ALASKA STATE LEGISLATURE
SENATE COMMUNITY AND REGIONAL AFFAIRS STANDING COMMITTEE
February 15, 2022
3:31 p.m.

MEMBERS PRESENT

Senator Shelley Hughes, Chair
Senator Robert Myers, Vice Chair
Senator Lyman Hoffman
Senator David Wilson
Senator Elvi Gray-Jackson

MEMBERS ABSENT

All members present

COMMITTEE CALENDAR

SENATE BILL NO. 181
"An Act relating to identification requirements for contractors."

- HEARD & HELD

SENATE BILL NO. 177
"An Act relating to microreactors."

- HEARD & HELD

PREVIOUS COMMITTEE ACTION

BILL: SB 181
SHORT TITLE: IDENTIFICATION OF CONTRACTOR IN ADS
SPONSOR(s): COMMUNITY & REGIONAL AFFAIRS

02/04/22	(S)	READ THE FIRST TIME - REFERRALS
02/04/22	(S)	CRA, L&C
02/15/22	(S)	CRA AT 3:30 PM BELTZ 105 (TSBldg)

BILL: SB 177
SHORT TITLE: MICROREACTORS
SPONSOR(s): RULES BY REQUEST OF THE GOVERNOR

02/01/22	(S)	READ THE FIRST TIME - REFERRALS

02/01/22	(S)	CRA, RES
02/15/22	(S)	CRA AT 3:30 PM BELTZ 105 (TSBldg)

WITNESS REGISTER

Daniel Phelps, Staff
Senator Shelley Hughes
Alaska State Legislature
Juneau, Alaska
POSITION STATEMENT: Introduced SB 181 on behalf of the committee.

HOLLY BORGMANN, Vice President of Government Affairs
ADT Security Services
Boca Raton, Florida
POSITION STATEMENT: Testified in support of SB 181.

CHRISTINA CARPENTER, Director
Division of Environmental Health
Department of Environmental Conservation
Anchorage, Alaska
POSITION STATEMENT: Presented SB 177 on behalf of the administration.

GWEN HOLDMANN, Director
Alaska Center for Energy and Power (ACEP)
University of Alaska Fairbanks
Fairbanks, Alaska
POSITION STATEMENT: Presented a PowerPoint on SB 177.

JOHN JACKSON, PhD., National Technical Director
Department of Energy-nuclear Microreactor Program
Idaho National Laboratory
Idaho Falls, Idaho
POSITION STATEMENT: Offered his perspective during the hearing on SB 177.

ACTION NARRATIVE

3:31:21 PM
CHAIR SHELLEY HUGHES called the Senate Community and Regional Affairs Standing Committee meeting to order at 3:31 p.m. Present at the call to order were Senators Gray-Jackson, Hoffman, and Chair Hughes. Senator Wilson arrived immediately thereafter and Senator Meyer arrived during the course of the meeting.

SB 181-IDENTIFICATION OF CONTRACTOR IN ADS

3:31:53 PM
CHAIR HUGHES announced the consideration of SENATE BILL NO. 181 "An Act relating to identification requirements for contractors."

She stated that this was the first hearing and the intention was to hear the introduction and sectional analysis, take public testimony and hold the bill in committee.

3:32:49 PM
Daniel Phelps, Staff, Senator Shelley Hughes, Alaska State Legislature, Juneau, Alaska, introduced SB 181 on behalf of the committee. He spoke to the sponsor statement that read as follows:

> Since 1968 when AS 08.18.051 became statue, contractors in the State of Alaska have been required to list their name, mailing address, address of the contractor's principal place of business, and contractor registration number in all advertising. Although simple, this requirement can incur great expense for contractors, particularly those looking to advertise in print, radio, or television where each additional word or line increases the cost. Furthermore, many contractors in our state maintain several business licenses specific to each service they provide. This requires the contractor to list multiple registration numbers within the same advertisement.
>
> Senate Bill 181 amends the current statute by adding a section which allows contractors to provide an internet website or landing page that contains the identification requirements for contractor advertisements in place of those same requirements. Additionally, this bill requires contractors to specify that the internet website or landing page provided contains the information required under statute.
>
> This section is added to spare costs to contractors and streamline the advertisement process

3:33:56 PM
Senator Wilson joined the meeting.

MR. PHELPS presented the following sectional analysis for SB 181:

> **Section 1 - AS 08.18.051 (b) - Page 1, Line 3 through Page 1, Line 15**
> Amends AS 08.18.051 regarding identification requirements for contractors in advertisements. The new language specifies that a contractor's internet website or landing page satisfies the contractor's identification requirements in advertisements so long as it contains the identifiers required under AS 08.18.051 and the advertisement states that the required information is contained on the contractor's Internet website or landing page.

CHAIR HUGHES asked if this was compulsory.

MR. PHELPS answered no; SB 181 offers contractors the choice to continue to list the required identifiers manually or provide that information on a website instead.

3:35:26 PM
CHAIR HUGHES opened public testimony on SB 181.

3:35:37 PM
HOLLY BORGMANN, Vice President of Government Affairs, ADT Security Services, Boca Raton, Florida, stated support for SB 181 which will modernize the law and help provide more robust consumer protection for customers in Alaska. Similar legislation has broad support from a diverse range of states. She described the manual process ADT consumers go through to find contractor information versus the simpler process of accessing the information at ADT.com. She opined that the electronic option was more consumer-friendly.

3:37:05 PM
CHAIR HUGHES closed public testimony and held SB 181 in committee.

3:37:33 PM
At ease.

SB 177-MICROREACTORS

3:38:55 PM

CHAIR HUGHES reconvened the meeting and announced the consideration of SENATE BILL NO. 177 "An Act relating to microreactors."

