

**ALASKA STATE LEGISLATURE**  
**SENATE RESOURCES STANDING COMMITTEE**

March 25, 2009

3:38 p.m.

**MEMBERS PRESENT**

Senator Lesil McGuire, Co-Chair  
Senator Bill Wielechowski, Co-Chair  
Senator Charlie Huggins, Vice Chair  
Senator Hollis French  
Senator Bert Stedman  
Senator Gary Stevens  
Senator Thomas Wagoner

**MEMBERS ABSENT**

All members present

**COMMITTEE CALENDAR**

**SENATE JOINT RESOLUTION NO. 16**

Expressing support for environmentally sound and culturally sensitive development of the oil and gas resources in federal waters offshore of Alaska's coast as a means to ensure energy independence, security for the nation, and jobs for Alaskans; and urging the United States Congress to provide a means for consistently sharing with all coastal energy-producing states, on an ongoing basis, revenue generated from oil and gas development on the outer continental shelf, to ensure that those states develop, support, and maintain necessary infrastructure and preserve environmental integrity.

HEARD AND HELD

Overview: Status of North Slope Pipelines and Other Facilities

HEARD

Overview: Effect of Shale Gas Development on Prospects for an Alaska Natural Gas Pipeline

HEARD

**PREVIOUS COMMITTEE ACTION**

BILL: SJR 16

SHORT TITLE: OFFSHORE OIL & GAS REVENUE

SPONSOR(S): SENATOR(S) WIELECHOWSKI

03/20/09

(S)

READ THE FIRST TIME - REFERRALS

03/20/09 (S) RES  
03/25/09 (S) RES AT 3:30 PM BUTROVICH 205

**WITNESS REGISTER**

MICHELLE SIDEMAN, Staff  
to Senator Wielechowski  
Alaska Capitol Building  
Juneau, AK

**POSITION STATEMENT:** Provided information on SJR 16.

DENNIS HINNAH, Deputy Director  
Alaska Office  
Pipeline and Hazardous Materials Safety Administration (PHMSA)  
U.S. Department of Transportation

**POSITION STATEMENT:** Delivered a presentation.

ALLISON IVERSEN, Coordinator  
Petroleum Systems Integrity Office (PSIO)  
Division of Oil and Gas  
Department of Natural Resources (DNR)

**POSITION STATEMENT:** Delivered a presentation.

LARRY DIETRICK, Director  
Division of Spill Prevention and Response  
Department of Environmental Conservation (DEC)

**POSITION STATEMENT:** Delivered a presentation.

IRA ROSEN, Project Manager  
Alaska Risk Assessment of Oil and Gas Infrastructure  
Department of Environmental Conservation (DEC)

**POSITION STATEMENT:** Delivered a presentation.

MARK MYERS, AGIA Coordinator  
Gas Pipeline Office  
Department of Natural Resources

**POSITION STATEMENT:** Delivered a presentation.

**ACTION NARRATIVE**

3:38:55 PM

**CO-CHAIR LESLIE MCGUIRE** called the Senate Resources Standing Committee meeting to order at 3:38 p.m. Senators French, Stedman, Stevens, Huggins, Wagoner, Wielechowski, and McGuire were present at the call to order.

**SJR 16-OFFSHORE OIL & GAS REVENUE**

[3:40:07 PM](#)

CO-CHAIR MCGUIRE announced the consideration of SJR 16.

SENATOR WIELECHOWSKI, Alaska State Legislature, sponsor of SJR 16, said that on April 14 the U.S. Department of Interior Secretary Ken Salazar is coming to Alaska seeking input on exploration in the Outer Continental Shelf (OCS). SJR 16 is a timely resolution that supports responsible oil and gas development in the OCS and asks for revenue sharing from oil and gas leasing and development in those federal waters. A similar, but more limited, resolution passed unanimously last year.

SENATOR STEDMAN referenced page 2, line 30, and said he is not sure how to define environmentally sound and culturally sensitive.

SENATOR WIELECHOWSKI said he is open to suggestion as to how that is defined. He wants to take into account the cultural issues that are in play on the North Slope, particularly whaling. Environmentally sound development would protect the environment in all of Alaska. He added that the committee certainly could hold the resolution to flesh it out; he was pushing for the April 14 deadline and tried to use broad terms to appease the interests that people have.

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SENATOR HUGGINS suggested that the phrase "responsible development" would work in both instances.

SENATOR WIELECHOWSKI said he would accept that change as a friendly amendment.

SENATOR WAGONER referenced the next to last "Whereas" on page 2, line 26, and said he doesn't know of any OCS oil and gas production off the Alaska coast since it became a state. He suggested the committee strike that "Whereas."

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MICHELLE SIDEMAN, Staff to Senator Wielechowski, said the reference is to the money that has been collected through high bids in the lease sale; it's not money from actual production.

SENATOR WAGONER said that is his point. He agrees that the sales of leases have generated millions of dollars, but there hasn't been any oil and gas development that produced anything.

SENATOR FRENCH suggested the committee strike the word "production" on page 2, line 26, and insert "lease sales" so it would refer to oil and gas lease sales. Also, on line 27, strike the word "has" and insert the word "have."

