

Load Management Tests Education Session

Load Management Test Requirements

- OATT Attachment DD.11A
 - <https://www.pjm.com/directory/merged-tariffs/oatt.pdf>
- Manual 18 - PJM Capacity Market
 - <https://www.pjm.com/-/media/documents/manuals/m18.ashx>
 - Section 8.8 Load Management Test Compliance

Overview

- Typically, Load Management performance is measured during Load Management events requiring a mandatory response
 - If dispatched, the registration is not required to be tested
- However, when a LM registration has not been dispatched in such a Load Management event it is required to be tested
- Over the past five delivery years there have been no mandatory Load Management events thus in those years all LM performance has been demonstrated through testing
- In the years prior to that time most performance was measured during Load Management events requiring a mandatory response

Annual Performance Summary

Delivery year	Event performance	Test performance
2009/10	No Events	118%
2010/11	100%	111%
2011/12	91%	107%
2012/13	104%	116%
2013/14	94%	129%
2014/15	No Events	144%
2015/16	No Events	134%
2016/17	No Events	153%
2017/18	No Events	163%
2018/19	No Events*	148%

<https://www.pjm.com/-/media/markets-ops/dsr/2018-2019-dsr-activity-report.ashx?la=en>

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
 - Base DR: Jun – Sep, 10:00 AM – 10:00 PM, Non Holiday Weekdays
 - Summer DR/CP DR: Jun – Oct, May 10:00 AM – 10:00 PM, Non Holiday Weekdays
- Notify PJM of intent to test 48 hours in advance
 - Test and retest notifications must be submitted in DRHub
- No limit on the number of tests a CSP can perform
 - If you test your portfolio a second time, it is considered a second test, not a retest
 - Retest means only a portion of your portfolio is tested (see upcoming retest slides)
 - Only submit data for specific test that you want PJM to measure compliance

Any Registration not dispatched in a mandatory response Load Management Event **MUST be tested**

Retest Requirement Details

- A Retest allows a CSP that achieves over 75% in a Test to strive for better performance without having to subject all of his registrations to another Test.
- 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 Summer Nominated ICAP are eligible to participate in the retest
 - 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
- Retest notifications are submitted in DR Hub 48 hours in advance of start time

Under Compliance Example Re-Test Eligibility

Resource in eLRS	Resource in eRPM	Product Type	Summer Nominated Load Reduction (MW)	Initial Test Reduction (MW)	Pass/Fail Initial Test	Retest Reduction (MW)	Final Reduction (MW)
FSL1*	CSP1 PEPCO CPDR1	CP	5	4.7	Fail	4.8	4.8
FSL2	CSP1 PEPCO CPDR1	CP	8	8.3	Pass		8.3
FSL3	CSP1 PEPCO CPDR1	CP	2	1.5	Fail	1.6	1.6
FSL4*	CSP1 PEPCO CPDR1	CP	10	10	Pass	11	11
GLD1	CSP1 PEPCO CPDR2	CP	15	8	Fail	10	10
GLD2	CSP1 PEPCO CPDR2	CP	3	2	Fail	0	0
GLD3	CSP1 PEPCO CPDR2	CP	7	0 (no data submitted)	Fail	7.3	7.3
FSL5	CSP1 PEPCO CPDR2	CP	50	50	Pass		50
	Zonal Total		100	84.5			93

Resource	Product Type	Summer Average RPM Commitment (ICAP MWs)
CSP1 PEPCO CPDR1	CP	25
CSP1 PEPCO CPDR2	CP	73
Zonal Total	CP	98

