

US gas interchangeability policy ripples through global LNG industry

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In response to growing concerns related to the interchangeability of new sources of natural gas, in particular regasified LNG, with the historic US natural gas stream, the Federal Energy Regulatory Commission issued a policy statement in June of this year that addresses gas quality and interchangeability.

Although the policy statement seeks to respond to concerns voiced by industry stakeholders up and down the chain, for LNG importers and terminal operators, important questions remain unanswered.

Most notably, FERC's policy statement requires that all gas composition standards be set forth in a pipeline's FERC-approved tariff and adopts the Natural Gas Council Plus's (NGC+) Interim Guidelines as the baseline for evaluating proposed gas-quality and interchangeability standards in such tariffs.¹

It also outlines FERC's process for adjudicating disputes between pipeline operators, gas customers, and LNG suppliers, who in recent years have been wrangling over gas composition and heating-value specifications.

By clarifying federal policies and procedures, FERC's June policy statement lends support to LNG infrastructure development and clearly recognizes the vital role that LNG will play in the US's energy-supply portfolio. But at the same time, the policy statement and recent FERC rulings underscore the complexities and uncertainties in the interchangeability debate, particularly in determining the potential impact on end-use facilities.

These impacts may include impaired performance, equipment damage, increased emissions, and other safety and reliability issues. In seeking to balance the competing interests, the commission calls for "flexible tariff provisions [that] will allow pipelines to balance safety and reliability concerns with the importance of maximizing supply, while recognizing the evolving nature of the science underlying gas quality and interchangeability specifications."²

Recognizing that not all end users can tolerate the same degree of variation in gas composition and that pipeline tariffs define "pipeline quality" gas differently, FERC did not adopt a

"one-size-fits-all" approach to setting gas-composition policies and standards. Rather, the commission's policy statement prescribes a case-by-case, tariff-by-tariff approach to reconciling operational and safety concerns of end users with energy-policy priorities.

This case-by-case approach affects all stakeholders in the US gas industry, from LNG importers to end users. In particular, developers and operators of LNG infrastructure face the prospect of tightening standards and increased processing costs, as they negotiate with downstream players about what "flexible" means.

NGC+ GAS COMPOSITION STANDARDS APPLIED

Table 1

	NGC+		FGT	
	Minimum	Maximum	Minimum	Maximum
Wobbe Index	1,302	1,400	1,340	1,396
Heating value, btu/std. cu ft	—	1,110	1,025	1,110
Heavy hydrocarbons (C ₄ +) %	—	1.5 mole %	—	1.2 mole %
Total inerts	—	4.0 mole %	—	3.0 % (vol)*

*Total combined CO₂ and N₂.

Sources: "White Paper on Natural Gas Interchangeability and Non-Combustion End Use," Natural Gas Council Plus (NGC+) Interchangeability Work Group, Feb. 28, 2005; 115 FERC ¶63,009, Docket Nos. RP04-249-001, Initial Decision, Apr. 11, 2006.

Interchangeability defined

FERC's June policy statement emerged from a multi-year process of hearings, conferences, and working groups that began in earnest in February 2004 with a FERC technical conference convened to fulfill the recommendations of a report published by the DOE-commissioned National Petroleum Council (NPC).³ The NPC report had identified natural gas interchangeability standards as an important step "to allow a broader range of LNG imports."

As a result of the February 2004 technical conference, the Natural Gas Council—a private organization representing various gas-industry stakeholders—formed a working group known as NGC+ to study gas-quality and interchangeability issues and develop industry consensus on standards and specifications for gas composition.

After a year of work, the NGC+ filed two White Papers with FERC containing technical recommendations and policy information related to gas quality and interchangeability.⁴ These White Papers recommend interim guidelines for addressing gas quality and interchangeability issues.

These industry efforts, related FERC inquiries, and administrative proceedings form the basis for the policy statement that sets forth FERC's generic policies and procedures for regulating gas quality and interchangeability issues.

