# Draft Proposal
# Maximum Notification and Startup Times for Capacity Units

# Overview

- Proposed Operational Approach
- Additional Market / Committee Issues
- Previous Committee meeting slides (background)

# Proposed Operational Approach

- Peak Periods (should these line up with RPM / outage periods):
  - May 1 – Sep 30
  - Dec 1 – Feb 29
- Peak (PMNST[1]) ≈ 70% number w/exception process & alerts to reduce exception times[2]
- Off Peak (PMNST[1]) ≈ 90% number w/exception process & alerts to reduce exception times[2]
- Alert timing – PJM will "declare" alerts to reduce lead time to Peak:
  - Will be based on exception timeframes
  - Off Peak – week ahead – use eDart Margins
  - Peak – days ahead – use eDart Margins

[1]PMNST – Peak Maximum Notice / Start Time

[2] Applies to both price and cost schedules

# Proposed Operational Approach - Notes

- PJM develop alert process and messages similar to Cold Weather Alerts
- Alert “cancelled” startup costs – will use current process for cost recovery
- PJM make tool and process changes to forecast into the exception “time windows” to implement the alert process
  - Longer term commitment
  - Scenario based committment
- Exception process should be a long term (annual vs. daily) process
- Startup & Notification time “options”
  - Values (70% / 90%) based on one or combination of approaches:
    - Performance data from PLS table (see later slide)
    - Version of the current “market” times (see 2 “TTS” slides)
    - MMU provided historic data – by unit type
  - Unit specific
  - Operational “norm” value

- Proposal since 12/10 SOS:
  - Exceptions up to x (3?) days documented – nothing longer
- 2 phases of “notice”
  - 1st – “think we might need them” – no startup compensation
  - 2nd notice to be ready to run – normal startup cost recovery process
- Who is the “exception judge”?
- Does location matter?

# Proposed Operational Approach - Notes

- Proposed Peak Exceptions:
  - Physical limitations
  - Sequential starts
  - Gas contracts
- Proposed Off Peak Exceptions
  - Peak Period Exceptions
  - Labor contract, staffing related
  - Historic off peak run history*
  - Potential economic exception (will need more definition)
- Proposed General Exceptions
  - Return from outages
  - Generation bottled by outages
  - Base load / always on (nuclear, wind, etc.)

*PJM may need to modify as current / future retirements and RTEP outages may change historic dispatch patterns

# Additional Market / Committee Issues

- Operating Committee review draft tariff and manual language to address Reliability Concerns
  - Proposed Implementation date – 6/1/2011
- Units with Notification + Startup that are outside of proposed times (including approved exceptions) will be considered a Forced Outage.
- RPM and Market Impacts will not be addressed by OC
  - engage PJM RPM staff
  - Engage MIC
  - RPM “grandfather” issues
- Demand Side – engage MIC – equity issues

# Cold Notification and Cold Startup Percentiles

(In hours)

| | Cold Notification Time | | | Cold Startup Time | | | CS + CN | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter Class | 70th | 80th | 90th | 70th | 80th | 90th | 70th | 80th | 90th |
| PETROLEUMSTEAMPRE-1985 | 4 | 8.5 | 18 | 12.5 | 14 | 18 | 16.5 | 22.5 | 36 |
| PETROLEUMSTEAMPOST-1985 | 1 | 1 | 2 | 6 | 12 | 14 | 7 | 13 | 16 |
| COMBINEDCYCLE | 2 | 5 | 7 | 5 | 6.2 | 8 | 7 | 11.2 | 15 |
| SUBCRITICALCOALPLANTS | 2 | 2 | 4 | 15 | 16 | 20 | 17 | 18 | 24 |
| SUPERCRITICALCOALPLANTS | 2 | 2 | 8 | 19 | 20 | 22 | 21 | 22 | 30 |
| SMALLCTSTO29MW | 0.25 | 1 | 2 | 0.5 | 0.5 | 0.8 | 0.75 | 1.5 | 2.8 |
| MEDIUMCTS30TO65MW | 0.2 | 0.3 | 1.4 | 0.3 | 0.5 | 0.5 | 0.5 | 0.8 | 1.9 |
| MEDIUMLARGECTS66TO134MW | 1 | 2 | 2 | 0.5 | 0.7 | 1 | 1.5 | 2.7 | 3 |
| LARGECTS136TO180MW | 2 | 5 | 6 | 0.5 | 0.7 | 1 | 2.5 | 5.7 | 7 |

*Data based on active cost-based offers within one standard deviation of the mean, since November, 2007.
**Analysis based on calculating notification and startup time distributions independently, then adding together.

