

# Gas Pipelines

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## *Forward Looking Statements / Non-GAAP Financial Measures*

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# Disclosure

## *Forward Looking Statements / Non-GAAP Financial Measures*

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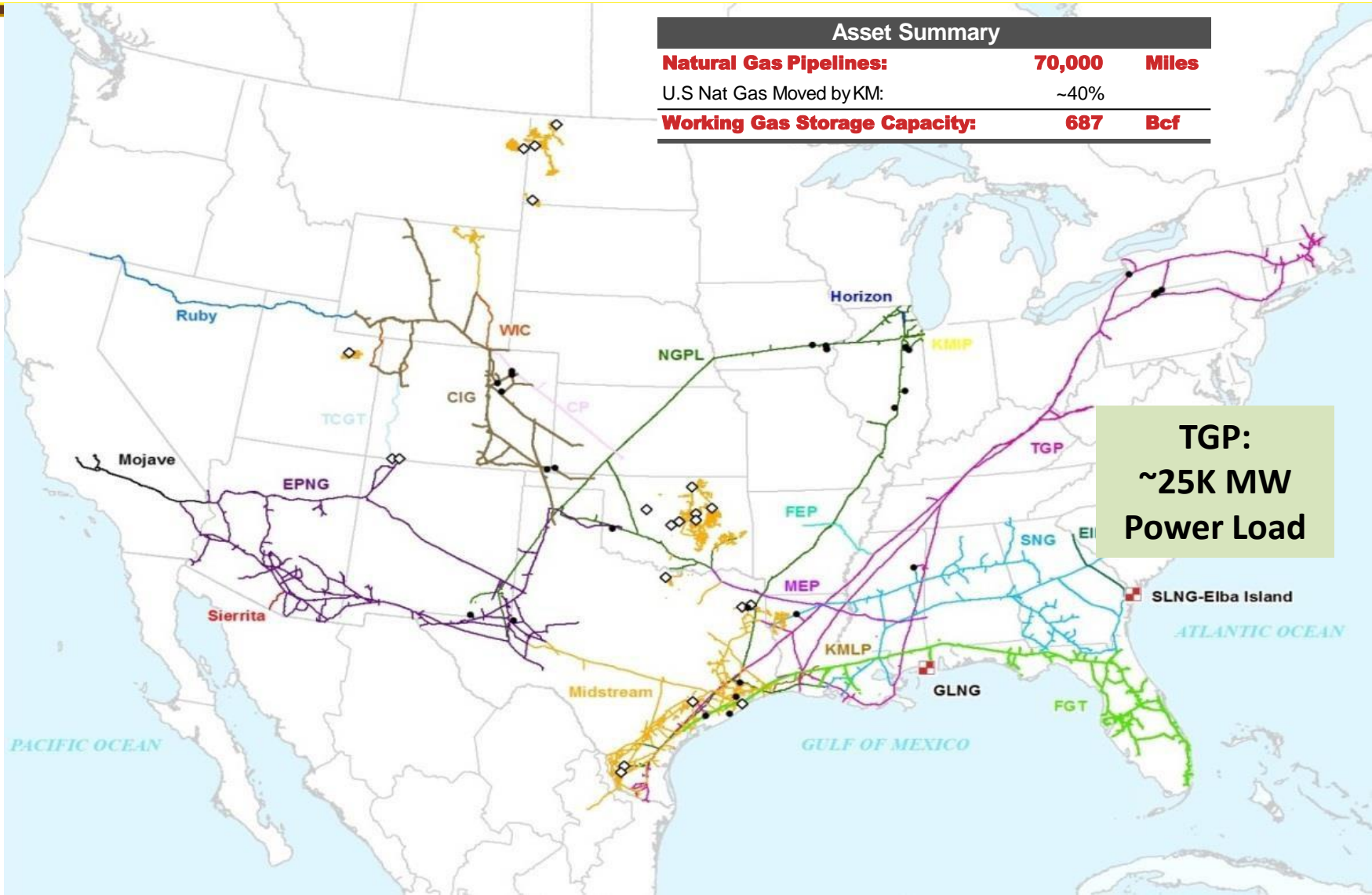
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# INTRO

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- BRIEF Overview
- Business Model
- Physical Characteristics
- Management Tools

# Overview



Asset Summary		
<b>Natural Gas Pipelines:</b>	<b>70,000</b>	<b>Miles</b>
U.S Nat Gas Moved by KM:	~40%	
<b>Working Gas Storage Capacity:</b>	<b>687</b>	<b>Bcf</b>

**TGP:**  
~25K MW  
Power Load

# Business Model

- Generates Revenue by Providing Transportation Services
- TGP is a Transmission Pipeline

