Assessment of Gas Scheduling Changes to Assist Power Customers

Presentation to Electric Associations Representatives and ISO/RTO Council

January 21, 2014
Today’s Objectives

• Review consensus process
• Present strawman
• Discuss options and alternatives considered
• Request feedback for further dialogue
Natural Gas Council Gas Day Initiative

• Council approval of process in September 2013
  – Willing to explore changes to FERC policies on the gas day and gas nomination schedule that would improve coordination with electric day and electric commitment and dispatch schedules, without imposing undue costs on gas customers
  – Recognize central issue of how to expand gas infrastructure, particularly in Northeast, will not be solved by scheduling issues

• Steering Committee
  – Representatives from each sector (6 producers, 6 pipelines, 6 LDCs)

• Technical Working Group
  – Over 70 schedulers, operators, traders, regulatory reps from each sector
  – Industrial customers participated

• Consensus Strawman
  – Steering Committee achieved consensus around strawman
  – Council approved the recommendation to initiate a dialogue with electric stakeholders toward reaching a comprehensive and lasting resolution of the scheduling issues based upon the consensus strawman

• FERC kept apprised
Operational Considerations

• Gas industry unbundled: Producers, gathering systems, processors, intrastate pipelines, interstate pipeline and LDCs all need to coordinate

• Infrastructure in remote locations (plants, compressors, thousands of wells) and millions of miles of pipelines (gathering, transmission and distribution)
  – Many unmanned and not supported electronically, requiring physical changes at times to maintain services and operations

• Physical operations will remain prevalent part of gas industry
  – Start of gas day requires physical operations such as redirecting flows from one pipeline to another

• Producers must flow all production on ratable basis to ensure operations not adversely impacted
Consensus Strawman

1. Extends Timely Nomination deadline to 1:00 pm CT (from current 11:30 am)
2. Provides two bumpable intraday cycles during business day
3. Adds third, evening intraday cycle for early morning gas flow
4. Retains 9:00 am CT for start of the gas day
What Strawman Represents

• Not a unilateral proposal, but basis for starting dialogue that may lead to a comprehensive and lasting resolution of the scheduling issues

• Expectations:
  – Changes from both industries: Conforming changes to electric scheduling rules will be required to ensure that certain changes to the gas nomination schedule are fully effective
  – Expansion of gas infrastructure to meet long-term energy needs must be part of discussion

• Results in material changes and costs for gas industry, but facilitates greater coordination and generator participation in scheduling while maintaining current effectiveness and reliability of the gas system
### Consensus Strawman Details

#### Gas Nomination Timeline (all times Central Clock Time)

<table>
<thead>
<tr>
<th>Cycles</th>
<th>Nomination Deadline</th>
<th>Confirmations</th>
<th>Schedule Issued</th>
<th>Start of Gas Flow</th>
<th>Remaining Gas Day</th>
<th>Firm Bumping Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timely</td>
<td>1:00 p.m.</td>
<td>4:30 p.m.</td>
<td>5:00 p.m.</td>
<td>9:00 a.m.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Evening</td>
<td>6:30 p.m.</td>
<td>9:00 p.m.</td>
<td>9:30 p.m.</td>
<td>9:00 a.m.</td>
<td>Bumpable</td>
<td>Bumpable</td>
</tr>
<tr>
<td>Intraday 1</td>
<td>9:00 a.m.</td>
<td>11:30 a.m.</td>
<td>12:00 p.m.</td>
<td>3:00 p.m.</td>
<td>3/4 (18 hours)</td>
<td>Bumpable</td>
</tr>
<tr>
<td>Intraday 2</td>
<td>2:00 p.m.</td>
<td>4:00 p.m.</td>
<td>4:30 p.m.</td>
<td>9:00 p.m.</td>
<td>1/2 (12 hours)</td>
<td>Bumpable</td>
</tr>
<tr>
<td>Intraday 3</td>
<td>9:00 p.m.</td>
<td>11:00 p.m.</td>
<td>11:30 p.m.</td>
<td>12:00 a.m.</td>
<td>3/8 (9 hours)</td>
<td>No Bump</td>
</tr>
</tbody>
</table>
# Current Gas Schedule vs. Strawman

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Strawman</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timely Cycle</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nomination Deadline</td>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
</tr>
<tr>
<td>Confirmations</td>
<td>3:30 p.m.</td>
<td>4:30 p.m.</td>
</tr>
<tr>
<td>Schedule Issued</td>
<td>4:30 p.m.</td>
<td>5:00 p.m.</td>
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<tr>
<td>Start of Gas Flow</td>
<td>9:00 a.m.</td>
<td>9:00 a.m.</td>
</tr>
<tr>
<td><strong>Evening Cycle</strong></td>
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<td></td>
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<tr>
<td>Nomination Deadline</td>
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<td>6:30 p.m.</td>
</tr>
<tr>
<td>Confirmations</td>
<td>9:00 p.m.</td>
<td>9:00 p.m.</td>
</tr>
<tr>
<td>Schedule Issued</td>
<td>10:00 p.m.</td>
<td>9:30 p.m.</td>
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<tr>
<td>Start of Gas Flow</td>
<td>9:00 a.m.</td>
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<tr>
<td><strong>Intraday 1 Cycle</strong></td>
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<tr>
<td>Nomination Deadline</td>
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<td>9:00 a.m.</td>
</tr>
<tr>
<td>Confirmations</td>
<td>1:00 p.m.</td>
<td>11:30 a.m.</td>
</tr>
<tr>
<td>Schedule Issued</td>
<td>5:00 p.m.</td>
<td>12:00 noon</td>
</tr>
<tr>
<td>Start of Gas Flow</td>
<td>5:00 p.m.</td>
<td>3:00 p.m.</td>
</tr>
<tr>
<td>Hours of Flow</td>
<td>16 hours</td>
<td>18 hours</td>
</tr>
<tr>
<td><strong>Intraday 2 Cycle</strong></td>
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<td></td>
</tr>
<tr>
<td>Nomination Deadline</td>
<td>5:00 p.m.</td>
<td>2:00 p.m.</td>
</tr>
<tr>
<td>Confirmations</td>
<td>8:00 p.m.</td>
<td>4:00 p.m.</td>
</tr>
<tr>
<td>Schedule Issued</td>
<td>9:00 p.m.</td>
<td>4:30 p.m.</td>
</tr>
<tr>
<td>Start of Gas Flow</td>
<td>9:00 p.m.</td>
<td>9:00 p.m.</td>
</tr>
<tr>
<td>Hours of Flow</td>
<td>12 hours</td>
<td>12 hours</td>
</tr>
<tr>
<td>Firm Bumping Rights</td>
<td>No-bump</td>
<td>Bumpable</td>
</tr>
<tr>
<td><strong>Intraday 3 Cycle</strong></td>
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<td></td>
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<tr>
<td>Nomination Deadline</td>
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<tr>
<td>Confirmations</td>
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<td>11:00 p.m.</td>
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<tr>
<td>Schedule Issued</td>
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<td>11:30 p.m.</td>
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<tr>
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Issues Raised by Electric Industry

