The Alaska Natural Gas Pipeline Project

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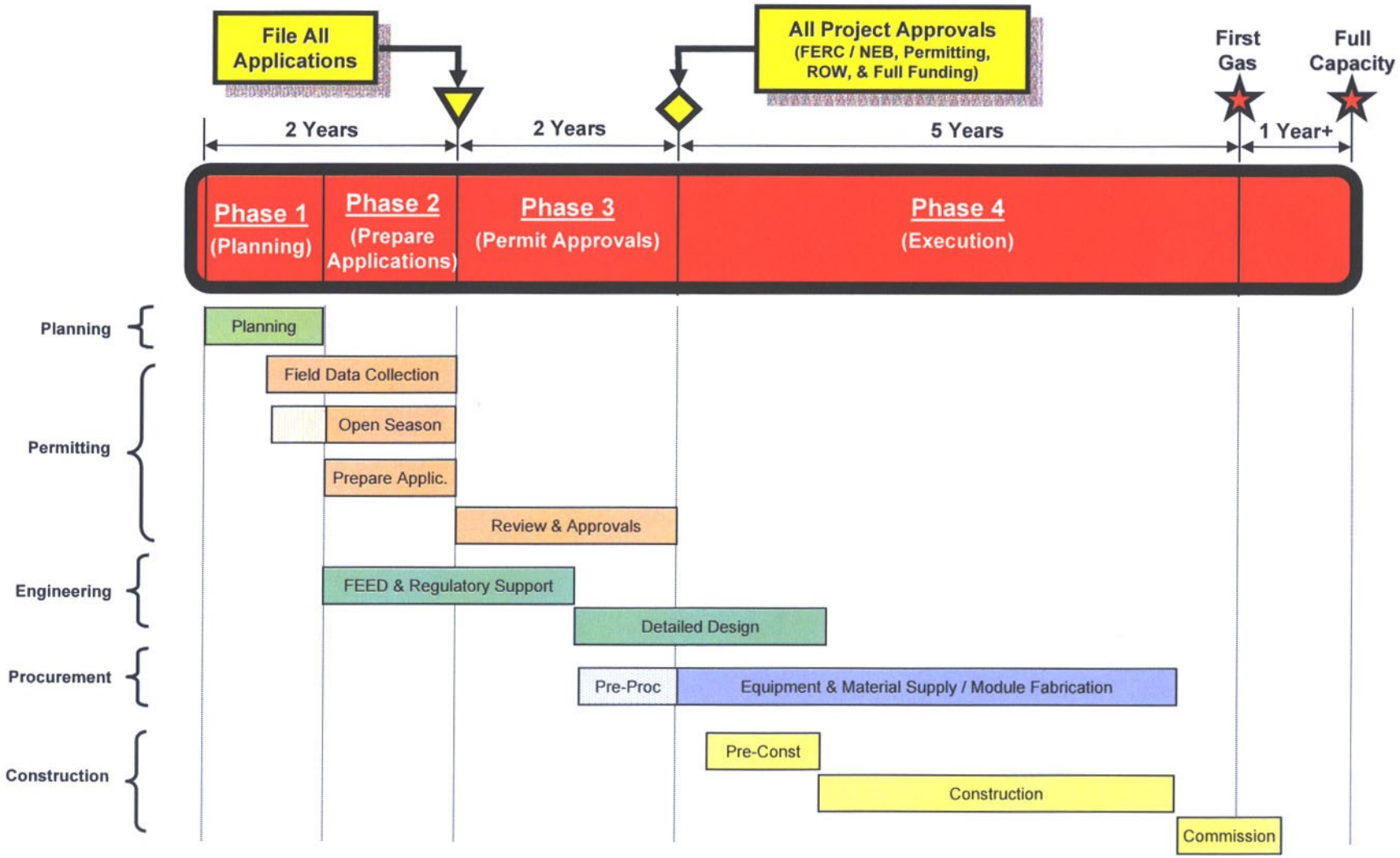
DECLINING OIL - NEED TO MONETIZE GAS

- Oil Revenue currently covers 90% of the state's budget
- ANS oil production will continue to decrease
- The state's budget situation will become critical well before 2016
- Alaska needs to move rapidly and decisively toward replacing its oil-based economy with a more diversified economy based on natural gas

Estimated Project Timeline for a Gas Pipeline



COMMON CARRIER vs. CONTRACT CARRIER

- Oil Pipelines are Common Carriers
  - *Transporter required by law to provide service to all legitimate applicants*
- Gas Pipelines are Contract Carriers
  - *Transporter that provides service on a contractual basis*

WHO SHOULD OWN THE PIPELINE?