# Time-To-Start Percentiles

(In hours)

| | All Months | | | Peak Months | | | Off-Peak Months | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter Class | 70th | 80th | 90th | 70th | 80th | 90th | 70th | 80th | 90th |
| PETROLEUMSTEAMPRE-1985 | 18 | 20 | 32 | 18 | 20 | 30 | 17 | 19 | 32 |
| PETROLEUMSTEAMPOST-1985 | 9 | 13 | 14 | 9 | 13 | 14 | 9 | 13 | 14 |
| COMBINEDCYCLE | 9 | 11 | 14 | 8.5 | 10 | 13.5 | 9 | 11 | 14 |
| SUBCRITICALCOALPLANTS | 16.5 | 18 | 22 | 16.5 | 18 | 22.5 | 16 | 18 | 22 |
| SUPERCRITICALCOALPLANTS | 21 | 22 | 30 | 21 | 22 | 30 | 21 | 22 | 30 |
| SMALLCTSTO29MW | 1 | 1.5 | 2.2 | 1 | 1.5 | 2.2 | 1 | 1.5 | 2.2 |
| MEDIUMCTS30TO65MW | 0.5 | 0.8 | 1.7 | 0.5 | 0.7 | 1.7 | 0.5 | 1 | 2 |
| MEDIUMLARGECTS66TO134MW | 2 | 2 | 3.3 | 2 | 2 | 3.3 | 2 | 2.3 | 3.4 |
| LARGECTS136TO180MW | 3 | 5 | 6.6 | 2.5 | 4.3 | 6.6 | 4 | 5 | 6.8 |

*Data based on active cost-based offers within one standard deviation of the mean since, November, 2007.
**Analysis based on adding notification and startup times together first, then calculating the distribution.

# Proposed Operational Approach (with numbers)

- Peak Periods:
  - May 1 – Sep 30
  - Dec 1 – Feb 29
- Peak (PMNST[1]) ≈ 70% number w/exception process & alerts to reduce exception times[2]
- Off Peak (PMNST[1]) ≈ 90% number w/exception process & alerts to reduce exception times[2]

| Parameter Class | OPS | All Months | | | Peak Months | | | Off-Peak Months | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 70th | 80th | 90th | 70th | 80th | 90th | 70th | 80th | 90th |
| PETROLEUMSTEAMPRE-1985 | 18 | 18 | 20 | 32 | 18 | 20 | 30 | 17 | 19 | 32 |
| PETROLEUMSTEAMPOST-1985 | 10 | 9 | 13 | 14 | 9 | 13 | 14 | 9 | 13 | 14 |
| COMBINEDCYCLE | 10 | 9 | 11 | 14 | 8.5 | 10 | 13.5 | 9 | 11 | 14 |
| SUBCRITICALCOALPLANTS | 18 | 16.5 | 18 | 22 | 16.5 | 18 | 22.5 | 16 | 18 | 22 |
| SUPERCRITICALCOALPLANTS | 24 | 21 | 22 | 30 | 21 | 22 | 30 | 21 | 22 | 30 |
| SMALLCTSTO29MW | 1 | 1 | 1.5 | 2.2 | 1 | 1.5 | 2.2 | 1 | 1.5 | 2.2 |
| MEDIUMCTS30TO65MW | .5 | 0.5 | 0.8 | 1.7 | 0.5 | 0.7 | 1.7 | 0.5 | 1 | 2 |
| MEDIUMLARGECTS66TO134MW | 2 | 2 | 2 | 3.3 | 2 | 2 | 3.3 | 2 | 2.3 | 3.4 |
| LARGECTS136TO180MW | 3 | 3 | 5 | 6.6 | 2.5 | 4.3 | 6.6 | 4 | 5 | 6.8 |

[1]PMNST – Peak Maximum Notice / Start Time

[2] Applies to both price and cost schedules

# Previous Committee meeting slides (background)

# Notification & Startup maximum times - Approach

- Proposed business rules for maximum startup and notification times for capacity units
  - Currently no maximum requirements
  - PJM staff envision between 48 hours and 5 days maximum
    - 48 hours ideal for reliability, but may not be feasible for units
    - Propose an approach similar to parameter limited schedule – guidelines by unit type – all other times are exceptions
  - Envision a “system conditions” notification to prep the units to reduce lead time for reliability – may be forecast hot weather alert, cold weather alert, weather emergencies, etc.

# Member Feedback

- Consider a seasonal notification requirement – allowed to be shortened by owner during winter and summer peak periods
  - Reserve Triggers for Spring and Fall
- Request for quantifying current startup and notification times in buckets; maybe by unit type
- Develop Exception Criteria
- Impact on Demand Response Requirements

# PJM (Notification + Time to Start) Summary

| TTS Range (hour) | Number of Units | MW |
|---|---|---|
| TTS = 0 | 188 | 28,027 |
| 0 < TTS <= 1 | 347 | 20,450 |
| 1 < TTS <= 2 | 83 | 4,760 |
| 2 < TTS <= 3 | 58 | 4,227 |
| 3 < TTS <= 4 | 12 | 1,507 |
| 4 < TTS <= 5 | 30 | 4,151 |
| 5 < TTS <= 6 | 14 | 4,964 |
| 6 < TTS <= 12 | 101 | 15,881 |
| 12 < TTS <= 24 | 186 | 52,550 |
| 24 < TTS <= 48 | 37 | 18,049 |
| 48 < TTS <= 72 | 5 | 1,353 |
| 72 < TTS <= 96 | 10 | 4,074 |
| TTS > 96 | 8 | 1,760 |
| | 1079 | 161,755 |

