ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
January 30, 2015
3:30 p.m.

MEMBERS PRESENT

Senator Cathy Giessel, Chair
Senator Mia Costello, Vice Chair
Senator John Coghill
Senator Bill Stoltze
Senator Bill Wielechowski

MEMBERS ABSENT

Senator Peter Micciche
Senator Bert Stedman

COMMITTEE CALENDAR

OVERVIEW: Alaska LNG Projects by Steve Butt, ExxonMobil Corporation

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

STEVE BUTT, Project Manager
Alaska Liquid Natural Gas Project (AKLNG)
POSITION STATEMENT: Provided the first of three 2015 AKLNG updates as provided for in SB 138.

ACTION NARRATIVE

3:30:30 PM
CHAIR CATHY GIESSEL called the Senate Resources Standing Committee meeting to order at 3:30 p.m. Present at the call to order were Senators Costello, Coghill, Wielechowski, Stoltze and Chair Giessel.

Alaska LNG Overview by Steve Butt, Project Manager of the AKLNG Project

3:30:56 PM
CHAIR GIESSEL announced the only order of business today would be an overview of the Alaska LNG (AKLNG) project and welcomed project manager, Steve Butt.

3:32:35 PM
STEVE BUTT, AKLNG Project Manager, said he represents the work of hundreds of people from all the different companies involved in the project. Those companies include the Alaska Gasline Development Corporation (AGDC), BP, ConocoPhillips, ExxonMobil, and TransCanada. That leadership teams leads several hundred contractors to create the Alaska LNG project. They are now doing pre-front end engineering and design (pre-FEED). He said the project was created under a set of agreements by those companies to do shared work to see if an infrastructure can be created to transport, treat, and liquefy gas here in Alaska in a competitive manner.

These shared teams were created, because they think it drives down costs. Their objective is shared: create an infrastructure, and LNG project that can compete globally. Another 100-plus people are working "owner issues" (commercial issues, and framework issues with the state, and places where different owners have different views) in different forums outside of his review. He would be happy to bring any of those people to the Senate Resources Committee to answer any questions.

CHAIR GIESSEL asked if he had been involved in a project like this before and if so, where, and how it worked out.

MR. BUTT replied that there has never been a project like this before. Each element of it exceeds what a mega project is typically defined as, which is anything in $1 billion to 10 billion range. He and others on the team had worked in projects with several similar parallels: in Venezuela they built large field treating plants connected with large pipelines to the coast where there were large treating facilities for export. They also have experience in other parts of the world building treating facilities to remove impurities and 400 miles of pipe to liquefaction facilities for export. These are parallels, but nothing of the scope of the AKLNG project. The experience of those parallels can be drawn on and the owner organizations have all their experience.

He liked to say that the 130-person team has well over a couple thousand years of experience, but their leadership team, the 27 top managerial jobs, has over 800 years of experience, in excess

of 300 million metric tons of LNG design experience. To put that into context, the whole world only consumes 250 million metric tons of LNG. One of the engineering managers has individually designed and built almost 80 million metric tons of LNG; their LNG plant manager has personally been involved in an excess of 30 million metric tons of LNG. Each of the pieces of this project has been done somewhere. He was general manager of the gas treatment plant in the Middle East as large as this one. There are pipelines as big as this and there are bigger LNG plants than this, but no one has put all three together or put them together in Alaska, or in Alaska and permitted it in the United States, and nobody has ever done it in this environment.

3:39:41 PM
MR. BUTT recapped that the AKLNG project is three projects in one $45-65 billion project: they treat the gas, which means removing impurities and putting it back in the ground, and transporting the gas, which means moving it from the North Slope to where it is liquefied by making it very cold. At -260°F it shrinks from the volume of a gas to the volume of a liquid by a factor of 600, which means a given volume of gas can be shipped with one carrier instead of 600. That is why it is done. The first thing people who buy it do is warm it up. It gets used for utilities, home heating or a number of other benefits. That makes it a commodity, and in the commodity business low cost wins, because that commodity is always trying to get sourced at the lowest cost possible.

SENATOR STOLTZE asked who pays him - to clarify who the presentation is from.