<b>TGP Power Load:</b>	
-CONTRACT : 900Kdth (~110K MWH)	Flow
-AVG : 140%	/mile
-MAX : 250%	ments
<b>*Expansion Cost Allocation*</b>	<b>-Project Driven (not shared)</b>

# Physical Characteristics – Speed



# Physical Characteristics – Storage

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## Types of Storage :

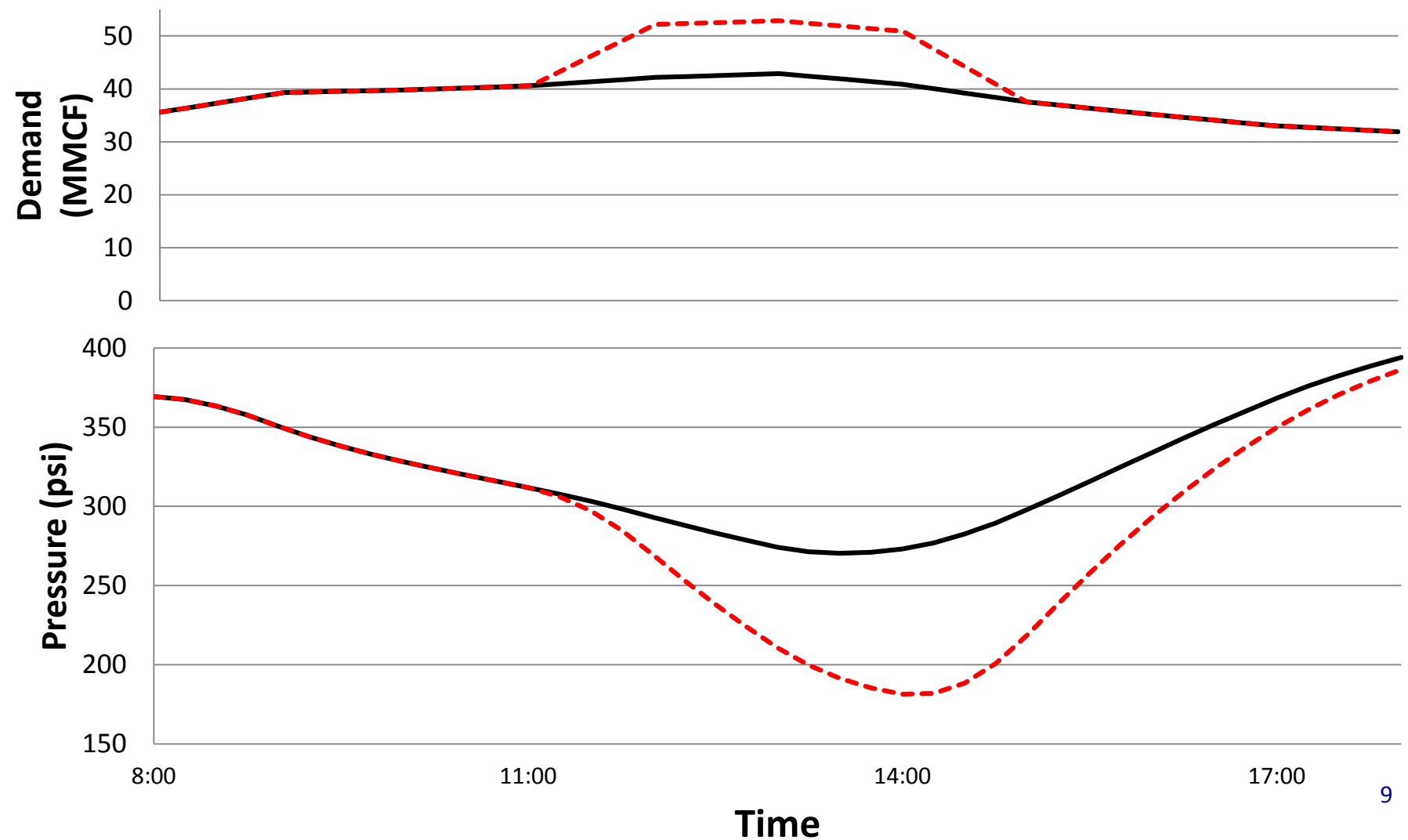
- LNG Storage Tanks
- Storage Fields
- Line Pack (Storage within the Pipe)**

[Inspiring Line Pack Video](#)