CHAIR MCGUIRE recapped the suggested changes and asked for a motion to adopt the first amendment.

SENATOR HUGGINS moved Amendment 1.

**AMENDMENT 1**

Page 1, line 1:

Delete "environmentally sound and culturally sensitive"

Insert "responsible development"

Page 1, line 14:

Delete "environmentally responsible and culturally sensitive"

Insert "responsible development"

Page 2, lines 30-31:

Delete "environmentally sound and culturally sensitive"

Insert "responsible development"

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CHAIR MCGUIRE announced that without objection Amendment 1 is adopted.

SENATOR FRENCH moved Amendment 2.

**AMENDMENT 2**

Page 2, lines 26:

Delete "production"

Insert "lease sales"

Page 2, lines 27:

Delete "has"

Insert "have"

CO-CHAIR MCGUIRE announced that without objection Amendment 2 is adopted.

SENATOR STEDMAN suggested the committee hold the resolution until the next meeting since this is the first hearing.

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CHAIR MCGUIRE announced she would hold SJR 16 in committee.

**Overview: Status of North Slope Pipelines and Other Facilities**

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CHAIR MCGUIRE announced the next order of business is an update on the status of North Slope pipelines and other facilities. It's been suggested that an update is a good idea given the age of the pipeline and associated facilities.

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DENNIS HINNAH, Deputy Director, Alaska Office, Pipeline and Hazardous Materials Safety Administration (PHMSA), U.S. Department of Transportation, said he is pleased to discuss PHMSA actions in overseeing safe operations of pipelines in Alaska. This federal agency is responsible nationwide for the development and enforcement of safety regulations for natural gas pipelines, hazardous liquid transmission and distribution pipelines, and liquefied natural gas (LNG) facilities. The agency does not currently have the authority to regulate North Slope production facilities. However, PHMSA does inspect and regulate interstate and intrastate gas transmission pipelines, hazardous liquid pipelines, gas distribution systems, and LNG facilities in Alaska. Hazardous liquids subject to regulation include crude oil and refined petroleum products.

Ensuring the safety of over two million miles of pipeline is an enormous task. Most states partner with PHMSA to oversee 90 percent of pipeline mileage that requires operator compliance with pipeline safety regulations. Alaska and Hawaii are exceptions and do not participate in the state/federal safety program. Still, PHMSA takes pipeline safety in Alaska very seriously and has, since 2006, increased its staff in Alaska to prepare for oversight of the proposed natural gas pipelines.

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MR. HINNAH said Alaska is part of the PHMSA Western Region with headquarters in Denver. The Anchorage office currently has four fulltime engineer/inspectors in addition to an assistant and himself. PHMSA works closely with pipeline owners and operators, the Joint Pipeline Office, the Petroleum Systems Integrity Office, the Office of the Federal Coordinator, and other state and federal regulators.

PHMSA uses a risk-based approach to determine which of the more than 40 pipelines and LNG facilities it will inspect each year. TAPS is inspected annually and all pipelines are inspected at least ever three years. PHMSA also investigates accidents and safety issues. As the lead federal agency to investigate the 2006 BP Alaska spills on two North Slope transit lines, PHMSA subsequently issued a corrective action order, which led to the replacement of the eastern and western area oil transit lines. PHMSA conducts inspections of pipeline design, construction standards, integrity management, operator qualifications, and drug and alcohol requirements. These inspections include document reviews, sealed inspections, and interviews. Additionally, PHMSA takes a role in ensuring operator preparedness and response to oil spills.

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PHMSA regulations require pipeline owners and operators to report certain types of incidents. State and federal agencies are subsequently informed of the findings. In the case of TAPS, much of the coordination is handled through the Joint Pipeline Office. That is a consortium of 11 federal and state agencies that provides oversight of TAPS and shares information on other Alaska pipelines. In some instances PHMSA follows up an investigation with enforcement action.

Examples of recent PHMSA investigations include: the 2007 TAPS pump station 9 fire; the January 15, 2009 incident where natural gas was pushed into TAPS pump station 1; the January 15 2009 sinking of the M/V Monarch near the Granite Point platform; and the March 12, 2009 residential gas explosion in Anchorage.

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MR. HINNAH said that in the last three years PHMSA actions include corrective action orders issued to BP Alaska and notices of probable violation issued to Aleyska and Enstar. The corrective order requiring BP Alaska to replace the failed North Slope oil transit lines has been closely monitored.

The PHMSA integrity management (IM) regulations require operators to assess and mitigate the risk that their pipelines pose to high consequence areas. TAPS, Alpine, and Endicott have completed this process and PHMSA periodically reviews their required IM program updates. Under the 2008 low-stress rule, more pipeline operators are required to develop IM programs.

CHAIR MCGUIRE asked what the low-stress rule is.

MR. HINNAH explained that prior to 2006 pipelines that operated at low pressure were exempt from PHMSA regulations. In 2004 and 2005 PHMSA was trying to bring them under regulation, and the 2006 spills on the North Slope pushed it forward. Low pressure pipelines are no longer exempt from PHMSA regulation.