• Timely nomination deadline occurs before electric dispatch – more acute in capacity-constrained markets
• Limited scheduling opportunities to manage intraday changes in electric load
• Too many hours between the last opportunity to schedule and the end of the gas day
Timely Nomination

Moving the Timely nomination deadline to 1:00 pm CT:

– Allows generators increased opportunities to make a timely nomination, particularly if electric dispatch schedules are also changed to conform to this modification
– Increases value of firm transportation
– Helps reduce forecasting errors

However:

– Requires increased time by schedulers and traders: anywhere from 20 to 30% increases based on size of company’s scheduling division
– Reduces time for pipelines and LDCs to confirm and schedule and for producers and customers to react
Timely Nomination

• Considered moving the Timely nomination deadline to later in the afternoon:
  – To give generators more time to know power commitments and greater opportunity to participate in timely nomination cycle
    • Most pipeline capacity is confirmed in the Timely cycle with other cycles used primarily to tweak existing nominations

• However:
  – Pipelines and LDCs require four hours to complete confirmation process for Timely cycle; moving beyond 1:00 pm CT highly problematic if cycle not completed by end of the business day (leaves transactions unsettled until evening)
  – 1:00 pm option is doable but adds costs due to extending business day for scheduling
Intraday Changes

Providing 2 bumpable intraday cycles during business hours increases opportunities for generators to:

– Manage intraday variations in load and accommodate changes in dispatch orders throughout the day
– Bump interruptible transportation during the day if they hold firm transportation
– Flow more gas intraday (18 hours of flow/75% at ID 1, as opposed to the current maximum intraday flow of 16 hours/67% in ID 1)

However:

– Increased staffing costs
– Allows bumping later in the day – leaving less time in the business day to redo transactional arrangements when bumping occurs
– Shortened cycle time may make process more difficult depending on how active the cycle turns out to be
Intraday Changes

• Considered numerous cycle times and schedules
  – If a nomination is not confirmed, shipper must coordinate alternative supply and transportation arrangements
  – Adequate time needed between cycles
  – Overlap between cycles should be minimized
  – Bumpable cycles must be concluded by end of business day so that schedulers and traders can end their day knowing that their gas will flow
Additional Late Intraday Cycle

Adding a third, late intraday cycle for gas flow at 12:00 midnight:

– Increases opportunities for generators to arrange for fuel supplies starting at the beginning of the electric day, helping to avoid derates during the morning electric ramp-up period
– Increases opportunities for generators to accurately forecast gas needs and manage imbalances prior to the end of the gas day
– Reduces the gap between the last scheduling opportunity and the end of the gas day to 12 hours (with 9 hours of gas flow remaining)

However:

– Given potential lack of liquidity in the evening, cycle may be primarily used to move gas into or out of storage
– Increased staffing will be needed to manage an additional late cycle
Additional Late Intraday Cycle

• Considered numerous cycle times and schedules:
  – Cycles after normal business hours must be no-bump
    • Creates cascading effect on supply transactions that cannot be easily redirected if cut in later periods
    • Not all industry participants are financially equipped to stay open to deal with late night transactions
  – While gap between last nomination opportunity and end of the gas day could be closed even further, it reduces amount of hours of gas flow remaining
    • 12 hour gap (with 9 hours of gas flow remaining) seems a good balance
Start of Gas Day

Thoroughly considered changing the start of the gas day:
  – 12:00 midnight, 3:00 am, 6:00 am, and 12:00 noon CT

However:
  – Nighttime gas day start times raise significant safety concerns
    • actions take place at the start of the gas day (e.g., changes of physical flows, maintenance, declarations of force majeure)
    • should be limited to emergency situations
  – Shipper imbalances may become more difficult to manage if gas day is moved to night-time
  – Different gas day start times have vastly different impacts by region
  – Some existing contracts based on the start of the gas day (options need to be exercised prior to gas day start)
  – Consensus that uniform gas day must remain at 9am CT
Further Dialogue

• Gas industry committed to further dialogue
  – Willing to consider suggestions that recognize gas industry operations and that are effective in improving electric reliability
  – Continued dialogue on addressing gas infrastructure expansion issues

• FERC anxious to see progress
  – Mutual interest in reaching consensus
    • FERC process likely to be contentious and time consuming with substantial uncertainty as to outcome
    • Both industries want improved coordination through a timely and efficient process