**TGP : ~50 million cubic feet of Pipe Space**



# Change in Demand Results in Change in Pressures

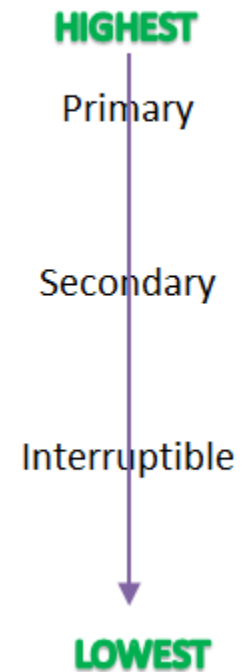


# Pipeline Management Tools – Scheduling

## NAESB Cycles eff. April 1, 2016

	Day Ahead	Day Ahead	Intra day	Intra Day	Intra day
	Timely	Evening	ID1	ID2	ID3
Nom Deadline	1:00 PM	6:00 PM	10:00 AM	2:30 PM	7:00 PM
Confirmations Deadline	4:30 PM	8:30 PM	12:30 PM	5:00 PM	9:30 PM
Scheduled Volumes Available	5:00 PM	9:00 PM	1:00 PM	5:30 PM	10:00 PM
Start of Gas Flow	9:00 AM	9:00 AM	2:00 PM	6:00 PM	10:00 PM
Hours of Flow left in Gas Day	24 Hrs	24 Hrs	19 Hrs	15 Hrs	11 Hrs
EPSQ	N/A	N/A	20.83%	37.50%	54.17%
		<i>Bumpable</i>	<i>Bumpable</i>	<i>Bumpable</i>	<i>No Bumping</i>

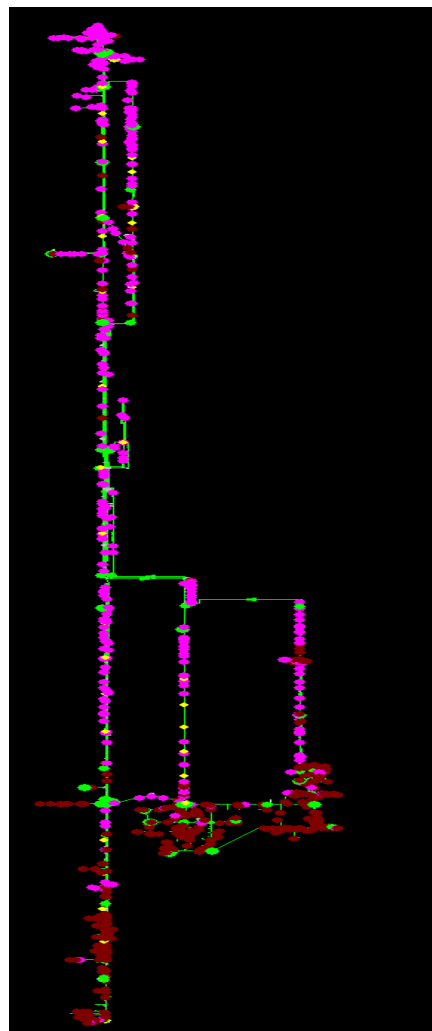
### Scheduling Priorities:



# Pipeline Management Tools – Hydraulic Simulation



Maximizing Throughputs



# Pipeline Management Tools – Maintenance Coordination

TGP - Outage Impact Report Seven Day Forecast (updated 11/02/17)									-Primary impact restrictions may be necessary
									-Major impact restrictions may be necessary
									-Minor impact restrictions may be necessary depending on flow conditions
									-Little to no impact, though minor outages may cause incremental reductions
Station # / Lateral (FH)=forward haul (BH)=backward haul	Est Nominal Design Capacity (Thousand Dth)	Saturday (11/4)	Sunday (11/5)	Monday (11/6)	Tuesday (11/7)	Wednesday (11/8)	Thursday (11/9)	Friday (11/10)	Primary Outage(s) that may Impact Throughput
Est. Operational Capacity (Operational Impact) - Thousand Dth									
Station 409 (Donna Line) (segment 490 FH)	581	581	581	581	581	581	581	581	
Station 1 (segment 101 BH)	296	296	296	296	296	296	296	296	
Station 9 (segment 109 BH)	757	720 (37)	720 (37)	720 (37)	720 (37)	720 (37)	720 (37)	720 (37)	MLV 17-1 to 12-1: Pressure Weld Replacement (M) (9/15/2017 - 11/25/2017)
Station 17 (segment 117 BH)	921	887	887	887	887	887	887	887	99% Reliable