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SENATOR HUGGINS asked at what point pressure becomes high.

MR. HINNAH replied the cut off is usually 20 percent of the maximum pressure that a line can carry.

MR. HINNAH continued the presentation saying that PHMSA is aware of the risk assessments the state is performing and is committed to sharing certain risk information on pipelines over which they have safety jurisdiction. Currently PHMSA is providing data to the Department of Environmental Conservation (DEC).

MR. HINNAH said that responsibility for safety rests with the pipeline owners and operators. The PHMSA mission is to achieve and maintain safe and environmentally sound operations for the nation's pipeline system. This requires understanding the condition of the pipelines and ensuring that operators take appropriate action to address unsafe conditions. PHMSA takes a risk-based systems approach to setting priorities and makes full use of the 2002 Pipeline Safety Improvement Act and the 2006 Pipeline Inspection, Protection Enforcement, and Safety Act. The IM program made it possible to take effective action when the BP Alaska Prudhoe Bay low-stress oil transit lines failed in March and August 2006.

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MR. HINNAH said that over the past eight years PHMSA has undertaken prioritized rulemaking projects acting first on infrastructure that posed the greatest risk to people and the environment. Initially, PHMSA defined and mapped high consequence areas in the National Pipeline Mapping System. This included areas that are unusually sensitive to environmental damage. PHMSA is in the process of implementing regulations that provide protection for people and the environment that could be affected by failures in high and low pressure hazardous liquid pipelines and high pressure gas transmission pipelines.

Given the impact the 2006 incidents, PHMSA has deployed a team to assess the risk of the other feeder line shutdowns including

those at Kuparuk, Alpine, Budami, North Star, Oliktok, and Milne Point.

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MR. HINNAH said PHMSA has recently amended its pipeline safety regulations to bring previously unregulated hazardous liquid gathering and low-stress pipelines in rural areas into its oversight program. The low-stress rule will add to PHMSA oversight of pipelines in Prudhoe Bay, Cook Inlet, and the Kenai Peninsula. This is a risk-based approach to protect lines that, in the event of failure, could spill into unusually sensitive areas. The assessment of which lines to regulate is based on how they could impact a sensitive area, the pressure of the line, and the volume of the product that could be spilled.

These phased-in safety regulations will provide robust protection to areas where oil pipelines in rural areas could affect drinking water, endangered species and other ecological resource concerns. These regulations will enhance corrosion protection by requiring continuous monitoring, integrity assessments, and leak detection. Operators will be required to follow safety rules for design, construction, testing, and maximum operating pressure. In addition, operators will be required to protect lines from corrosion and excavation damage; install and maintain line markers; establish operator qualification and damage prevention programs; provide public education; and report accidents and safety conditions.

MR. HINNAH assured the committee of PHMSA's dedication to improving safety, reliability and public confidence in pipeline infrastructure.

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CHAIR MCGUIRE asked if the regulations he's referencing have been promulgated.

MR. HINNAH replied the low-stress regulations are being phased in right now. PHMSA is currently working with operators to identify which ones apply in Alaska. The North Slope oil transit lines now fall under the low-stress rule and pipelines in the Cook Inlet area will fall under it as well.

CHAIR MCGUIRE asked if regulations related to drinking water, endangered species, design and construction and other things are extensions of the low-stress rule.

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MR. HINNAH replied these are part of the PHMSA Integrity Management Program, which looks at sensitive areas like wetlands, endangered species, and drinking water. That program has been fully implemented and in Alaska everyone has gone through the first improvement cycle. It is a continuous process.

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ALLISON IVERSEN, Coordinator, Petroleum Systems Integrity Office (PSIO), Division of Oil and Gas, Department of Natural Resources (DNR) cited a speech by a Petrobras executive on an oil platform off the coast of Brazil to show why quality management in oil and gas is so important. The executive talked about the elimination of unnecessary safe jackets and the win-win bonus of enhanced profitability. Just 18 months later that Petrobras platform had two explosions that killed 11 of the 175 people on board. Petrobras was fined \$50.8 million for environmental damages. Inadequate safety inspections and no quality management were blamed.

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MS. IVERSEN said the PSIO was established in April 2007 by administrative order. It has four primary tasks: 1) to coordinate state, federal and local agencies; 2) to investigate incidents or employee concerns that do not fall within other agency jurisdiction; 3) the gap/overlap analysis; and 4) quality management. PSIO has multiple designated liaison agencies that it works with closely. Among others, this includes DEC, ADF&G, DPS, DOR, DOT&PF, DOLWD, DOL, DNR, AOGCC, and the governor's office in Washington, D.C.

Coordinating efforts among agencies that deal with oil and gas is one of PSIO's largest tasks. This includes regular notification of incidents and coordination of investigations; circulation of employee and public concerns to impacted agencies in an effort to have a unified response; regular liaison interaction; and regular contact with local, state and federal agencies. PSIO works closely with the local PHMSA offices.

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MS. IVERSEN said that recent incident investigations include the September 2008 artificial lift gasline rupture at the Prudhoe Bay Y-Pad facilities and the January 2009 Pump Station 1 pigging incident. PSIO has been working with other agencies to investigate those incidents.

