

Gas Nomination Timeline Impact Upon LDC Operations

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Local Distribution Company (LDC) Goal:

Provide Safe, Economic and Reliable Service to Customers.

Most LDCs have a statutory Obligation to Serve.

Gas Control/Dispatch has a central role ensuring that customers are served:

- Monitoring system pressures and flows, deploying contingencies as needed.
- Keeping the system in balance to avoid an adverse impact on reliability and to promote structural integrity.
- Maintaining constant contact with pipelines and suppliers.

ˆ From Section 5 (a) of the Natural Gas Act ... “gas distributing company”

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LDC/Customer Load Characteristics

LDC Customers, for the most part, take gas on demand.

Most Customers, particularly residential and small commercial customers, have weather responsive consumption profiles. Even the largest industrial customers sometimes have a weather responsive demand component.

Industrial Customers typically have a process dependent load profile, consuming the bulk of their daily requirement during the hours their manufacturing process is running, for example, 24/7, M-F 9-5, or based upon product pricing.

Gas-fired Electric Generation can be a large component of the LDC's load with the potential to create large load swings. Some generators have no base load.

Most customers have a base load component, that is, a portion of the load that is neither weather or process dependent. The base load component can sometimes be seasonal.

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LDC/Customer Load Characteristics (continued)

As a whole, the cumulative customer load does not occur on an even-hourly basis. A common LDC load profile has a major peak from 7 A.M. to 9 A.M. local time and a secondary peak from 5 P.M. to 7 P.M. local time.

Every LDC is a little different. The presence of on-system balancing or gas-fired electric generation behind the city gate can alter the LDC load profile described above.

LDCs balance the load throughout the day by relying upon system line pack (usually very minimal on LDCs) and a mix of firm pipeline services, for example, No-Notice, peaking, storage and other balancing services.

Some LDCs also have storage assets, LNG and/or other peaking facilities attached to their systems. Flexible pipeline takes and interruptible services can also make a contribution towards balancing.

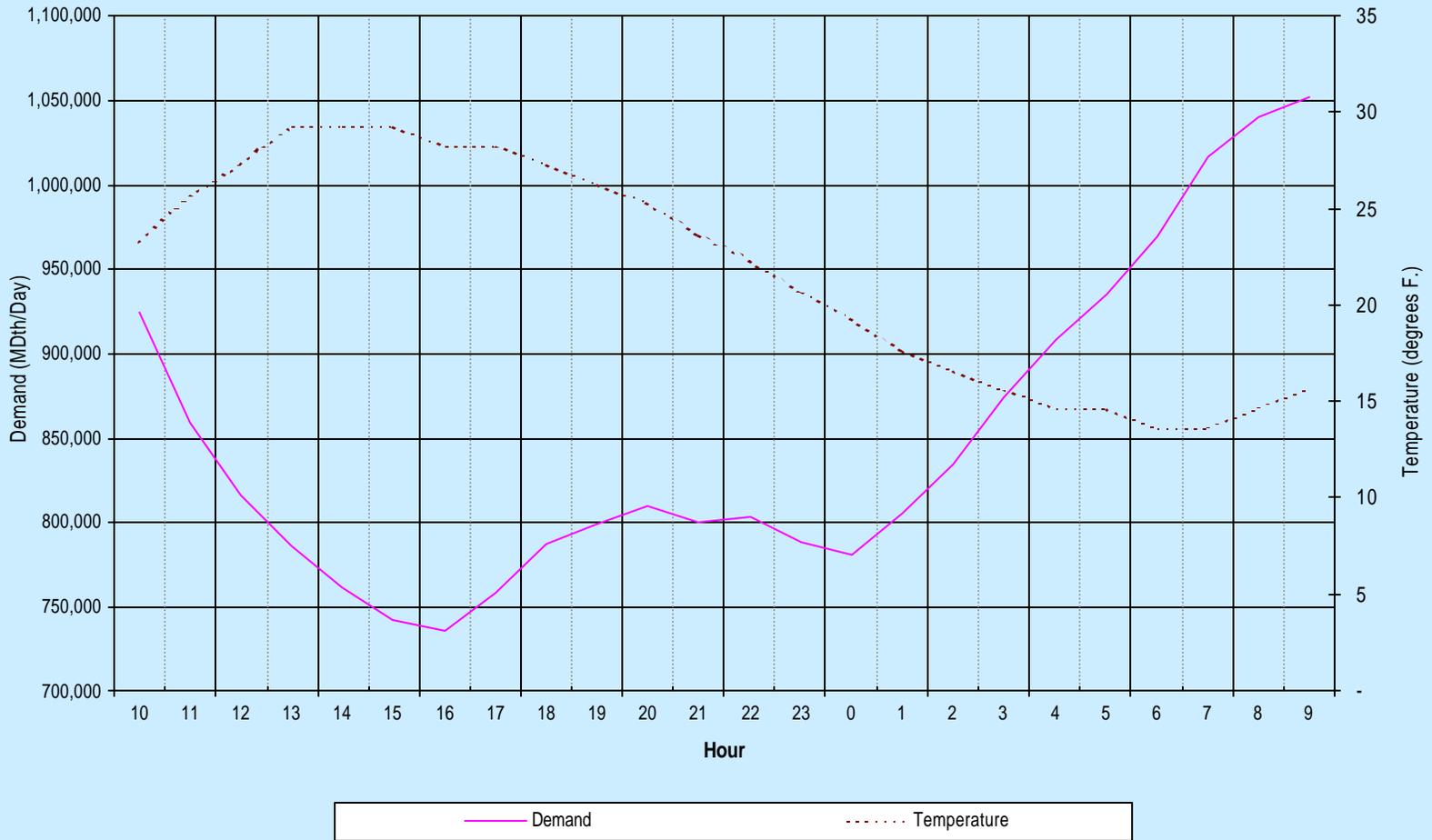
Gas Nomination Timeline Impact Upon LDC Operations

