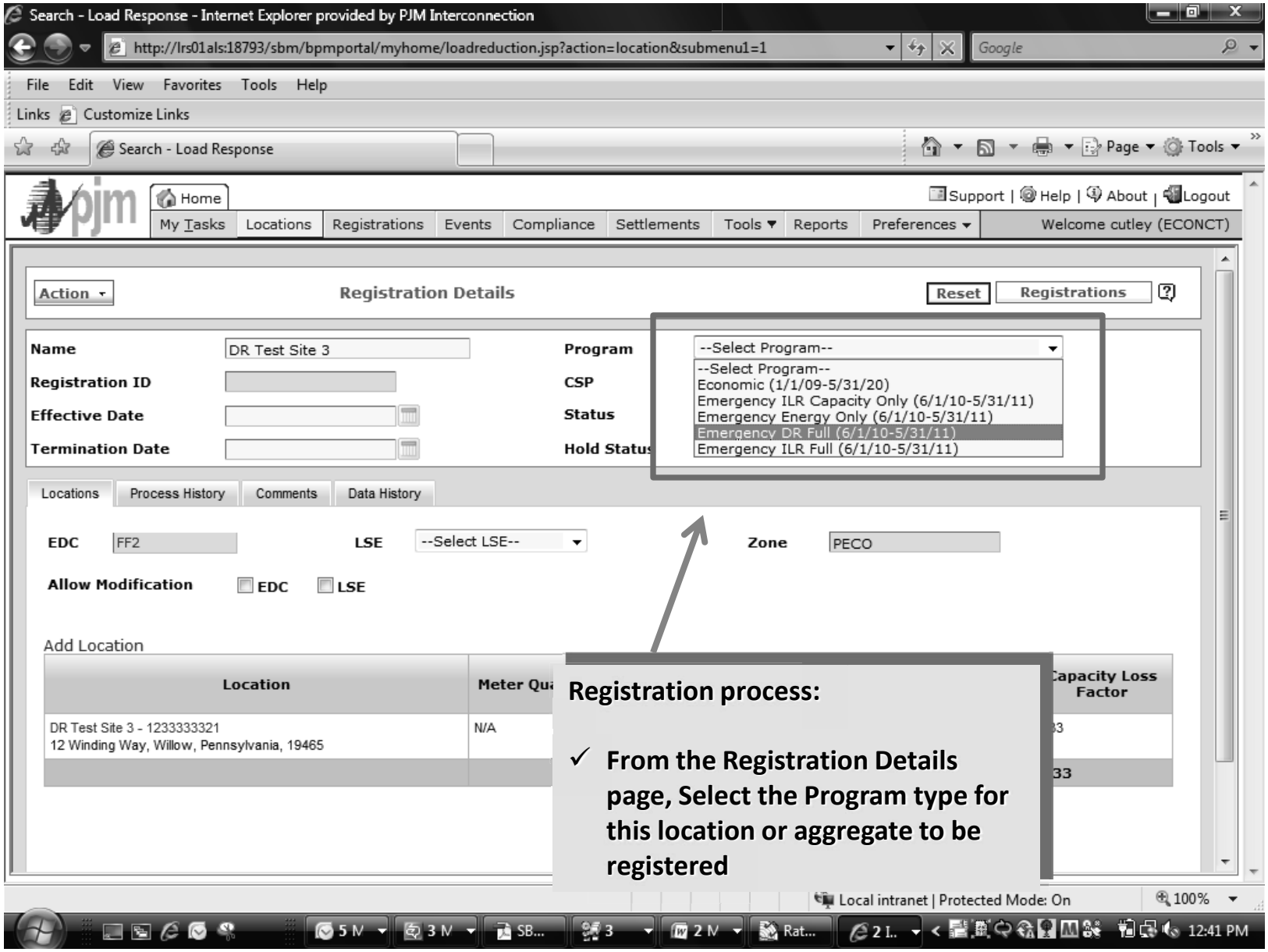
Data Requirements – Registration

- All data elements on a Registration are supplied by the Curtailment Service Provider, including retail rate, peak load contribution, and loss factors
  - except for P-Node IDs, which are supplied by EDC via an eLRS dropdown

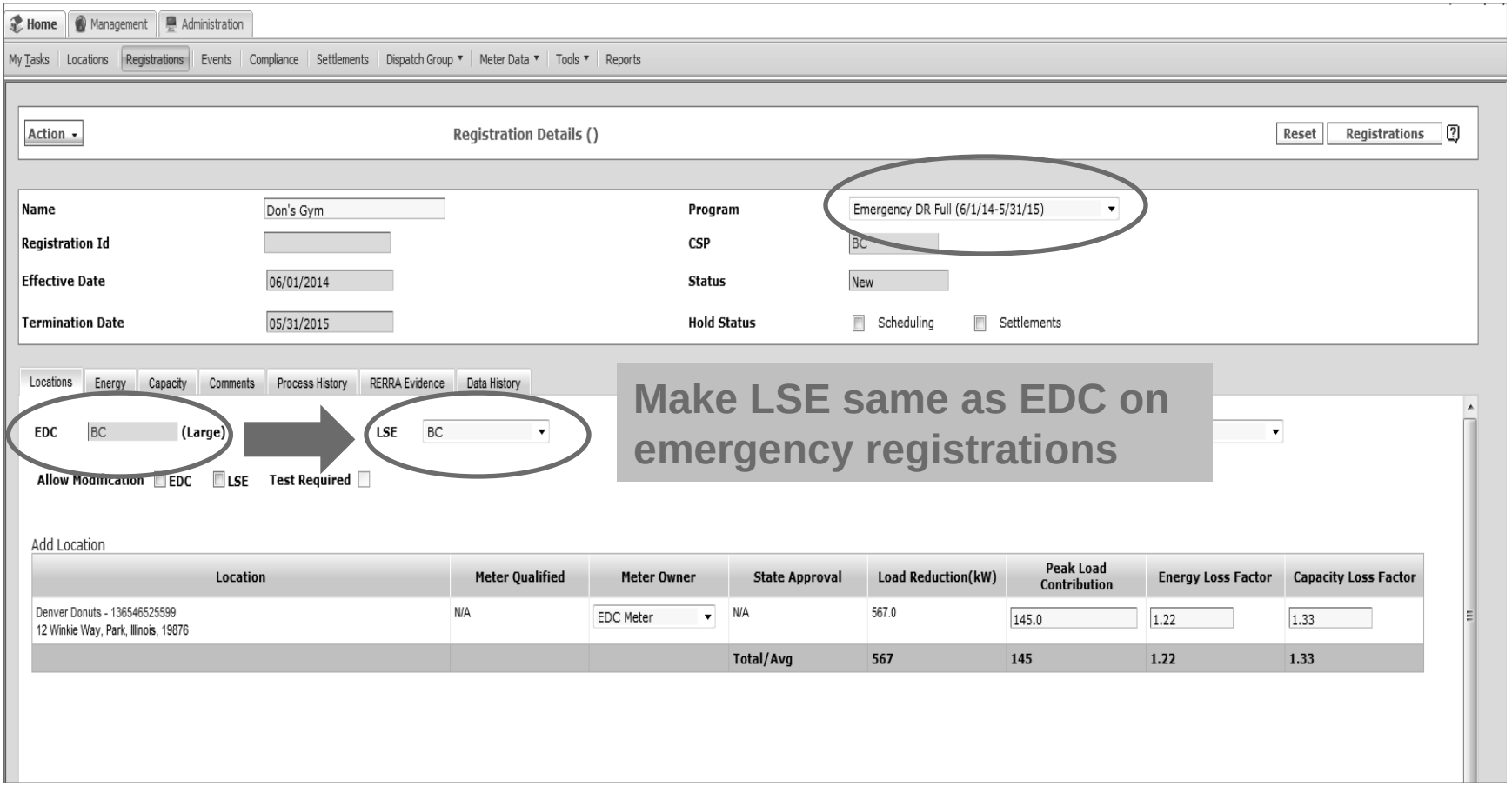
- Updatable fields can only be modified by the Curtailment Service Provider (unless the EDC is given access via the Allow Modifications selection)

- Market Sensitive data will be restricted from view

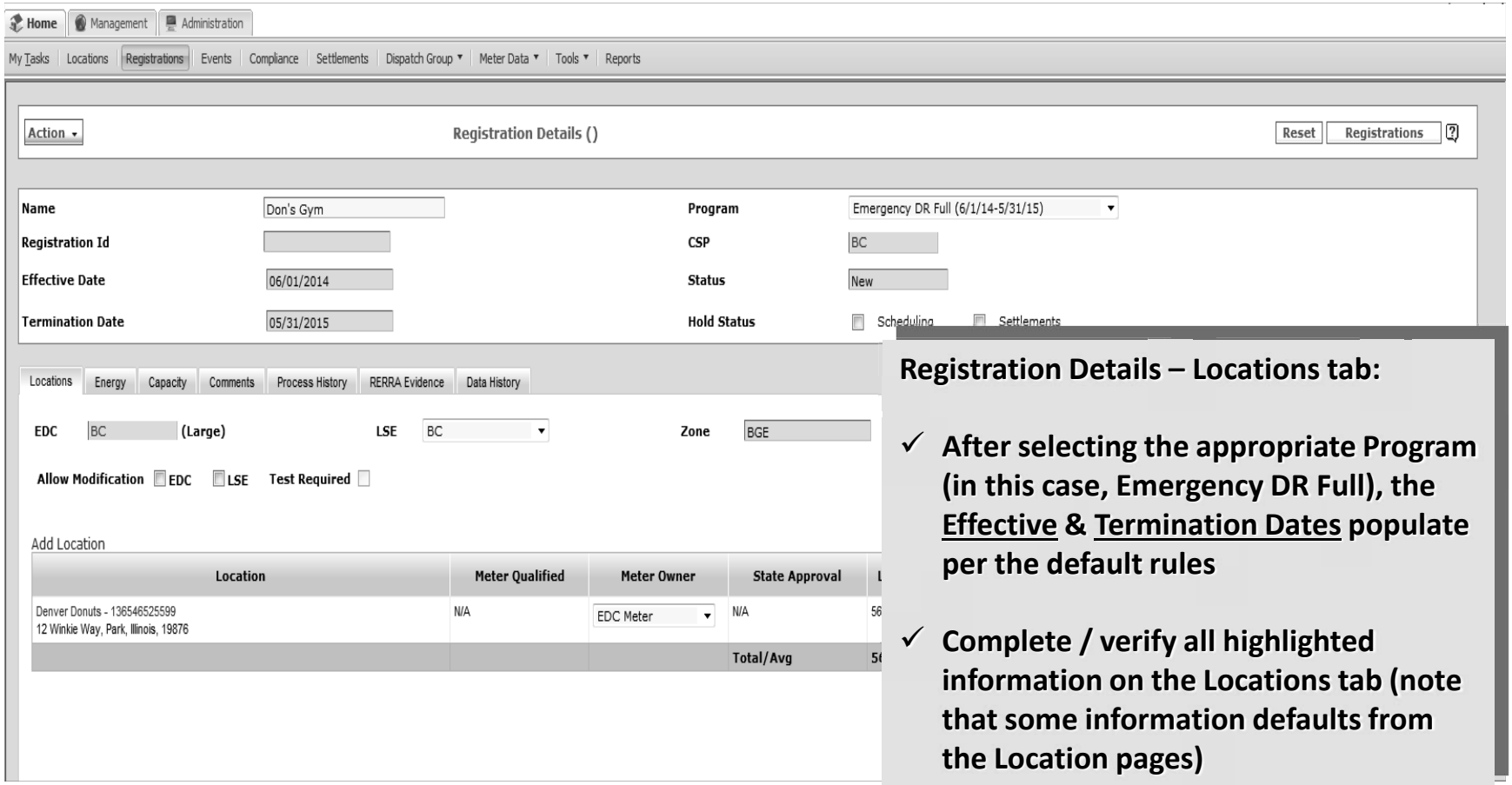
Registration (CSP perspective)



Registration (CSP perspective)



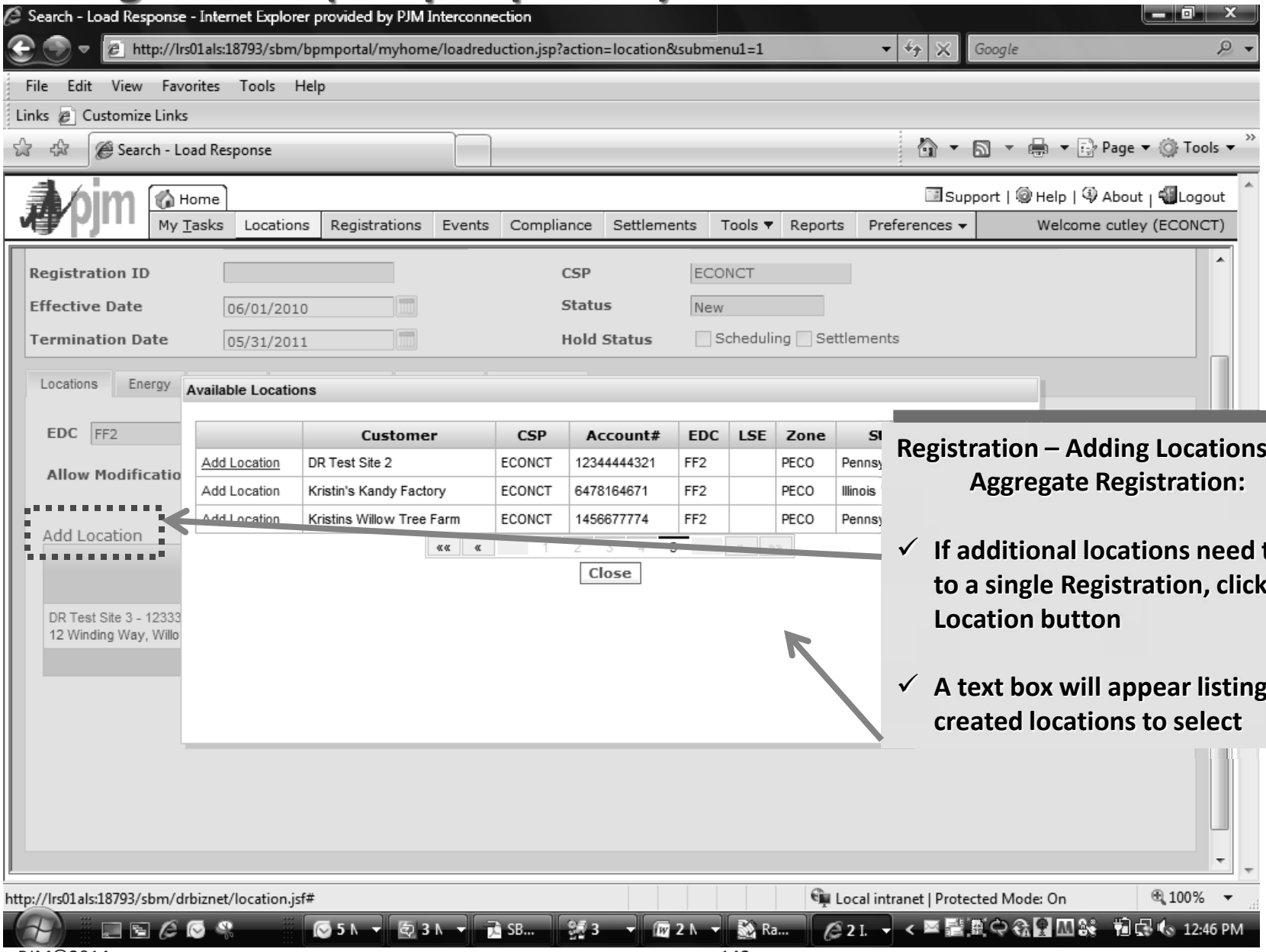
Registration (CSP perspective)



Registration Details – Locations tab:

- ✓ **After selecting the appropriate Program (in this case, Emergency DR Full), the Effective & Termination Dates populate per the default rules**
- ✓ **Complete / verify all highlighted information on the Locations tab (note that some information defaults from the Location pages)**