- Third Party Ownership
- Producer Owned Pipeline

There MUST be a separate legal entity that ships the gas apart from the entity that owns the transportation system.

THIRD PARTY OWNERSHIP

PERCEPTION

- Third Party will build cost overruns into tariff
- Why pay a middleman to ship the State's gas?
- High tariffs make more profits and companies will strive to meet this objective.

PRODUCER OWNED PIPELINE

PERCEPTION

- Producers will tie up explorers
- Explorers will be at a disadvantage by being forced to pay their competitors for transporting gas

TARIFFS

- ***Tariff*** – The cost of shipping gas to market, usually given in mmBtu (as opposed to mmcf)
- Only incorporates cost of pipeline, including return on equity, and treatment, not the cost of exploration and development

OWNERSHIP OF PIPE
vs.
OWNERSHIP OF GAS

- What are risks?
- Who takes them?

EXPANSIONS

- Compression versus Looping

COMPRESSION

- Expansion by compression offers relatively inexpensive addition utilizing compressors. It increases throughput.

GENERALLY SPEAKING, COMPRESSION DRIVES TARIFF DOWN – DEPENDING UPON HOW MUCH ADDITIONAL GAS IS ADDED.

LOOPING

- Increasing capacity of a transmission system by inserting an additional section of pipeline. This is less expensive if included in the original design.

GENERALLY SPEAKING, LOOPING DRIVES THE TARIFF UP.

TWO TYPES OF TARIFFS FOR EXPANSION

- ***Rolled-in Tariffs*** - Costs are borne by all shippers, both new and old. Usually in the US, tariffs are only rolled-in when the tariff is lowered for existing shippers.
- ***Incremental Tariffs*** - Additional costs are borne by the entity that caused the expansion.
- **FERC** must approve tariff changes.

FEDERAL ENERGY REGULATORY COMMISSION (FERC)

- FERC is an independent federal agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects.

LEARN WHAT FERC IS AND DOES

FERC, *continued*

- The Energy Policy Act (EPAct) of 2005 gave FERC additional responsibilities
  - ***Regulates the transmission and sale of natural gas for resale in interstate commerce***
  - ***Approves the siting of and abandonment of interstate natural gas facilities, including pipelines, storage and liquefied natural gas***
  - ***Monitors and investigates energy markets***
  - ***Uses civil penalties and other means against energy organizations and individuals who violate FERC rules in the energy markets***

FERC TOP PRIORITIES – GOAL 1

- Energy Infrastructure – *Promote the Development of a Strong Energy Infrastructure*
  - Implement infrastructure provisions of Energy Policy Act of 2005 (EPAct)
  - Oversee development of mandatory Electric Reliability standards to protect bulk power supply
  - Encourage the development of new Gas Storage capacity
  - Maintain an environmentally safe infrastructure: Hydropower, Gas, LNG
  - Promote pre-filing processes for all Liquefied Natural Gas (LNG) terminals and Gas Pipelines
  - ***Process expeditiously Alaska Natural Gas Transportation Projects***

FERC TOP PRIORITIES – *GOALS 2 & 3*

GOAL 2

- ***Support Competitive Markets***

GOAL 3

- ***Prohibit Market Manipulation through Order 670, Prohibition of Energy Market Manipulation***

WHAT FERC DOES *NOT* DO

- ***Regulation of retail electricity and natural gas sales to consumers***
- ***Oversight for the construction of oil pipelines***
- ***Regulation of local distribution pipelines of natural gas***

RISKS

Risk = Money

$$$$$$$$$$$$$$$$$$$$$$$$$$

- Completion Risk
- Cost Overrun Risk
- Firm Transportation Risk
- Market Price Risk
- Political, Tax and Regulatory Risk

RISKS, *continued*

- Midstream (PIPELINE BUILDER)
  - Risk from now until **open season** is 100% on Builders
- Upstream (SHIPPER)
  - Risk from **open season** through first gas without sufficient parameters will be on the Shippers
  - Market risk after first gas

WHAT IS AN "OPEN SEASON"?