Rather than prescribing rigid national standards, however, FERC’s policy statement describes a general framework for stakeholders in US gas markets to address gas-composition issues. FERC built this framework upon the foundation of the NGC+ Interim Guidelines (Table 1). In “negotiating technically based solutions, pipelines and their customers are strongly encouraged to use the [NGC+] interim guidelines ... as a common reference point,” the commission stated.

Moreover, in direct response to earlier complaints, FERC mandated that gas-composition requirements be included in FERC-approved pipeline tariffs. As such, FERC’s policy encourages pipeline operators facing interchangeability issues to specify gas-composition factors as “essential standards” in their tariffs.

FERC’s statement also endorses the principles of flexibility and technical diligence for developing gas-quality and interchangeability provisions in individual pipeline tariffs. The commission admonished stakeholders to cooperate with each other in developing workable tariffs, with specifications based on the actual technical requirements of downstream systems and end users. The “limits themselves must be derived to fit within the specific circumstances of each pipeline,” the commission stated.

And while FERC encouraged industry stakeholders to address gas-composition issues outside FERC proceedings, it assured them that, if necessary, FERC would address disputes on a case-by-case basis, subjecting them to factual discovery and technical review.

Beyond these basic principles, FERC’s policy statement has imposed very little on the gas industry. For example, it did not prescribe techniques LNG suppliers should use to meet tariff requirements, saying only that blending of gas in the pipeline and other methods should be “implemented on a non-discriminatory basis and in a manner that is consistent with safe and reliable operations.”

Indeed, the policy statement itself takes up fewer than eight pages of a 35-page document. In these 8 pages, however, FERC set forth a path for industry stakeholders to follow in addressing gas-composition issues in the months and years to come.

Additional guidance may be found in other FERC administrative rulings.

Adjudicating disputes

FERC issued its June policy statement amid increasing conflict over gas-quality and interchangeability issues. A dearth of legal precedents and policy guidance had exacerbated an uncertain and contentious situation, which threatened to delay LNG

GAS-COMP SPECS ADOPTED IN AES OCEAN EXPRESS

Table 2

	Minimum	Maximum
Wobbe Index	1,340	1,396
HHV (Market Area)	1,025	1,110
HHV (Western Division)	1,022	1110
Methane number	80	—
C ₁ - methane	85 mole %	—
C ₂ - ethane	—	10 mole%
C ₃ - propane	—	2.75 mole%
C ₄ + - butanes +	—	1.2 mole%
C ₅ + - pentanes +	—	0.12 mole%
CO ₂ + N ₂ (combined)	—	3% by volume
CO ₂ (not used as dilutant)	—	1 %
O ₂ - oxygen	—	0.25 vol %
Hydrogen sulfide	—	0.25 grains/100 cu ft
Total sulfur	—	2 grains/100 cu ft
Water vapor Temperature	—	7 lb/1,000 Mcf 120° F.
	FGT can determine on case-by-case basis	
Wobbe rate of change	—	2%/6 min

projects badly needed to buttress US gas supplies.⁵

In recent years, the commission grappled with interchangeability-related questions in a number of proceedings, including tariff proposals, project-permitting processes, and complaint hearings. Several recent FERC cases illustrate how the commission’s interchangeability policies apply in practice.

For instance, in AES Ocean Express vs. Florida Gas Transmission (FGT), a FERC administrative law judge approved a pipeline tariff with gas-composition standards more stringent than the NGC+ Interim Guidelines, based on demonstrated operating requirements of end users. As the first case fully litigated before FERC that centered on imported LNG and gas-composition issues, AES

Ocean Express set some important precedents for gas-industry stakeholders going forward.⁶

In that case, downstream stakeholders argued that gas supplies with heating values outside a narrow range could create performance problems for end-use facilities—most notably gas-turbine generators using sensitive low-NOX combustors.

In April 2006, FERC Administrative Law Judge Herbert Grossman decided in favor of FGT’s proposed tariff requirements, saying its proposed gas-composition standards—including Wobbe Index limits set between 1,340 and 1,396—were just and reasonable (Table 2).⁷ These tariff limits were based on operating specifications for specific Siemens-Westinghouse gas-turbine power plants on Florida Power & Light’s system that would receive significant amounts of fuel from the Ocean Express LNG terminal.