MR. BUTT responded that Alaska LNG is a joint venture organization formed under a joint venture agreement that was signed in the middle of 2014. He represents the entities who were involved in developing this material as the senior project manager for the group. He talks about all the project issues that are shared by all the parties. It doesn't mean he talks about the owner issues and the different commercial frameworks where the owners have different views. He was here to talk about how the project works and moves. In the project context, they are designing the facilities required to build the project, the regulatory work that is required to permit the project, and all the cost and schedule work that is required to support moving from a pre-FEED decision to a FEED decision.

SENATOR STOLTZE asked who pays him.

MR. BUTT replied that he bills his time back to the entities. His time is paid for as a function of the participating interests, by all of them. All 130 people are billed in the same manner.

3:43:20 PM
CHAIR GIESSEL said she would invite the individual parties here in about three weeks. So, today is one aspect of a sequence of hearings that will fulfill the statutory requirement of SB 138.

MR. BUTT said a project of this size requires 10,000-15,000 jobs for construction and somewhere around 1,000 jobs for operating it. The construction phase lasts several years and the operating phase lasts decades. For permitting, engineering, and all the work they are doing now over 1,000 people are working through all the different owner organizations, the project organizations, and the contract organizations.

Accomplishments since the last update in December 2014 are:
-No safety, health or environmental incidents to report
-Continued progress in building a “culture of caring” where people have an individual role to help each other to go home safely.

SENATOR COSTELLO asked what types of jobs will be created so that kids in third and fourth grade today can be prepared for the jobs that might exist for them in the future if this project goes through.

MR. BUTT answered that he can characterize where the work is and the type of skills needed, but they are still at an early stage of definition and cost. The FEED stage - how big the studs are, what kind of foundation, where the concrete is coming from, and where to get the nails from - gets more specific. That is the stage at which you have great clarify on every single job you need.

3:48:59 PM
SENATOR COSTELLO asked who will be identifying the jobs.

MR. BUTT answered once they have a FEED design and understand what is needed they can work with the different state agencies, the Department of Labor and Workforce Development (DOLWD) for one, on how to do it. They will work on training centers and enabling mechanisms to make sure of getting as much of the right resources as possible. One of the early elements of pre-FEED is labor studies on what is available. The state and federal

agencies and the broader market are engage to find out who is building what and where. Getting the right people is very competitive, as well, because there are a lot of projects out there.

3:50:43 PM
MR. BUTT related some high-level accomplishments:
-The resources about 35 tcf of gas at Pt. Thomson and Prudhoe Bay,
-The gas is piped into a treatment plant (GTP), which is proximal to the central gas facility at Prudhoe Bay.
-The GTP removes impurities (Prudhoe Bay has about 11 percent CO_2) and put back in the ground. Their objective is to take methane gas and move it from 30°F to -260°F so that anything that isn't methane freezes early and drops out.
-Once the gas is treated, it is put in an 800-mile long pipeline and goes to a proposed LNG plant at Nikiski that will compress and shrink the gas by a factor of 600.

To that end since the middle of 2014 they have spent $82 million on pre-FEED. Those monies are carried by the participating partners of the joint agreement. The State of Alaska through SB 138 has a 25 percent participating equity interest in the project. Two agents represent it: the first is TransCanada, which represents the state in the mid-stream elements (pipeline and gas treatment plant (GTP)), (which means TransCanada is paying the state's share of all work for the GTP and the pipeline) and the Alaska Gasline Development Corporation (AGDC) that carries the state's participating interest in the down-stream costs. The other elements are paid for by the other joint venture participants consistent with their equity interests.

Right now their spending has ramped up to $25-30 million per month, which they believe will stay the same over the next several months. One of the reasons he has confidence the pre-FEED work will get done is because all the contracting is done and all the companies are in place; they have met their 30-day deliverables and contracting objectives were met in October 2014, as expected. He explained that very large LNG companies are involved: Chiyoda and CB&I are working together on the LNG plant; URS and CB&I are working on the GTP; the Arctic Slope Resource Corporation's (ASRC) Energy Services Arm is also represented. So, it's a great example of having global LNG players working with a local Alaskan corporation from day one in the design at both plants. A small group of people are doing pipeline design work with a company called Worley Parsons that

has a long history of doing the previous design work for other companies.