The gap analysis was called for in the administrative order and is currently PSIO's largest task. The goal is to provide a

comprehensive and cost-effective approach to state oversight of oil and natural gas facilities, equipment, infrastructure, and activities on state oil and gas leases. To accomplish this analysis PSIO is coordinating with liaison officers to indentify statutory and regulatory authorities; look at how these authorities are implemented; identifying not only gaps but also overlaps; assessing risks associated with the gaps and overlaps; coordinating the review of gaps, overlaps, and risks; and providing recommendations to the appropriate entities for further action.

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MS. IVERSEN said that ARCADIS was hired to analyze the gaps and overlaps in the statutes and regulations. Data compilation is underway and PSIO will soon look at how agencies have implemented their authorities. Results are expected in August 2009 with the caveat that PSIO is relying on other agencies' timelines and availability to work on the project.

The Department of Environmental Conservation is the project manager for the risk assessment. The risk assessment and the gap analysis are interrelated in that they will serve as tools that the state can use to determine how best to coordinate agency efforts and provide comprehensive and cost-effective oversight of oil and gas activities and facilities. Where high risks exist in areas of little or no oversight, the gap should probably be filled. Where low risks exist in areas of duplicative oversight, those overlaps should probably be removed so the agencies are more cost-effective.

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MS. IVERSEN said the administrative order also calls for the review of quality management in the state. It requires industry businesses to provide a comprehensive description of current practices of quality management that they utilize. Quality assurance focuses on the product to determine if it meets the agreed upon characteristics for performance. It establishes the rules and procedures to achieve the expected results and conformity to the requirements of the plan. Quality control is the process, procedures, and activities that are employed to test or check the physical characteristics and performance requirements against the predetermined criteria.

MS. IVERSEN displayed a characterization of the plan-do-check-adjust (PDCA) cycle and said it's a common process in quality management. She recapped the fundamentals of quality management systems which are quality control, quality assurance,

monitoring, inspection, and other practices to ensure the integrity and reliability of the infrastructure.

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MS. IVERSEN said PSIO is helping agencies understand quality management systems in order that they can more knowledgeably maintain the integrity and reliability of oil and natural gas facilities, equipment, and infrastructure. For example, instead of asking whether a company inspected a certain facility this year, a more appropriate question may be to ask if they have a procedure or policy that requires a facility inspection this year. Ask about follow-up procedures and if they are reviewed on a regular basis to ensure that they are appropriate.

PSIO expectations of agencies and itself includes: documented evaluations of oil and gas facilities, equipment, infrastructure, and work activities; effective communication of results to industry; and to review evaluations, identify gaps, and seek remedial action. PSIO is implementing a quality management system for itself asking if policies and procedures are written, if they are effective, and if they can be improved.

The PSIO expectations of the petroleum industry are to provide evidence that their management systems or processes for quality control, quality assurance, monitoring and inspections are implemented, effective, and periodically reviewed by upper management.

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SENATOR HUGGINS asked for a timeline for the gap analysis.

MS. IVERSEN said the results are expected August 2009. The caveat is that they are at the whim of other agencies availability to provide the data. ARCADIS is the contractor and Black and Beach is their main engineering subcontractor.

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LARRY DIETRICK, Director, Division of Spill Prevention and Response, Department of Environmental Conservation (DEC) introduced himself.

IRA ROSEN, Project Manager, Alaska Risk Assessment of Oil and Gas Infrastructure, Department of Environmental Conservation (DEC) said he will give a snapshot of today and what remains to be done in the project.

MR. DIETRICK said the initiative to take a comprehensive look at the state's oil infrastructure was twofold. It was in response to the spills in 2006 and to the business decision to continue production on the North Slope for another 50 years. It is a novel project that hasn't been done on this scale before.

MR. ROSEN said the risk assessment project is a three-year \$5 million initiative to evaluate the operational safety of Alaska's oil and gas infrastructure. It is the outcome of spills, leaks, and corrosion that was discovered on the North Slope in recent years. When complete this will be an engineering-oriented assessment that identifies and ranks the risks involved in operating the system for another generation. The risks will be evaluated in terms of the consequences to state revenue, safety, and the environment. The final report will be published in June 2010.

A slide of the organizational structure shows that DEC will provide management and contract administration over the project. Overall direction comes from the state agency oversight team. The state in June 2008 awarded the contract for the risk assessment to Doyon Emerald, an Anchorage-based engineering firm that is familiar with the Alaska oil and gas industry. ABS Consulting is the main subcontractor and has expertise in large infrastructure risk assessments.

MR. ROSEN displayed a slide that lists the state agencies that have an oversight or regulatory role in regard to the oil and gas industry. The state agency oversight team includes: Department of Environmental Conservation (DEC), Department of Labor and Workforce Development (DOLWD), Department of Law (DOL), Department of Natural Resources (DNR), State Pipeline Office (SPO), Petroleum Systems Integrity, Department of Public Safety (DPS), State Fire Marshall (SFM), Department of Revenue (DOR), and Alaska Oil & Gas Conservation Commission (AOGCC). The Joint Pipeline Office and the University of Alaska are also on the oversight team.