The Gas Nomination Timeline is a key tool, helping to match system supplies with customer demand.

To determine how much should be nominated, an LDC forecasts market demand and projects deliveries by third-party suppliers for transportation customers.

In order to provide its backstop function at the city gate, the LDC contracts for a mix of firm services and supplies to meet its (the market's) requirements. Firm supply contracts will sometimes provide for flexibility in terms of daily take obligations.

Demand and Temperature for a gas day



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Concerning the gas nomination timeline and transportation on the gas grid, LDCs have multiple roles:

Pipeline Shipper (nomination role)

- LDCs place nominations on pipelines to move supplies from receipt points to the city gate and/or other delivery points.

Transportation Scheduling (operator role)

- LDCs process nominations from their End User customers and/or their suppliers to transport gas from the city gate to the customer burner tip.

Point Operator at the City Gate (confirmation role)

- LDCs reconcile nomination information with the pipeline to develop a schedule for the city gate.

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Gas Supply Planning/Nomination Timeline:

Based upon the weather forecast and other consumption intelligence, the LDC develops a consumption forecast for the next gas day - 9 A.M. to 9 A.M. Central Clock Time (CCT).

Gas Supplies and transportation services are nominated in quantities sufficient to meet forecasted customer demand by 11:30 A.M. CCT the day before gas flows (Timely Cycle).

- Note1: The gas nominated at the Timely Cycle does not begin to flow for another 21 ½ hours.
- Note 2: Except for western LDCs, the peak morning burn falls at the end of the gas day or approximately 44 hours from the time the nomination is placed. This creates a balancing challenge because the morning peak is the largest source of load forecasting error and it occurs well after the last intraday nomination deadline.

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Gas Supply Planning/Nomination Timeline (continued):

By 4:30 P.M. CCT, the LDC learns whether gas (including third party gas) nominated at the timely cycle was scheduled.

- Nominated gas is not scheduled (at any cycle) for a variety of reasons including insufficient transportation priority, loss of supply and confirmation errors.

Additional nominations to accommodate changed forecasts and to replace timely nominations that were not scheduled are placed by 6:00 P.M. CCT the day before gas flows (Evening Cycle) by the LDC and in some cases, third parties.

Note: The gas nominated at the Evening Cycle does not begin to flow for another 15 hours.

Gas Nomination Timeline Impact Upon LDC Operations

Gas Supply Planning/Nomination Timeline (continued):

By 9:00 P.M. CCT, the LDC learns whether gas nominated at the evening schedule was scheduled. If gas scheduled at the timely cycle utilized interruptible transportation, it may become unscheduled or “bumped” by gas scheduled under a firm transportation schedule.