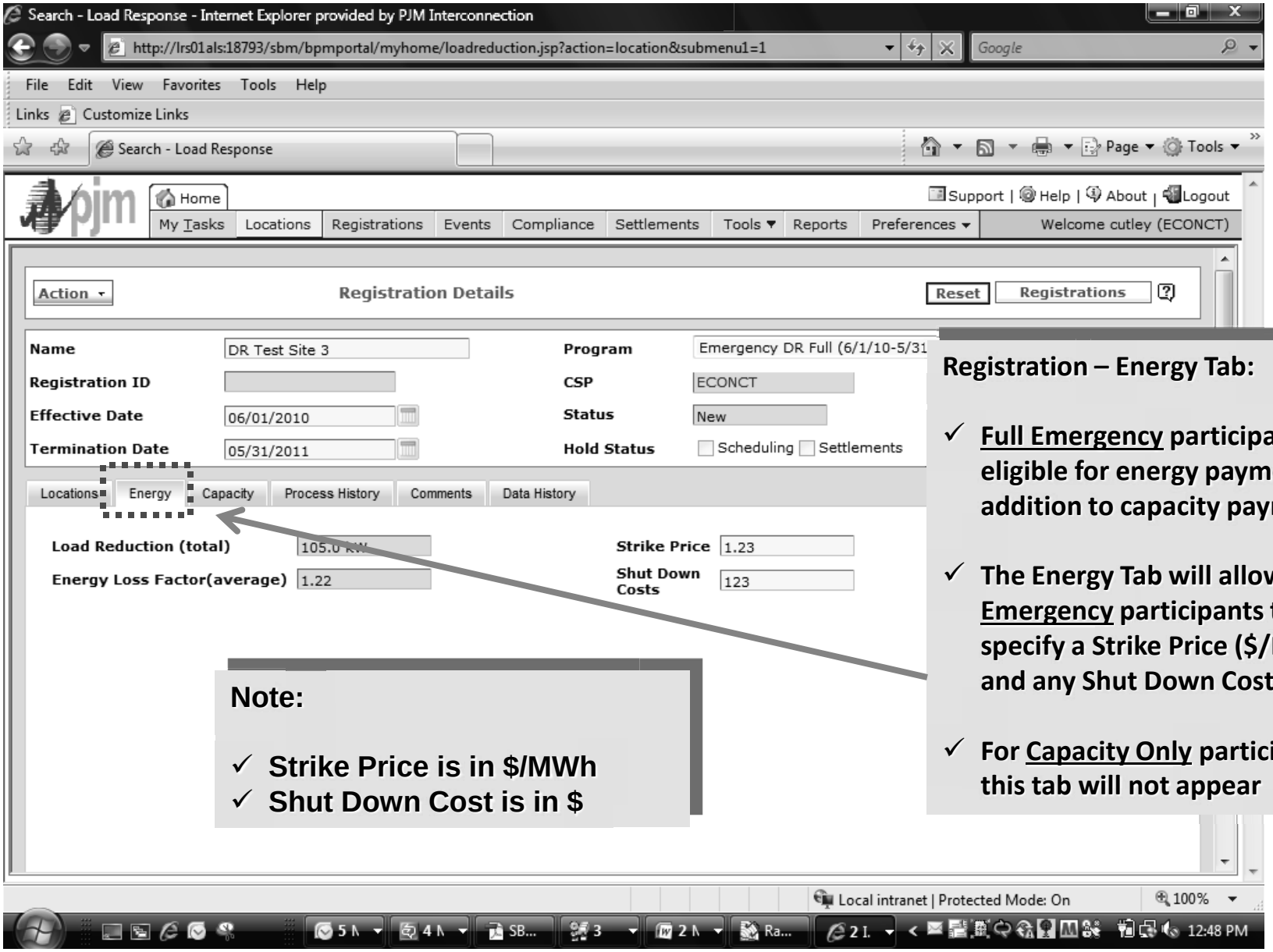
Registration (CSP perspective)



Registration – Adding Locations to create Aggregate Registration:

- ✓ **If additional locations need to be added to a single Registration, click the Add Location button**
- ✓ **A text box will appear listing previously created locations to select**

Registration (CSP perspective)



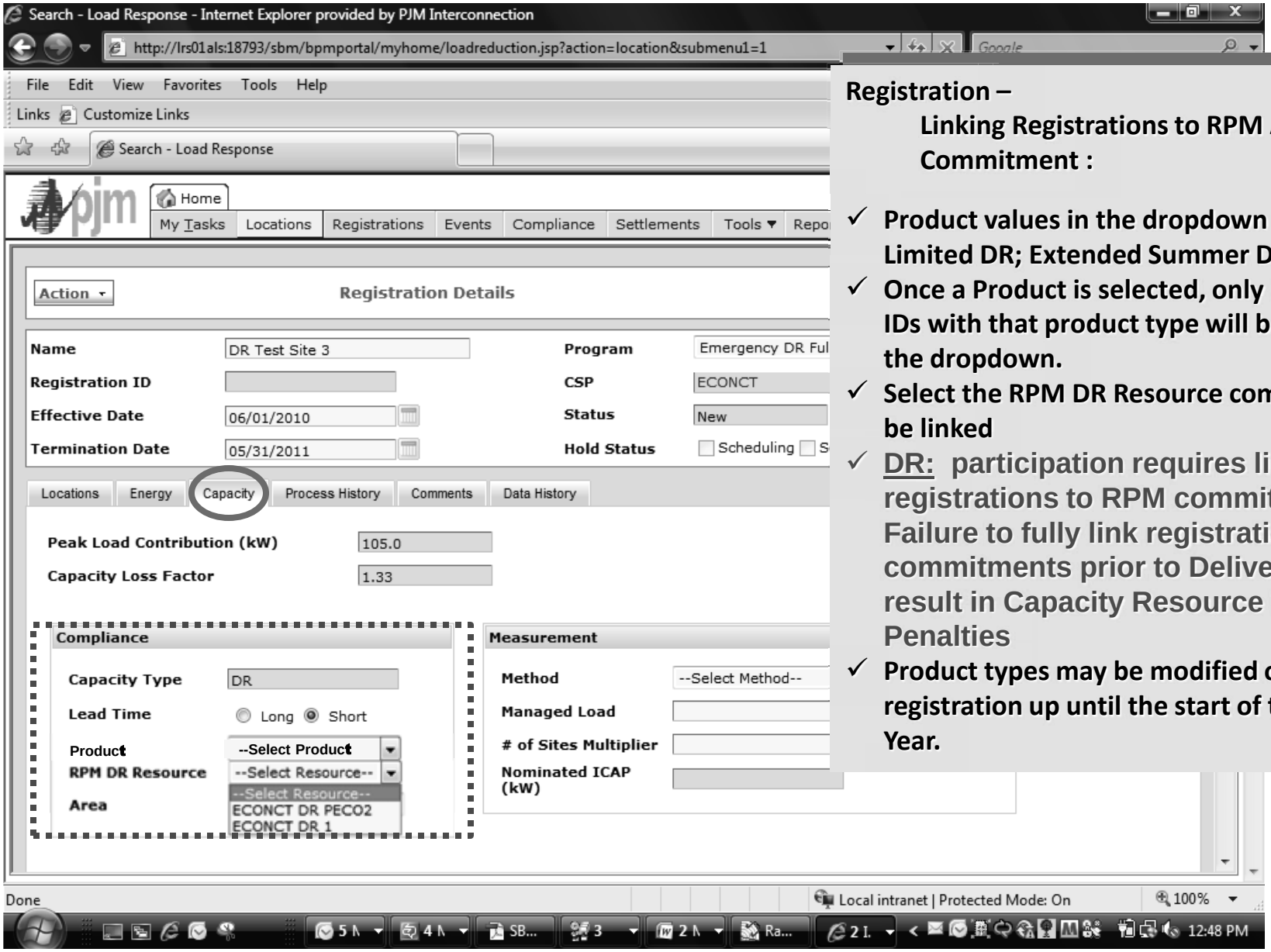
Registration – Energy Tab:

- ✓ **<u>Full Emergency</u> participants are eligible for energy payments in addition to capacity payments**
- ✓ **The Energy Tab will allow the <u>Full Emergency</u> participants to specify a Strike Price ($/MWh) and any Shut Down Costs ($)**
- ✓ **For <u>Capacity Only</u> participants, this tab will not appear**

Note:

- ✓ **Strike Price is in $/MWh**
- ✓ **Shut Down Cost is in $**

Registration (CSP perspective)

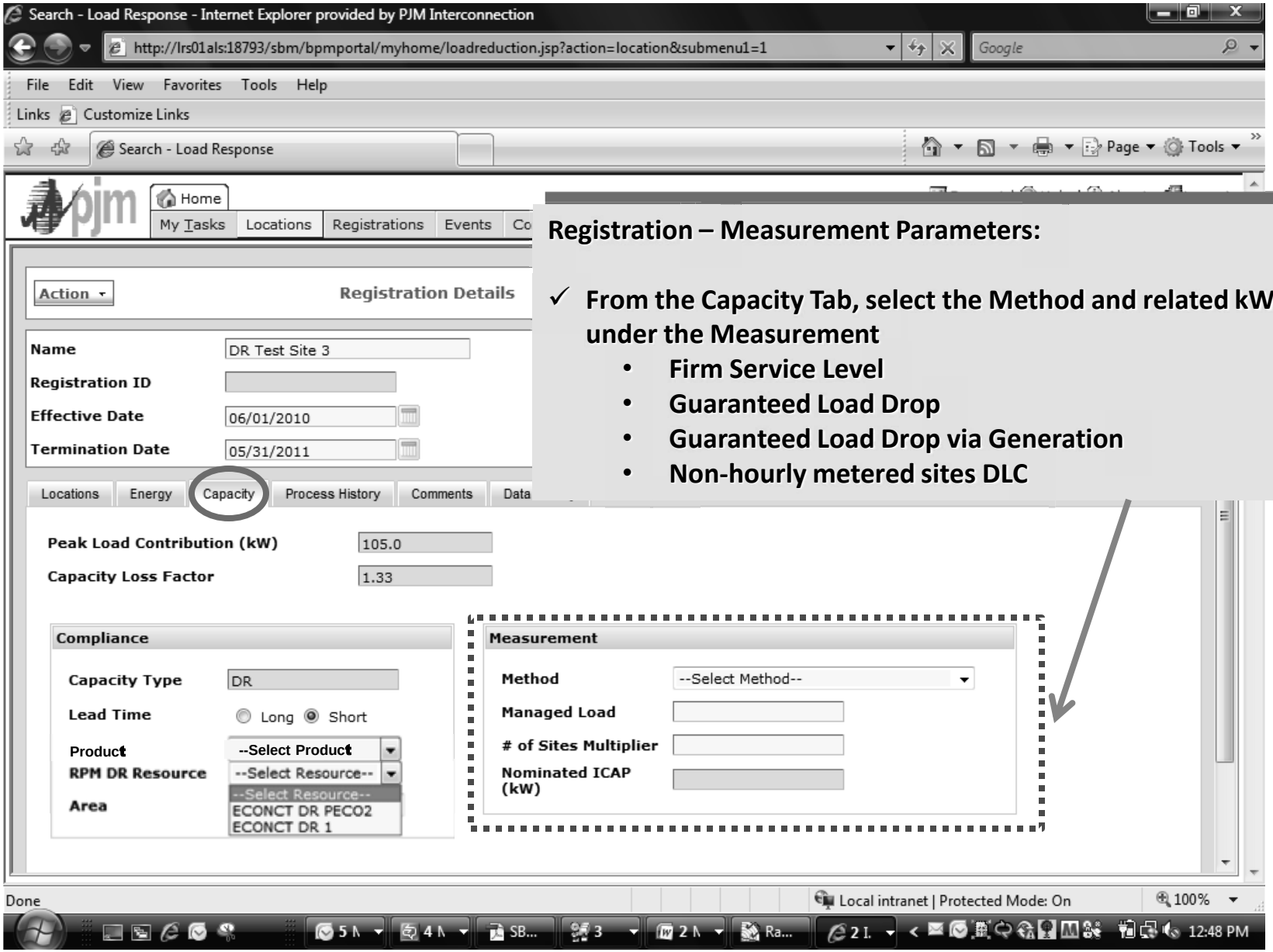


Registration –

Linking Registrations to RPM Auction Commitment :

- ✓ **Product values in the dropdown will be: Limited DR; Extended Summer DR; Annual DR**
- ✓ **Once a Product is selected, only RPM Resource IDs with that product type will be available in the dropdown.**
- ✓ **Select the RPM DR Resource commitment to be linked**
- ✓ **DR: participation requires linking eLRS registrations to RPM commitments. Failure to fully link registrations to commitments prior to Delivery Year will result in Capacity Resource Deficiency Penalties**
- ✓ **Product types may be modified on a registration up until the start of the Delivery Year.**

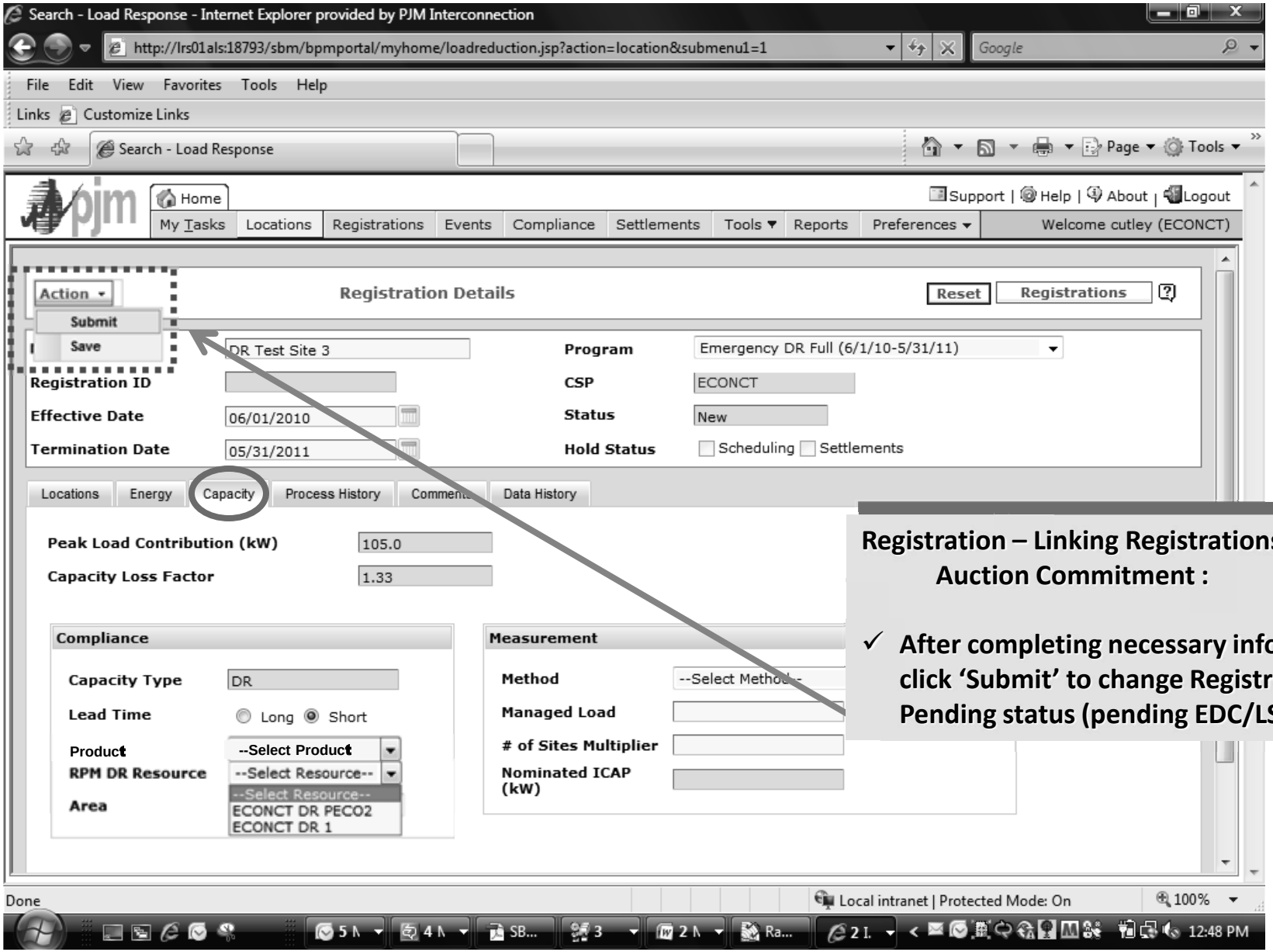
Registration (CSP perspective)



Registration – Measurement Parameters:

- ✓ **From the Capacity Tab, select the Method and related kW values under the Measurement**
  - **Firm Service Level**
  - **Guaranteed Load Drop**
  - **Guaranteed Load Drop via Generation**
  - **Non-hourly metered sites DLC**

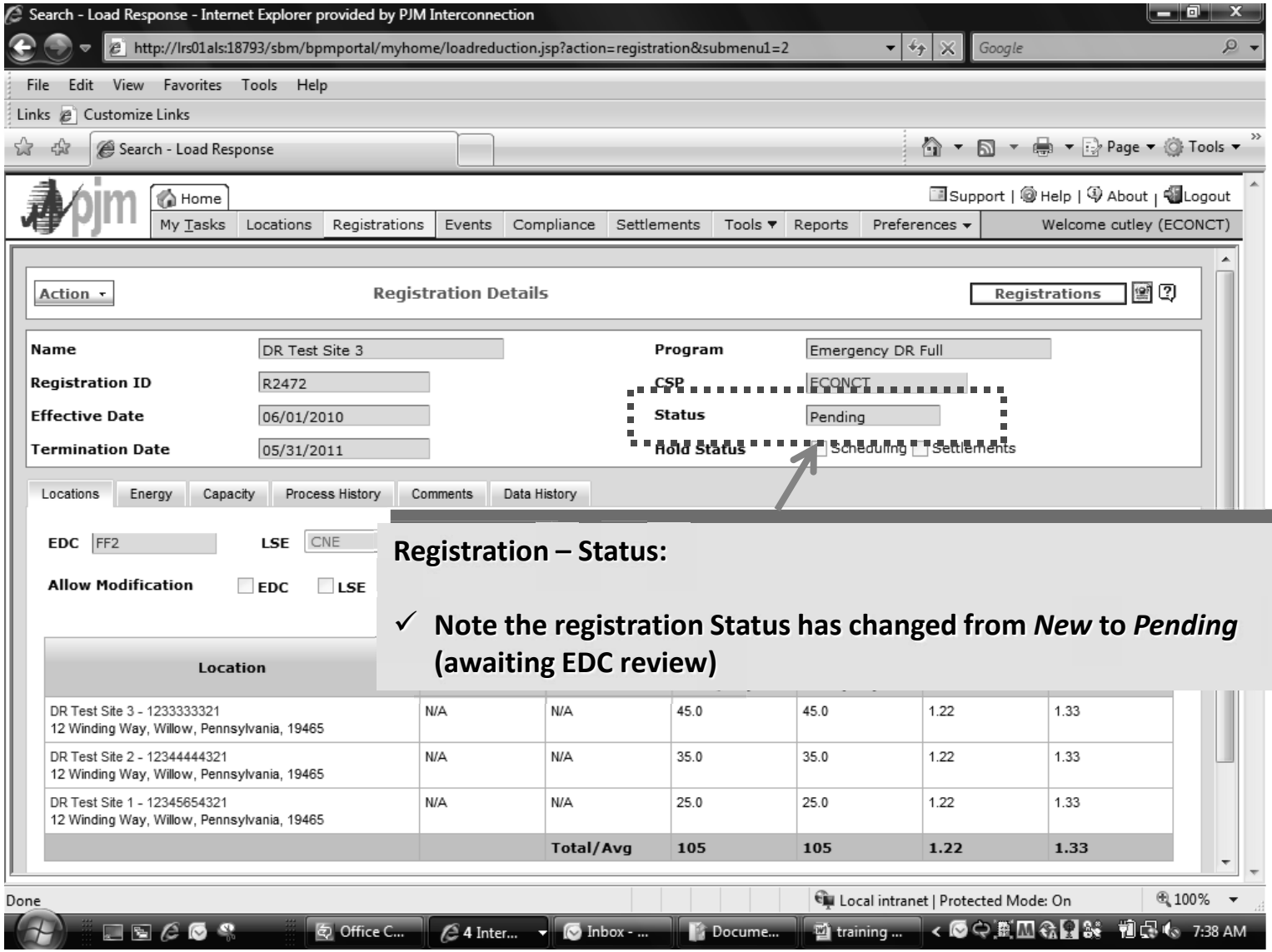
Registration (CSP perspective)