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MR. ROSEN explained the format for a risk assessment for pipelines and facilities is to first break out individual facilities or pieces of pipeline. The team then postulates different types of things that could go wrong in terms of natural or operational hazards. Next they estimate the likelihood of the event occurring followed by the consequences should it occur. The probability of the event occurring combined with the significance of the consequence equals the risk.

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MR. ROSEN said the project was established in three phases. The purpose is to develop a method that will be used to conduct the risk assessment that responds to the public's concerns. Public meetings were held in Anchorage, Fairbanks, Valdez, Kenai, and Barrow to explain the project to the key stakeholders and find areas of concern. Stakeholders include oil and gas industry, local governments, nongovernmental organizations, and the public.

He showed a map of the general project scope, which includes the North Slope, TAPS, the Valdez oil corridor, and Cook Inlet. He noted that tanker traffic was not included in the project. A Venn diagram shows the three areas of concern, which are safety, environment, and reliability. The highest level of concern was water quality and subsistence impacts. Safety concerns for the public and industry employees were next highest.

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MR. ROSEN recapped that phase 1 focused on outreach and efforts to develop a method to conduct the risk assessment. He noted that included crafting a description of what would be an unacceptable consequence or significant event. Phase 2 will consist of data collection including information about the infrastructure, previous studies and risk assessments, spill and corrosion reports, operating procedures, and business practices. That information will be applied to the model and will estimate the likelihood of an event occurring and the consequences of natural and operational hazardous events. In phase 3 the information will be analyzed, summarized and presented in the final report. The first report in phase 1 summarized the stakeholder process and all the work through December 2008. The design and methodology report also is complete and was formally released in a press release earlier this week. It's available on their website.

MR. ROSEN described this as the kickoff for the public review period. The team will return to the same locations to present the proposed methodology and confirm that it addresses stakeholder concerns. The state has contracted with the National Academy of Science to examine the assumptions and industry standards that are proposed as the basis for the methodology. The final report will be a summary of the event scenarios categorized for reliability, safe, and environmental impact. Identified high risks will be listed for potential mitigation. Recommendations may include repair or replacement if the risk

relates to physical infrastructure. Or there may be modifications to policies or regulations or perhaps changes in management or oversight of the facilities.

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CHAIR MCGUIRE asked if there is an economic component.

MR. ROSEN replied the report will only indentify and rank the risks; it will not estimate the cost of addressing the risks. The companies will make business decisions based on the risks. For example, they may consider replacement or repair, additional monitoring, more frequent inspections, or different business practices.

SENATOR HUGGINS asked if the commercial operators will inform DEC about how they intend to address the risks that are identified.

MR. ROSEN said the final implementation is yet to be refined. He expects it will be an interactive process. Industry will likely step forward with a plan to mitigate the identified risks, and if that is satisfactory they can go ahead.

SENATOR HUGGINS asked about penalties.

MR. ROSEN said the project is an engineering-based study to identify risks; it is not intended to include regulatory or enforcement actions. However, if the agencies are not satisfied with the industry response, then additional regulation or oversight would be a state option.

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SENATOR HUGGINS asked if whoever prepares the report assumes some responsibility if an event occurs that had not been identified as a risk.

MR. ROSEN said hundreds of risks may be identified and they'll be considered to be high risk, moderate, or low risk. At some point a determination will be made as to where to draw the line for high risks, which will require action by the asset owner.

**Overview: Effect of Shale Gas Development on Prospects for an Alaska Natural Gas Pipeline.**

CO-CHAIR MCGUIRE announced the next order of business is to hear about the effect of shale gas development on prospects for an Alaska natural gas pipeline.

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MARK MYERS, AGIA Coordinator, Gas Pipeline Office, Department of Natural Resources, said he wants to provide baseline information. The first slide shows increasing energy use worldwide coupled with a growing population. With current growth rates, the population by mid century will be 9 billion. The competition for resources is huge, with a lot coming from developing areas like China and India. Increased urbanization is requiring point-source energy supplies. Worldwide there is a strategic shift in how energy is used, and there is an increase in energy demand.

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SENATOR FRENCH asked for an explanation of a point-source energy supply.

MR. MYERS said it's a supply that is highly distributable that can be delivered to a city.

SENATOR FRENCH asked if it is any source of energy that can be delivered or transported.

MR. MYERS said the old philosophy was that any energy that worked was good enough, but with development and increased population all resources are under more and more pressure. Water, for example, is becoming a critical and limiting resource in the production of energy because it's in increasingly short supply. That competition for resources limits the availability of supplies that previously were abundant and it's changing the way energy will be used in the future. Environmental constraints result in more limitations as to which energy supplies can be used. It's important to see how Alaska, natural gas, and nonconventional sources of natural gas fit in the marketplace globally and specifically in North America, he said.

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MR. MYERS said what hasn't been fully discussed is what happens if CO<sub>2</sub> and carbon emissions are regulated. What sources of energy will become preferred and how will that shift pricing and availability of resources? In the next few years Congress and the Obama administration will address that substantial policy question.