# Pipeline Management Tools – Gas Control



# *OFO Overview*

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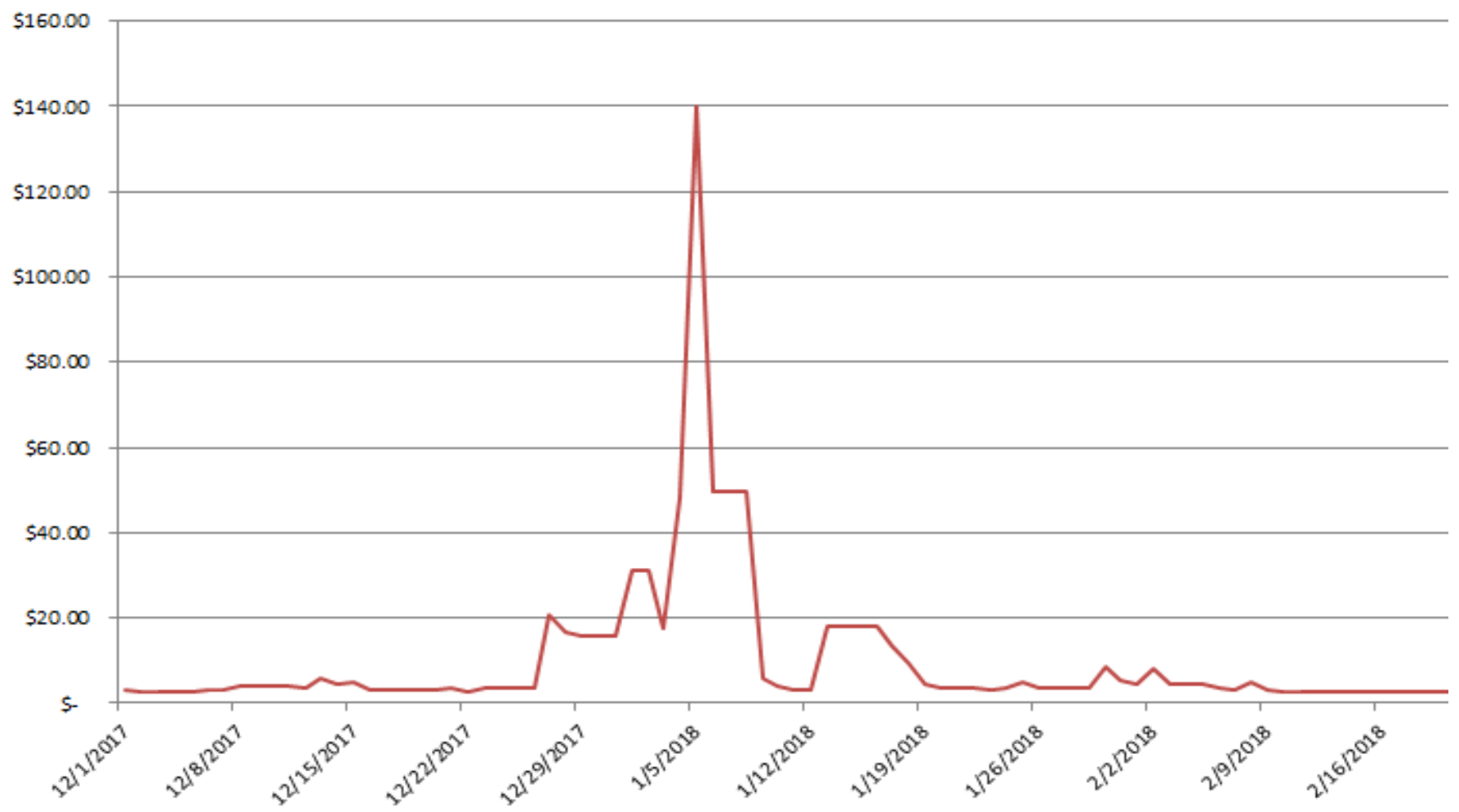
- Operational Flow Orders (OFOs) are implemented when demand is forecasted to exceed capacity
  - OFOs are used to protect primary firm services
- System conditions dictate the level of interruptible reductions and OFOs needed

# *Segment Restrictions & OFO Factors*

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- Factors considered when evaluating whether to implement Segment Restrictions and/or OFO penalties:
  - Weather Forecast – where demand starts to approach capacity
  - Day of week – weekday demand exceeds weekend/holiday demand
  - Expected duration of heavy demand
  - Recent history
  - Nominated deliveries
  - Actual takes from the system higher than entitlements
- Factors considered in scheduling once Segment Restrictions or OFO is implemented:
  - Receipts downstream of constraint increase TGP's ability to deliver
  - Actual takes from the system vs entitlements (Demand is greater than capacity)
  - Expected duration of heavy demand

### NGI-Transco Zone 6 NY





**January 4th**