As this issue went to press, the commission has not acted upon Judge Grossman’s decision, and it has not resolved the concerns of all stakeholders. For example, some participants in the Western Florida market have argued that application of uniform standards across the FGT system results in more restrictive gas-composition standards than historically applied. But FERC has addressed other cases in ways that further demonstrate and amplify its stated policy.

One day after it issued its policy statement, the commission approved Dominion Cove Point LNG LP’s application to expand its LNG regasification terminal in Lusby, Md.⁸ In that proceeding, several entities protested Cove Point’s proposal on the basis of concerns related to gas composition. In particular, utility Washington Gas Light Co. alleged that lean gas from the Cove Point LNG terminal contributed to a series of distribution-line failures in WGL’s territory in Prince George’s County, Md. WGL argued Cove Point’s application for expansion should be

denied until Cove Point proves WGL's infrastructure would not be harmed.

Through a series of inquiries and studies, FERC considered the possibility that low levels of heavy hydrocarbons in regasified

development but also will work to minimize risks for downstream stakeholders. It encourages stakeholders to negotiate gas-quality conditions before coming to the commission but will arbitrate disputes as needed.

Toward that effort, the NGC+ Interim Guidelines will provide a reasonable starting point, but the commission will not be bound by them. Instead FERC will weigh specific factors that might merit different local standards or restrictions.

The mandate is on gas-market stakeholders to ensure their concerns are adequately addressed in pipeline tariffs and project proceedings.

Bearing the burden

As a result of these cases and FERC's guidance in the policy statement, pipelines, end users, LNG suppliers and terminal operators should work and, in some cases, are working more closely together in informal settings to settle questions about gas-quality and interchangeability requirements. Pipelines such as Transcontinental Gas Pipe

Line Corp. and Dominion Transmission Inc., for example, have announced customer meetings to discuss changes in tariff terms, and it is anticipated that these types of discussions will continue to occur across the US gas-supply market.

In many cases, existing tariffs already specify gas-composition standards, which might merit revisiting or adjustment. In other cases, such standards are nonexistent or vague and will be developed in accordance with FERC's stated policies (Table 3).

Pre-filing and post-filing processes serve a vital role in addressing the concerns of downstream stakeholders and assessing the impact of restrictions. Accordingly, stakeholders have strong incentives to involve themselves in these proceedings. Petitioners who engage early and remain engaged stand the best chance of ensuring their interests are appropriately considered—in terms of operational conditions and costs, through tariffs and project-approval procedures.

As tariffs become finalized in multiple jurisdictions during the coming months and years, LNG importers and terminal operators will bear the burden for ensuring regasified LNG conforms to gas-composition requirements. In practical terms, LNG suppliers face a choice between four primary options:

1. Import LNG from sources that already meet tariff requirements and plan to treat regasified LNG from sources that do not. LNG from tariff-compliant sources might merit a premium in the US market.
2. Add stripping facilities at regasification plants to remove heavier hydrocarbons to decrease the heating value—or use US terminals that already have such capabilities. The market value

GAS-QUALITY STANDARDS OF SELECT INTERSTATE PIPELINES

Table 3

Pipeline	Wobbe	Heating value, btu	Total inert	Status of standards
Columbia Gas Transmission Corp.	No limit	967 min.	No current limit; proposed: 4% (0.02% O ₂ ; 1.25% CO ₂)	FERC filing; informal settlement discussions, summer-fall 2006
Columbia Gulf Transmission Co.	No limit	978 min.	4% (1% O ₂ ; 3% CO ₂)	Expected compliance filing (may propose changes), summer 2006
Transcontinental Gas Pipe Line Corp.	No current limit; proposed: 1,300-1,400	980-1,100; proposed: 980-1,110	No current limit; proposed: 3% (0.1% O ₂ ; 1% CO ₂ ; 2% N ₂)	Customer meetings, summer 2006
Iroquois Gas Transmission System LP	No limit	950 min.	4% (0.2% O ₂ ; 3% CO ₂)	Customer meetings, 2005-06
Dominion Transmission Inc.	No limit	967-1,100	5% (0.2% O ₂ ; 3% CO ₂ ; 4% N ₂)	Customer meetings, fall 2006
Dominion Cove Point LNG LP	No limit	967-1,100	No total limit (0.2% O ₂ ; 1% CO ₂ ; 4% N ₂)	Currently, no change proposed
Texas Eastern Transmission, LP	No limit	967 min.	4% (0.2% O ₂ ; 3% CO ₂)	Discussions with customers, 2006-07
Tennessee Gas Pipeline Co.	No limit	967-1,100	4% (0.2% O ₂ ; 3% CO ₂)	Currently, no change proposed
El Paso Natural Gas Co.	No limit	967 min.	3% (0.2% O ₂ ; 2% CO ₂) but certain grandfathered receipt points	Currently, no change proposed
Southern Natural Gas Co.	No limit	950 min.	3% (3% CO ₂ or N ₂ ; 1% O ₂)	Currently, no change proposed

