ALASKA STATE LEGISLATURE
JOINT MEETING
HOUSE TRANSPORTATION STANDING COMMITTEE
HOUSE SPECIAL COMMITTEE ON ECONOMIC DEVELOPMENT, TRADE, AND TOURISM
March 4, 2014
1:06 p.m.

MEMBERS PRESENT
HOUSE TRANSPORTATION

Representative Peggy Wilson, Chair
Representative Doug Isaacson, Vice Chair
Representative Lynn Gattis
Representative Craig Johnson
Representative Bob Lynn

HOUSE SPECIAL COMMITTEE ON ECONOMIC DEVELOPMENT, TRADE, AND TOURISM

Representative Shelley Hughes, Chair
Representative Lynn Gattis
Representative Pete Higgins
Representative Craig Johnson
Representative Geran Tarr

MEMBERS ABSENT
HOUSE TRANSPORTATION

Representative Jonathan Kreiss-Tomkins
Representative Eric Feige

HOUSE SPECIAL COMMITTEE ON ECONOMIC DEVELOPMENT, TRADE, AND TOURISM
Representative Bob Herron
Representative Kurt Olson
Representative Lance Pruitt
Representative Harriet Drummond

COMMITTEE CALENDAR

PRESENTATION: "TRANSFORMING ALASKA - AIRSHIPS" BY MICHAEL SMITH~ CEO~ & KURTIS ZELL~ DEVELOPMENT COORDINATOR~ MERGED ENERGY SOLUTIONS

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

MICHAEL SMITH, Chairman; Chief Executive Officer
Sky Lift Aeronautics - Merged Energy Solutions (MES)
Anaheim, California
POSITION STATEMENT: Provided a presentation "Transforming Alaska - Airships".

ACTION NARRATIVE

1:06:12 PM

CHAIR PEGGY WILSON called the joint meeting of the House Transportation Standing Committee and the House Special Committee on Economic Development, Trade, and Tourism to order at 1:06 p.m.Representatives, Gattis, Lynn, and Isaacson and P. Wilson of the House Transportation Standing Committee were present at the call to order. Representative Johnson arrived as the meeting was in progress. Representatives Gattis and Hughes of the Special Committee on Economic Development, Trade, and Tourism were present at the call to order. Representatives Johnson, Higgins and Tarr arrived as the meeting was in progress.

Presentation: "Transforming Alaska - Airships" by Michael Smith, CEO, & Kurtis Zell, Development Coordinator, Merged Energy Solutions

1:07:19 PM

CHAIR P. WILSON announced that the only order of business would be a Presentation: "Transforming Alaska - Airships" by Michael Smith, CEO, & Kurtis Zell, Development Coordinator, Merged Energy Solutions.

1:08:55 PM

MICHAEL SMITH, Chairman; Chief Executive Officer, Merged Energy Solutions (MES), said that a thorough presentation on airships would take hours but today he will condense his remarks and give members as much information about the airship as possible. He hoped members received supplemental information with specifications on the airship. He stated that Sky Lift

Aeronautics LLC, Merged Energy Solutions was formed in 2012 to become the exclusive marketing, sales, and leasing representative for Lockheed Martin's hybrid aircraft. He related that if anyone wanted to purchase an aircraft they would need to go through Skylift Aeronautics to do so. The beauty of this airship is that it is going to transform so many aspects of business that he characterized as being "a game changer." He highlighted the "Benefits to Alaska" including economic growth, lower operating costs versus fixed wing, more productivity, new jobs, safer transportation, expanded domestic and international commerce, and cleaner environment [slide 1].

CHAIR P. WILSON remarked that she is anxious to see how it will happen.

1:11:30 PM

MR. SMITH discussed the economics [slide 2]. He acknowledged significant mining is happening in Interior Alaska. The infrastructure such as roads and power that it takes to get from civilization to the mining site would cost hundreds of millions and perhaps billions to accomplish, but the capabilities of the airship, including vertical loss, the drop down and landing site, would save time, effort, and needless expense. He commented the limited space an airship needs to land, approximately a flat area of land about the size of a football field. Therefore, using the airship could significantly reduce the cost of any type of infrastructure. He turned to alternative shipping, noting the fuel savings since the airship can go point-to-point. He explained the process the airship uses is to load, fly, and drop down. With respect to oil and gas applications, he speculated that the airship would have ability to transport various types of fuel, including liquid and liquefied natural gas (LNG). He pointed out this is significant since the airship can do a number of things fixed wing aircraft cannot. In terms of alternative transportation, he mentioned the Dalton Highway. The aircraft can fly year round, in temperatures ranging from [a negative] 40 degrees to 122 degree temperatures. He described the process again, such that the airship can fly up, drop the payload and come down. The airship is not yet rated for passengers, but he anticipated that within one to one and a half years it will be certified by the Federal Aviation Administration (FAA) for transporting passengers so the airship could provide an alternative to ferry or bus service. In terms of on the spot medical response, the airship is so stable that it could carry an operating room on board. Thus, it could fly into any disaster area or respond to any medical need.