The process by which a pipeline company invites prospective shippers to bid for transportation capacity and, after having reviewed the bids, awards to and allocates capacity among prospective shippers.

Process is regulated by the Federal Energy Regulatory Commission (FERC)

*****LEARN THIS*****

ALASKA NATURAL GAS PIPELINE ACT OF 2004 (ANGPA)

- ***The passage of ANGPA was a major milestone in advancing an Alaska gas pipeline project***
  - Expedited approval process
  - Prohibition of an over-the-top route
  - FERC required to adopt regulations for open season
  - Environmental reviews
  - FERC given expansion rights for first time

ANGPA, *continued*

Special in-state provisions

- ***FERC required to provide reasonable access for meeting local consumption needs***
- ***Open Season – Regulation must promote competition in the exploration, development, and production of Alaskan natural gas***

ANGPA, *continued*

- ***FERC given expansion rights for first time***
- Drue Pearce, Federal Coordinator, 2006
- Study of alternative means of construction
- Loan guarantees
- Expedited and limited judicial review

CHANGES TO OPEN SEASON NOPR – *As Result of Public Comments*

- ***Changes as result of comments***
  - Affiliate rules being reviewed by FERC for proposed rule-making
  - ***Prospective applicant must create or designate an independent unit or division for owning the pipeline and separately for shipping***
  - Pipeline entities will be holding the open season
  - Information made available to any potential shipper must be made available to all potential shippers

CHANGES TO OPEN SEASON NOPR – *As Result of Public Comments*

- Recognition of Alaskan In-state needs
  - ***In-state capacity, delivery points, and transportation rates based on in-state needs study***
  - ***Separate bidding on in-state capacity.***

FINANCING

- Department of Energy Loan guarantees
- Firm Transportation Commitments (FT)
- Debt Equity Ratio

DEPARTMENT OF ENERGY (DOE) *Loan Guarantees*

- The Alaska Natural Gas Pipeline Act (ANGPA) authorized loan guarantees to the sum of ***$18 billion***, indexed for inflation (measured by the Consumer Price Index)
- They are to be administered by the Secretary of Energy
- They are not to exceed 80% of the total capital costs of the project – including interest during construction
- Terms of any loan not to exceed 30 years

FIRM TRANSPORTATION COMMITMENTS - FT

- Binding commitment made by a shipper to a pipeline to ship gas (or pay even if no gas is shipped) at a specified volume and cost, for a set period of time.

******LEARN THIS******

DEBT-EQUITY RATIO

- What formula will be sought for financing?
- FERC mandates the rate of return on equity.

TECHNICAL ISSUES

- Treatment - Reinject vs. Pipeline Quality
- Central Processing Facility (CPF)
- Gas Conditioning Plant
- Gas Treatment Plant (GTP)
- Central Compression Plant (CCP)
- How a Reservoir Works - Oil is far more valuable than gas.

CENTRAL PROCESSING FACILITY (CPF)

- Separates oil from everything else
- Also known as flow stations and gathering centers – essentially performing the same tasks

GAS CONDITIONING PLANT

- There is only one in Alaska and it is at Prudhoe. It is the one of the largest in the world.
- Separates Natural Gas Liquids (NGLs) and water from gas

CENTRAL COMPRESSION PLANT (CCP)

- There is only one and it is at Prudhoe
- Huge, barn-like structure full of compressors
- Compresses the gas and then it is reinjected