No LM event for CP DR in PEPCO zone

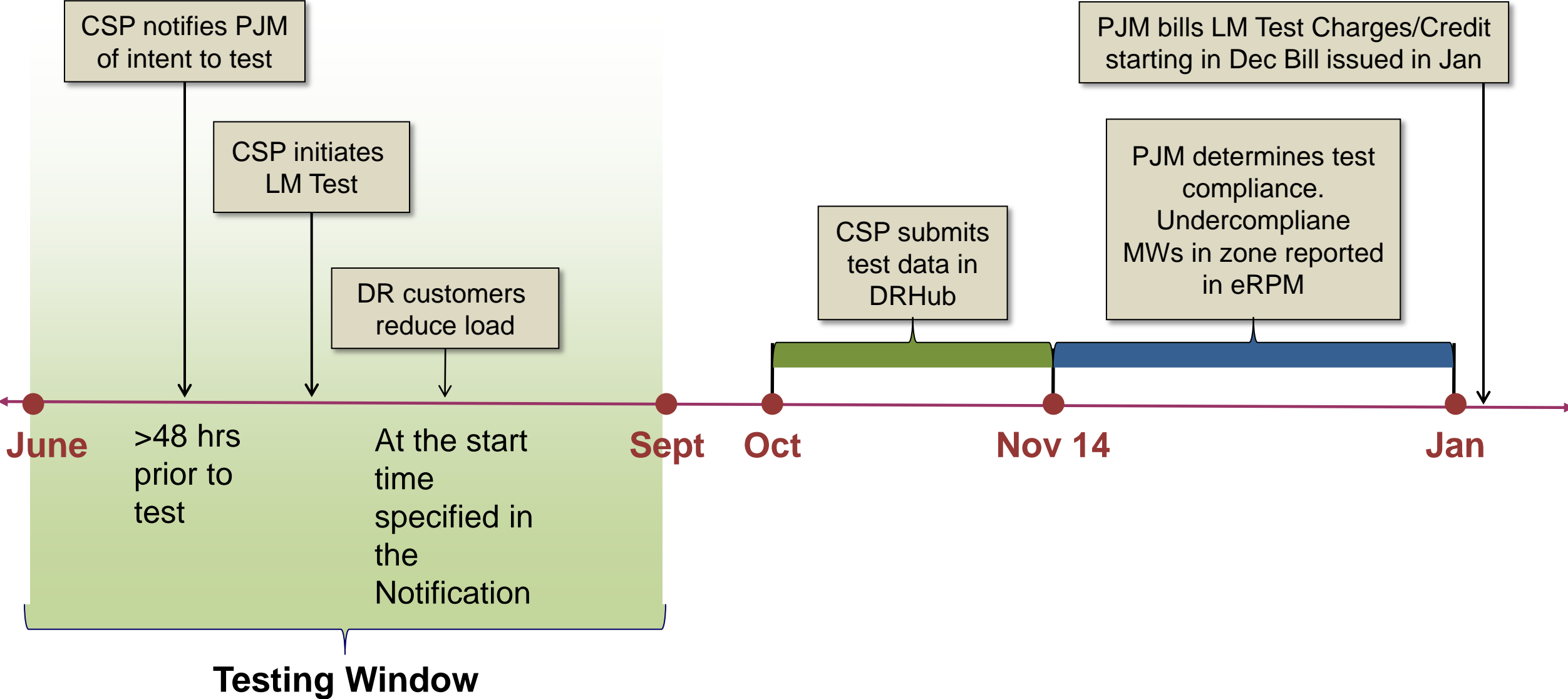
*FSL1 & FSL4 are affiliated resources, and, as such, must perform together in any re-test