1:16:00 PM

REPRESENTATIVE LYNN asked about the cross winds restrictions of the airship.

MR. SMITH answered that the airship can handle up to 45 knot crosswinds. The airship aerodynamics airship is quite effective plus it has "fly by water" which means the navigational and drive system piloting the airship was taken from the F35. He emphasized its ability to compensate even though it looks quite huge testing in 40 knot winds did not move the airship.

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CHAIR P. WILSON asked about the airspeed.

MR. SMITH responded that the three airship sizes range from the 25, 100, and 500 tons. In further response to a question, he answered that the 25 ton airship travels at 60 knots or about 90 miles per hour. The midsize ship travels at 80 knots and the largest ship is capable of 120 knots.

1:18:34 PM

CHAIR HUGHES clarified the temperature range. She asked whether the lower range temperature is a negative 40, or 40 below zero.

MR. SMITH answered yes, in fact, the colder the temperature, the better the airships fly. In response to a question, he agreed that the airship is better suited to Alaska than for use in the Lower 48. He hoped the airship will get its biggest test in Alaska.

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REPRESENTATIVE GATTIS remarked that Representative Lynn and she both pilot fixed wing aircraft so they will probably have some aviation questions. She asked whether the testing will be done in Alaska due to its temperatures or because it is a large state.

MR. SMITH answered that the company wants to see how the airships perform in cold temperatures and the company prefers to test in the U.S. rather than in Canada. In further response to a question, he reiterated that it would be a cold temperature test

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CHAIR HUGHES commented that a smaller version of the airship is in a Lockheed Martin hangar and anticipate signing an agreement on April 1 with them to build a 25-ton airship with hopes that the airship will be ready for flights next February in Alaska. She asked whether the ship will be taken from California to Anchorage.

MR. SMITH answered that is correct and the flight would be from Palmdale, California to Anchorage.

CHAIR HUGHES thought it would be helpful for people to know the timeframe. She asked him to cover the safety aspects of the airship and why this aircraft is safer than the Hindenburg blimp since many people think of that disaster.

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MR. SMITH turned to the tourism industry, noting that once the aircraft becomes passenger rated it will have implications. He related that capacity for a 20-ton aircraft is 8 passengers, but if the cargo compartment was converted, it could transport 100 passengers. Since it can be adapted to a passenger aircraft and the slow moving flight would be attractive to tourism. He said people in Las Vegas want to use a 100-ton airship as a restaurant and fly over the Grand Canyon and the city. He said that almost everything is possible with these airships.

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CHAIR P. WILSON asked for clarification on the status. She related her understanding that currently none are being flown but they will do some testing in Alaska next year.

MR. SMITH answered yes.

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CHAIR HUGHES referred to the passenger aspect and asked for the capacity of the 500-ton airship.

MR. SMITH indicated a 2,800 person capacity for the 500-ton airship, with 1,200 on one deck and 1,200 plus the crew. He pointed out that the aircraft has windows on all sides.

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CHAIR P. WILSON asked about the cost and whether an airship will be economical to buy and operate.

MR. SMITH recommended the state should use the small to medium aircraft for tourism use since taking 2,800 passengers is feasible. He reported the estimated cost for the small airship at $45 million, the medium airship at $83 million, and the 500-ton at $273 million. He acknowledged that the cost analysis hasn't been done, but he envisioned it would be similar to operating a cruise ship. At this point the airships are in the concept phase, but he further envisioned the large ones could be used as "flying hotels." He characterized the uses of the aircraft as being "pretty remarkable." In further response to a question, he agreed operating costs would be similar to a cruise ship.

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CHAIR HUGHES asked him for a cost comparison for regular aircraft.