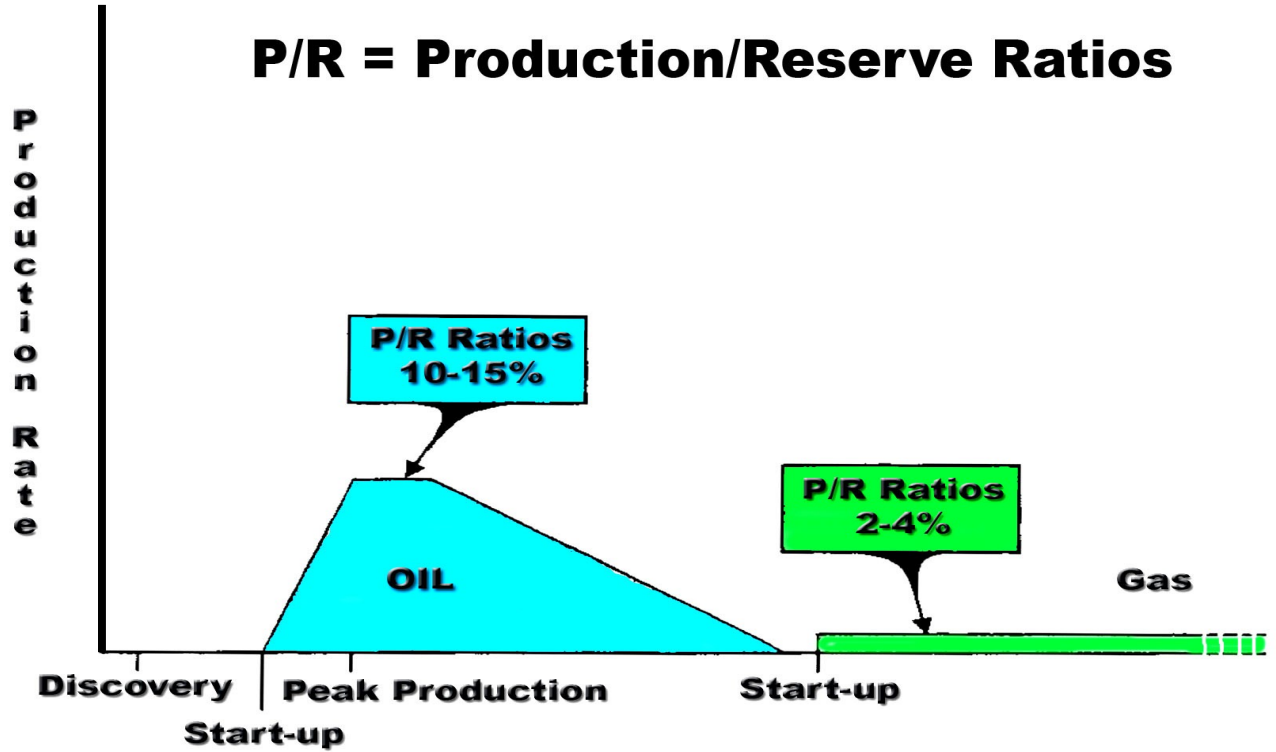
GAS TREATMENT PLANT – [GTP]

- Would be located on ANS and would be designed to remove carbon dioxide (CO_2), hydrogen sulfide (H_2S), and other impurities from the natural gas stream to meet Inlet pipeline specifications. These pipeline specifications would also require that the gas be compressed and chilled.

HOW A RESERVOIR WORKS

One of the differences due to market constraints is *timing* of production. For those fortunate enough to find a gas market it usually takes *longer to get on-stream* and typically gas fields cannot be produced as quickly as oil fields i.e. *lower P/R ratios*.

