

**Emerging Issue #RAS-3: *Gas-Electric Interdependency***

Emerging Issue	Item	Specifics
Horizon	<b>Number of years</b>	Current and On-Going
Status	<b>Emerging or Standing</b>	Standing
	<b>Technical Group</b>	Reliability Assessment Subcommittee (RAS)
Background	<b>Description</b>	<p>The majority of new North American generating capacity projected for the next ten years will rely on natural gas as its primary fuel. With a shift to unconventional gas production in North America, the potential to increase availability of supply makes gas-fired generation a premier choice for new generating capacity in the future, overtaking and replacing coal-fired capacity. However, increased dependence on natural gas for generating capacity can amplify the bulk power system’s exposure to interruptions in natural gas fuel supply and delivery. Mitigating strategies, such as storage, firm fuel contracting, alternate pipelines, dual-fuel capability, access to multiple natural gas basins, nearby plants using other fuels, or additional transmission lines from other areas, can contribute to managing this risk.</p> <p>In addition, going forward the electric sector will be responsible for most of the growth in natural gas demand. The combination of this growth in gas demand within the electric sector and its changing status among the gas consuming sectors has increased significantly the interdependences of the two industries, and caused many within both industries to focus more sharply on the interface between the two industries. A key element of this focus on the interface between the two industries is the need for increased coordination between the two industries, particularly at a regional level.</p>
	<b>What changes during the 10-year horizon?</b>	Over the next ten years, a significant amount of gas-fired generation is projected—45 GW of Planned and an additional 48 GW of Conceptual capacity.
	<b>What is the impact to regional reliability?</b>	<ul style="list-style-type: none"> <li>• Increased dependence on natural gas</li> <li>• Just-in-time fuel source</li> <li>• Contracting practices resulting in insufficient supplies for electric generators</li> <li>• Large, common-mode failure on pipeline resulting in multiple unit outages</li> <li>• Insufficient communication and coordination between the two industries could result in real-time and emergency challenges, as well as lack of integrated long-term planning.</li> </ul>

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Assessment Factors	<b>Resource Adequacy Considerations</b> [Yes/No]?	Yes. Real-time availability of gas-fired generation could be hampered by insufficient gas-supplies stemming from production (e.g., well-head freeze offs), contracting practices (e.g., non-firm, interruptible service), and uncoordinated response to pipeline system conditions (e.g., pipeline fractures, pressure limits).
	<b>Transmission Adequacy Considerations</b> [Yes/No]?	Yes. Transmission must be considered as new gas-fired generation comes online.
	<b>Resource Siting Impacts</b> [Yes/No]?	Yes. Siting new gas plants at existing locations (coal brown-field sites for example) may be difficult due to pipeline availability/capacity in the area. The current layout of the gas pipeline network and the transmission network would make it difficult (economically) to site generation without considering the limitations of both. This is especially true if the new gas plant is not purchasing a long-term firm contract for gas delivery and transportation.
	<b>Operations Impacts</b> [Yes/No]?	<p>Yes. Real-time availability of gas-fired generation could be hampered by insufficient gas-supplies stemming from production (e.g., well-head freeze offs), contracting practices (e.g., non-firm, interruptible service), and uncoordinated response to pipeline system conditions (e.g., pipeline fractures, pressure limits).</p> <p>Communications and coordination between two industries are hampered by the incompatibility between the traditional gas day, traditional electric day, and the market day (in market areas), which increases the difficulty of the gas industry providing the needed services to its largest consumer. Additionally, pipeline communications and coordination have generally continued between pipeline system operators and its customers—generators, not Reliability Coordinators or Balancing Authorities.</p> <p>Contracting practices also make it difficult to plan the flexibility needed for both industries' reliable operation. A coordinated approach for engaging the two industries to come together and develop compromising solutions to address operational strategies, operational changes, and tariff changes is critical. In some cases, vital information needed for the reliable operation of the bulk power system is not exchanged or shared with system operators from both industries.</p> <p>Gas shortfalls caused problems for some generators in Texas, although not nearly to the extent as did direct weather-related causes such as equipment failure from below-freezing temperatures. In ERCOT, the outages and derates from inadequate gas supply during the cold weather event totaled 1,294 MW, compared to a peak net capacity reduction of 14,453 MW. While gas supply to Salt River Project and El Paso Electric was compromised due to problems at the Chevron Keystone Storage Facility, those utilities' generators failed for other reasons. However, during the 2003 cold weather event, there were significant gas curtailments to electric generators in Texas, which affected generating capacity.</p>

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	<b>Remaining Uncertainties</b>	<ul style="list-style-type: none"><li>• Federal policies for mitigating dependency on any one fuel, regulatory changes, and tariff modifications to reflect growing concern of interdependency</li></ul>
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