MR. MYERS said that the U.S. is now about 70 percent dependent on imported oil and in some scenarios it will be dependent on much higher quantities of imported natural gas. Will the gas be

available and secure in terms of national security, national policy, and the environment? Tracking energy growth over the long-term shows increasing demand on a predictably large scale. Worldwide, certain sources of fuel will be limited by environmental constraints, policy direction, and scarcity of other resources affected by energy development.

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CHAIR MCGUIRE asked if he agrees that, as a result of a 1970s policy decision, the U.S. now relies on crude oil for less than 2 percent of its electrical generation. She further asked if developing countries like India and China have similar policies and how that might impact natural gas.

MR. MYERS said we'll be with existing fuels for a long time because growth outstrips capacity to grow. He displayed pie charts of percentage of electric power generation by fuel type in 1975 and 2004. All fuel sources have grown except hydro. Capacity for hydro projects is decreasing, particularly in the west, due in large part to systematic climate change. It dropped from 15.6 percent to just 7 percent. Natural gas has grown very slightly due to limits in supply. Coal and nuclear supplies for electrical generation have increased the most in that 30 year time period. Petroleum shrank to 3 percent in 2004 and it keeps shrinking. It's not cost effective to use oil when there are alternative supplies. He summarized that the dynamic market is shifting from an oil-based supply to a larger dependence on coal and nuclear.

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CHAIR MCGUIRE asked what carrots and sticks the government used to reduce dependence on crude oil for electrical generation.

MR. MYERS said not a lot; policies have really been market and supply-reliability driven. Electrical generation has shifted dynamically to coal. Nuclear isn't growing now and demand for natural gas has stayed flat. Demands for electricity keep increasing.

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MR. MYERS said energy sources for the future have real constraints. Bio-fuels have seen huge growth, but water is a big challenge. Water usage and availability will play a huge role in future development of resources. Current policies will be challenged. No free lunch is true with any energy, renewable or not.

MR. MYERS highlighted some changes that have occurred since AGIA was passed to answer whether the fundamental economics have shifted.

- The global economic downturn has caused a decrease in energy use, which resulted in oversupply and a dynamic short term fall in prices. Gas prices have fallen to less than \$4/mmbtu on the major markets.
- There's been a rapid expansion of unconventional shale gas supplies to the U.S. He noted that in the U.S. the first shale gas well was drilled in 1820. Commercial production began in 1926. The first Barnett shale well was drilled 1981.
- Policies on federal land really matter because much of the available resources for fossil and renewables are on federal land. In Alaska that's a major point. What will the policies be? Will the Atlantic margin or the West Coast be open for gas development? The development of nonconventional gas is dependent on continued availability of these areas. There's a great deal of conflict over the use of these lands with water, grazing rights, ecological change, endangered species, and human habitation. He believes that with the current administration there will be new restrictions in certain areas. How the development of gas resources and nonconventional gas resources will be affected in the next few decades is the question that's relevant to the Alaska gas pipeline.
- The first authoritative Arctic oil and gas assessment was completed by the USGS in 2008. The results are favorable to Alaska resources.
- There's an increased likelihood of carbon regulation.

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SENATOR STEVENS said one thing you'd hope would have changed since the AGIA license was awarded is an international recognition that this is a global issue. He thinks the U.S. economy would have been impacted enormously if the Kyoto treaty had been ratified. Hopefully the current downturn will stop folks from thinking that the U.S. should do something that the rest to the world isn't willing to do.

MR. MYERS said his perspective is that Alaska gas is a positive mechanism for the new administration to honor restricted carbon loads and still have a vibrant economy. If President Obama signs a post Kyoto treaty he has to dramatically decrease CO<sub>2</sub> emissions in this country and the way to get there is to increased use of natural gas. The countries that didn't support the Kyoto treaty

are now becoming the largest carbon emitters. He believes that the U.S. will be inclusive and try to put something together that will work for the developed and the developing world. There is intent in Congress and the administration to do that.

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MR. MYERS said there's need for growth line base of gas from nonconventional as well as conventional sources. Alaska gas will be very cost competitive with nonconventional gas and LNG. He noted that ConocoPhillips CEO, Jim Mulva, is still bullish on Alaska gas being a key market-driven product. Also, natural gas helps extend oil production on North Slope oil; it allows more barrels of oil to be recovered and it allows for better economic development of major fields like Prudhoe Bay and Point Thomson. A gasline becomes essential for not just gas recovery, but for the integrated economics of oil and gas fields and lengthening the useful service of TAPS

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MR. MYERS said that natural gas was found in the discovery process of conventional high quality oil. Initially the gas was flared off, but over time it became a valuable commodity and there was deliberate exploration for natural gas. In that process, the U.S. became a leader in the production of natural gas. Over time the quality and size of the conventional fields declined and more challenged reservoirs were developed. Now nonconventional reservoirs are becoming the dominant form of production in the U.S. Shale gas is among those sources of nonconventional gas, but it's not the dominant source that's produced today. Nonconventional gas requires higher technology and is generally more expensive to produce than conventional gas. It's the same with oil; the light hot sweet crudes were produced first, then heavier oils were produced and now production is from tar sands and potentially oil shales.