They also have confidence in being able to get the first 12 resource reports done early in the next month. The first intent was submitted late last year and 2-9 and 11-12 are largely complete. Hopefully they will go to FERC, the umbrella organization that administers the Environmental Impact Statement (EIS), soon. These resource reports are very important because they enable them to complete an EIS and that underpins a construction permit. The project can't be started without it.

CHAIR GIESSEL said these reports, particularly report 5 that addresses socio-economic issues, are the opportunity for the general public to review and offer input.

3:56:56 PM
MR. BUTT said that was correct, but suggested that it is only one of many mechanisms that show opportunities for engaging the public. FERC has open houses, for instance. He said the first draft is a framework that is used to work with stakeholders and it is written in pencil. The completed report, the second one, is written in pen.

He said the Department of Energy (DOE) has provided export authorization to the project to all free trade nations, but that allows them to export LNG to only a portion of the globe. Their original application solicited both free-trade agreement (FTA) and non-free-trade agreement country access. The reason is simple: they want to be able to sell LNG to anybody that wants to buy it, because they want to have the most competitive environment for buyers, just like they have the most competitive environment as sellers. It needs to work both ways. The DOE is continuing to work this issue very hard.

3:59:05 PM
In addition to the resource reports, probably the best way for the public to get involved is through the open house sessions with FERC. After the first draft resource reports are submitted FERC "kind of takes the reins." The reason is to make sure that all the community members and stakeholders have unfettered access and can say whatever is on their mind.

4:00:02 PM
MR. BUTT said these sessions are a fundamental mechanism to help Alaskans feel comfortable with this project. The new administration has done a great job of helping everyone

understand the importance of transparency and as an owner, Alaskans need to know that their share of that investment makes sense.

The flip side of that is sometimes talked about in terms of confidentiality. They think about confidentiality in a competitive context. He explained that the LNG business has about two projects pursuing every one LNG molecule, which from a supply side means there's twice as much capacity being designed and pursuing regulatory permits as the market thinks it needs. It's not exact 2:1 on the number of projects, but 2:1 on the volume. This is a very big project, so for it to move forward it will displace more than one project. Given that competitive framework, it's important to keep the information that preserves their competitiveness a little bit confidential. That doesn't mean anyone should be excluded, but it means they need to be very thoughtful about how to have transparent information available to a broad range of people. They would feel uncomfortable putting some of the design work they do in the public domain, because of competition around the world. The project team and participants feel like they're pretty good at this and aren't really interested in helping others compete with them. The SOA as an owner equity shares that, so a balance is needed.

The challenge is how to preserve a competitive environment while being as transparent as possible. He said the DNR Deputy Commissioner challenged the sponsoring groups to come up with a way to build that trust. One of the business leaders said tongue in cheek that everybody's bid should be in the public domain except his. And that is the challenge. One great step towards transparency are the FERC-led community open houses where people can say whatever is on their minds to the FERC representatives about the project. Building on that is the 2015 summer field season where all the data is gathered for regulatory permits.

SENATOR COGHILL said Japan is not part of the FTA, but they are probably our best working customer and Mr. Butt's plan is to sell to them at the first application. He asked who else besides Japan.

4:06:01 PM
MR. BUTT answered that he couldn't talk about marketing strategies, because of anti-competitive reasons, but the owners who created the commercial framework want to secure export permits and the authorizations for both FTA and non-FTA

countries to pursue the broadest market possible. So, they must get Japan as a customer.

He explained that Alaska has a natural advantage in transportation over a lot of projects, because it is 12-14 days away from the Asian market whereas other parts of the world are 18-28 days away depending on whether you're talking about the Gulf of Mexico or the Middle East. He emphasized that it's a fundamental law that low cost wins in the commodity business.

SENATOR COGHILL said one of his concerns is about the competition from the Canadian West Coast, because they might not be limited by FTA issues.

MR. BUTT responded that the state has a lot of great people working for it to support the LNG project, but how the state will market its gas is an element, and it might want to think about how much the buyers know about its plans for marketing. This folds back into the broader conversation about how to manage this information flow to preserve competitiveness and private information.