Registration – Linking Registrations to RPM Auction Commitment :

- ✓ **After completing necessary information, click 'Submit' to change Registration into Pending status (pending EDC/LSE review)**

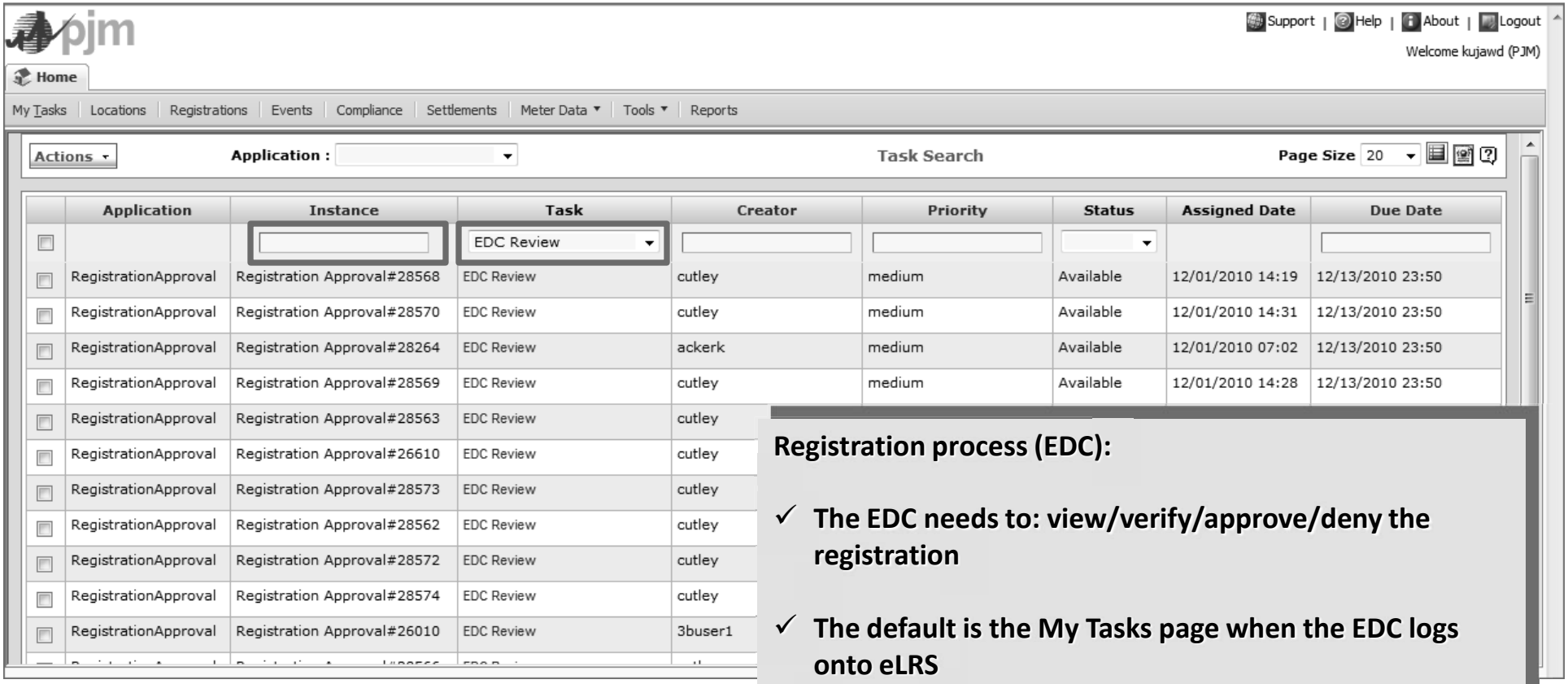
Registration (CSP perspective)



Reports (CSP Perspective)

- Product type will be displayed and reports will be sorted by Product type.
  A. "Resources Linked to Registrations" - Lists all DR Resources and the DR registration(s) linked to them.
  B. "Orphan DR Registrations" - Lists DR registrations available to be linked to a DR Resource

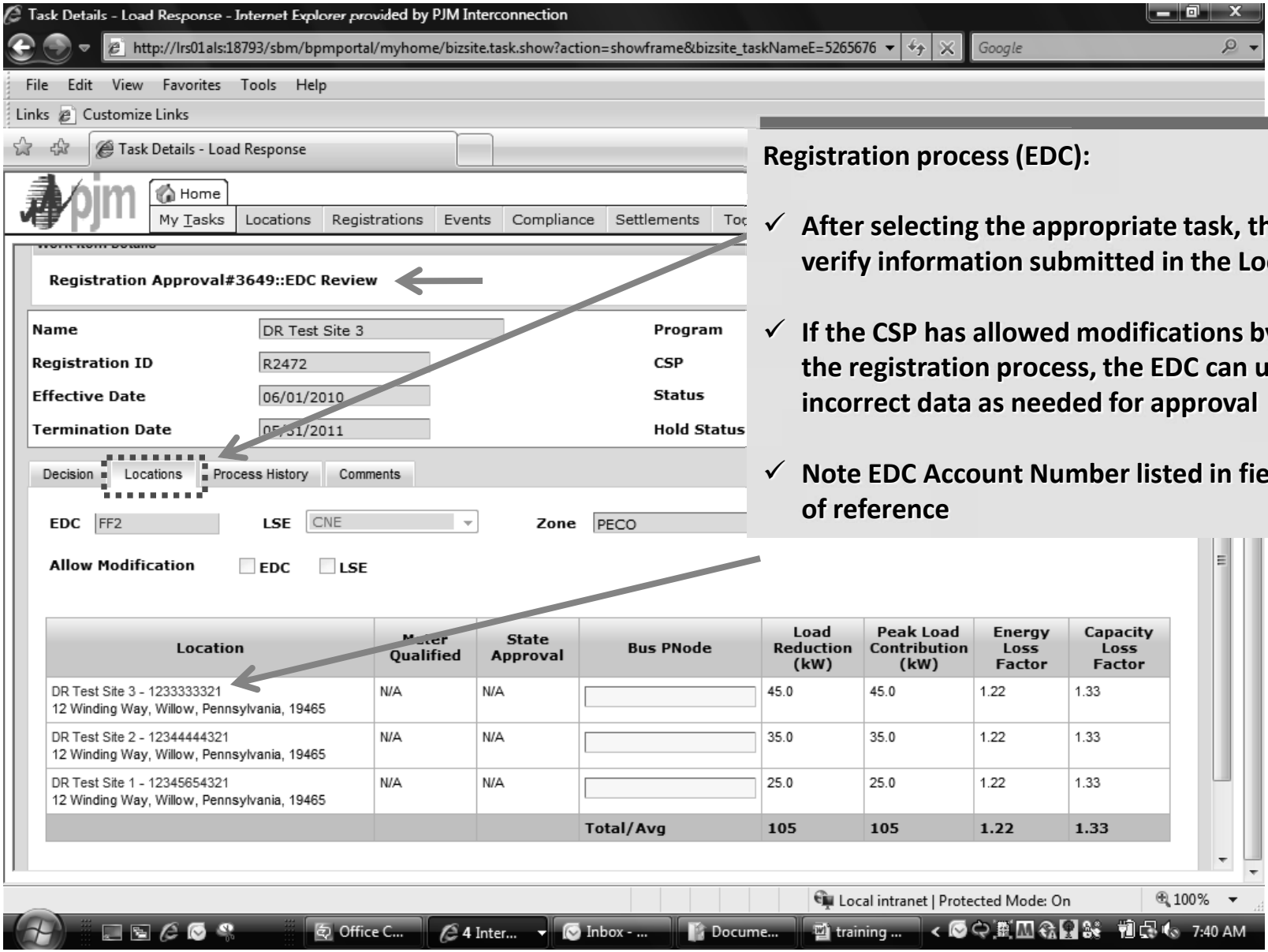
Registrations (EDC perspective)



Registration process (EDC):

- ✓ **The EDC needs to: view/verify/approve/deny the registration**
- ✓ **The default is the My Tasks page when the EDC logs onto eLRS**
- ✓ **Filter as appropriate to select certain tasks (i.e. Instance: Registration Approval, Task: EDC Review)**

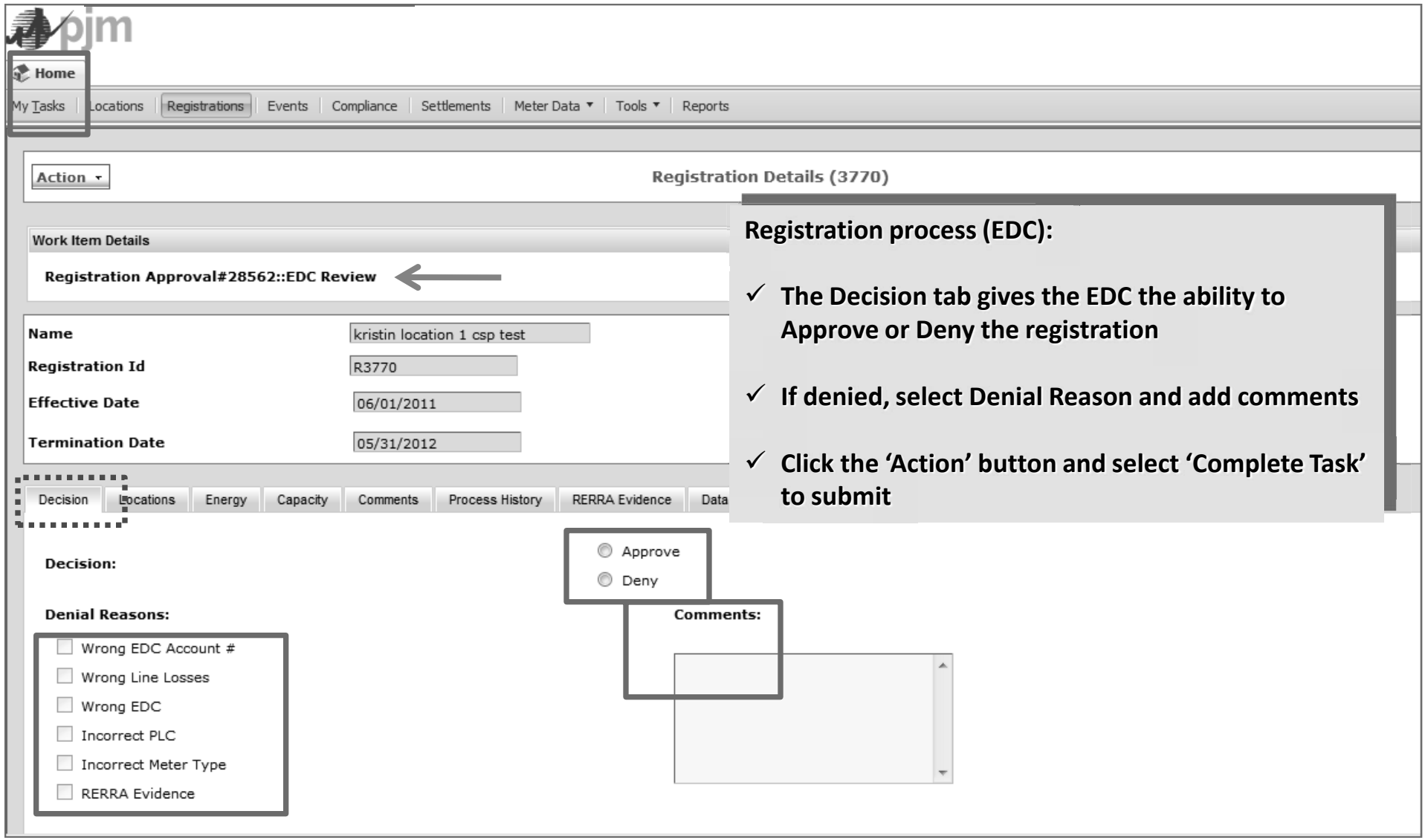
Registrations (EDC perspective)



Registration process (EDC):

- ✓ **After selecting the appropriate task, the EDC would verify information submitted in the Locations tab**
- ✓ **If the CSP has allowed modifications by the EDC in the registration process, the EDC can update incorrect data as needed for approval**
- ✓ **Note EDC Account Number listed in field for ease of reference**

Registrations (EDC perspective)



Registration process (EDC):

- ✓ **The Decision tab gives the EDC the ability to Approve or Deny the registration**
- ✓ **If denied, select Denial Reason and add comments**
- ✓ **Click the 'Action' button and select 'Complete Task' to submit**

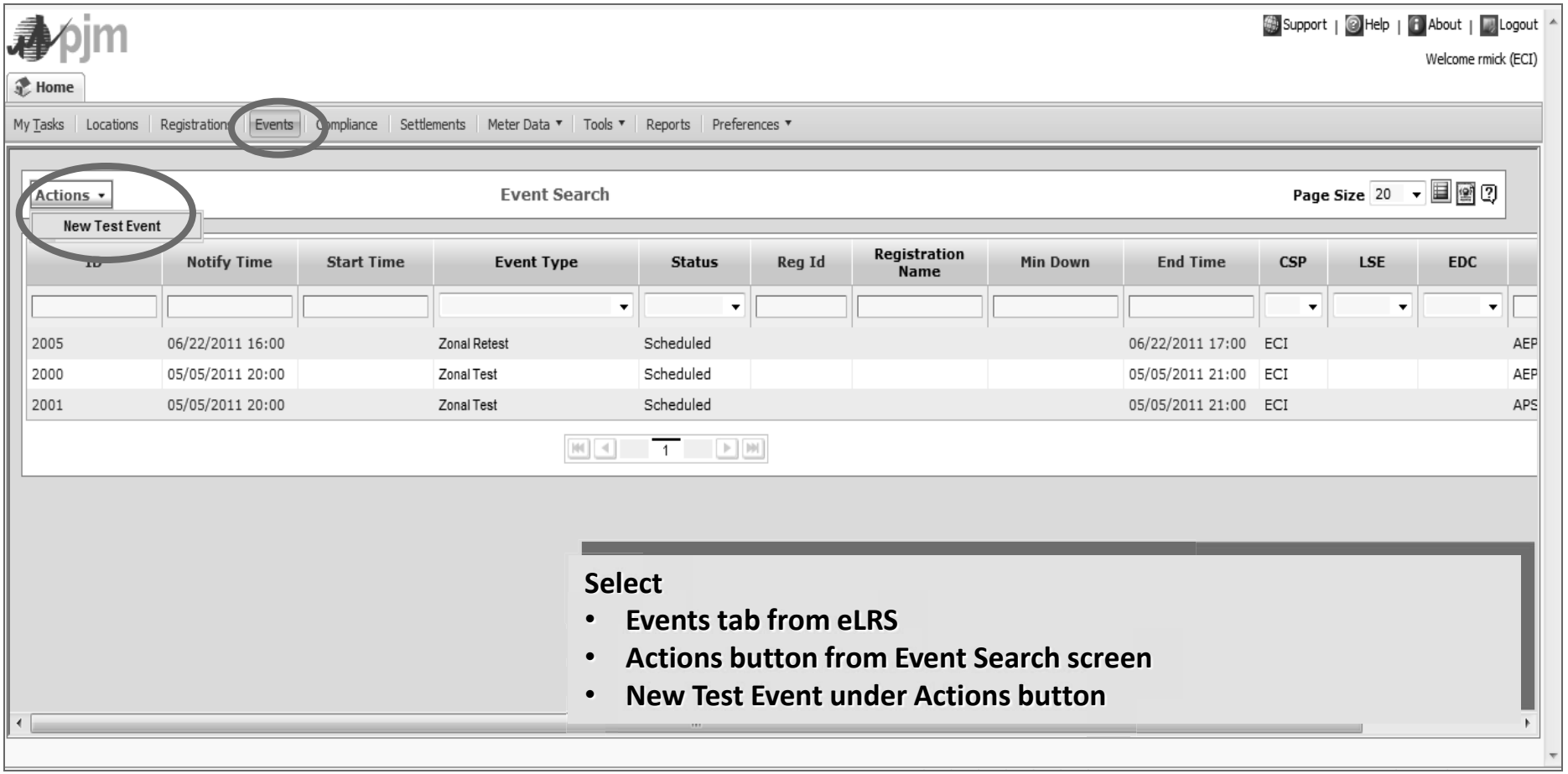
Appendix

- Appendix
  - eLRS - Load Management Registration
  - eLRS - Notification of Load Management Tests and Retests
  - eLRS - Submission of Load Management Compliance data
  - eLRS – Submission of Emergency Energy Settlements
  - DLC Documentation
  - Resources