MR. SMITH compared the large airship as being equivalent to a Boeing 747 airliner, which costs $273 million to build, but keeping in mind a Boeing 747 carries 200 to 250 passengers whereas the ship can carry 2,800 passengers. The medium size airship would be similar to a "C 7" which is basically a cargo ship, can carry about three times the load capacity as a [Lockheed C-5 Galaxy] "C-5" - the cost of a "C 5" is a $120 million whereas the medium size airship would cost $83 million. The small airship is similar to a [Douglas DC-10 Advanced Tanker Cargo Aircraft] or a [Lockheed Martin C-130J] which cost about $66 million and carry three times the amount.

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CHAIR HUGHES asked for further clarification, that the small airship would cost $45 million and could carry triple the load of a C130J equivalent that would cost $66 million.

MR. SMITH answered yes.

1:30:45 PM

CHAIR HUGHES asked him to discuss the operating costs of the airship.

MR. SMITH compared the operating cost as being about one-third the cost of the fixed wing aircraft, but it depends on the use. For example, it would be more feasible to use the hybrid airship within the state. In some instances international travel costs are less expensive and in others the operating costs are more expensive. He offered to provide copies of a study to the committee.

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REPRESENTATIVE LYNN asked about the airship's speed. He suggested that the small airship speed of 60 miles per hour was too slow to fly from Juneau to Prudhoe Bay plus the airship wouldn't be moving large numbers of people to a project. He could see that using an airship could be effective to move large pieces of equipment, but it might be limited as a passenger carrier in Alaska.

MR. SMITH agreed it depends on the application. He explained that these airships are designed for "other than" passenger transport, but again, it would depend. He suggested if the seas were rough and safety issue arose it could be a factor.

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REPRESENTATIVE HIGGINS asked how much cubic feet of helium it would take to fill a [20-ton airship, the cost, and how long it takes for the helium to dissipate or if it would need to be reenergized.

MR. SMITH answered that envelope volume for the 20-ton airship is 1.3 million cubic feet. The explained the airship is designed with three bladders that takes up three-fourths of the interior filled with air. The perimeter or the space between the outer envelope and the [bladder] is filled with helium, which keeps the integrity of the structure together and acts as a frame. He acknowledged that the [bladder] will lose a little helium, which is minimal unless the airship has a gaping hole. He related that the airship maintenance is done quarterly, and the helium is recharged, which means that it is removed, cleaned, and returned. The bladder will keep the frame compressed, he said. He explained that the cost of helium is all inclusive of the sale so he was unsure of the cubic foot cost for the helium.

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CHAIR P. WILSON related her understanding that the airship is purchased "full" and is ready to do, and hardly needs to be adjusted unless something happens.

MR. SMITH agreed; noting that the helium is refilled during maintenance.

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REPRESENTATIVE HIGGINS questioned why the helium doesn't lose its charge.

MR. SMITH responded that it will lose some of its charge, but the Federal Aviation Administration (FAA) and by the Merged Energy Solutions (MES) will require, the helium charge will be checked and it will be brought up to standards. In further response to a question, he agreed the maintenance is conducted quarterly. He further clarified that the maintenance for the airships is just like any fixed wing aircraft, but it isn't done as often. He acknowledged that the longer the aircraft is in production, the more the MES will learn. He anticipated that the maintenance program would be adjusted over time.

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CHAIR HUGHES referred to the specifications in members' packets, and noted that diesel is required. She asked whether the diesel is used for takeoff. She further asked whether diesel is used once the airship is airborne. She recalled that the company is working to get away from using diesel.

MR. SMITH answered that the airships have Mercedes engines that are basically diesel fuel engines. The MES has been working on bio-diesel which would take the place of diesel and would burn 98 percent clean. He explained that the aircraft is like a helium balloon, which is like a regular aircraft. It has lift, but is built for aerodynamics. He said that if the engines were shut down, the airship would not shut off engines and it would drop down and float.

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MR. SMITH turned to disaster relief [slide 3]. He suggested that if the airships had been used during Hurricane Katrina, that it would have saved lives. The ships can pick up

passengers, contain a hospital, and land on water and land during disaster situations.

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CHAIR P. WILSON asked about hospital applications. She asked whether the airship could sit on the ground and then taken somewhere else to accomplish the rescue efforts.

