# PJM Load Management Test Proposal 1a and 1a'

Markets & Reliability Committee

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# PJM proposal, a balanced approach

## Avoid unnecessary testing

- Test only required when there is no event
- Only 1 test per year

## Balance "real life" test with cost

- PJM directed test
  - Test hour unknown in advance
  - Test year round
- Re-test/Do-over for unforeseen issues
- Advanced notification to prepare and schedule maintenance

## Energy market compensation

- Direct/simple energy market compensation
- Self schedule (price taker) to avoid uplift

PJM proposal modified several times to meet stakeholder identified interests


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# Example PJM 1a Test Cycle

PJM notifies CSP of zones to be tested

I know test can only take place on 20 potential days

I also know there will be no tests in any other zones. Get maintenance done there

PJM notifies CSP by 10am that test will be tomorrow

I know test is tomorrow and I have at least 13 hours to prepare

Check that my generator can start

PJM notifies CSP with normal lead time

I know test will occur only between 11a-6p and I will be given my lead time

| | AUGUST | | | | | | | | | | | SEPTEMBER | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8/21/19 | 8/22/19 | 8/23/19 | 8/24/19 | 8/25/19 | 8/26/19 | 8/27/19 | 8/28/19 | 8/29/19 | 8/30/19 | 8/31/19 | 9/1/19 | 9/2/19 | 9/3/19 | 9/4/19 | 9/5/19 | 9/6/19 | 9/7/19 | 9/8/19 | 9/9/19 | 9/10/19 | 9/11/19 | 9/12/19 | 9/13/19 | 9/14/19 | 9/15/19 | 9/16/19 | 9/17/19 | 9/18/19 | 9/19/19 | 9/20/19 | 9/21/19 | 9/22/19 | 9/23/19 | 9/24/19 | 9/25/19 | 9/26/19 | 9/27/19 | 9/28/19 | 9/29/19 | 9/30/19 |
| Potential Test Days | | | | | | | | | | | | | | X | X | X | X | | | X | X | X | X | X | | | X | X | X | X | X | | | X | X | X | X | X | | | X |
| Actual Test Day | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | |

Each zone tested one day per year for only 2 hours.


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# Example PJM 1a' Test Cycle

I also know there will be no tests in any other zones. Get maintenance done there

I know test can only take place on 10 potential days

PJM notifies CSP of zones to be tested

PJM notifies CSP by 10am that test will be tomorrow

I know test is tomorrow and I have at least 13 hours to prepare

Check that my generator can start

July

| | | 7/1/2019 | 7/2/2019 | 7/3/2019 | 7/4/2019 | 7/5/2019 | 7/6/2019 | 7/7/2019 | 7/8/2019 | 7/9/2019 | 7/10/2019 | 7/11/2019 | 7/12/2019 | 7/13/2019 | 7/14/2019 | 7/15/2019 | 7/16/2019 | 7/17/2019 | 7/18/2019 | 7/19/2019 | 7/20/2019 | 7/21/2019 | 7/22/2019 | 7/23/2019 | 7/24/2019 | 7/25/2019 | 7/26/2019 | 7/27/2019 | 7/28/2019 | 7/29/2019 | 7/30/2019 | 7/31/2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Potential Test Days | | | | | | | | | | | | | | | | X | X | X | X | X | | | X | X | X | X | X | | | | | |
| Actual Test Day | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | |

PJM notifies CSP with normal lead time

I know test will occur only between 11a-6p and I will be given my lead time

Each zone tested one day per year for only 2 hours.


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# PJM 1a and 1a' Retest

| Test Score greater than 75% | Test Score 75% or lower |
| --- | --- |
| • CSP scheduled retesting | • PJM scheduled retest |

Registrations that individually scored < 100% can be included in retest


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# PJM Proposal Summary

## Better Simulate Event Conditions

- Avoid CSP “open book” test with unlimited Do-over’s

## Tests throughout the Delivery Year

- CP DR is required to perform throughout the Delivery Year

## Leverage Notification System Used in Actual Events

- Web service communication not currently tested

Significant modification to original proposal to address key CSP concerns of unnecessary testing and cost mitigation


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# Appendix


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# PJM Proposal 1a – PJM schedules test, CSP schedules retest(s) or PJM schedules retest based on test performance

- PJM managed test will better simulate event conditions and therefore actual DR load reduction capability
  - Avoid CSP "open book" test with unlimited Do-over's
- Conduct test throughout the Delivery Year since DR is required to perform throughout the Delivery Year
- Leverage communication/notification mechanism used for real events.

High Impact / Low Frequency event – requires training/practice/testing to be ready.
DR only dispatched when we are in emergency conditions (expected to be short on reserves)


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# Modified proposal to address key CSP concerns: Minimize unnecessary testing and mitigate costs

- Testing only required when there is no event in the Delivery Year
- Only 1 test per year required when there is no event
  - ½ the zones tested in the summer and ½ tested in the winter
- Only test for 2 hours whereas typical events are ~ 5 hours
  - load reduction averaged over 2 hours, provides more flexibility in case load reduction starts late.
- Compensate for load reductions in the energy market as a price taker to help offset cost.