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MR. MYERS said that shale gas is now being produced in large amounts because of improved technology and increased price. He displayed a map showing shale gas plays in the U.S. and noted that not all of it is economic. Production will be in the sweet spots, and as prices rise and technology gets better it will be expanded to different areas.

CO-CHAIR WIELECHOWSKI asked if [competition for] water might limit shale gas production in the Lower-48.

MR. MYERS said yes, in some areas water will be the leading environmental concern. Dry wells require chemically treated water to be injected for fracturing, and then it has to be pumped out and disposed. There is natural flow back of hydrogen sulfate and salts associated with the shale from the wells. Sometimes oil shale is found close to fresh water reservoirs and that is a big issue. And regulatory structures don't yet exist in areas where shale gas occurs in nontraditional oil and gas areas. Those may or may not be favorable. The resource is needed, but it isn't logical to assume that the growth from the sweet spots will be linear.

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MR. MYERS said nonconventional gas is filling the gap as offshore and onshore conventional gas declines. At this point shale gas accounts for about five percent of total production; tight sands is dominant, followed by coalbed methane. The bottom line is that shale gas is only one component of nonconventional gas. The AGIA probability models considered the long term growth of nonconventional gas and recognized that over time LNG would be put into the market place.

The history of gas production in Wyoming shows that over time [1977-2006] nonconventional gas is becoming dominant as conventional production declines. The largest source is tight gas sands. Much of the production in western states is on public lands.

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MR. MYERS said the Arctic Basin is one of the last remaining large areas for undiscovered oil and gas development; Siberia and Arctic Alaska are the best of the best. Alaska represents about 36 percent of the national potential for undiscovered conventional gas. If the current administration does not open the Atlantic or Pacific OCS for oil and gas production, Alaska becomes more dominant.

Nonconventional continuous gas, including coalbed methane, shows that Alaska has 18.06 TCFG of the mean national total of 364.2 tcfg. Excluding coalbed methane, the national total is [274.9 tcfg.] The Alaska gas endowment is much bigger than the shale gas endowment, based on USGS December 2008 data. Undiscovered conventional gas potential shows that, for Alaska, much of the resource is onshore.

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The real question, however, is how much of the resource is economic to recover and at what cost. USGS data for conventional pure gas play on the central North Slope shows the mean number is 33.32 tcf. A probability model of the mean case shows that, over a large portion, the gas is economic in the \$4 to \$6 range. The Bank of America numbers for economic shale gas breakeven prices vary a lot, but the resources vary as well. The mid range was about \$6.64 and the high range was \$11.50. Alaska gas fits into the lower end of the cost of production of this nonconventional gas.

CHAIR MCGUIRE said the committee heard that some estimates are as low as \$3.

MR. MYERS said it depends on whether capital costs are included or just the operating costs to keep the wells on line. Once production starts there's a cash flow issue. Many small companies developing shale gas are heavily leveraged by banks and they're worried about their credit. So they will continue to flow gas to make their operating costs or their pipeline tariff commitments. The best cost estimate he could find was \$800,000 for a vertical fractured well. Estimates for a horizontal multi-phased fractured well, which is predominant, was about \$4 million. The other thing is that if it was just \$3 they'd still be drilling a lot of wells. The Baker rig count between August 2008 and today is 43 percent of the oil and gas rigs have been laid down. Most of those are gas rigs so there's a huge decline in drilling, which over time will lead to a decline in production. There may be shale gas that could be economic at \$3 but not the kinds of figures you're seeing out there.

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SENATOR WAGONER asked, at the current rate of use and assuming they stack 50 percent of the rigs, how long will it take to see an effect on the price of gas?

MR. MYERS said it's a supply and demand and storage issue and it depends on how much gas is in storage. Right now storage is peaked out. Within about a year you could see significant declines in production and if demand doesn't grow in that time then prices will stay down. Also, we are not an attractive market for LNG. European and Asian markets pay significantly more.

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MR. MYERS said the Department of Energy view is that over half of the conventional gas on North Slope is economically

recoverable. There aren't good numbers for recovery of unconventional resources in shale locations. Another plug for Alaska is that it has about 1/80 the well density that Wyoming has. Clearly, Alaska has a lot of growth room and upside potential. Nonconventional gas in Alaska includes gas hydrates, over pressured basin-centered gas, and coalbed gas. The first assessment of technically recoverable hydrates came out with 85 tcf. The number is conservative; it's just for depressurizing the gas and does not include heating, changing the stability zones of hydrates by thermally inducing heat or injecting CO<sub>2</sub> and removing methane. What's positive about hydrates is that a lot sits within the existing infrastructure.