LNG from Cove Point might have contributed to WGL's coupling failures. The commission concluded WGL's claims "provide no basis" to deny Cove Point's application. The "application of hot tar and the increase in operating pressures on WGL's distribution system were the more significant causative factors of the leaks..." the commission said. Shrinkage "due to a change in HHC is well within the design margin of safety and should not have caused the leaks."

In such cases, FERC has been thorough in its efforts to understand the evidence and review relevant studies, as well as conduct numerous hearings and conferences to gather information. In further keeping with the policy statement, it has continued adjudicating these issues as part of new-project filings as well as tariff proceedings.

In the Crown Landing LNG order,⁹ FERC reiterated its policy that new projects being authorized under Sections 3 and 7 of the Natural Gas Act should, as a matter of course, include information in their filings that shows ability to comply with tariff terms and conditions. Adhering to its policy statement principle that gas-composition standards are enforceable only if they are included in the tariff, in Crown Landing, the commission concluded "We see no reason why [the pipeline] cannot ensure adequate protection of its own system by enforcing the provisions of its own tariff."

This series of rulings illustrates how FERC's policies on gas quality and interchangeability translate into practical standards for pipelines, end users, and LNG suppliers and terminal operators. In short, the commission will encourage LNG facility

of these hydrocarbons might not always justify their separation from the fuel stream, but reselling such resources will help offset the cost of meeting tariff specifications.

3. Blend regasified LNG with domestic pipeline gas to achieve a compliant mixture. Blending may be feasible at sites with a large amount of nearby storage capacity, but generally pipeline operators cannot control nominations from gas-storage facilities. As a result, depending on location, blending may be an unreliable solution.

4. Blend LNG of varying sources and gas compositions in the tank at the terminal facility.

5. Inject nitrogen or other inert gases into gasified LNG to reduce its heating value. Inert injection might be the most economical approach in many circumstances, but the regasified LNG must meet tariff requirements for content of inert gases—most importantly nitrogen CO₂ and oxygen, which can affect pipelines and end-use equipment.

Whichever strategies they choose, LNG suppliers and terminal operators must factor the costs and operational implications of these solutions into the commercial calculus for their LNG-import plans. Such considerations will be particularly critical for long-term LNG-supply agreements, in which even small cost factors can alter financial assumptions dramatically.

These assumptions likely will change further, as ongoing research and operating experience provide a more complete picture of how imported and unconventional gas supplies affect US gas consumers. As gas-composition standards and the definition of “flexible tariff provisions” continue evolving, participants in US gas markets can most effectively protect their interests by understanding interchangeability issues and staying engaged in related proceedings.

Given the stakes involved, participants in the US gas-supply market will find ways to accommodate changing standards. With FERC’s policies to guide them, end users, pipelines, and suppliers will define structures that work, one case at a time.

References

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6. 115 FERC ¶63,009, Docket No. RP04-249-001.

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8. “Order Issuing Certificates and Granting Section 3 Authority,” June 16, 2006, FERC Docket Nos. CP05-130-000, -001, -002; CPO5-131-000, -001; CP05-132-000, -001.

9. 115 FERC ¶61,348, Docket Nos. CP04-411-000, CP04-416-000. **LNG**

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