Additional intraday nominations (Intraday 1 cycle) can be placed during the gas day at 10:00 A.M.CCT to begin flow at 5:00 P.M.CCT. As with the evening cycle, gas scheduled at prior cycles utilizing interruptible transportation may be “bumped” by gas scheduled under a firm transportation schedule. An intraday 1 nomination can provide at least two-thirds of the contract maximum daily quantity.

And finally, additional intraday nominations (Intraday 2 cycle) can be placed during the gas day at 5:00 P.M. CCT to begin flow at 9:00 P.M.CCT. No gas scheduled at prior cycles may be “bumped” by gas scheduled regardless of service priority. An intraday 2 nomination can provide at least one-half of the contract maximum daily quantity.

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No-Notice Service – the descendant of pre-Order 636 bundled pipeline sales services.

LDCs, in most cases, are more likely to depend upon the timely and evening cycles to schedule gas. Each of these cycles results in a full day's quantity.

When capacity is tight, that is, situations where no interruptible gas is flowing and the pipeline is flowing at or near capacity, no gas can be bumped. Depending upon a variety of operational factors and assets on hand, intraday nomination cycles 1 and 2 provide less value to some LDCs.

While intraday nominations could be used to approximate the daily load profile, LDCs most often rely upon No-Notice used to balance hourly flow fluctuations and to accommodate the difference between supply scheduled to the system and market demand on a daily basis.

No-Notice also reduces staffing requirements – more intraday nomination deadlines would require additional staff to handle the nomination/confirmation process.

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No-Notice Service (continued)

No-Notice Service varies from pipeline to pipeline often relying upon pipeline storage assets. The pipeline may have unique rules fashioned around its capabilities and assets.

Sometimes, the combination of a firm transportation service and a firm storage service create the no-notice service. In addition to providing hourly balancing, the daily difference between gas scheduled and gas delivered at the city gate is injected into storage or withdrawn from storage.

In other cases, multiple balancing services can be tied to the city gate imbalance. The LDC instructs the pipeline through a ranking mechanism which services to utilize in high burn or low burn situations.

While the amount of no-notice service is often proportional to the primary delivery capacity contracted to a primary delivery point, lower priority deliveries (such as secondary firm) that are scheduled to the same delivery point, in some cases displace or decrease no-notice and unscheduled primary firm rights.

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Third Party Transportation on LDCs

Increases the complexity and uncertainty of supply planning and balancing. LDCs may operate under three broad regulatory and/or business paradigms:

1. LDCs that provide bundled sales service to all of their customers.
2. LDCs providing transportation services that permit their largest customers (industrial and commercial) to arrange for their own supplies.
3. LDCs providing transportation services that permit all customers (including residential) to arrange for their own supplies.

LDCs often coordinate with transportation customers and their suppliers to balance the system. In some cases, LDCs require third party suppliers to hold firm transportation capacity and can direct them to bring additional supplies. Those suppliers will place intraday nominations, if necessary, to meet their share of the market.

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Third Party Transportation on LDCs (continued)

Depending upon business circumstances and the regulatory environment, LDC's support the Gas Nomination Timeline (and Intraday nominations) in varying degrees:

- Some LDCs provide all balancing at the city gate – transportation customers (if present) do not place intraday nominations.
- Other LDCs provide their transportation customers with limited intraday nominations.
- Finally, some LDCs fully support the gas timeline (including all intraday nominations) and have full-blown nomination systems. In effect, these LDCs schedule like a pipeline.

No matter which model, in the end, the LDC is responsible for seeing that its system is in balance on both an hourly and daily basis.

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Regional Pipeline Grid Considerations

In some areas of the continent, transportation capacity is tight, that is, delivery capacity approximates market demand at peak periods.

In other areas of the continent, transportation capacity may exceed market demand at peak periods which makes the gas nomination timeline more forgiving in terms of scheduling, that is, intraday nominations can be more reliable. Even then, a supply constraint could undo a successful nomination.

The best way to ensure gas flow is to contract for firm capacity and firm supplies, to nominate gas at primary receipt point (where the firm supply is located) and primary delivery points (where the load is located), to nominate without error at the timely nomination cycle and match nominated flow to the best possible consumption estimate.

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Important Gas Scheduling “Rules of the Road”:

The “Lesser Of” Rule

When two confirming parties have different nomination quantities for the same transaction at an interconnect, the smaller quantity will be confirmed and/or scheduled. This means zero in some cases.