MR. SMITH answered yes. He said that would be the optimal situation. He envisioned that the main purpose would be to get to point A, drop down, and treat patients instead of evacuating them to a hospital, but he did not envision the operating room in use while airborne. He offered his belief that this airship would be critical for life threatening issues in which treatment must be delivered within a few hours.

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REPRESENTATIVE LYNN recalled him mentioning "fly by wire" controls. He understood that there wouldn't be any mechanical linkage, but there would be wire. He asked whether crosswinds would affect the airship. He wasn't certain he understood if the airship was programmed.

MR. SMITH recalled that Lockheed Martin had issues with cross winds, but once the "fly by wire" was programmed, that it minimized the issues. He explained that the engines on the side of the ship can rotate 180 degrees, which help to combat the elements.

REPRESENTATIVE LYNN said he could see that with the moveable engines.

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MR. SMITH suggested that search and rescue would be similarly applicable, that the airship can land in the water if a ship capsizes and pick up the survivors. The airships are applicable for fishing, since the fishing boat cargo could be unloaded to the airships and the fish could be transported and the airships have firefighting capabilities. He surmised numerous forest fires start due to lightning. He envisioned the large airship could transport liquid to douse out any fires. For example, if an oil platform was on fire, the airship could fight the fire from a logistical distance.

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CHAIR P. WILSON asked whether any other companies in the world are using this technology.

MR. SMITH answered no. He elaborated that the airship can hover. When using nozzles and pumps on fixed crafts such as fire engines or stationary platforms the technology exists, but this has been converted to fit the airship. He referred to page [13] that showed an oil platform being sprayed. In further response to a question, he said that the airship technology is not being used in the world; however two major companies besides Lockheed Martin are trying to build these ships, but he estimated the companies lag five years behind Lockheed technology.

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REPRESENTATIVE GATTIS asked for any reasons this technology hasn't been used in the past 50 years.

MR. SMITH answered that the past experience with the Hindenburg disaster created a stigma. In the past ten years engineers have considered the options for a hybrid airship or a blimp. About 10 years ago, engineers realized another way to build an operational vehicle of this type that could make it safe. For example, the airship uses a combination of helium and air and is more aerodynamic. Previously, it was a long tube that held hydrogen. He characterized this type of aircraft as being the safest aircraft. The airship has been tested. For example, an AK 47 could riddle the side of the aircraft and it will not come out of the air. Certainly, it would start to lose helium, but the beauty of the bladder system is the ability to increase the oxygen to keep the craft taut and the airship can be brought down slowly. Further, a patch kit can be used. He noted that the outer envelope tensile strength is 1,500 pounds per square inch. The patch kit contains the same amount of tensile strength. He related a scenario in which someone shoots an RPG weapon; it will go through the airship, leaving a gaping hole. In this instance, the airship would drift down about 10 miles per hour, but the cargo bay is protected by the landing gear. He suggested the airship would still float. He concluded that the safety factor is quite high for the airships.

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REPRESENTATIVE GATTIS understood the stigma and that perhaps the technology hadn't been developed. She asked whether finances also play a role since fuel is so expensive. She specifically asked if fuel costs play a factor.

MR. SMITH answered that a number of factors are involved, for example, shipping costs. He related that the largest airship has the capability of hauling 300 automobiles, with a 6,800 miles range at a cruising speed of 100 knots. Currently, if Detroit ships vehicles to China, the vehicles are put on rail to the coast, loaded on a ship, which takes one month to arrive in China and the vehicles are transported by rail to the final destination. The airships could go directly to the facility and go point to point. This eliminates a number of steps, which could decrease the cost to ship the vehicles. He said that many companies are interested in the airships. He anticipated that in the U.S., rail will be the "king" since the infrastructure exists. The airship can be most effective for routes not accessible by rail.

MR. SMITH related a scenario in which LNG must be distributed at the end of the pipeline. Typically, it would be transported by truck, but an airship could go directly to the field and load up and distribute the LNG. He offered his belief that the airship has a number of advantages. He suggested that feasibility would depend on a number of factors, not just on fuel costs.

1:57:36 PM

REPRESENTATIVE LYNN asked for the timeline out of factory and when it would arrive in Alaska.

MR. SMITH stated that MES will sign the contract with Lockheed on April 1, 2014. He anticipated it would take Lockheed Martin nine to 10 months to get the aircraft built. He further anticipated that the airship would come to Alaska in February or March 2015. In further response to a question, he said the airship would fly to Alaska.