4:09:31 PM
His key messages:
1. AKLNG is an integrated LNG project, a pipeline plus plants. The pipeline is only a small portion of the total cost. The majority of the costs are the plants. The gas can't be liquefied unless it is cleaned up and it can't be sold overseas unless it is liquefied. So, it is a large integrated LNG project with the pipeline as an important portion as it allows gas to go to Alaskans and to the south.

As an integrated project, it is regulated under a different section with FERC, section 3, which is for export projects instead of section 7. This is very important to them, because the resource owners, who are the state and the parties who have purchased the right to produce the resource through the leases, have 98 percent of the gas on the North Slope. This is an opportunity to work together in an integrated manner allowing the project people talk to the resource people in a way that has never happened before.

Previous incarnations of this project were always done under FERC, section 7, which means there are limitations on data exchange between the project and the resource owners. In an integrated project like this the project owners and the resources owners are the same group of people and therefore are

not limited by those factors. Because they are not limited they are able to be much more efficient in their design. They can make design decisions in how the GTP is built and how the business gets integrated at Prudhoe Bay that previous projects could not. These provide big advantages that help competitiveness particularly in terms of costs.

2. For the large LNG project to be successful three things are necessary: alignment, risk, and costs (ARC). This is a framework to test the questions like he is hearing from the committee today against: like what a factor does to alignment and how it impacts risk and cost. The most important project element of success for any mega project is alignment of the parties and their ability to resolve differences and move forward effectively.

4:12:46 PM
SENATOR WIELECHOWSKI said he heard talk about maybe some misalignment with the new administration and asked if he shared that concern.

MR. BUTT replied that he hoped the life of the AKLNG Project would be measured in decades and there will be a lot of political transition. The challenge is to preserve the alignment across the parties such that they all continue to work together. He was happy to say the folks in new administration have been great; the previous administration did a tremendous amount of work to make this project happen. They did an excellent job, but the transition process can be managed in a way to preserve alignment. He is very optimistic. He repeated that preserving alignment is everything.

A second question to ask themselves is how a factor impacts risk: how they move through the gates. Pre-FEED is all about identifying risk, mitigating risks, and reducing uncertainty. Anything that creates risk or uncertainty makes it much more difficult to move the project forward, because as it moves forward the amount of resources - people, money, time - increases by factors of two and three. It's a very abrupt escalation.

3. With that said, alignment and risk tie back to cost, because cost of supply is the fundamental metric that says how much was spent to build and operate the project and how much gas was delivered to the consumers, or taking those total dollars and dividing them by the total millions of btus of energy, can he deliver that energy to a buyer at a low enough cost to compete?

An old adage says if you are losing money on a unit basis, don't try and make it up with volume. This is a huge project and they have to make sure every one of those molecules has a margin that generates enough return to make the investment and the risk worthwhile for all the owners.

Last, he wanted to talk about status. They are moving through pre-FEED and going really well, but there are some open commercial and fiscal considerations that need to be resolved. SB 138 offered a roadmap for how to address commercial and fiscal issues such as property tax, royalty structures, fiscal durability and predictability. It will be very difficult to get any owner group to feel comfortable with increasing their investment without some reduction in the uncertainty around these factors.

4:17:09 PM
MR. BUTT said the way that would work is by using a gated project management process. They do different things - move through different decisions and do different levels of work - but then they hit decision points called "gates" where they decide to either go forward or stop. He related in 2012 and 2013 the group did concept work, which is where they decided where the GTP would go, where the LNG plant would go, and how big the facilities would be. That cost $100 million; the state through Alaska Gasline Inducement Act (AGIA) carried about $28 million. That information allowed them to get to a decision point in the middle of 2014 to ask themselves whether or not they wanted to move into pre-FEED that will cost on the order of $400-500 million.

They have now spent $82 million for a total of $180 million. They will spend another $300-350 million in pre-FEED. That information will allow them to make a FEED decision, the detailed work that really defines how this project would get built. At the final investment decision (FID) they will spend $2-3 billion before deciding to build the project or not. So, they will want to know before putting up all that money if they can get a regulatory permit to build it, about the Environmental Impact Statement (EIS), and about the federal construction permits, the export licenses, and the authorizations to sell to non-FTA countries as well as FTA countries.