P/R = Production/Reserve Ratios



LEASE TERMS

- ***Duty to Produce***

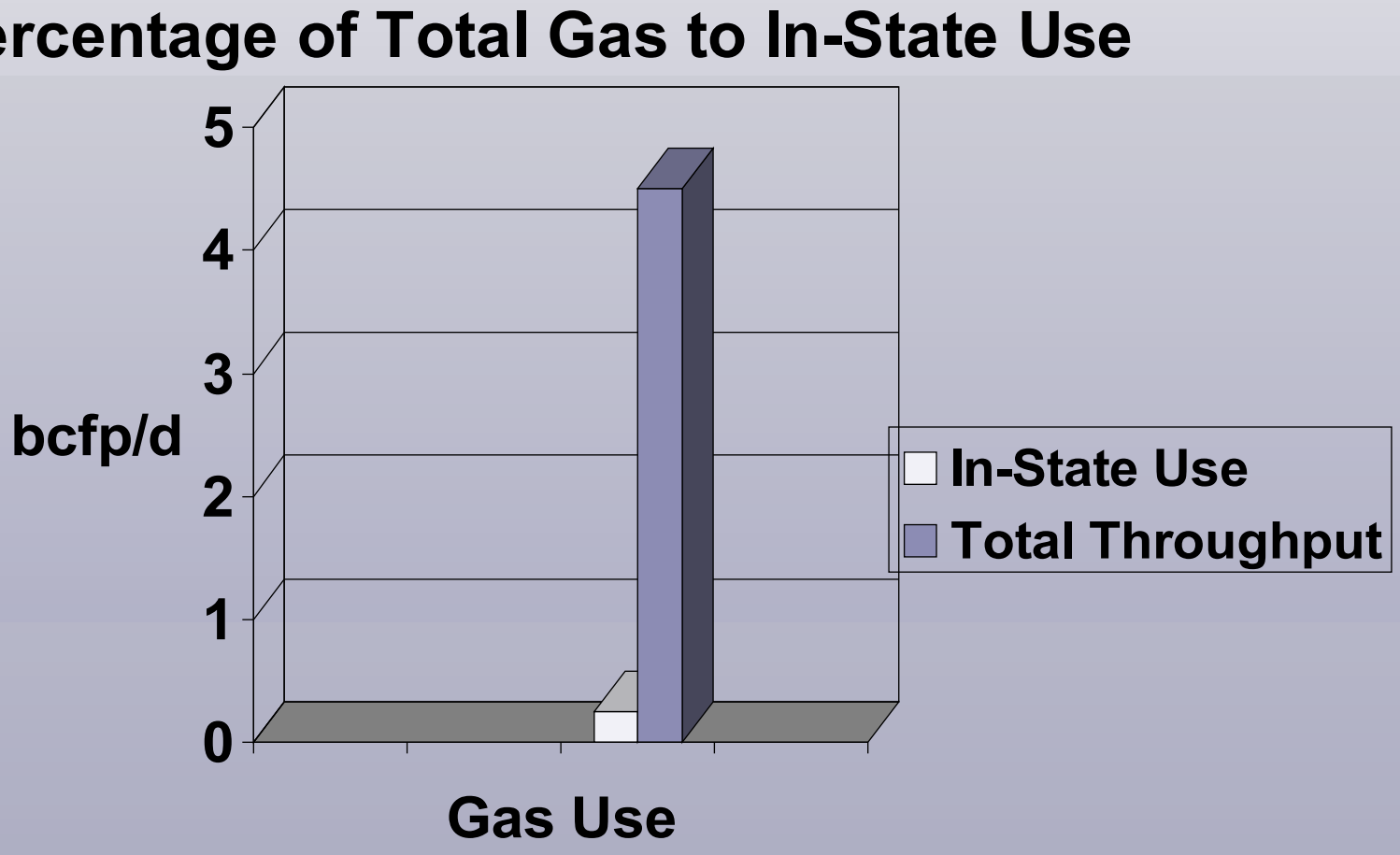
Oil and gas leases: "Production in paying quantities" means production in such quantity as to ***enable the operator to realize a profit***.

Unitization: "Paying quantities" means quantities sufficient to ***yield a return in excess of operating costs***.

LOCAL ACCESS

- Affordable energy is vital to growing a healthy economy throughout Alaska and new energy sources are critical to railbelt and Southcentral Alaska as well as interior communities. Access to the gas from the ANS is a key element in meeting these needs.

Total Gas Throughput Compared to In-State Use



CONSTRUCTION EMPLOYMENT – *ALASKA HIRE*

- **Alaska North Slope Gas Treatment Plant – 1,150 construction man years; 76 operating man years; cost: $2.6 billion**
- **Alaska Portion of a Gas Pipeline – 5,880 construction man years; 32 year operating man years; cost: $4.5 billion (732 miles)**
- **In-State Module Fabrication – 5,000 construction man years**
- **6,500 direct Alaska jobs - Thousands of indirect jobs for Alaskans**
- **Billions of dollars in new revenues**

OPERATION EMPLOYMENT

- A smaller number of permanent jobs will be needed to operate the mainline and other project components during the operational period.

ROYALTY IN-KIND (RIK)
ROYALTY IN-VALUE (RIV)

- Royalty in-kind – Taking the gas and selling it ourselves
- Royalty in-value – Telling shipper to sell the gas for us
- Risk - State taking FT commitments

ROLE OF DRUE PEARCE – *FEDERAL COORDINATOR*

- The office of the Federal Coordinator for Alaska Natural Gas Transportation Projects is established as an independent office in the executive branch to (1) coordinate the expeditious discharge of **all activities by federal agencies with respect to an Alaska natural gas transportation project;** and (2) ensure compliance with federal agencies with the provisions of ANGPA. ***In August of 2006, the U.S. Senate confirmed Drue Pearce as the federal coordinator.***

FEDERAL COORDINATOR, *continued*

- Unless required by law, no Federal agency shall add to, amend, or abrogate any certificate, right-of-way, permit, lease, or other authorization issued to an Alaska natural gas transportation project ***if the Federal coordinator determines that the action would prevent or impair in any significant respect the expeditious construction and operation, or an expansion, of the Alaska natural gas transportation project***.