CHAIR P. WILSON asked to be informed.

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REPRESENTATIVE HIGGINS fabric has been produced. He asked for the life span of the hybrid airship.

MR. SMITH answered that the envelope must be replaced every 15 years at an estimated cost at $5 million, which would be factored in as a maintenance issue.

1:59:35 PM

CHAIR HUGHES requested that the airship stop in Juneau so the legislature can look at it. She referred to slide [8] entitled "It's about the payload, as well as the platform." She suggested that the advantage of being able to transport heavy equipment in areas without infrastructure.

MR. SMITH answered that the functions have basically already been covered. He pointed out one use would be to clean up, which has an implication for use in logging and forest management. He recalled that shipping a rocket booster to the launch is very costly. He offered his belief the airship would be an ideal alternative for shipping. Additionally, carrying windmills could be a routine application. He suggested the number of applications for the airship is left to the imagination.

2:02:31 PM

MR. SMITH recalled a question during another committee and whether the airship could transport platforms to specific areas, and depending on the platform, even if it took three to four trips, it could still pay for itself due to the time savings in getting the platform operational. In response to a question, he discussed safety factors in using helium versus hydrogen. He explained that Hydrogen is very volatile, whereas helium has a zero combustion factor. Helium will not explode. Lightning could damage an engine, but it would not take the airship out of the sky and it would be impervious to electricity. Thus, the airship has a very high safety factor. He offered his belief that the airship has advantages and while it will not replace fixed wing aircraft, it has advantages a fixed wing aircraft does not. Each is useful, he said. He emphasized that this could change the dynamics in Alaska in a number of ways. He anticipated that once the airships are in use, more and more ways to use the aircraft will be found.

2:06:45 PM

CHAIR HUGHES remarked that it could be "a game changer." She pointed out that it costs less to build than a regular aircraft and it costs less to operate. She referred to [slide 14]

entitled "LNG Transport," which is an artist's rendering of what an airship might look like.

MR. SMITH acknowledged it is an artist's rendering. He anticipated that the payload bay would likely be cylindrical tanks. He emphasized that the option to add LNG tanks exists and the company currently is in discussions in Louisiana for LNG transports. He said the MES engineers are working on a new design just for LNG alone, which would likely be used on the 100 and 500 ton aircraft.

CHAIR P. WILSON asked whether it could be transported from the North Slope treatment plant without necessitating building a natural gas pipeline.

MR. SMITH agreed that the airship could take transport gas from the source to the destination point. He pointed out that it is possible to eliminate high cost of infrastructure in mining. He suggested a few dozen aircraft could be used for transport, although he surmised a few could "go a long way."

2:10:46 PM

CHAIR P. WILSON said she is dreaming about the implications of transporting LNG from Prudhoe Bay to Fairbanks an on to villages, Anchorage, and Nikiski.

MR. SMITH answered absolutely. He exclaimed the advantages of point to point delivery, which could eliminate any trucking from the distribution point, which is more economical and safer.

2:11:56 PM

CHAIR P. WILSON suggested that gas could be transported to Japan, India, or China.

MR. SMITH suggested that the 500 ton airship could be taken from point to point with a 6,800 mile range.

2:12:32 PM

CHAIR P. WILSON reiterated the timeline and asked for clarification on the deadline to arrive in Alaska.

MR. SMITH anticipated the airship would arrive in Alaska in February or March 2015.

CHAIR P. WILSON asked whether he would do the "beta testing" at that point. She asked for the timeline for ordering airships.

MR. SMITH answered it would depending on size ship. Lockheed Martin will build the 25-ton airship out of Palmdale. The MES anticipates acquiring 1,000 acres at Millington Naval Base in Tennessee to build a new hangar to manufacture the 100 ton and 500-ton airships, which should take approximately two years. He stated that Lockheed Martin needs approximately one year production on the 20-ton airship, prior to building the 100-ton model. He speculated that by early to mid-2017 to early 2018 as the 100 ton to 500-ton airship production date. However, he suggested that the 25-ton airship could be available next year for transporting LNG. He suggested the smaller aircraft would be most appropriate for delivering LNG to villages.

2:15:30 PM

ADJOURNMENT

There being no further business before the committee, the joint meeting of the House Transportation Standing Committee and the House Special Committee on Economic Development, Trade, and Tourism was adjourned at 2:15 p.m.