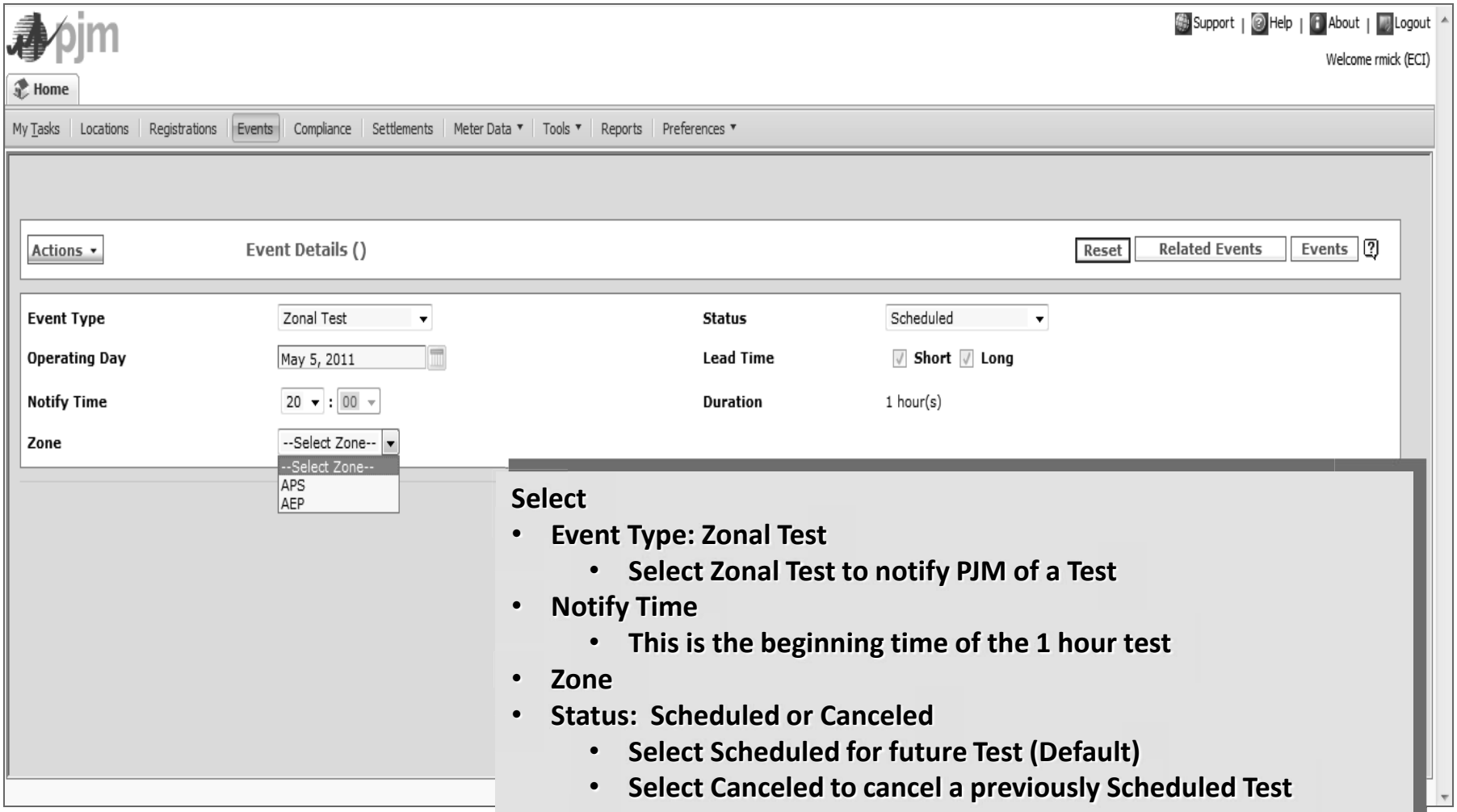
Load Management Tests and Retests

Notification of Load Management Tests
and Retests in eLRS

Create New Test Event in eLRS



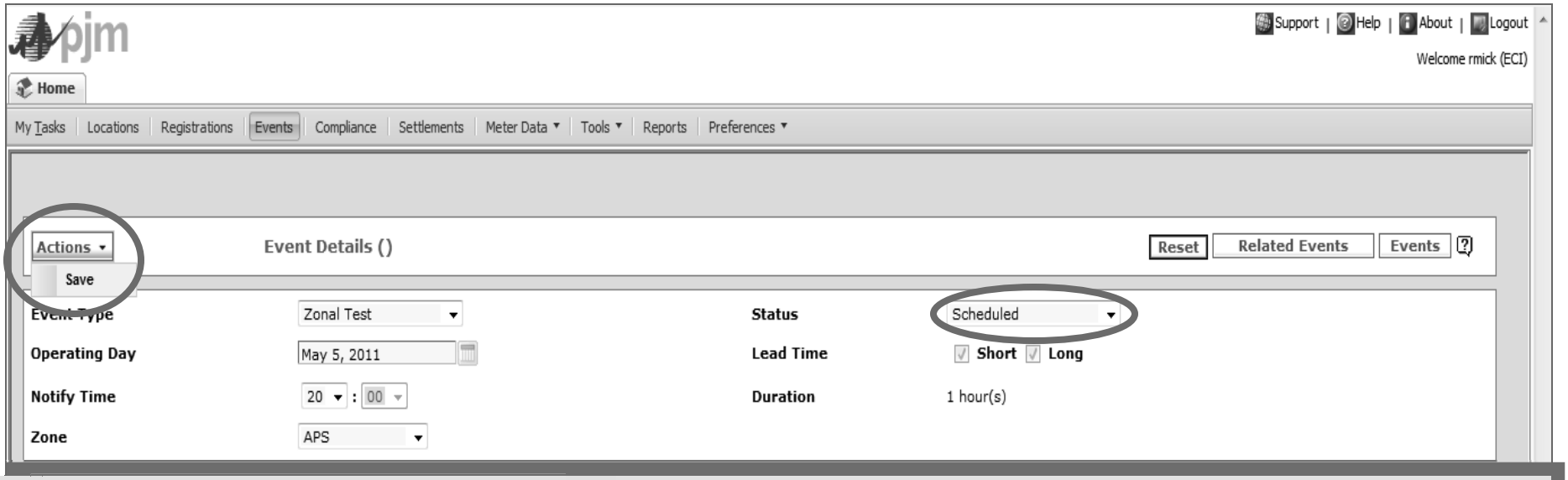
Create New Test Event in eLRS



Select

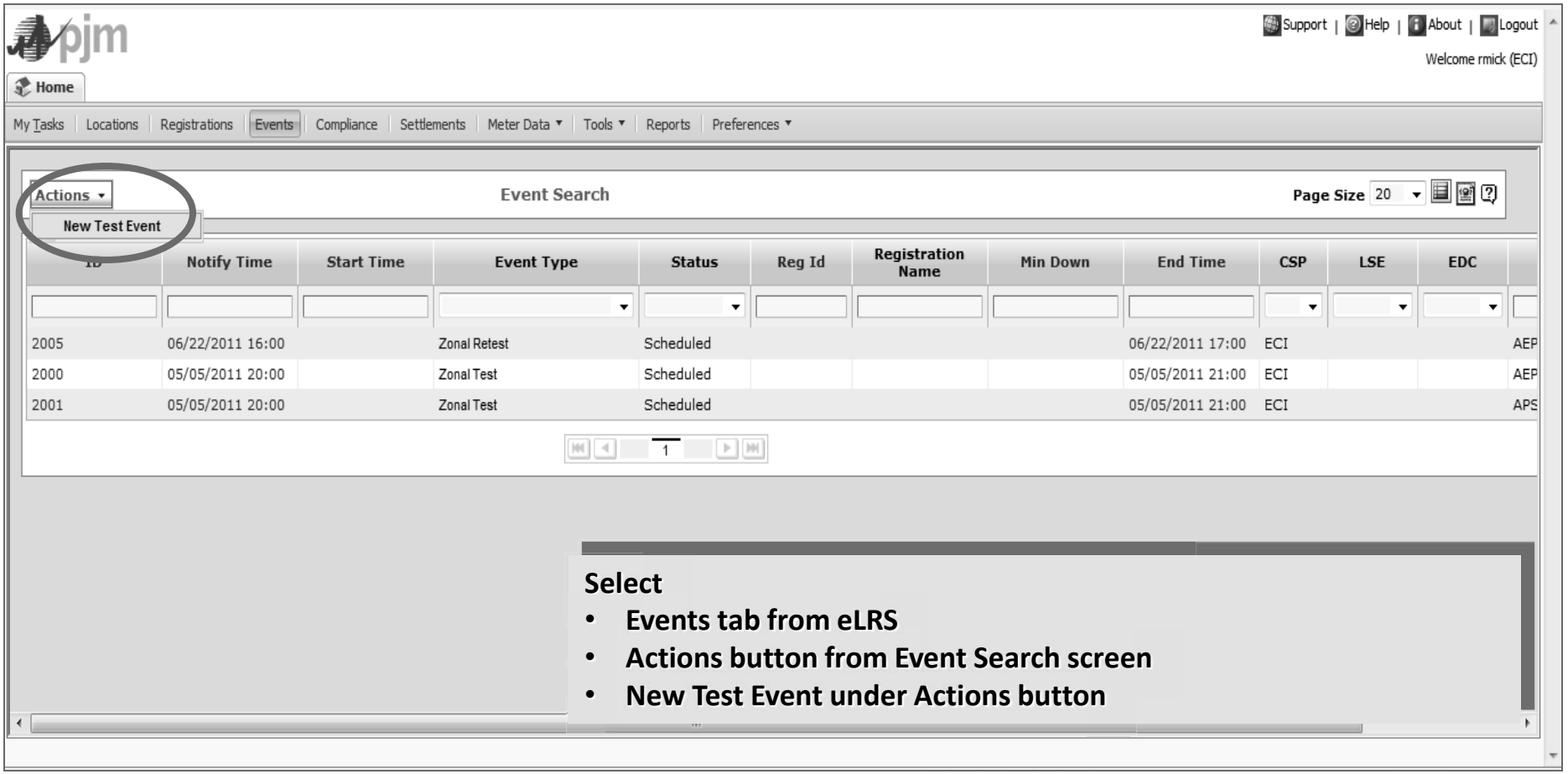
- **Event Type: Zonal Test**
  - **Select Zonal Test to notify PJM of a Test**
- **Notify Time**
  - **This is the beginning time of the 1 hour test**
- **Zone**
- **Status: Scheduled or Canceled**
  - **Select Scheduled for future Test (Default)**
  - **Select Canceled to cancel a previously Scheduled Test**

Create New Test Event in eLRS

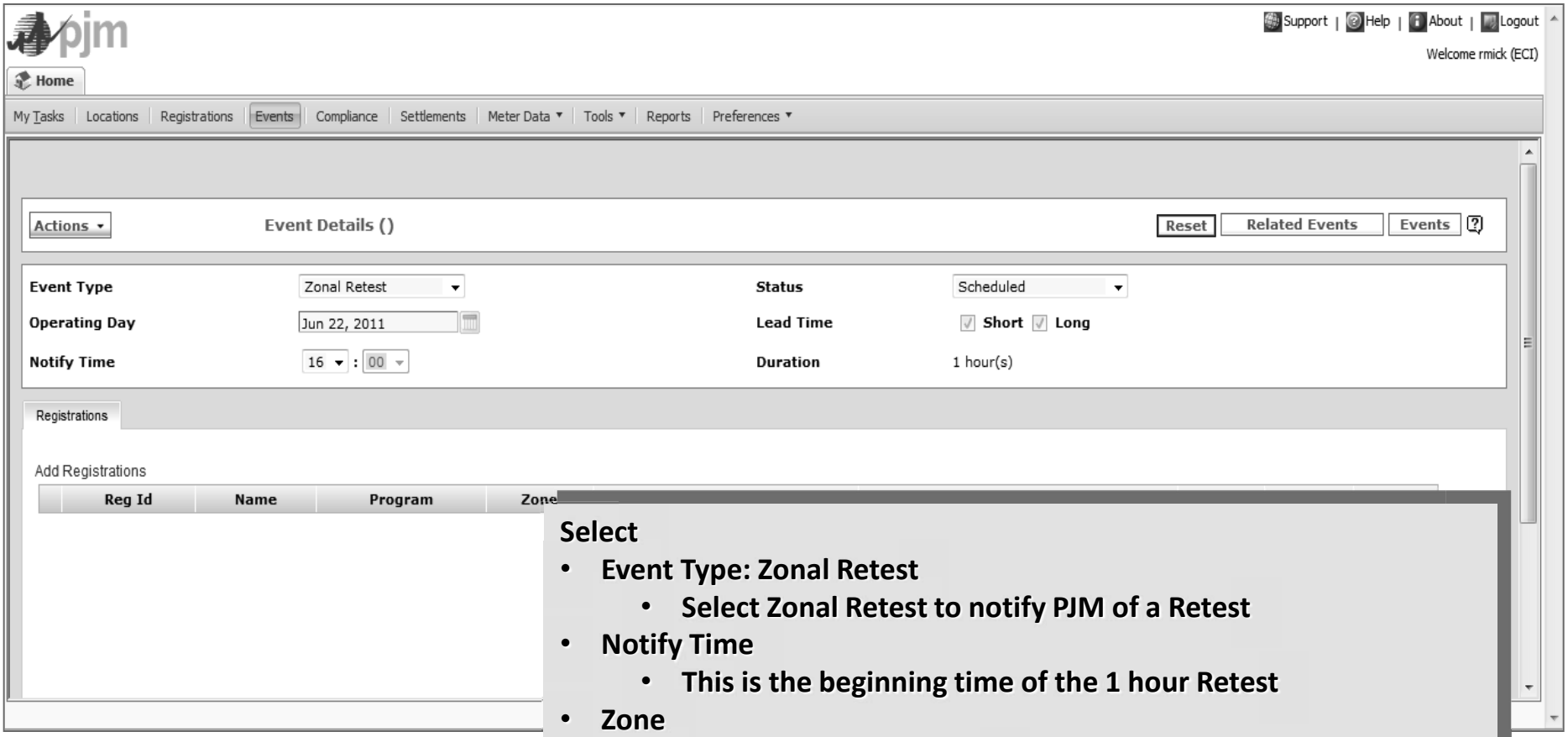


- When finished, select Save under Actions
- Once saved, only the status can be modified (Canceled or Confirmed)
  - Cancel can be selected before or after the Notify Time of the Test
    - Before Notify Time: Notify PJM that test is Cancelled
    - After Notify Time: CSP will not use test results for Compliance
  - The Confirmed status can only be selected between October 1 and November 14
    - Compliance will be calculated using the submitted data that corresponds to the Confirmed test
      - Missing data equates to 0 MW reduction
      - Missing Confirmed Test equates to total non-compliance for all of the registrations in the zone
  - There can only be one Confirmed Test and Retest for each zone