# PJM (Notification + Time to Start) by unit type

| TTS Range (hour) | Type | Number of Units | MW |
|---|---|---|---|
| TTS = 0 | CT | 10 | 285 |
| TTS = 0 | Diesel | 4 | 33 |
| TTS = 0 | Hydro | 49 | 4,217 |
| TTS = 0 | Landfill | 20 | 101 |
| TTS = 0 | Nuclear | 18 | 18,938 |
| TTS = 0 | Steam | 55 | 4,112 |
| TTS = 0 | Wind | 32 | 341 |
| 0 < TTS <= 1 | CT | 288 | 16,078 |
| 0 < TTS <= 1 | Diesel | 20 | 188 |
| 0 < TTS <= 1 | Hydro | 25 | 1,605 |
| 0 < TTS <= 1 | Landfill | 5 | 19 |
| 0 < TTS <= 1 | Steam | 6 | 2,508 |
| 0 < TTS <= 1 | Wind | 3 | 53 |
| 1 < TTS <= 2 | CT | 77 | 4,687 |
| 1 < TTS <= 2 | Diesel | 3 | 14 |
| 1 < TTS <= 2 | Hydro | 1 | 35 |
| 1 < TTS <= 2 | Landfill | 1 | 12 |
| 1 < TTS <= 2 | Steam | 1 | 13 |
| 2 < TTS <= 3 | CT | 46 | 3,878 |
| 2 < TTS <= 3 | Diesel | 5 | 12 |
| 2 < TTS <= 3 | Landfill | 4 | 33 |
| 2 < TTS <= 3 | Steam | 3 | 304 |
| 3 < TTS <= 4 | CT | 3 | 243 |
| 3 < TTS <= 4 | Diesel | 1 | 2 |
| 3 < TTS <= 4 | Steam | 8 | 1,262 |
| 4 < TTS <= 5 | CT | 19 | 886 |
| 4 < TTS <= 5 | Steam | 11 | 3,265 |
| 5 < TTS <= 6 | CT | 2 | 115 |
| 5 < TTS <= 6 | Steam | 12 | 4,849 |
| 6 < TTS <= 12 | CT | 32 | 2,796 |
| 6 < TTS <= 12 | Diesel | 2 | 4 |
| 6 < TTS <= 12 | Steam | 67 | 13,082 |
| 12 < TTS <= 24 | CT | 6 | 372 |
| 12 < TTS <= 24 | Hydro | 2 | 0 |
| 12 < TTS <= 24 | Nuclear | 3 | 3,186 |
| 12 < TTS <= 24 | Steam | 175 | 48,992 |
| 24 < TTS <= 48 | Nuclear | 7 | 6,076 |
| 24 < TTS <= 48 | Steam | 30 | 11,973 |
| 48 < TTS <= 72 | CT | 1 | 60 |
| 48 < TTS <= 72 | Steam | 4 | 1,293 |
| 72 < TTS <= 96 | Nuclear | 2 | 1,593 |
| 72 < TTS <= 96 | Steam | 8 | 2,481 |
| TTS > 96 | Diesel | 4 | 10 |
| TTS > 96 | Nuclear | 1 | 1,010 |
| TTS > 96 | Steam | 3 | 740 |
| **Total** | | **1079** | **161,755** |

# Peak Maximum Unit Lead Time Proposal

| Hours of Lead Time | 70 % of units have (N+CS) ≤ # below | 80% of units have (N+CS) ≤ # below | 90% of units have (N+CS) ≤ # below | Recommended Max (N + CS) hours |
|---|---|---|---|---|
| SMALL CTS TO 29 MW | 4 | 4 | 5 | 5 |
| MEDIUM CTS 30 TO 65 MW | 3 | 9 | 12 | 12 |
| MEDIUM LARGE CTS 66 TO 135 | 3 | 4 | 15 | 12 |
| LARGE CTS 136 TO 180 MW | 3 | 4 | 7 | 12 |
| COMBINED CYCLE | 12 | 14 | 16 | 16 |
| PETROLEUM STEAM POST-1985 | 13 | 15 | 24 | 24 |
| PETROLEUM STEAM PRE-1985 | 20 | 65 | 72 | 48 |
| SUB CRITICAL COAL PLANTS | 20 | 22 | 29 | 24 |
| SUPER CRITICAL COAL PLANT | 25 | 30 | 87 | 48 |

Chart shows current notification and cold start time that companies have submitted in parameter limited schedules (added together); lists the % of units that have Notification + Cold Start times that are less than or equal to that value (i.e., if you have 4 hours in a 70 pct column it means that 70% of the units in that class have submitted Notification + Cold Start times that are 4 hours or less).

# Next Steps / Timeline

- PJM to investigate Tool Modification
- PJM to define communication procedures
- exception criteria
- Proposed Timeline:
  - November Meetings:  Solicit Additional Feedback
  - December Meeting:  Present Documented Proposal
    - Manual and Tariff language
  - January Meeting:  Solicit feedback on proposal
  - February/March: Committee Approval
  - June Implementation
- Market Issues
  - Impact on RPM payments for violating start-up/notification rules