He said all the owners will want to see information that will make them confident that at the end of pre-FEED when they will have spent a half billion dollars, they have the right to spend $1-3 billion in FEED. They are spending $25-30 million a month

now; going to FEED they will spend well in excess of $100 million a month. Going to construction will make that number go up to millions a day.

4:21:51 PM
SENATOR WIELECHOWSKI asked if he will be evaluating a plan only to Nikiski or to other locations.

MR. BUTT answered that line routing and plant location decisions have been made in concept. Some of those elements are being revisited in pre-FEED, but their resources are focused on the LNG plant in the Nikiski industrial area at this time. It may move, but dozens of alternatives across the state were tested in the concept work and the Nikiski industrial site was selected, because they think it has the lowest profile for risk and cost. It's basically a very big flat space, which means they don't have to spend a lot on civil work and it reduces the environmental impact. Other places would have to move 30-35,000 cubic meters of rock. That is very expensive and would have huge impacts on the environment that they would like avoid.

He said they also looked at the pipeline routing that made it most expeditious to source gas to Alaskans, and they looked at operability - weather and snow loads - everything that gave them a sense that the project as designed with its current route and current plant locations is the right place to focus energy for pre-FEED. But it's not final until the FERC work is done.

SENATOR WIELECHOWSKI said he had heard concerns that about the water depth in Nikiski versus a greater depth in Valdez.

MR. BUTT explained that LNG carriers are very different from crude tankers that carry a heavier denser liquid and draft 100-110 feet. An LNG carrier drafts 40-45 feet. They have done a lot of work that gives comfort that the sites as they are working them are the place to start.

SENATOR STOLTZE asked about using Mat-Su for a deep water port.

MR. BUTT responded if they could avoid crossing Cook Inlet, they would consider it seriously, but a combination of pipeline approach characteristics, construction characteristics and operation characteristics make the Nikiski industrial area a better choice.

4:25:54 PM

He said that Pt. Thomson and Prudhoe Bay provide 25-35 tcf of gas. All work in the unit is managed by the unit operators under the unit joint operating agreements, but they work together on a very close basis to make sure the design of the project is as efficient as possible. A fundamental strength this project has that others didn't is the use of the existing infrastructure (compression facilities and wells). The infrastructure is needed to source the gas to the project so they don't have to create it.

4:27:38 PM
The design work for added compression and expansion is done. The gas is sourced to the GTP, about three-quarters from Prudhoe Bay and one-quarter from Pt. Thomson. The facility will be big enough to handle the big swings in volume in the winter - about .4 bcf/d for export, about 400-500 mmcf for in-state use - with the balance for fueling the GTP, the compression facilities, and the LNG plant.

He explained that the facilities are 3,000-9,000 ton modules that consist of 250,000 tons of steel each, the size of a Nimitz air craft carrier. Geotechnical work and sealift strategies are being done to make sure it can all get moved.

They are also looking at the fabrication. He showed a 130-foot tower that was 28 inches in diameter; the steel walls were 12-14 inches thick. So they have to be able to take a single piece of steel that thick and roll it. It is a very specialized task, but they have confirmed the ability to fabricate and move them.

He showed a one-minute video of the virtual operation of a plant using a tool where people can work in real-time 3-D and move around to their heart's content. They do that to make sure that the designs are as efficient as possible from a hydraulic and thermal perspective.

4:33:39 PM
From the GTP the gas goes into the pipeline, Mr. Butt said, but that is a lot more complex than people think. It goes through multiple environments and multiple design regimes. Starting at Pt. Thomson the line is above ground to the GTP; the Atigun Pass regime is continuous perma-frost, which uses a conventional under-ground pipeline design, because the ground is always frozen; moving down to the Interior is the central section where the strains and loads have to withstand 150° swings over the course of the year, because it's very warm in the summer and very cold in the winter; it is always moving. Once it gets onto

the back of the Alaska Range, they move back into a conventional design range, because it doesn't have the temperature swings. Then an off-shore section is needed to cross the Cook Inlet. So when they talk about the pipeline, they are actually talking about five different regimes.

With that said, they have started a pipeline testing process by acquiring $2.5 million worth of pipe to see who can source what is needed. Not a lot of folks can make pipe this big. One or two in North America can handle up to 42 inches, but above 42 inches it would have to go to Asia.