Create Retest Event in eLRS



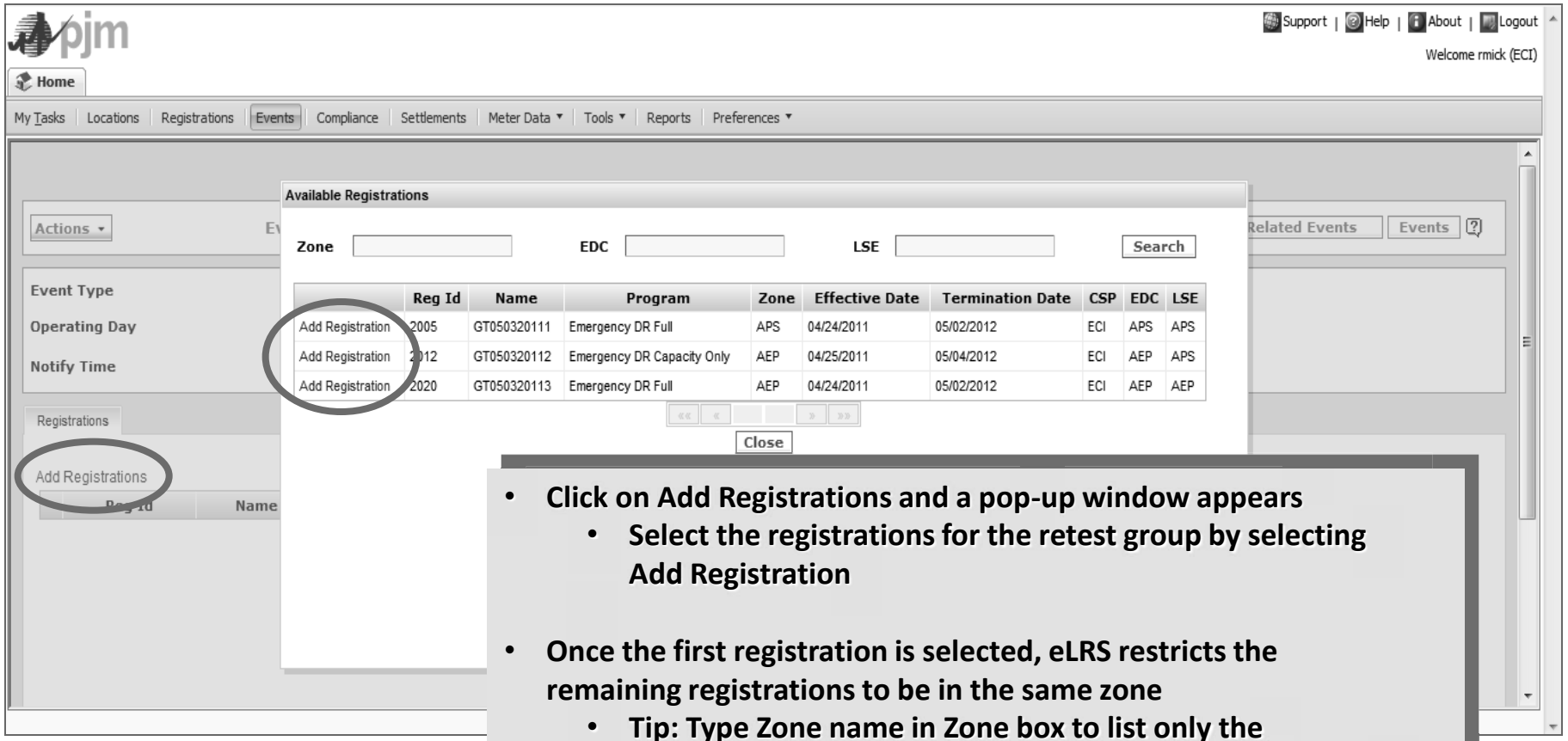
Create Retest Event in eLRS



Select

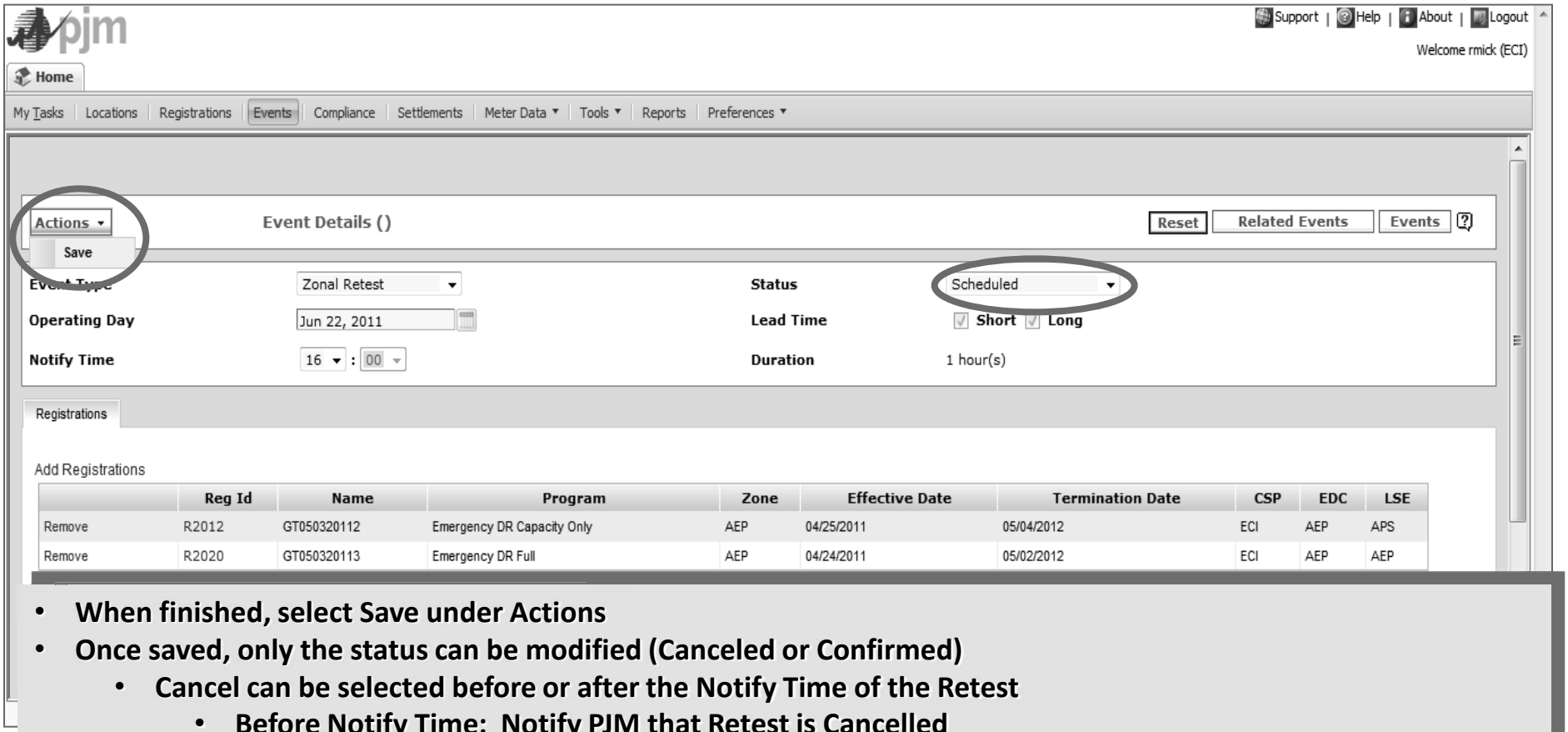
- **Event Type: Zonal Retest**
  - **Select Zonal Retest to notify PJM of a Retest**
- **Notify Time**
  - **This is the beginning time of the 1 hour Retest**
- **Zone**
- **Status: Scheduled or Canceled**
  - **Select Scheduled for future Retest (Default)**
  - **Select Canceled to cancel a previously Scheduled Retest**

Create Retest Event in eLRS



- **Click on Add Registrations and a pop-up window appears**
  - **Select the registrations for the retest group by selecting Add Registration**
- **Once the first registration is selected, eLRS restricts the remaining registrations to be in the same zone**
  - **Tip: Type Zone name in Zone box to list only the registrations for the zone where the retest will take place**
- **When finished, select the close button**

Create Retest Event in eLRS



- When finished, select Save under Actions
- Once saved, only the status can be modified (Canceled or Confirmed)
  - Cancel can be selected before or after the Notify Time of the Retest
    - Before Notify Time: Notify PJM that Retest is Cancelled
    - After Notify Time: CSP will not use retest results for Compliance
  - The Confirmed status can only be selected between October 1 and November 14
    - Compliance will be calculated using the submitted data that corresponds to the Confirmed retest
      - Missing data equates to 0 MW reduction
  - There can only be one Confirmed Test and Retest for each zone

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Compliance Data Submission

Submission of Load Management
Compliance Data in eLRS

Compliance Data Submission

- Both FSL and GLD Emergency registrations require 24 hours of data for all Load Management Compliance submissions
  - Load Management Event
  - Load Management Test
  - Load Management Retest

- All compliance data is in the Daily load format similar to the load data for Economic Settlements
  - Load and compliance profile data in hour ending format

Compliance Data Submission

- Templates for uploading Load Management Compliance data is posted on the PJM website under:

markets & operations> eTools > eLRS > eLRS Meter Data Management (non web services)

1. Meter Data Example EmergCap GLD Gen (M19 - *Generation*)
2. Meter Data Example EmergCap GLD Regression (M19 - *Regression Analysis*)
3. Meter Data Example EmergCap GLD Same Day (M19 - *Same Day (Before/After Event)*)
4. Meter Data Example EmergCap GLD Similar Day (M19 - *Customer Baseline*)
5. Meter Data Example EmergCap GLD Compare Day (M19 - *Comparable Day*)
6. Meter Data Example EmergCap FSL
7. Meter Data Example EmergCap DLC

Compliance Data Submission

- Load Management Compliance Data can be submitted in three different ways:
  - Upload from Compliance Details screen
  - Upload from Meter Data Management Screen
  - Uploaded via web services

- Emergency registrations that have a Measurement Method of Firm Service Level (FSL) must submit 24 hours of load data

- Emergency registrations that have a Measurement Method of Guaranteed Load Drop (GLD) must submit data as follows on the next slide:

Compliance Data Submission (continued)

- Emergency registrations that have a Measurement Method of a GLD type must submit 24 hours of load data and, in addition, the following data must also be submitted:
  - GLD Generation must submit 24 hours of generation data
    - 24 hr load data not required if site PLC < 500 kW and it has no interval meter
  - GLD SameDay must submit the customer's average hourly integrated consumption for two full hours prior to notification of an emergency event or prior to one full hour before a test and for two full hours after skipping first full hour after the event or test
    - See example data submission format on next slide
  - GLD SimilarDay must submit the resultant baseline and all of the hourly load data used to calculate it
    - See example data submission format on the slide after next
  - GLD Regression must submit the regression results
  - GLD CompareDay must submit:
    - the customer's hourly load data for the 10 days prior to the event
    - the date selected as the Comparable Day
    - see example data submission format on next slide

Compliance Data Submission
GLD SameDay and GLD CompareDay examples

Example of file format for GLD-SameDay (referred to as *Same Day (Before/After Event)* in PJM Manual 19)

Registration	Account	Date	Type	UOM	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24	HE25
R2001	2001	7/7/2011	GLD-SameDay	KW	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	987	
R2001	2001	7/7/2011	HourlyLoad	KW	887	872	803	754	779	770	779	795	839	854	927	950	970	1050	1079	197	195	200	1043	1033	994	970	990	1016	

Example of file format for GLD-CompareDay (referred to as *Comparable Day* in PJM Manual 19)

Registration	Account	Date	Type	UOM	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24	HE25
R2001	2001	7/17/2012	HourlyLoad	KW	710	698	642	603	623	616	623	636	671	683	760	780	816	808	560	158	156	160	856	842	795	776	792	813	
R2001	2001	7/17/2012	GLD-CompareDay	KW	20120716	872	803	754	779	770	779	795	839	854	927	950	970	1050	1079	1080	1078	1065	1043	1033	994	970	990	1016	
R2001	2001	7/16/2012	HourlyLoad	KW	887	872	803	754	779	770	779	795	839	854	927	950	970	1050	1079	1080	1078	1065	1043	1033	994	970	990	1016	
R2001	2001	7/15/2013	HourlyLoad	KW	798	785	723	679	701	693	701	716	755	769	855	878	918	909	630	177	176	180	963	947	895	873	891	914	
R2001	2001	7/14/2013	HourlyLoad	KW	976	959	883	829	857	847	857	875	923	939	1045	1073	1122	1111	770	217	215	220	1177	1157	1093	1067	1089	1118	
R2001	2001	7/13/2014	HourlyLoad	KW	1064	1046	964	905	935	924	935	954	1007	1025	1140	1170	1224	1212	840	236	234	240	1284	1262	1193	1164	1188	1219	
R2001	2001	7/12/2014	HourlyLoad	KW	621	610	562	528	545	539	545	557	587	598	665	683	714	707	490	138	137	140	749	736	696	679	693	711	
R2001	2001	7/11/2015	HourlyLoad	KW	710	698	642	603	623	616	623	636	671	683	760	780	816	808	560	158	156	160	856	842	795	776	792	813	
R2001	2001	7/10/2015	HourlyLoad	KW	665	654	602	566	584	578	584	596	629	641	713	731	765	758	525	148	146	150	803	789	746	728	743	762	
R2001	2001	7/09/2020	HourlyLoad	KW	754	741	683	641	662	655	662	676	713	726	808	829	867	859	595	167	166	170	910	894	845	825	842	864	
R2001	2001	7/08/2021	HourlyLoad	KW	843	828	763	716	740	732	740	755	797	811	903	926	969	960	665	187	185	190	1017	999	944	922	941	965	
R2001	2001	7/07/2022	HourlyLoad	KW	1020	1003	923	867	896	886	896	914	965	982	1093	1121	1173	1162	805	227	224	230	1231	1210	1143	1116	1139	1168	

4

1

Load data for event day

Data for the CompareDay chosen by the CSP

3

CompareDay candidate pool.
Load data (HourlyLoad) for 10 days prior to event must be submitted.

2

Date chosen (from the candidate pool) by CSP to be most representative of what the load would have been absent the event (must be a weekday).

Place comparison day date in HE1 cell using **YYYYMMDD** format (actual HE1 load data will be omitted). This identifies to PJM the CompareDay the CSP has chosen.

The data submission example depicted above illustrates the data submission requirement of a registration with a single loaction (account) using the CompareDay method. A total of 12 records (11 HourlyLoad and 1 GLD-CompareDay Types) is required for each location included in the registration.

Compliance Data Submission
GLD SimilarDay

Example of file format for GLD-SimilarDay (referred to as *Customer Baseline* in PJM Manual 19)

Registration	Account	Date	Type	UOM	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24	HE25
R2001	2001	7/17/2012	GLD-SimilarDay	KW	887	872	803	754	779	770	779	795	839	854	927	950	970	1050	1079	1080	1078	1065	1043	1033	994	970	990	1016	
R2001	2001	7/17/2012	HourlyLoad	KW	887	872	803	754	779	770	779	795	839	854	950	975	1020	1010	700	197	195	200	1070	1052	994	970	990	1016	
R2001	2001	7/16/2012	HourlyLoad	KW	798	785	723	679	701	693	701	716	755	769	834	855	873	945	971	972	970	959	939	930	895	873	891	914	
R2001	2001	7/15/2012	HourlyLoad	KW	710	698	642	603	623	616	623	636	671	683	742	760	776	840	863	864	862	852	834	826	795	776	792	813	
R2001	2001	7/14/2012	HourlyLoad	KW	976	959	883	829	857	847	857	875	923	939	1020	1045	1067	1155	1187	1188	1186	1172	1147	1136	1093	1067	1089	1118	
R2001	2001	7/13/2012	HourlyLoad	KW	1064	1046	964	905	935	924	935	954	1007	1025	1112	1140	1164	1260	1295	1296	1294	1278	1252	1240	1193	1164	1188	1219	
R2001	2001	7/12/2012	HourlyLoad	KW	1153	1134	1044	980	1013	1001	1013	1034	1091	1110	1205	1235	1261	1365	1403	1404	1401	1385	1356	1343	1292	1261	1287	1321	
R2001	2001	7/11/2012	HourlyLoad	KW	621	610	562	528	545	539	545	557	587	598	649	665	679	735	755	756	755	746	730	723	696	679	693	711	
R2001	2001	7/10/2012	HourlyLoad	KW	710	698	642	603	623	616	623	636	671	683	742	760	776	840	863	864	862	852	834	826	795	776	792	813	
R2001	2001	7/9/2012	HourlyLoad	KW	532	523	482	452	467	462	467	477	503	512	556	570	582	630	647	648	647	639	626	620	596	582	594	610	
R2001	2001	7/8/2012	HourlyLoad	KW	444	436	402	377	390	385	390	398	420	427	464	475	485	525	540	540	539	533	522	517	497	485	495	508	
R2001	2001	7/7/2012	HourlyLoad	KW	621	610	562	528	545	539	545	557	587	598	649	665	679	735	755	756	755	746	730	723	696	679	693	711	
R2001	2001	7/6/2012	HourlyLoad	KW	710	698	642	603	623	616	623	636	671	683	742	760	776	840	863	864	862	852	834	826	795	776	792	813	
R2001	2001	7/5/2012	HourlyLoad	KW	798	785	723	679	701	693	701	716	755	769	834	855	873	945	971	972	970	959	939	930	895	873	891	914	
R2001	2001	7/4/2012	HourlyLoad	KW	1064	1046	964	905	935	924	935	954	1007	1025	1112	1140	1164	1260	1295	1296	1294	1278	1252	1240	1193	1164	1188	1219	
R2001	2001	7/3/2012	HourlyLoad	KW	976	959	883	829	857	847	857	875	923	939	1020	1045	1067	1155	1187	1188	1186	1172	1147	1136	1093	1067	1089	1118	
R2001	2001	7/2/2012	HourlyLoad	KW	1064	1046	964	905	935	924	935	954	1007	1025	1112	1140	1164	1260	1295	1296	1294	1278	1252	1240	1193	1164	1188	1219	
R2001	2001	7/1/2012	HourlyLoad	KW	798	785	723	679	701	693	701	716	755	769	834	855	873	945	971	972	970	959	939	930	895	873	891	914	
R2001	2001	6/30/2012	HourlyLoad	KW	621	610	562	528	545	539	545	557	587	598	649	665	679	735	755	756	755	746	730	723	696	679	693	711	
R2001	2001	6/29/2012	HourlyLoad	KW	710	698	642	603	623	616	623	636	671	683	742	760	776	840	863	864	862	852	834	826	795	776	792	813	