FEDERAL COORDINATOR, *Limitations*

- The Federal Coordinator shall ***not*** have authority to override:
  - ***The implementation or enforcement of regulations issued by FERC under section 103 of ANGPA***
  - ***Impose any terms, conditions, or requirements in addition to those imposed by FERC or any agency with respect to construction and operation, or an expansion of, the project***

MITIGATING PROJECT RISK

- Economic Risk
- Resource Risk
- Political and Regulatory Risks
- *Force Majeure*

ECONOMIC RISK

- Economic risks are associated with building, operating, and maintaining the project, market-related conditions such as commodity prices and competition from foreign sources.

RESOURCE RISK

- Finding insufficient gas reserves to sustain the project throughout its useful life.

POLITICAL AND REGULATORY RISKS

- Includes the international, national, regional, and local political issues associated with the project as well as the risk of short-term social disruptions associated with economic booms that would occur if the project goes forward.

FORCE MAJEURE

- Events that are unavoidable events such as natural disasters that result in the inability of a party to perform or deliver contractual obligations.

COST OVERRUNS

- Potential cost overruns could result in a considerable negative economic impact on the project.
- Large cost overruns would increase gas shipping costs and could raise the delivered cost per mmBtu of natural gas beyond gas market prices.
- **TAPS was originally projected to cost $900 million – it was completed at just under $9 billion!**
- TAPS was first project needing an EIS

COMPLETION RISK

- Completion risk is inherent to any large-scale project.
- It includes non-completion and delay.
- Completion risk also changes as a project progresses.
- Front-end engineering, planning, permitting, and communication dollars help minimize completion risk.

TRANSPORTATION & SHIPPING RISK

- Initial allocation
- Insufficient capacity
- Excess capacity
- Inability to obtain market value

CANADIAN ISSUES

- Some of the obstacles/components on the Canadian side:
  - Federal government
  - Provincial governments
  - TransCanada long-standing right-of-way claims (NPA)
  - Enbridge
  - First Nations' claims
- Negotiating the Canadian end is multi-layered

CANADIAN ISSUES, *continued*

- ***The National Energy Board (NEB) regulates pipelines as an independent federal agency – it operates in many ways as FERC does for the US.***

- There is a long-standing history of MOUs between FERC and the National Energy Board that may well assist in precedent and as a model for negotiation.

THREE MOST IMPORTANT FACTORS IN A GAS PIPELINE

The Tariff

The Tariff

The Tariff

ALASKA NATURAL GAS PIPELINE STAKEHOLDERS

- People of the State of Alaska
- Governor
- Legislature
- Pipeline Builder
- Current Shippers
- Future Shippers
- Federal Government
- Canadian Government

TERMS TO KNOW

- ***FERC – Federal Energy Regulatory Commission*** – An independent federal agency that regulates interstate
- ***FT – Firm Transportation Commitments*** – Binding commitment made by a shipper to a pipeline to ship gas (or pay even if no gas is shipped) at a specified volume and cost for a set period of time.

TERMS TO KNOW, *continued*

- ***Open Season*** - The process by which a pipeline company invites prospective shippers to bid for transportation capacity and, after having reviewed the bids, awards to and allocates capacity among prospective shippers.

TERMS TO KNOW, *continued*

- ***Tariff*** - The cost of shipping gas to market, usually given in dollars/mmBtu (as opposed to mmcf)
- ***Rolled-in tariffs*** - Costs are borne by all shippers, both new and old. Usually in the US, tariffs are only rolled-in when the tariff is lowered
- ***Incremental tariffs*** - Additional costs are borne by the entity that caused the expansion

TERMS TO KNOW, *continued*

- ***Midstream*** – Assets for transportation of consumer quality product

- ***Upstream*** – Assets that it takes to get oil and gas out of the ground and turn it into pipeline quality

TERMS TO KNOW, *continued*

- ***RCA*** – Regulatory Commission of Alaska – regulates intrastate
- ***NEB*** – National Energy Board – The Canadian equivalent of FERC
- ***NPA*** – Northern Pipeline Act

TERMS TO KNOW, *continued*

- ***ANGPA*** – Alaska Natural Gas Pipeline Act
- ***ANGTA*** – Alaska Natural Gas Transportation Act of 1976
- ***EPAct*** – Energy Policy Act of 2005

TERMS TO KNOW, *continued*

- ***ANGDA*** – ***Alaska Natural Gas Development Authority*** – Mission: "Develop a natural gas pipeline for Prudhoe Bay to tidewater on Prince William Sound and a spur line to the gas distribution grid in Southcentral Alaska.