MR. BUTT explained that different kinds of pipe are required for the different loads. A longitudinal welding (LSAW) is difficult to make, because the weld has to be stronger than the body of the pipe. A little bit simpler type of design is a helical weld (HSAW) in which the volume of the weld is much greater than in a longitudinal weld; that means that both its loading and strain characteristics are different.

He said many different types of pipe are needed and are sourced from many different mills that have to fit five different regimes. So, they are in the process of testing different welding procedures and different material sourcing procedures to find out which mills have the capability to provide this pipe at a low enough cost. The goal is to make sure that the cost and schedule characteristics are as carefully defined as possible.

4:38:50 PM
He said the Pipeline Hazardous Materials Safety Agency (PHMSA) is the federal regulator that works on pipelines; FERC is its umbrella organization, but PHMSA has the permitting authority over pipelines.

MR. BUTT said the AKLNG Project and AGDC are continuing to cooperate. He thanked Fritz Kruzen who works for AGDC who helped him come up with an excellent helical pipe example. They are also cooperating on all the data and design work for the pipeline design. Most importantly, they have harmonized the routes so that all the different pipeline routing that is being looked at to move gas from north to south has a common route. This has meant gathering all the historical data from previous pipelines - TAPS, Denali, APP and ASAP - into one set of data. They are also sharing those studies - geotechnical program, aerial mapping, environmental field data, fault studies, infrastructure studies - in moving forward. These are very

important elements in making sure the pipeline has the lowest risk and the lowest cost possible.

4:41:19 PM
He showed a short video of the Atigun Pass segment of the pipeline route taken from a large interactive data base. The pipeline comes all the way down to the LNG plant that was permitted for 20 million metric tons (about 2.5 billion cubic feet of gas a day). It's ten times the average use of the State of Alaska and about one-third of what an industrial country the size of Germany, the UK, or Canada would use. Its design consists of three modular I-6 MT (million tons) trains (how liquefied gas is referred to). It takes about 800 million cubic feet (mcf) of gas a day to generate 5 million metric tons of LNG. So, each train is about 800 mcf or about 2.4 bcf/gas in total.

The reason they picked this size is because it was in the middle; the bigger trains have much larger drivers and are very efficient for very large resources; the smaller trains are better fits for smaller resources. They try to match the size of the trains to the size of the resource, so they have 25 years of plateau and can source gas over a 30 year period, which is the period they requested in their export authorization.

4:43:09 PM
He said the team had done all the engineering work around a selected liquefaction technology; the one selected is the most common one and these train sizes are also the most common. The reason being to reduce risk; they know these trains and this technology. He said the challenge with LNG manufacture is everything that is in a gas stream that isn't methane will freeze before the methane does, so it has to be very clean.

4:44:05 PM
He said the Nikiski site has a wide range of characteristics. The infrastructure is very important; 737s can land in Kenai and that allows equipment to be moved efficiently. It has an existing infrastructure, which is important because the workforce to build this plant is on the order of 3,000-3,500 people. Some of the places on the west side of the Inlet, particularly moving to the south, have no infrastructure. They also want to minimize their environmental impact, so the less civil work needed the better. The snow loads in Kenai are a little lower than in other parts of the state; some parts of the state have over 300 inches that makes it impossible to operate

an LNG plant, because unlike other industrial facilities, LNG facilities require constant care and attention.

MR. BUTT pointed out the three little dots that were the ConocoPhillips LNG facility that they had operated for 40 years never missing a cargo or had an issue, another demonstration that that area has a history of successful LNG manufacture. All those characteristics kind of role together as part of a very large, very detailed analysis that gives them the sense that this is the area they want to try first (there are three of four other possibilities).

4:46:01 PM
In terms of confidentiality, he explained that they are acquiring land and it's important to respect the privacy of the landowners and make sure that the deals are done in a manner that work for all parties. To date, most of the feedback has been that parties feel they have been treated fairly from day one. This is very important because they want to be a good neighbor and to be there for decades. Alaska has cold dry air, which is great for compression equipment and they would like this plant to operate well past 30 years, and think about that in their design process.

4:46:57 PM
SENATOR WIELECHOWSKI asked if he had ruled out Anchorage as a location.