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# Minimize unnecessary testing and mitigate costs (cont')

- Allow CSP to get prepared and schedule necessary maintenance activities
  - PJM will provide month ahead and day ahead notification of zones that will be tested
    - PJM will provide normal lead time advanced notification on the test day.
  - PJM will test when notified unless there is a reliability issue
    - CSP knows there will be a test and can get ready. For events, the CSP needs to get ready (more cost) but in most cases the event does not occur
  - Testing only done from HE12-18 which is in line with summer peak, winter second peak and normal workday
    - Avoid winter early morning test which would require personnel to be ready before typical work hours.
    - Narrow window allows CSP to better prepare for test
  - Testing only done on non-NERC holiday weekdays


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# Ability to retest (“do-over”) and/or improve score if CSP has unforeseen problem

- Performance aggregated  to zone
  - customer over-performance can offset another customer’s underperformance
- Allow CSP to self direct zonal retest(s) if performance >75%.
  - More chances to test if performance was decent but had a few issues
  - Leverage status quo CSP directed retest provisions
    - minimize rule changes
    - provide retest flexibility (multiple retests, only registrations that had performance issue are retested)
- Allow CSP to have one time PJM directed retest if performance <=75%
  - CSP notifies PJM with list of registration to retest and PJM will retest with day ahead notification.
    - CSP not required to retest all registration together, only registrations that had performance issue are retested.


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# Transition Plan – give CSPs plenty of time to adjust to new requirements

- PJM proposes to wait to implement new rules until 23/24 Delivery Year
  - New test requirements apply to new Capacity commitments (May 2020, BRA)
  - Allows CSPs to incorporate into contracts
  - Provides CSPs 3 years to get ready to implement the new test requirements
- PJM can run mock test dispatch in interim years where CSP schedule test under status quo but uses PJM test dispatch to practice.


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# PJM Proposal 3 – PJM schedules test, CSP schedules retest
## (more closely simulates events)

- PJM schedules tests with day ahead notice
  - PJM will provide normal lead time advanced notification on the test day
  - Leverage communication/notification mechanism used for real events
- Test duration is 5 hours
- Tests can occur on any day of year
- Tests can occur during any hour of day as defined by the product
  - Summer, 10AM-10PM
  - Winter, 6AM-9PM
- Test performance >75%, CSP can schedule retests
  - Score of 75% or less, result is final
- Compensate for load reductions in the energy market as a price taker to help offset cost


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# PJM1a - Use Case

- PJM notifies CSPs on 8/21 that test will be conducted in September
  - CSP knows test will be on 1 of the 20 weekdays from 11am to 6pm
- PJM notifies CSP on 9/16 at 10am that test will be on 9/17 (11am to 6pm)
  - CSP knows test will occur tomorrow from 11am to 6pm and can prepare
- PJM notifies CSP on 9/17 at 1:30pm that load reduction must start at 2pm
  - Assumes 30 minute lead time for simplicity.
- CSP implements load reductions
- If CSP aggregate zonal performance is >75% (at least a “C+”) then CSP can schedule and direct the retest, otherwise CSP may have PJM retest if PJM is notified by 10/31.
- Retest scenarios (Optional but only need to test registrations where performance <100%)
  - CSP may schedule as many retest as desired to improve score and eliminate penalty
  - CSP may request PJM to do a retest. PJM provides CSP day ahead notification by 10am that a test will occur. PJM provides same test day notification.

If CSP can not pass the test then the resource would likely not have performed during an actual event.


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# PJM Proposal 1a – Use Cases

| Zone | Test Month | Season | MW | Event | Test Status | Test Result | Retest Scheduler* | Retest 1 with test result | Retest 2 with test result | Retest 3 with test result | Final test Performance | Penality Volume (%) | Penality Volume (MW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Meted | 7 | summer | 35 | 8/20/2019 | Tested but subsequent event | no test needed | | | | | | | 0 |
| Peco | 8 | summer | 25 | | | 78% | CSP | 83% | 95% | 90% | 95% | 5% | 1.25 |
| PPL | 9 | summer | 35 | | | 85% | CSP | 102% | | | 102% | 0% | 0 |
| Dom | 10 | summer | 50 | | | 0% | PJM | 99% | | | 99% | 1% | 0.5 |
| JCPL | 9 | summer | 40 | | | 74% | PJM | 105% | | | 105% | 0% | 0 |
| AEP | 11 | winter | 60 | | | 103% | no retest needed | | | | 103% | 0% | 0 |
| DPL | 12 | winter | 40 | 8/20/2019 | No test, prior event | no test needed | | | | | | | 0 |
| DEOK | 1 | winter | 35 | | | 101% | no retest needed | | | | 101% | 0% | 0 |
| Comed | 2 | winter | 50 | | | 85% | CSP | 92% | 104% | | 104% | 0% | 0 |
| **Total** | | | **370** | | | | | | | | | **Penalty** | **1.75** |
| | | | | | | | | | | **Committed MW** | | | **370** |
| | | | | | | | | | | | | | |
| * If Test Result is <= 75% there is only 1 retest scheduled by PJM upon request by CSP | | | | | | | | | | **Penalty/Committed MW** | | | **0.47%** |
| Zonal test results are based on aggregate performance for all customers in the zone. | | | | | | | | | | | | | |


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# PJM issues with other Proposals

- CSP 1 and CSP 2 proposal does not address the following identified interests:
  - "Testing reflective of LM product availability requirements"
    - Too many months removed from test cycle
  - "Testing results consistent with expected performance during LM events under various conditions (time of day, time of year, etc.)"
    - Too many opportunities for "do over" – there are no "do overs" during an event
  - "Test notification process aligns with actual event process (i.e.: Emergency messages prior to LM event day)"
    - Too much notification and CSP scheduling which enables test to be choreographed (eliminates the element of surprise)
    - CSP does not schedule actual events
- IMM proposal and identified interest:
  - "Avoid unnecessary testing"
    - Amount of testing compared to potential gain in accuracy.


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