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

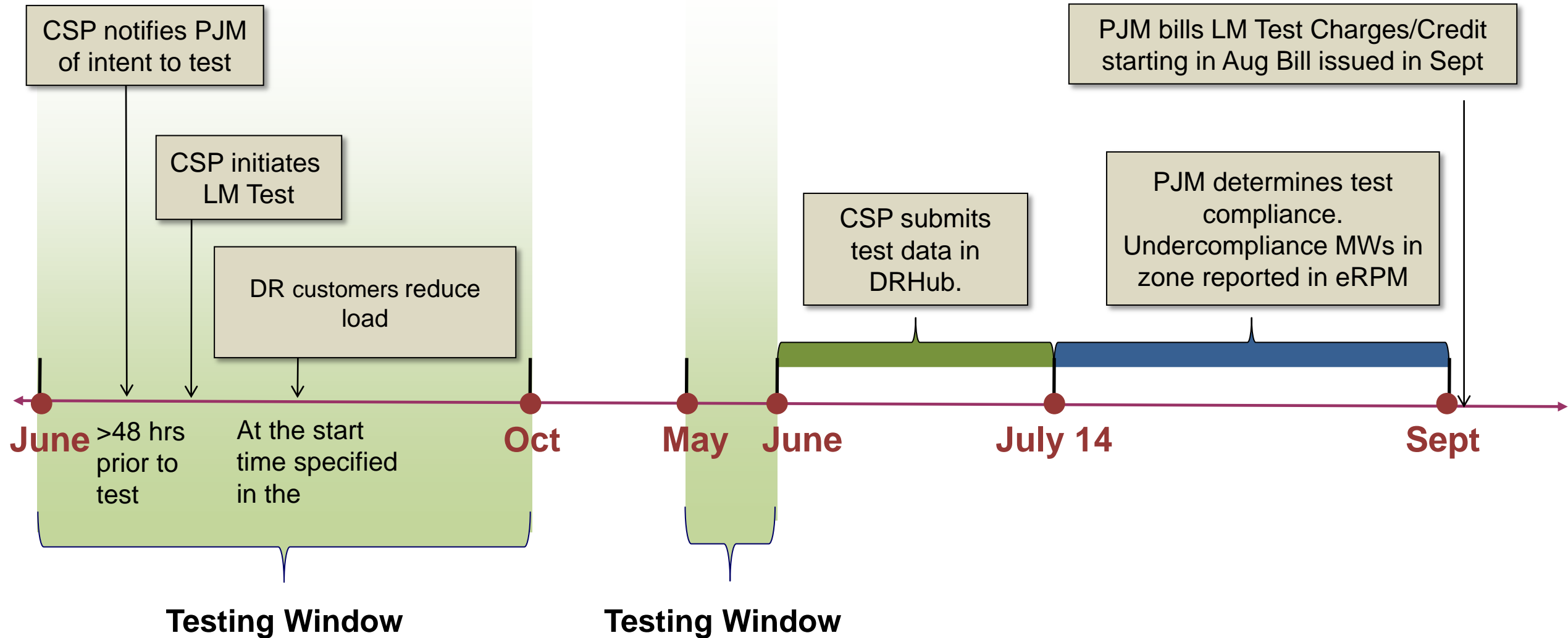
Sub Zonal Test Process

- 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 and Base DR



LM Resource Test Timeline – Annual/Extended Summer/CP DR



Load Management Test Compliance

- Methods to measure test compliance for FSL or GLD registrations are the same methods used to measure event compliance; however, in measuring test compliance, the Nominated Load Reduction Value in DRHub 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

Load Management Test Compliance (Cont'd)

- 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 and Base DR and between July 15 and August 30 after the DY for Annual DR, Extended Summer & CP DR

Net Testing Shortfall -

Net Testing Shortfall in zone for product-type =

Summer Avg RPM
Commitments in zone
for product-type

Total MWs of Load
Reduction provided by
registrations in zone for
product-type

Summer Daily Avg of
Capacity Resource
Deficiency Shortfalls
for product-type

To avoid
double-
counting of
deficiencies

Includes both
RPM & FRR
Commitments

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

Shortfalls in ICAP will be converted to UCAP using final DR Factor (except for CP) and FPR for DY

Daily LM Test Failure Charge

Daily LM Test Failure Charge =

$$\begin{array}{|c|} \hline \text{Net Testing Shortfall} \\ \text{in Zone for DR} \\ \text{Product Type} \\ \text{(UCAP)} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Daily LM Test} \\ \text{Failure Charge} \\ \text{Rate} \\ \hline \end{array}$$

- 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, Extended Summer, Base & CP 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 zone



Greater of (0.20 * Weighted Daily Revenue Rate in zone, or \$20/MW-day)

- 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

Overview of Generator Net Capability Test Requirements

- Manual 18, Section 8.5
- Manual 21, Rules and Procedures for Determination of Generating Capability
- Testing required in defined Summer and Winter test periods
 - 01JUN – 31AUG and 01DEC – 28FEB respectively
- Test can be self scheduled for specific time or actual operating data can be used
 - i.e. CTs may schedule a test time to operate and base load generator could use operating data
- Testing results from Summer period can be adjusted for Winter ambient conditions and used as Winter period test
- Test duration is 1 or 2 hours depending on generator type
- Generator receives LMP for energy output during test

Overview of Generator Net Capability Test Requirements

- No limit on number of tests during test period
- Shortfall results in a forced derating of unit, causing increased EFORd
- Increased EFORd carries over to next two years' auctions (lesser impact in second year)
- Increased EFORd results in lower capacity revenues for next two years