- ***Qualified Infrastructure Project*** – An Alaskan natural gas transportation project consisting of design, engineering, finance, construction, and completion of pipelines and related transportation and production systems (including gas treatment plants), that are used to transport natural gas from the Alaska North Slope to the continental United States.

TERMS TO KNOW, *continued*

- ***LNG - Liquefied Natural Gas -*** Consists of mainly methane gas, which is liquefied under high pressure and in a low temperature.

- ***GTL - Gas to liquids*** - A process that combines the carbon and hydrogen elements in natural gas molecules to make synthetic liquid petroleum products.

TERMS TO KNOW, *continued*

- ***Consumer Price Index (CPI)*** – The Consumer Price Index
- ***Eligible Lender*** – Any non-Federal qualified institutional buyer known as Rule 144A(a) of the Securities and Exchange Commission and issued under the Securities Act of 1933.
- ***Federal Guarantee Instrument*** – Any guarantee or other pledge by the Secretary to pledge the full faith and credit of the United States to pay all of the principal and interest on any loan or other debt obligation entered into by a holder of certificate of public convenience and necessity.

TERMS TO KNOW, *continued*

- ***Compression*** - Expansion by compression offers relatively inexpensive addition utilizing compressors - it increases throughput.
- ***Looping*** - Increasing capacity of a transmission system by inserting an additional section of pipeline. This is less expensive if included in the original design.
- ***Capacity Allocation*** – the methodology by which pipeline capacity will be awarded

TERMS TO KNOW, *continued*

- ***NEBA*** – National Energy Board Act – Canada
- ***GTP*** – Gas Treatment Plant
- ***NGL*** – Natural Gas Liquid
- ***DOE*** – Department of Energy

TERMS TO KNOW, *continued*

- ***OATT*** - Open Access Transmission Tariff
- ***NOPR*** – Notice of Proposed Regulation – FERC document describing proposed rules and soliciting comments by affected parties.
- ***NPV*** – Net Present Value

TERMS TO KNOW, *continued*

- ***Duty to Produce:* Oil and gas leases**: "Production in paying quantities" means production in such quantity as to ***enable the operator to realize a profit***.

- ***Duty to Produce:* Unitization**: "Paying quantities" means quantities sufficient to ***yield a return in excess of operating costs***.

TERMS TO KNOW, *continued*

- ***ANS – Alaska North Slope*** – The portion of Alaska north of 68 degrees North latitude
- ***AOGCC*** – Alaska Oil and Gas Conservation Commission
- ***Netback*** – Wellhead price determined by subtracting transmission and distribution and distribution costs from the market price.

TERMS TO KNOW, *continued*

- ***Royalty In-kind*** - Taking the gas and selling it ourselves
- ***Royalty In-value*** - Telling producer to sell the gas for us
- ***Reserves*** – Those resources believed to be recoverable with the highest degree of confidence

TERMS TO KNOW, *continued*

- ***Btu*** – ***British thermal unit*** – a measure of the energy content of a fuel
- ***mmBtu*** – million British thermal units
- ***mcf*** – thousand cubic feet
- ***mcfp/d*** – Million cubic feet per day

TERMS TO KNOW, *continued*

- ***Tcf*** – trillion cubic feet
- ***Bcf*** – Billion cubic feet
- ***Bcfp/d*** – Billion cubic feet per day

TERMS TO KNOW, *continued*

- ***R/P Ratio (Reserves to Production)*** – Ratio of remaining recoverable reserves to the current rate of production
- ***Shipper*** – Any pipeline customer who holds a contract with the pipeline for transportation service.
- ***Throughput*** – Volume of natural gas that may be carried on a pipeline over a period of time

TERMS TO KNOW, *continued*

- ***Wellhead*** – Point at which gas flows from the ground
- ***Wet Gas*** – Unprocessed or partially processed natural gas produced from strata containing condensable hydrocarbons and water