3

Economic CBL calculated by CSP

Load data for event day

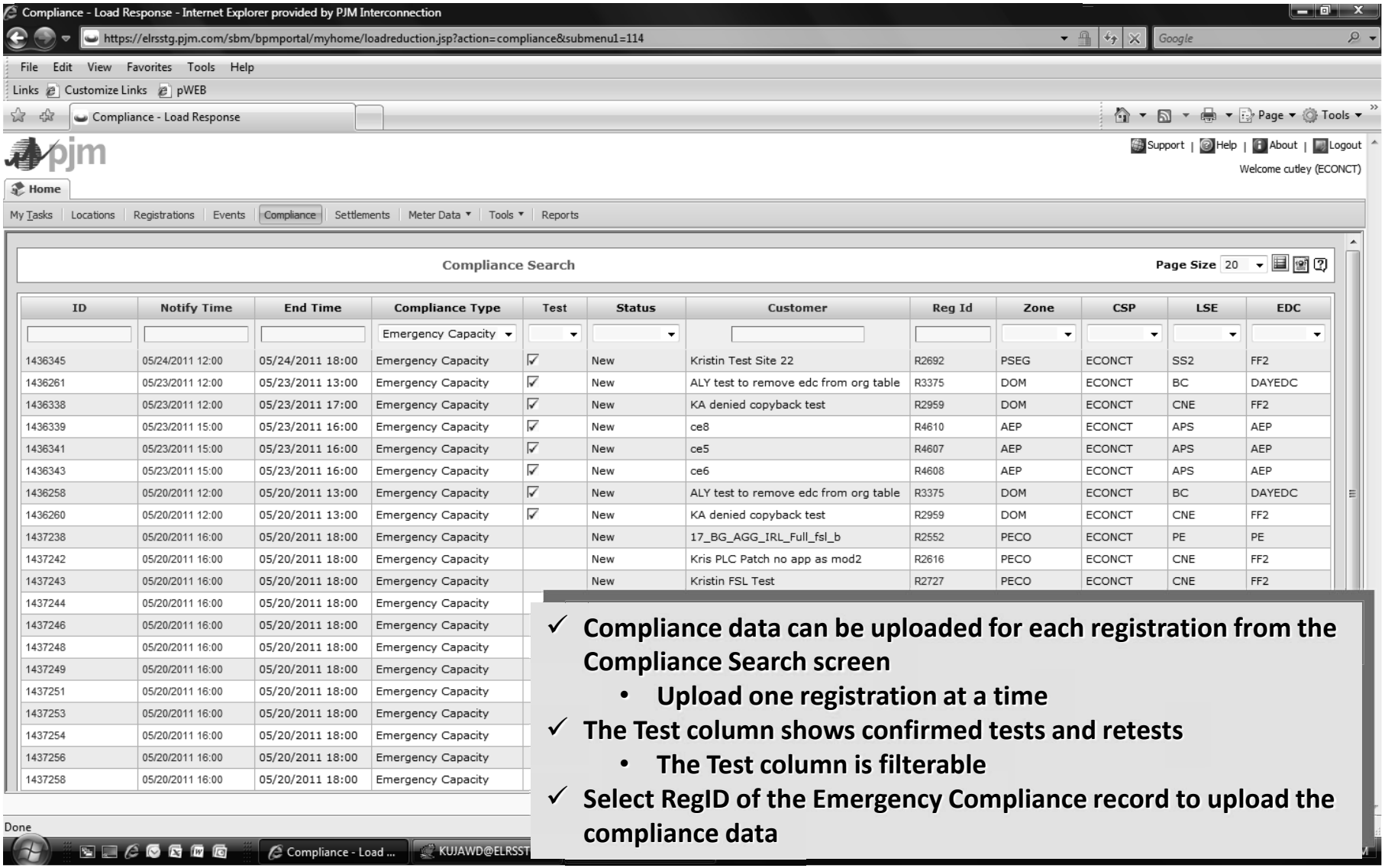
1

All of the HourlyLoad data needed to calculate the economic CBL (number of rows required varies).

2

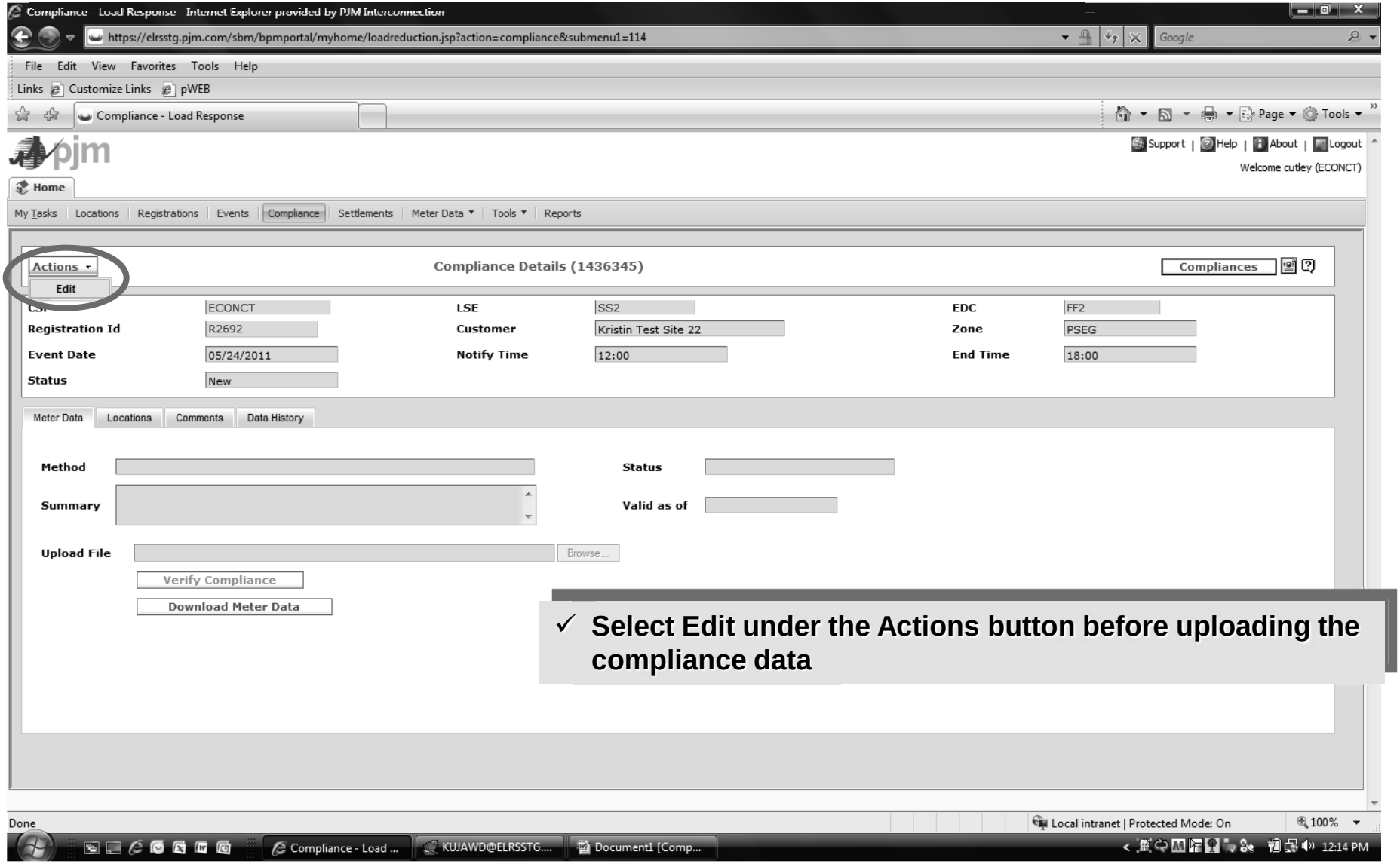
The data submission example depicted above illustrates the data submission requirement of a registration with a single location (account) using the SimilarDay (i.e. economic CBL) method. Total number of records depends on how far back the economic CBL needed to look to find sufficient number of non-event days. Data is required for each location included in the registration.

Submit Compliance Data from Compliance Search

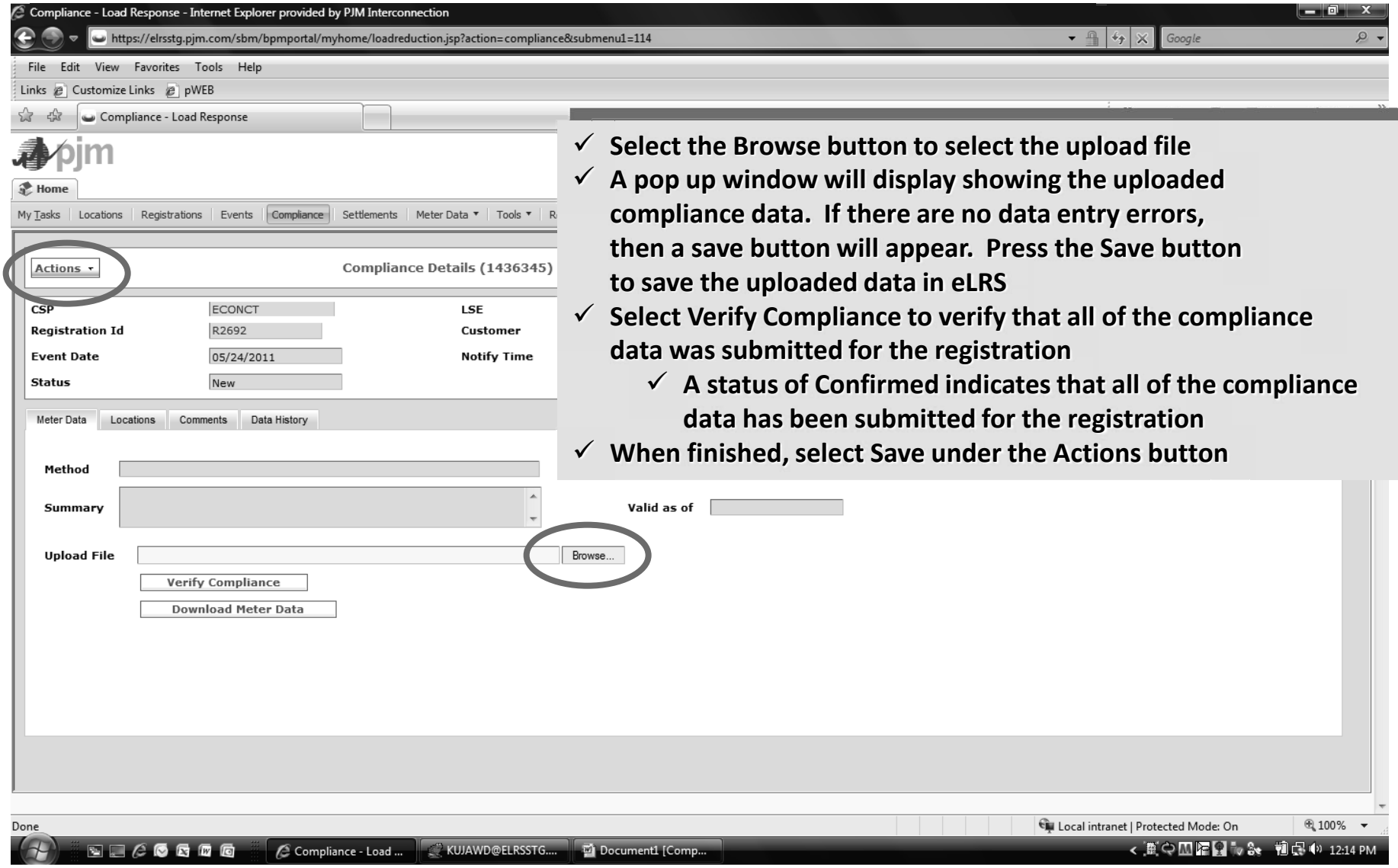


- ✓ **Compliance data can be uploaded for each registration from the Compliance Search screen**
  - **Upload one registration at a time**
- ✓ **The Test column shows confirmed tests and retests**
  - **The Test column is filterable**
- ✓ **Select RegID of the Emergency Compliance record to upload the compliance data**

Submit Compliance Data from Compliance Search

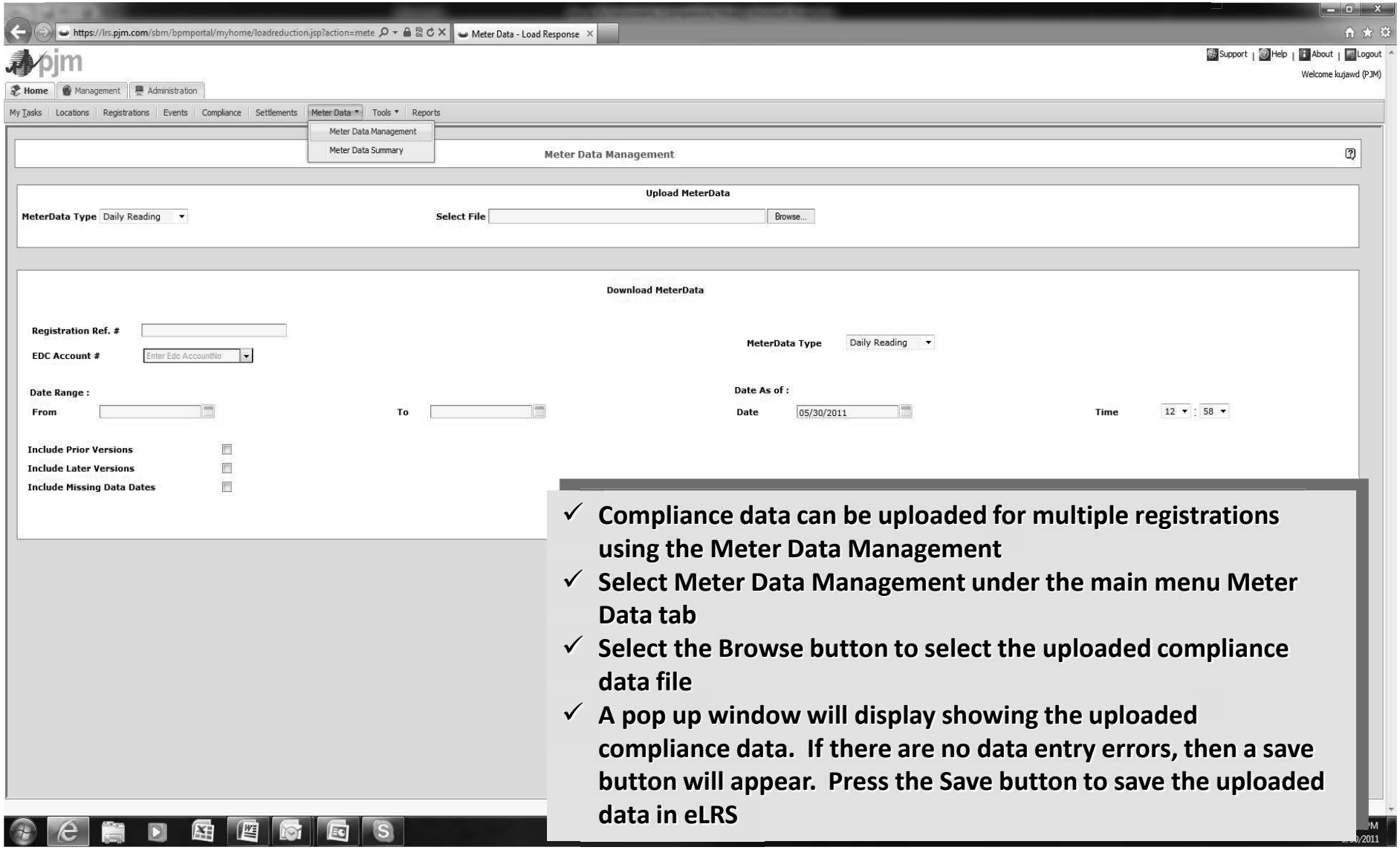


Submit Compliance Data from Compliance Search



- ✓ Select the Browse button to select the upload file
- ✓ A pop up window will display showing the uploaded compliance data. If there are no data entry errors, then a save button will appear. Press the Save button to save the uploaded data in eLRS
- ✓ Select Verify Compliance to verify that all of the compliance data was submitted for the registration
  - ✓ A status of Confirmed indicates that all of the compliance data has been submitted for the registration
- ✓ When finished, select Save under the Actions button

Submit Compliance Data from Meter Data Management



- ✓ Compliance data can be uploaded for multiple registrations using the Meter Data Management
- ✓ Select Meter Data Management under the main menu Meter Data tab
- ✓ Select the Browse button to select the uploaded compliance data file
- ✓ A pop up window will display showing the uploaded compliance data. If there are no data entry errors, then a save button will appear. Press the Save button to save the uploaded data in eLRS