Supply reliability is key. A loss of supply at any nomination cycle can un-schedule or reduce any transaction depending upon the cycle. If the loss occurs at the intraday 1 or intraday 2 confirmation cycles, one-third and one-half of the gas originally scheduled, respectively, continues to flow (elapsed pro-rata).

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Important Gas Scheduling “Rules of the Road” (continued):

Transportation Priority: Primary Firm, Secondary Firm, Interruptible.

- At the Timely Cycle primary capacity has the highest priority and secondary capacity has priority over interruptible capacity.
- Starting with the Evening Cycle (and applicable to the Intraday 1 cycle), secondary firm capacity that has been scheduled at a prior cycle becomes equivalent to primary capacity. New nominations for primary or secondary capacity can bump scheduled interruptible capacity but primary firm cannot bump scheduled secondary firm. For unscheduled capacity, timely priorities still apply.

This leads to the rule: **Secondary Firm, once scheduled, is Firm.**

When transportation is bumped, it creates a loss of supply for a downstream party, creating a need for intraday nominations to replace the supply and/or creating a balancing demand on the LDC.

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Important Gas Scheduling “Rules of the Road” (continued):

Transportation Priority: Primary Firm, Secondary Firm, Interruptible.

- At the Intraday 2 cycle, the priority of all gas scheduled at a prior cycles (including interruptible) becomes equivalent to primary capacity. New nominations cannot bump any scheduled capacity. For unscheduled capacity, timely priorities still apply.

Each of these rules impacts an LDC from both Shipper and Operator perspectives. Even though it may be possible for the LDC or a third party to place an intraday nomination, that nomination may not have a chance of being scheduled. The LDC still bears the balancing responsibility – it will most often utilize its no-notice service to balance the system when additional nominations cannot be scheduled.

Gas Nomination Timeline Impact Upon LDC Operations

Impact of Gas-Fired Electric Generation Behind the City Gate

Much depends on the operating profile of generating facility:

– Baseload plants are much like large process customers – in effect, they dampen the LDCs load profile.

– Intermediate load generators alter the load profile depending upon the timing and duration of operation. When adequate lead-time is provided, gas supplies can be arranged in advance (often by the generator itself) and LDC operations are manageable. Usually, Generators will schedule some gas and then attempt to adjust based upon actual dispatch.

– Peaking plants, which can be dispatched with little or no advance notice, can radically alter the LDCs load profile. Due to the uncertainty of dispatch, nominations are difficult. Generator operations coincident or just in advance of LDC peak periods can significantly reduce system pressure creating operational challenges for the LDC.

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Impact of Gas-Fired Electric Generation Behind the City Gate (continued)

Much depends on the character of service provided by the LDC to the generating facility, for example, a restriction on or interruption of operation when temperatures are below a certain level.

For LDCs, whether a gas-fired generator is behind the city gate or immediately upstream, unplanned/unscheduled operation could lead to a rapid drop in pipeline pressure, which in turn, could hinder an LDC's ability to meet its Obligation to Serve.

Rapid and/or unexpected changes in consumption can also lead to increased costs for LDCs in terms of storage operations or in some cases, penalties. LDC tariffs often only contemplate monthly or daily imbalances and not hourly imbalances.

In the end, the key to successfully sharing the gas grid is a combination of appropriate gas supply and transportation contracting decisions (for services on both the pipeline and the LDC) and ensuring that operators are never "surprised".

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Impact of Gas-Fired Electric Generation Behind the City Gate (continued)

A natural tension exists between generation plant operators that want to provide minimal advance notice and gas system operators that need time to reconfigure their system. Gas moves slowly – maybe 15 to 30 miles per hour in pipelines.

Each LDC responds to sudden load changes differently depending upon its asset mix and upstream services. Even if intraday nominations are made, due the slow speed of gas, pressures can continue to drop for a period because generator consumption occurs at a faster rate.

Planning and advance notice are critical. There are operational constraints on the pipelines to deliver and the LDCs to accept a large quantity of gas within a flow day. A very large shipper cannot wait to nominate all or a significant portion of their gas needs until flow day. Operationally the gas may not physically be deliverable depending upon the hourly capabilities and/or configuration of the gas system.

Good communication is essential to ensure that gas systems can respond with short notice to increases or decreases in plant consumption. Generators, Pipelines, LDCs and RTO/ISOs need to be “on the same page” to help avoid problems and ensure the gas system is responsive to all customers.

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Questions?