MR. MEYERS said the last point is what happens to our plans in a carbon constrained world. Traditional use relied on a dramatic increase in coal production to meet future demands. It shows modest growth in nuclear; hydro is flat; non renewables are increasing; oil production, largely from corn sources, is increasing; a dynamic increase in coal; and a flattening of natural gas. If coal is taken out of the equation, you have to fill the gap. Different climate scenarios say that based on the models the agreement of the scientists in the international panel is that without significant reduction of current levels of CO<sub>2</sub> we will see significant climate change and global warming. This is modeled, not actual, but if the U.S. believes this it will react and try to decrease CO<sub>2</sub>. Natural gas is the only readily available source to do that in the short term. To have an effect, it needs to be done in the next few years not a decade from now. The residual lag time of CO<sub>2</sub> in the atmosphere and the growth of CO<sub>2</sub> takes you over lip in almost all the climate scenarios.

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SENATOR WAGONER said the graph shows that coal is taking an uptick, but if the administration and Congress decide to sequester CO<sub>2</sub> a lot of coal plants will need to shut down. That will have a tremendous effect on the price of natural gas in the next three years or so.

MR. MYERS said that's the general consensus, and the way the policy is implemented has a huge effect. Whether it's a simple cap and trade, whether there's a value change and premium put on natural gas, whether it's a regulatory structure that says thou shalt not emit CO<sub>2</sub> unless you can sequester it, or whether it's another mechanism is crucial to whether those plants are shut down or new plants aren't built. Right now coal plants aren't being built because of the uncertainty of the markets. Capital

markets aren't willing to fund the coal plants nor do the regulators appear to be willing to regulate and approve these plants. At the same time natural gas plants have been slowed because of high volatility and availability of the commodity. That's why shale gas is our friend, he said. You have to build a base capacity now if you're going to treat this problem. New gas coming in - the fact that there was a 7 percent growth in natural gas capacity in the country - and the moderation of prices lead you to believe that policy will lead to gas-fired power plants as the dominant new source of power for the next decade or so while we increase solar, wind, and potentially nuclear as rapidly as we can but not fast enough to meet reasonably expected CO<sub>2</sub> goals. Natural gas is the fuel you've got to bridge and the way the policy is done will become crucial.

SENATOR FRENCH said it sounds like the movement to a green economy is very promising for Alaska. He wonders whether the downside might not be some environmental regulations regarding Arctic areas that impact development here.

MR. MYERS said there's a lot of speculation about what future Arctic policy will look like. Decisions by the Secretary of Interior in the next year become a critical element. He needs some source of energy that's environmentally preferred and available. That gives an opportunity for Alaskans to make their case. Also, there is the President's support for it. If you believe that cap and trade will occur, it will incentivize more gas demand. With Arctic policy, Alaskans have to be able make the case of how important it is and show the environmental balancing act that needs to occur. Recognizing that every type of energy has full cycle costs and benefit, we need to quantify those benefits better. He tried to show that with ethanol it was a choice that has a poor tradeoff with respect to the environment. Now we are making tough choices and the future will require us to make them rationally.

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SENATOR STEVENS asked if he's saying that cap and trade could be advantageous to Alaska.

MR. MYERS directed attention to a slide of Black & Veatch AGIA data showing the impact of carbon regulation on natural gas demand. It shows that demand for natural gas for power generation under the AGIA base case increases about 14 bcf/d under carbon managed growth. Alaska gas isn't the total solution, but it's important and at the right time. If you believe the figures that were generated under the many different

scenarios for what it will cost to get Alaska gas to market, it is very competitive with nonconventional gas in the Lower-48. From a strategic and economic perspective, the Alaska project makes sense, even with a significant increase in LNG imports and an increase in shale gas.

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MR. MYERS said that in the carbon managed growth case multiple different sources of natural gas will be needed to meet Lower-48 demand growth. The Black & Veatch analysis shows that demand for LNG will increase, nonconventional gas will increase, and conventional gas will increase if it's available through Alaska. A Black & Veatch chart shows that in the carbon managed growth case, gas prices will have a higher price path than in the AGIA base case. "Basically, the managed carbon case actually beats all the cases we based the economics of the pipeline on," he said.

MR. MYERS summarized that he tried to walk through a couple of logical scenarios to provide perspective on world energy demand and where that energy could come from, that energy use has evolved and that shale gas is a player. He does not see shale gas in any way negatively affecting the AGIA project. It is an opportunity to build a greater base of natural gas production for the generation of electricity. He didn't discuss transportation, but the fact that natural gas is projected to sell at a discount to oil enhances it as a transportation fuel.

SENATOR FRENCH commented that he is dismayed that there are only 30 people in the room listening because this thorough analysis should be broadcast statewide. He committed to file a bill to have a web camera in every committee room to stream information live. It's long overdue.

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SENATOR HUGGINS said he wants to know the modifiers because one perfect answer usually isn't as pure and brief as it's thought to be.

MR. MYERS agreed that it's not a good idea to rely on a single deterministic viewpoint. One of the powers of the AGIA analysis is that it didn't rely on one answer; it relied on a Monte Carlo probabilistic effect with all the outcomes modeled time and again under different circumstances. That data set captures a broad range of a very uncertain world in the best available statistical method to deal with the uncertainty.

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There being nothing further to come before the committee, Co-Chair McGuire adjourned the Senate Resources Standing Committee meeting at 5:30 p.m.