Appendix

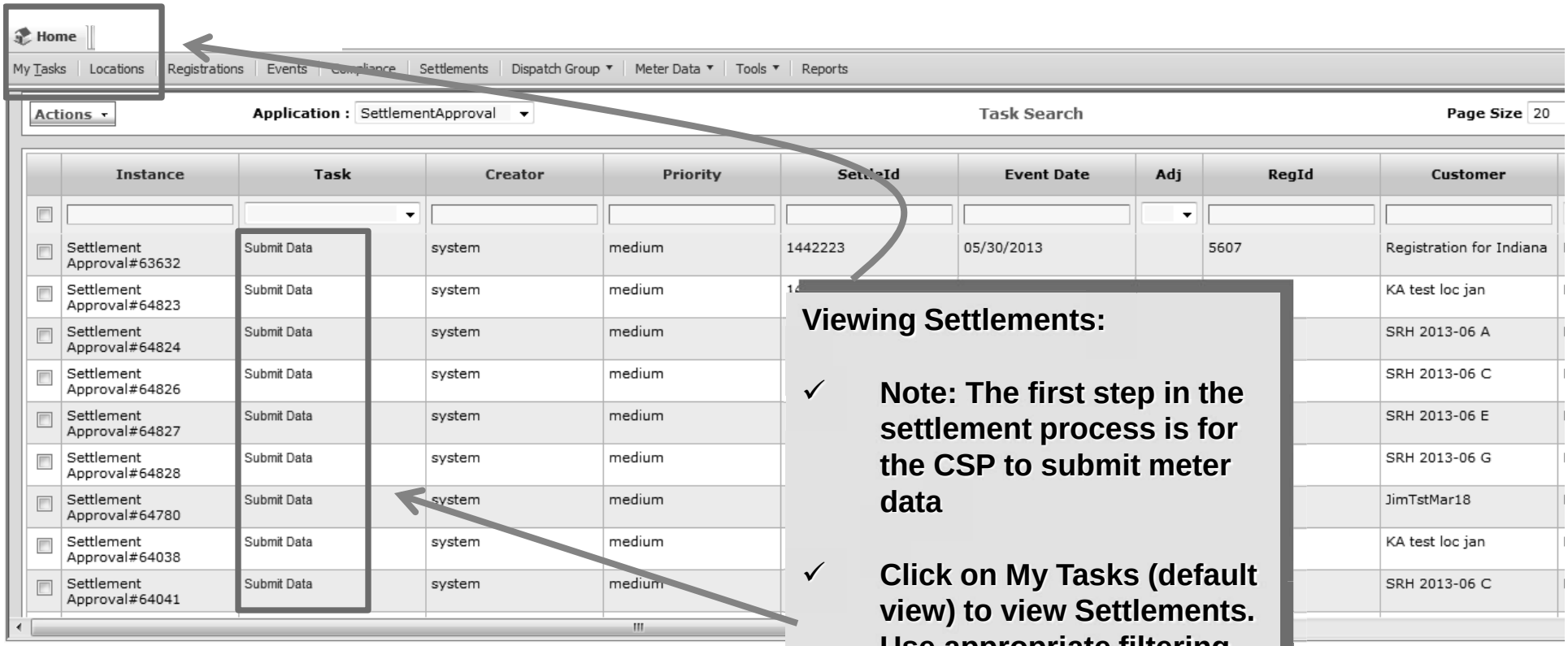
- Appendix
  - eLRS - Load Management Registration
  - eLRS - Notification of Load Management Tests and Retests
  - eLRS - Submission of Load Management Compliance data
  - eLRS – Submission of Emergency Energy Settlements
  - DLC Documentation
  - Resources

Emergency Energy Settlement Submission Process

1. CSP will receive eLRS “tasks” to submit settlements
2. CSP goes to each emergency energy settlement and:
   A. Adjust first 1 or 2 Settlement hours – eLRS default is that all emergency registrations began reductions when notified
      i. If registration did not start load reduction when notified (notification time) then CSP must deselect settlement hours as appropriate.

      Example – Event Notification Time 12:40 and Event Start Time 14:40. If registration began reduction at 13:00 then CSP must deselect HE 13 (noon to 1pm).
   B. Submit required meter data based on CBL needs
   C. Calculate CBL and associated load reduction
   D. Review results
   E. Submit emergency energy settlement

Submitting Emergency Energy Settlements

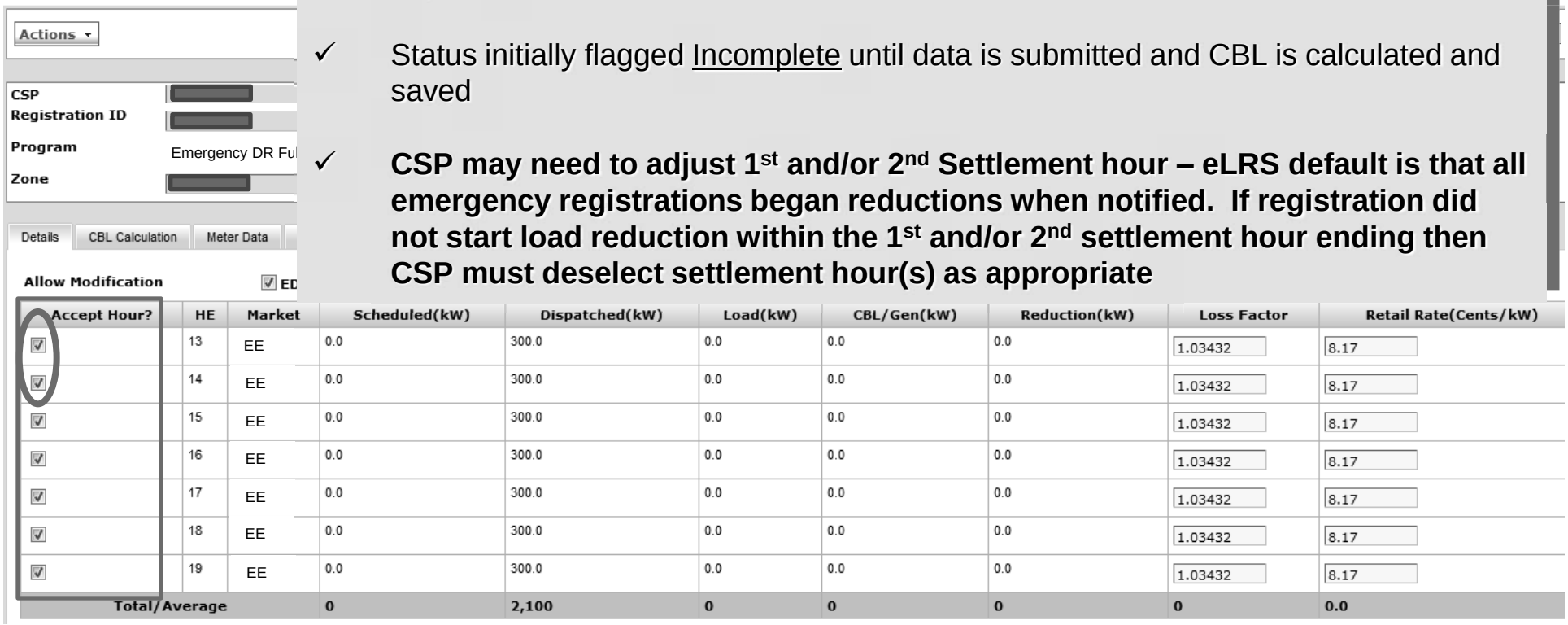


Viewing Settlements:

- ✓ **Note: The first step in the settlement process is for the CSP to submit meter data**
- ✓ **Click on My Tasks (default view) to view Settlements. Use appropriate filtering to narrow selections**

Settlement Details screen:

- ✓ After selecting the appropriate settlement record, the Settlement Details screen appears
- ✓ Status initially flagged Incomplete until data is submitted and CBL is calculated and saved
- ✓ **CSP may need to adjust 1st and/or 2nd Settlement hour – eLRS default is that all emergency registrations began reductions when notified. If registration did not start load reduction within the 1st and/or 2nd settlement hour ending then CSP must deselect settlement hour(s) as appropriate**



Accept Hour?	HE	Market	Scheduled(kW)	Dispatched(kW)	Load(kW)	CBL/Gen(kW)	Reduction(kW)	Loss Factor	Retail Rate(Cents/kW)
☑	13	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
☑	14	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
☑	15	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
☑	16	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
☑	17	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
☑	18	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
☑	19	EE	0.0	300.0	0.0	0.0	0.0	1.03432	8.17
Total/Average			0	2,100	0	0	0	0	0.0

Submit Meter Data

Meter data must first be submitted in order to calculate CBL and submit settlement.

1. Need Registration ID and EDC Account Number(s) to submit hourly meter data.

2. The meter data can be uploaded from the settlement or from the Meter Data Management.
   a) Only meter data for the registration location(s) can be uploaded from the settlement screen.
   b) Meter data for either a single registration location(s) or all registration locations can be uploaded from the Meter Data Management screen.
      - Bulk Upload

Energy Settlement Data Submission

- Templates for uploading Emergency Energy Settlement is posted on the PJM website under:

  markets & operations> PJM Tools > eLRS > eLRS Meter Data Management (non web services)

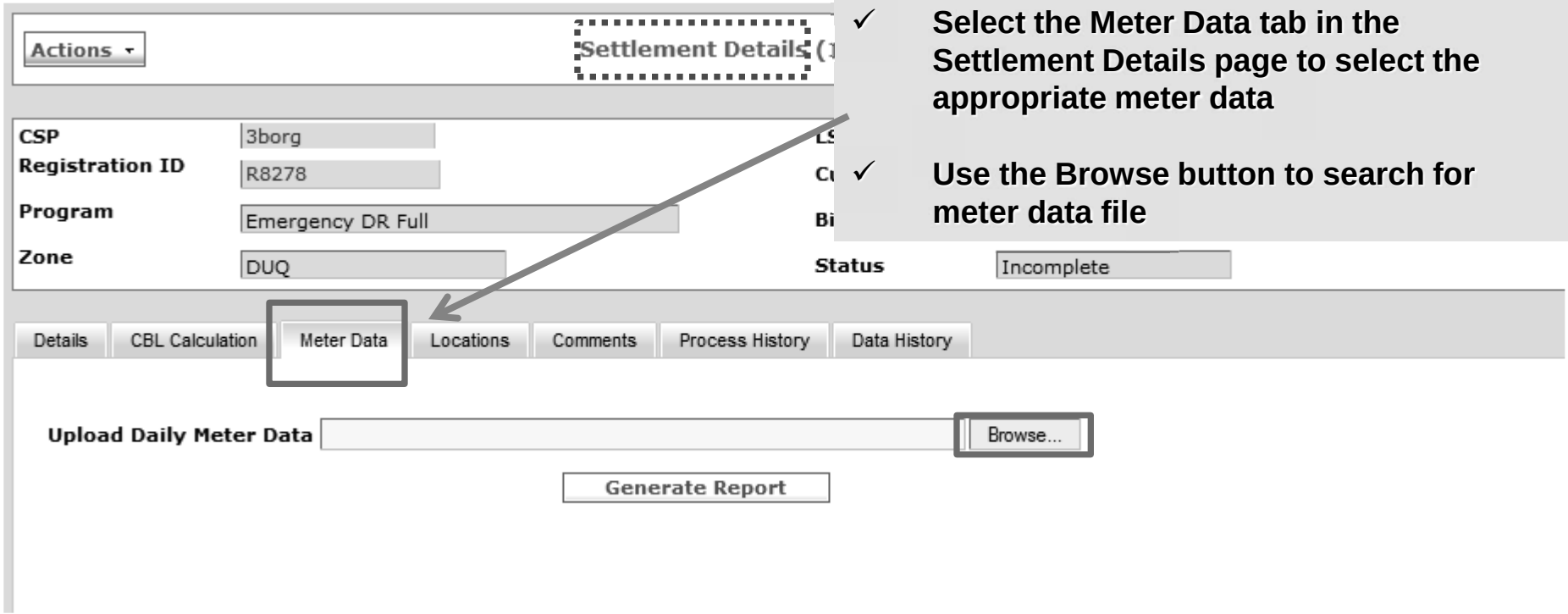
  1. Emergency Energy Example

Registration	Account	Date	Type	UOM	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8
R7271	01234567891	7/17/2012	HourlyLoad	KW	4617	4443	4370	4289	4186	4452	4932	5233

Submit Meter Data from Settlement

Uploading meter data from Settlement Details:

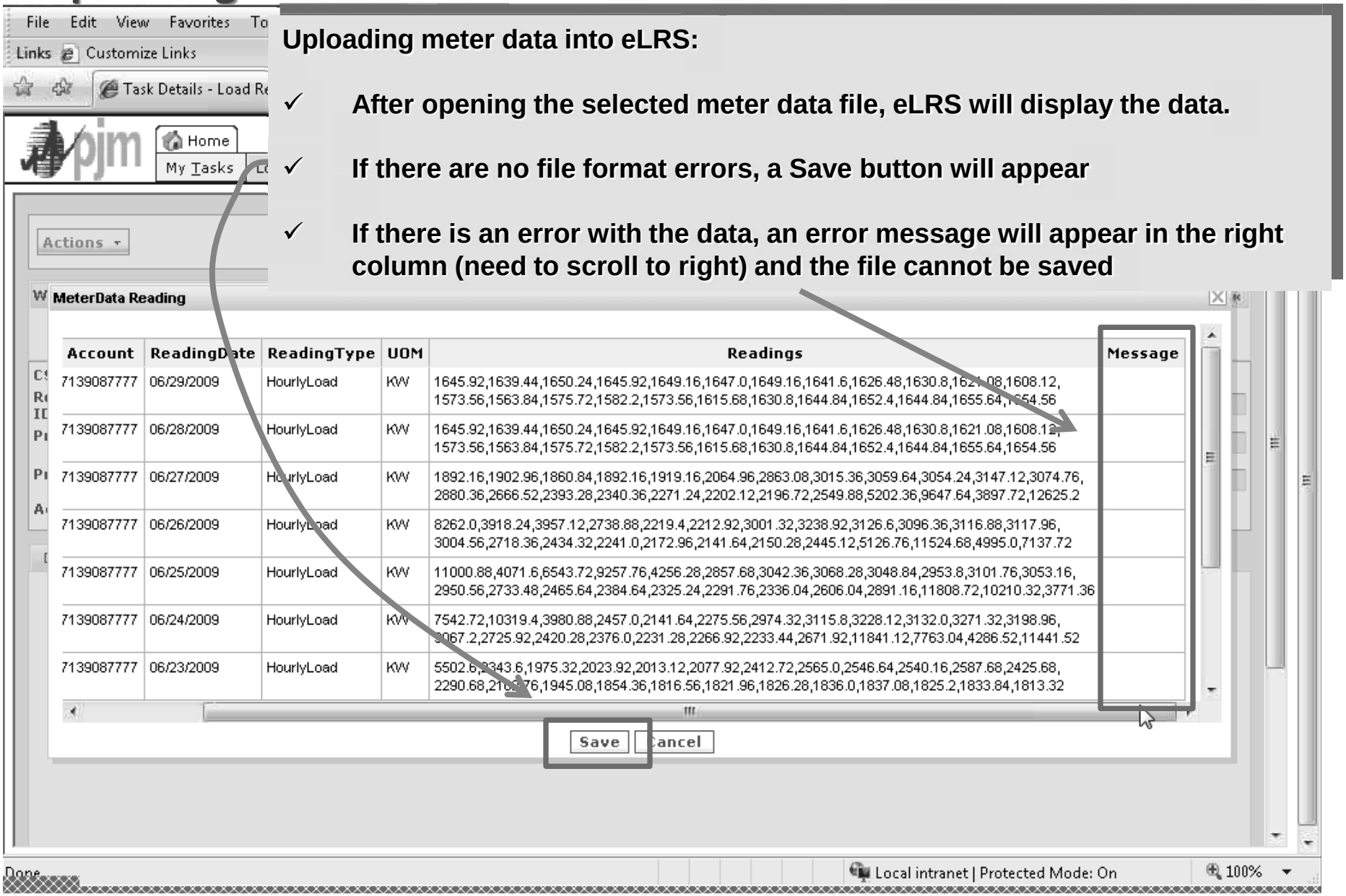
- ✓ **Select the Meter Data tab in the Settlement Details page to select the appropriate meter data**
- ✓ **Use the Browse button to search for meter data file**



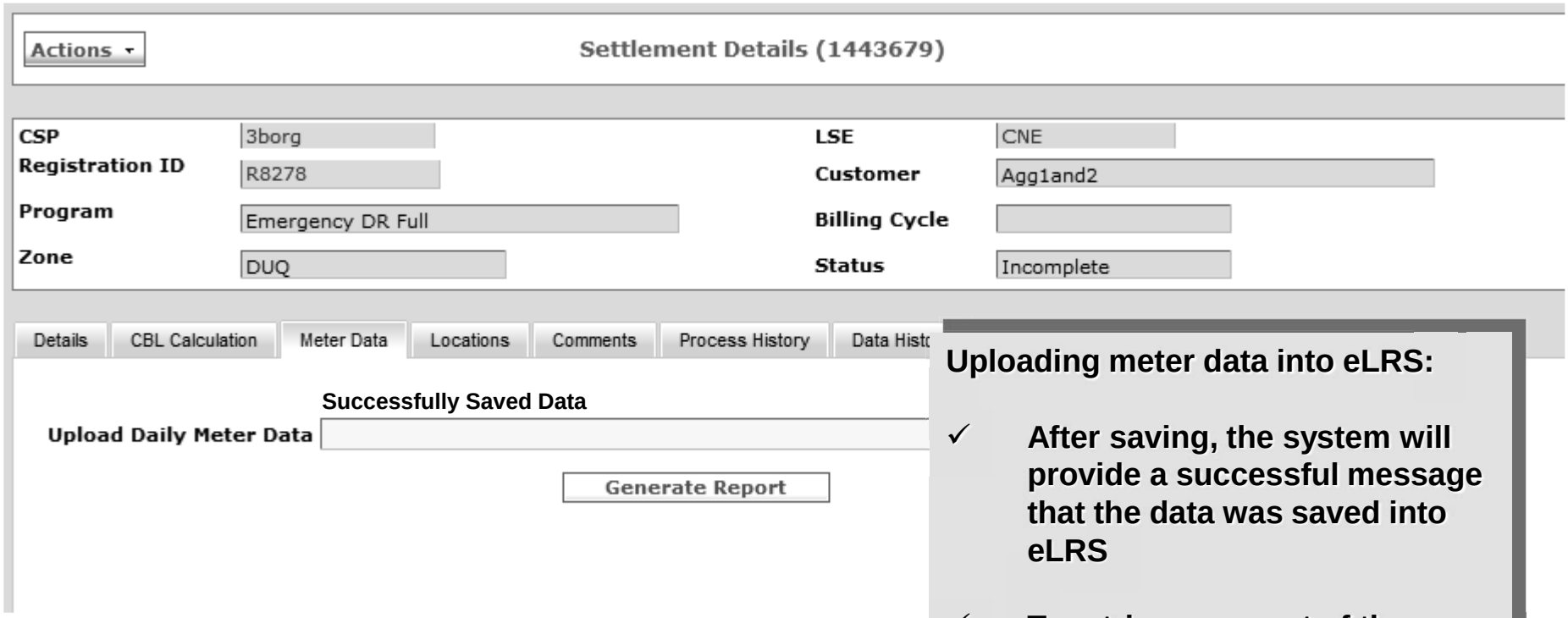
Uploading Meter Data

Uploading meter data into eLRS:

- ✓ **After opening the selected meter data file, eLRS will display the data.**
- ✓ **If there are no file format errors, a Save button will appear**
- ✓ **If there is an error with the data, an error message will appear in the right column (need to scroll to right) and the file cannot be saved**



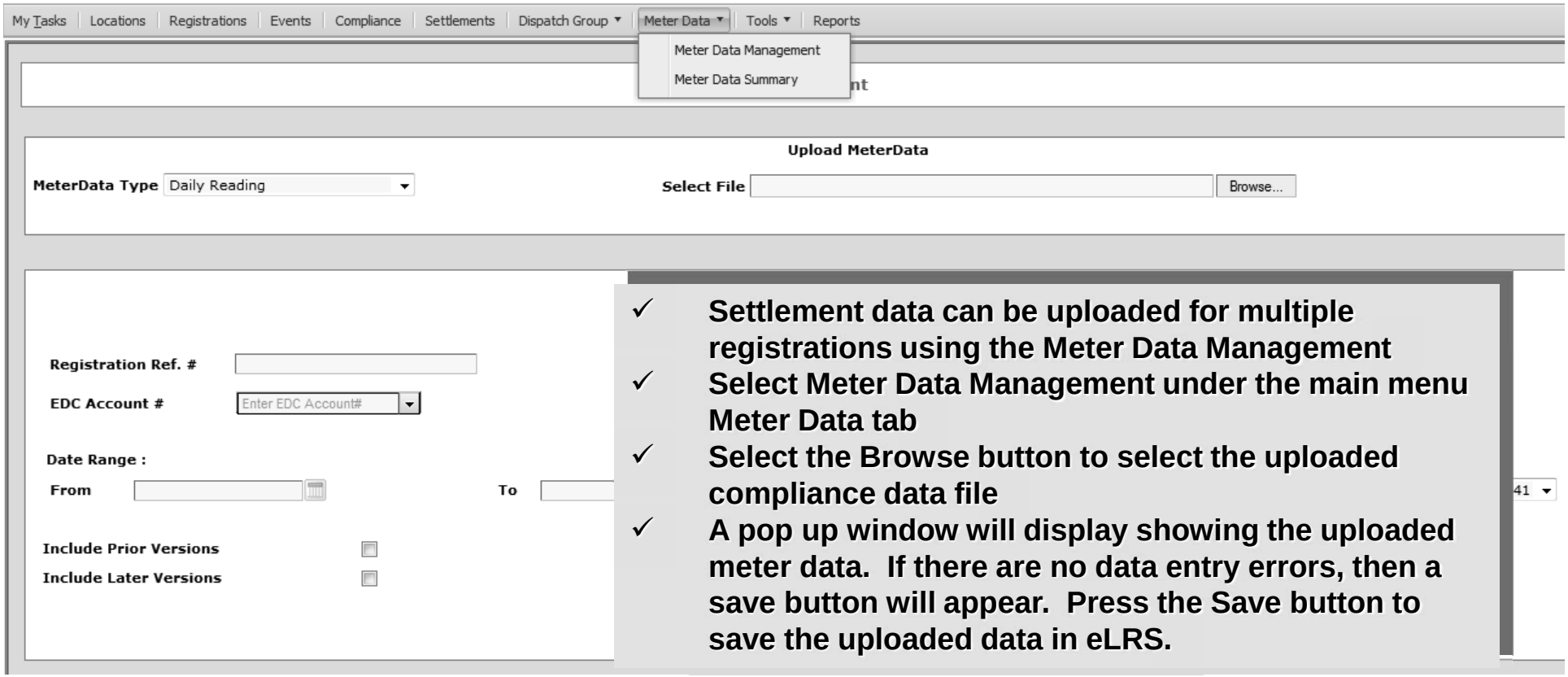
Submit Meter Data from Settlement



Uploading meter data into eLRS:

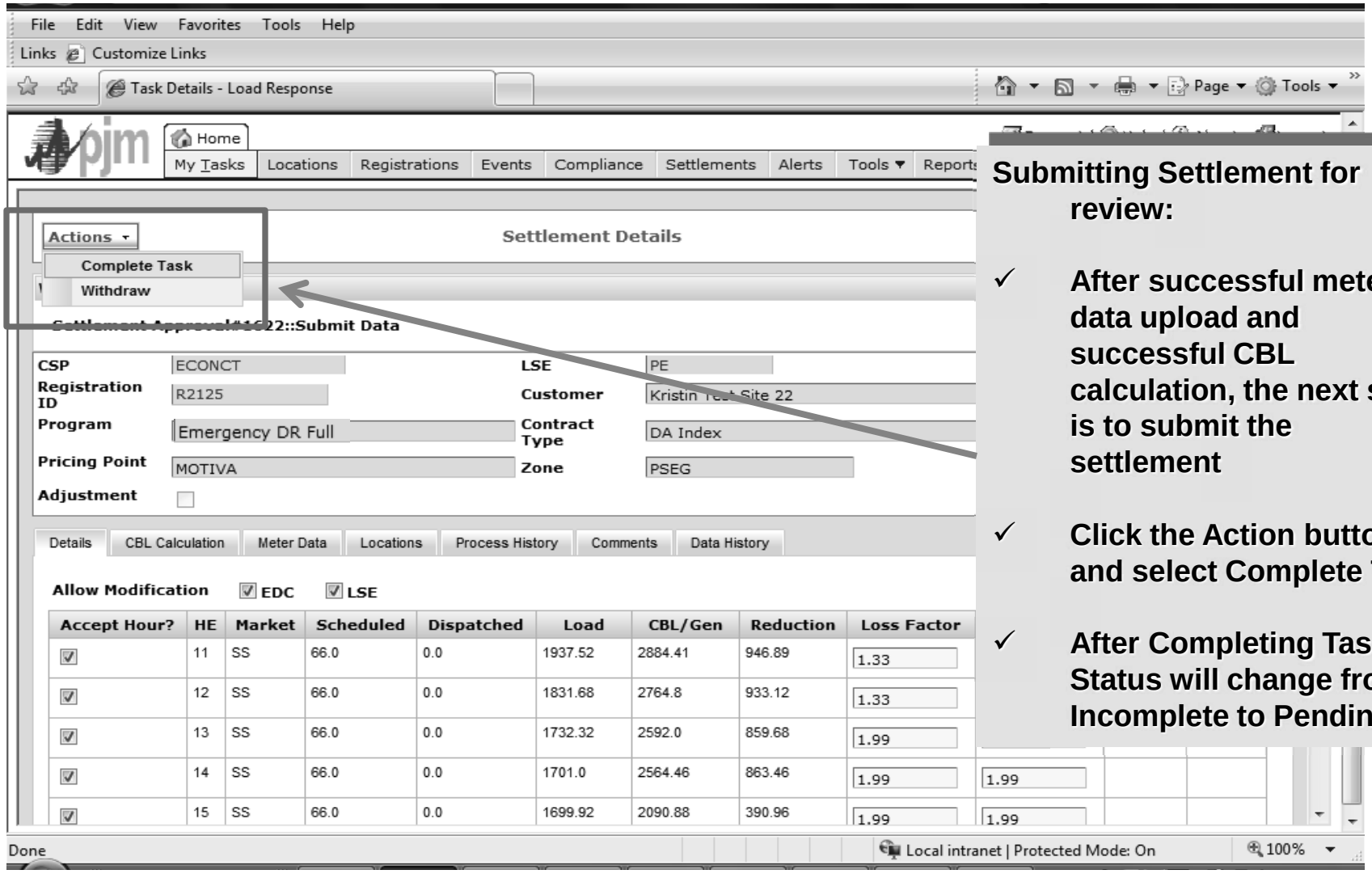
- ✓ **After saving, the system will provide a successful message that the data was saved into eLRS**
- ✓ **To retrieve a report of the meter data, click the Generate Report button under the Meter Data tab**

Submit Meter Data from Meter Data Management



- ✓ **Settlement data can be uploaded for multiple registrations using the Meter Data Management**
- ✓ **Select Meter Data Management under the main menu Meter Data tab**
- ✓ **Select the Browse button to select the uploaded compliance data file**
- ✓ **A pop up window will display showing the uploaded meter data. If there are no data entry errors, then a save button will appear. Press the Save button to save the uploaded data in eLRS.**

Submitting Emergency Energy Settlement



Submitting Settlement for review:

- ✓ **After successful meter data upload and successful CBL calculation, the next step is to submit the settlement**
- ✓ **Click the Action button and select Complete Task**
- ✓ **After Completing Task, Status will change from Incomplete to Pending**

Settlement Submission Process for DLC and GLD Generation Registrations

Method for submitting Hour Before Emergency Energy Settlements (No Economic registration exists) where capacity compliance will be based on:

a) Non-hourly metered sites DLC

- the hourly reductions are calculated by the CSP based on PJM approved methodology

b) Guaranteed Load Drop via Generation

- the hourly metered output of the generator is the energy reduction.

Since eLRS is set up to calculate the hourly reductions, and the hourly reductions are obtained outside of eLRS for the DLC and GLD Generation registrations, the following method must be used when submitting the metered data for the Economic and Emergency Energy Settlements:

1.Use the largest hourly reduction as the metered load for the hour prior to the event. This will be used as the CBL. Enter the CBL for the hour prior to the event in the meter data upload file.

2.Calculate pseudo meter data by subtracting the actual hourly reduction from the CBL in step 1. The pseudo meter data should be entered in the meter data upload file.

GLD via Gen must submit pseudo meter data and emergency energy settlement first and then upload actual meter data and do capacity compliance submission

Settlement Submission Process for DLC and GLD Generation Registrations

Example

The Load Management Event on at 13:58 and ended at 20:18. The Emergency Energy Settlements are created for hours ending 14 through 21. The actual hourly kW reductions for a DLC or a GLD Generation registration are obtained outside of the eLRS. The actual hourly reductions as follows:

Actual Hourly Reductions obtained outside of eLRS

HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
225	225	300	325	350	300	225	225

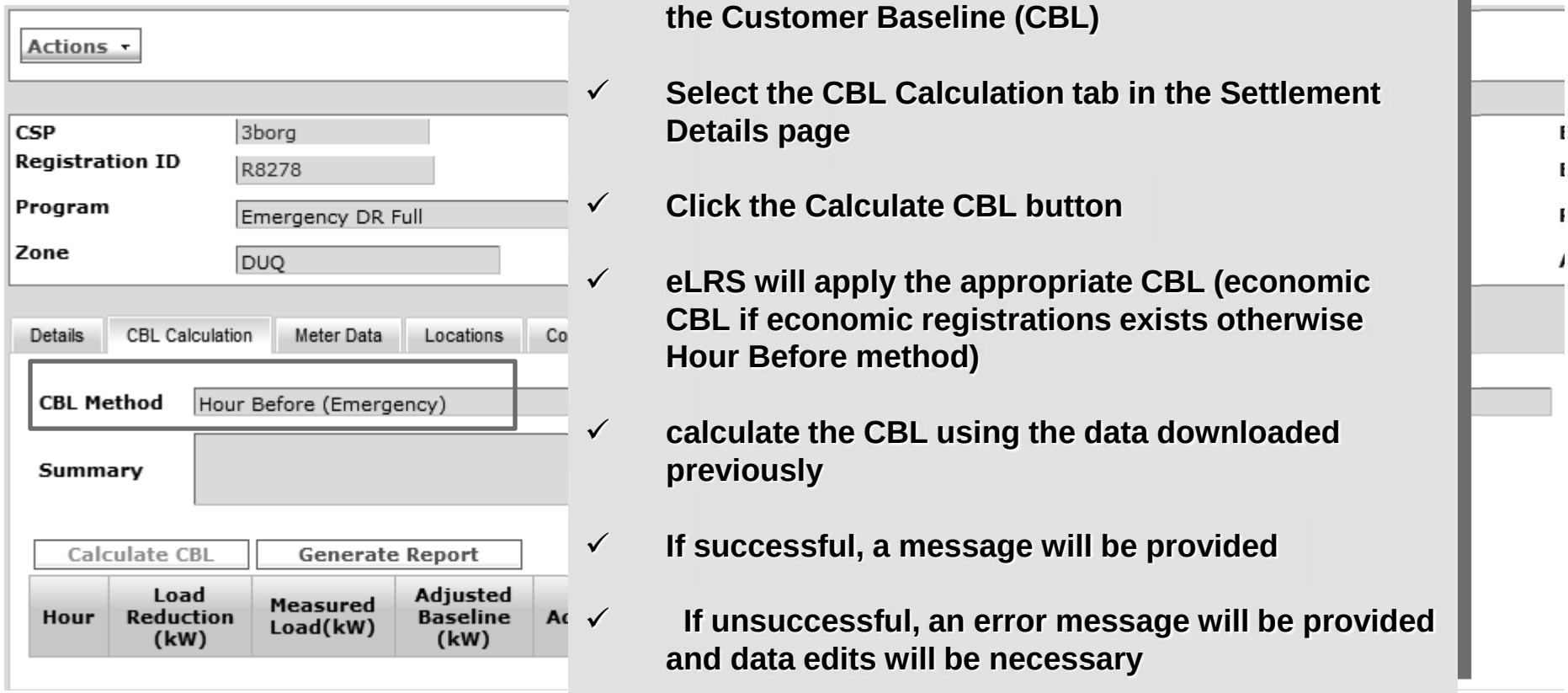
The highest reduction is 350 kW which should be entered as the CBL for hour ending 13 in the meter data upload file. The pseudo meter data is calculated by subtracting the actual reduction from the CBL. For hour ending 14, the pseudo meter data is 350 kW – 225 kW = 125 kW. The CBL and the pseudo meter data are entered in the meter data upload file as seen below:

CBL and pseudo meter data entered in meter data upload file

HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
350	125	125	50	25	0	50	125	125

The eLRS will calculate the reduction for the Emergency Energy Settlement by subtracting the metered load (the pseudo meter data) from the CBL (HE13).

Calculate CBL



Calculating CBL:

- ✓ **The next step in the settlement process is calculate the Customer Baseline (CBL)**
- ✓ **Select the CBL Calculation tab in the Settlement Details page**
- ✓ **Click the Calculate CBL button**
- ✓ **eLRS will apply the appropriate CBL (economic CBL if economic registrations exists otherwise Hour Before method)**
- ✓ **calculate the CBL using the data downloaded previously**
- ✓ **If successful, a message will be provided**
- ✓ **If unsuccessful, an error message will be provided and data edits will be necessary**

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DLC Documentation

Supporting Documentation

- Supporting documentation includes a switch operability study, per-participant impacts and a load research study if applicable
- All supporting documentation must be submitted to PJM with enough time to review and approve the documentation by **May 31, 2014** and no later than **May 15, 2014**. If there are any outstanding issues on May 31, the registration will not be approved
- Supporting documentation should be submitted before the registration is created in eLRS
- Supporting documentation should be e-mailed to dsr_ops@pjm.com
- Supporting documentation must be submitted for each DLC program for each delivery year, even if the documentation is eligible to be re-used from previous years
- **This is not the same as the DR Plan that is submitted to RPM**

DLC Documentation

- **Switch operability study**
  1. Switch operability studies are valid for 5 years. Any DLC program without a valid switch operability study will be assigned the default operability value of 50% in accordance with Manual 19
  2. Sample must be randomly draw and be representative of the population with at least 90% confidence at 10% error and stratified by technology
  3. Must check that switch is properly wired, received the radio signal and the compressor cycles with the signal is received

- **Per-participant impact**
  1. Can use either provider submitted study or deemed savings report
  2. Deemed savings report is only valid for legacy programs using radio signals for non-interval metered load
  3. Use the Weighted Temperature Humidity Index (WTHI) values for calculating per-participant impact
     - From the PJM home page select:
       planning > Resource Adequacy Planning > Load Forecast Development Process > Weather Standards for Demand Response Certification

DLC Documentation

- **Registration**
  1. EDC accounts for DLC must start with NIM (e.g.: NIM12345)

- **Reference Materials**
  1. Manual 19 Attachment B
  2. Demand Side Response Training Materials
     - From the PJM Home Page, select training and then select Training Material

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Contact Information

PJM Member Relations :	**610-666-8980**
(& DSR Hotline)	**866-400-8980**
	DSR_Ops@pjm.com
RPM Questions:	**RPM_Hotline@pjm.com**
PJM Technical Support:	**610-666-8886**