MR. BUTT replied that they did look at Anchorage, but it would have a lot of challenges. Moving up Cook Inlet, some of the ice loads are higher and finding 600-800 contiguous acres with access to the port was difficult.

He explained that FERC won't pursue EISs on projects that don't own acreage; the partners must be able to demonstrate that they own the land, control the resource (the four parties have 98 percent of the known resource), and can manage the technology. The three producer entities are three of the five largest LNG companies in the world, so they have the technology.

4:48:39 PM
SENATOR STOLTZE said he wanted a "solid second look" and due diligence done on all locations, because the public would have a greater degree of confidence in whatever ultimate decision is made.

MR. BUTT responded that he appreciated that and that they have had 65-75 community sessions where they took the design criteria and the site selection criteria and had sat down with the mayor of the Mat-Su Borough and showed him how the decisions were made. They sat down with the Valdez City Council with Governor Walker in attendance. All that material is available; he would be happy to ensure that the right representatives of the state see it again.

SENATOR STOLTZE said in those meetings there was a certain dynamic as Governor Walker was sitting in the back row then.

4:50:53 PM
MR. BUTT showed more video of the site that was largely uninhabited flat land with industrial infrastructure characteristics. He said the LNG plant weighs about 200,000 tons; the compression equipment is also very heavy and they want to make sure that the soil and the foundation designs are proper enough to carry that load. So geotechnical work is done with bore holes drilled and cuttings taken down to about 150 feet. Thirty have been done and another 150 are needed all over the site to make sure it all has the geotechnical characteristics to handle the loads of the plant.

SENATOR WIELECHOWSKI said the proposed site in Cook Inlet is obviously home to millions of returning salmon and asked if dredging would be necessary. Did he anticipate fisheries issues?

MR. BUTT said the decision was made to stay north of the Kenai River to minimize any impact on salmon. But there are fisheries in the area and they want to minimize any impact on those. So, they have opened conversations with the Borough and the Department of Natural Resources (DNR) on how those will be managed. Part of the EIS and the assessment process is demonstrating no adverse impact on fisheries. He didn't expect any, because their impact in the water is very limited.

He explained their 2-D seismic and sonar mapping of the ocean floor that is matched to other data that allows them to get very detailed maps of the Inlet. They also have years of data that have been captured on the metocean characteristics - tides and currents - and other characteristics of the Inlet to make sure that the shipping can be managed safely. Cook Inlet has seen 40 years of successful LNG operators. Further, LNG carriers are very different from crude carriers that are about the same size but very heavy. A crude carriers draft more the twice what an

LNG carrier does and that difference is very important when navigating up the Inlet.

4:54:47 PM
SENATOR WIELECHOWSKI asked if the LNG carriers are similar to the ones going into Nikiski now and if he anticipates needing to dredge.

MR. BUTT answered they are similar, but the ones going into Cook Inlet are smaller. A traditional vessel calling at Nikiski is somewhere between 80,000-90,000 cubic meters (gas on a boat is measured in cubic meters); really large LNG carriers are 215,000-265,000 cubic meters. Their plan is to use "conventionals" on the order of 150,000-165,000 cubic meters. Last year the existing facility brought in a vessel of about 130,000 cubic meters with the same length and beam.

To his second question, it's too early to say if they anticipate dredging for the jetty. They don't want to, because it has an environmental impact and a cost. Their intent is to design the jetty so dredging isn't needed, but they need to work with FERC and the U.S. Coast Guard to do a "water way suitability assessment" and other mechanisms to test the jetty. And it's too early to say about needing to dredge another part of the Inlet.

SENATOR WIELECHOWSKI asked how many ships per day/week they anticipate coming in and how many are coming in now.

MR. BUTT replied currently only one ship comes in once in a while, because the volumes are mainly consumed by in-state use. He is looking at one conventional ship (150,000 cubic meters) about every two or three days. The tanks on shore will be filled up every three days and one ship will be needed every three days to take it out.

SENATOR WIELECHOWSKI asked if the plan is to ship everything for the LNG plant into the Port of Anchorage and then truck it down to Kenai.

MR. BUTT answered that they would build an offloading facility at the site. Moving it into Anchorage and trucking it would be an enormous burden on everybody. Access by air is also important and those characteristics are why they chose the Nikiski industrial area to start.

SENATOR STOLTZE asked him to talk about potential environmental and habitat litigation costs. He knows what it has cost the Borough on a much smaller project.

5:00:28 PM
MR. BUTT responded there is no active litigation and they don't expect any.

MR. BUTT said the Mat-Su Borough can do a lot of important things; a lot of the pipe will be moved through there. He has had great conversations with folks in the Economic Development office and the Mayor. If something is missing, he would follow up.

SENATOR WIELECHOWSKI commented that putting the pipe in Mat-Su or Anchorage would save a lot of miles and crossing over the Cook Inlet with its Endangered Species issues. He hoped he would take a good hard look at it.

5:02:52 PM
MR. BUTT said that crossing the Inlet is difficult and expensive but the challenge in constructing on the west side of Inlet is the nature of its marine characteristics, the nature of the ice flows and the winter ice packs. The forelands move the ice in the east side of the Cook Inlet channel it is much deeper than the west side, which is why the existing industrial area was sited there and why shipping has been successful there for 40 years. The LNG plant does its peak demand work in the winter and probably there will be a vessel every two days in the winter. So, they have been very thoughtful and careful thinking through the marine design. Moving either west or north is very challenged and costly. It's cheaper to cross the Inlet and that is why the pipe is on the west and the plant is on the east.

5:04:49 PM
MR. BUTT said they had gotten great support from the Department of Energy, because they took Alaska out of the Lower 48 permit process and are treating it separately. A lot of the summer field work has been done. Part of that is digging holes to make sure there is no cultural heritage or sites of archaeological significance and work with water ways. The captured data goes into the resource reports.

5:06:19 PM
He said FERC is the agency that leads the National Environmental Protection Act process, which enshrines the EIS creation. To support FERC, the federal DOE has created an inter-agency

working group to bring all the parties together to talk about the regulatory process and how the federal government can support and get the information it needs for the permitting process.

5:07:10 PM
He said there are 13 resource reports: numbers 1 and 10 have been submitted and the other 10 of the first 12 are largely done. Submitting these reports triggers FERC into taking over the community engagement process where together they address the public's concerns. This creates transparency and hopefully the buy-in they need.

5:08:30 PM
CHAIR GIESSEL asked if Congress has to do anything to allow this project to go forward.

MR. BUTT answered nothing at this time; they had provided some enabling legislation that may or may not allow the pipeline to enter Denali National Park, but their intent is not to enter it.

5:09:36 PM
He showed a short video of summer field work activities and another of community engagement sessions they have had so far so that everyone understands the project.

5:12:39 PM
He summarized that to get to FEED, the FERC process needs to be completed and a lot of engagement is needed from Alaska as an equity participant. People need to feel that sense of ownership. They have invited local businesses to register on their website: AK-LNG.com; those businesses are invited to open houses where they will talk about different ways to engage them as the project moves forward and learn about their skills to match up global LNG knowledge and local Alaska knowledge. A lot of community meetings are planned and talks with FERC, so they can document that they have talked to the stakeholders and know they understand the process.

MR. BUTT said help is needed from the legislative to make sure they are really reducing project risk and cost of supply. The legislature needs to let them know what it needs to help them move this forward. This all goes together to position them for a decision point in 2016. The state needs to identify the off-takes and help is needed on key commercial agreements: how gas is sourced from the different fields and balanced, what third-party access looks like, and other commercial issues that need

to be resolved. They need to look at the Heads of Agreement (HOA) and SB 138 roadmap around durable, predictable fiscals. It's very important to take that higher level of resource commitment to understand that it's going to be durable for a long time. The project will last for decades and will the environment support that kind of commitment?

Finally, and most important of all, they have to really find ways to keep building alignment between all the parties. There will be a lot of transitions and the question is if parties can stay aligned such that the folks who have resource ownership of the known resource at Prudhoe Bay and Pt. Thomson - the State of Alaska, BP, ConocoPhillips and ExxonMobil - can find ways to use that shared resource to build an infrastructure that can then access the markets in a cost competitive manner.

CHAIR GIESSEL thanked Mr. Butt for the presentation.

5:16:40 PM
CHAIR GIESSEL adjourned the Senate Resources Committee meeting at 5:16 p.m.