3:39:14 PM
CHRISTINA CARPENTER, Director, Division of Environmental Health Alaska Department of Environmental Conservation, Anchorage, Alaska, presented SB 177 on behalf of the administration. She paraphrased the following prepared testimony:

> This one-page bill defines a microreactor according to the federal definition in the Infrastructure Investment and Jobs Act (IIJA). It also creates a carve-out from the ongoing study requirements and the legislative siting requirements.
>
> The existing study requirement involves six state departments and was designed to analyze the operations of a massive legacy reactor. We believe that the Alaska Center for Energy and Power (ACEP) along with national labs is the appropriate place for these studies. ACEP has been studying this issue for over ten years and is committed to work with DEC on a microreactor roadmap for Alaska.
>
> There are currently no microreactors in Alaska, and the timeframe for microreactors coming to the market is estimated at 5-7 years. Allowing these exemptions now, will allow microreactors to be situated without the necessity of legislative approval for land, reducing the burden on atomic industrial development.
>
> The legislative siting requirement reflects the statewide nature of a legacy reactor. A microreactor is a local issue, whereas a legacy reactor has a 50-mile emergency planning zone. A microreactor's planning zone ends at the reactor facility's door.
>
> This bill does not remove the requirement that municipalities must approve of the DEC siting permit.
>
> In addition to extensive clean energy industry support, SB 177 has received backing for a diverse group of stakeholders ranging from forward-thing Alaskans like the Copper Valley Electric Authority, clean energy nonprofits like Clear Path Action, and our own Alaska Center for Energy and Power in

Fairbanks. We expect that list to grow dramatically as we continue to engage with Alaskans in upcoming weeks.

MS. CARPENTER presented the sectional analysis for SB 177:

Section 1:
Removes the requirement for microreactors to be situated on legislatively designated land.

Section 2:
For microreactors, exempts state departments and agencies from the requirement to conduct studies concerning changes in laws and regulation.

Section 3:
Provides the definition of "microreactor."

3:42:15 PM
CHAIR HUGHES asked if legislative oversight would continue in communities in the unorganized borough that do not have a local government to provide oversight.

MS. CARPENTER said she believes that would be the case, but she would follow up with a definitive answer.

CHAIR HUGHES requested the follow up information include input from the Department of Law.

3:43:36 PM
GWEN HOLDMANN, Director, Alaska Center for Energy and Power (ACEP), University of Alaska Fairbanks, Fairbanks, Alaska, stated that her background was in thermal energy and physics, but she started working on the topic of micronuclear reactors about twelve years ago. Initially it was a request from Senator Hoffman to look at nuclear as a potential energy source for Alaska. She noted that in 2022 ACEP provided an update to the 2011 report that included recommendations to amend state statutes.

MS. HOLDMANN began the presentation, recognizing the technical experts at the National Laboratories that have supported the ongoing efforts to understand the opportunities that microreactors present to Alaska. She noted that Dr. John Jackson from the Idaho National Laboratory would be supporting the presentation today.

MS. HOLDMANN turned to slide 3 that lists different nuclear energy technologies from legacy reactors to modular nuclear reactors to microreactors. She acknowledged some of the preconceived notions people have about legacy reactors, then pointed out that microreactors are quite different. One of the big differences relates to safety. Microreactors have a small amount of nuclear material in one place and they have inherent safety features that are quite different than the legacy reactor technologies.

3:46:39 PM
CHAIR HUGHES noted the smoke billowing from the legacy reactors pictured on the slide and asked her to talk about whether microreactors were more environmentally friendly than legacy reactors.

MS. HOLDMANN clarified that it was water vapor coming from cooling towers, which is a legacy feature associated with nuclear power plants and other large-scale thermal power generation. Microreactors don't need cooling towers because they are small-scale and modular.

CHAIR HUGHES asked her to speak to the safety features of microreactors and how the technology differs from the legacy reactors that are associated with catastrophic accidents.

3:48:56 PM
MS. HOLDMANN responded that the nuclear energy industry has a very good safety record globally, but that isn't well understood because of the three major accidents that have occurred in the sixty-year history of using nuclear energy for power generation. She said it probably has the fewest deaths per megawatt hour of generation of any technology globally.

MS. HOLDMANN explained that microreactors are designed to ensure additional levels of safety for the public and the environment. Most are self-contained reactor systems with multiple levels of safety. These reactors don't need to be cooled continually. Further, if an unplanned event were to occur, the microreactor would naturally stop, so there wouldn't be the possibility of a runaway thermal reaction or meltdown of the reactor. There are also inherent safety features associated with the fuels used for these reactors. The fuel is encapsulated in a ceramic-like material that is thermally and mechanically resistant to damage. Microreactors use different types of fuel, but they all have these and other safety features.

3:51:16 PM
SENATOR D. WILSON asked whether nuclear energy was classified as a renewable energy resource.

MS. HOLDMANN answered no, but it qualifies as a carbon-free source of energy. She added that she believes microreactors have the potential to load-follow and back renewable, which would be a great benefit for Alaskan communities to potentially decarbonize their energy supply. The image on the slide is one example of the kind of technology ACEP works on.

3:52:16 PM
MS. HOLDMANN advised that ACEP was formed about 12 years ago to look at the opportunities and challenges associated with Alaska energy production. Based at the University of Alaska-Fairbanks, ACEP is an applied energy research center. It's research directly impacts the lives of the people, communities, and industries in the state.

MS. HOLDMANN advanced to slide 5. She stated that ACEP prepared reports in 2011 and 2021 at the request of the legislature. The first report focused on the historical use of nuclear energy in Alaska, including the Fort Greely SM1 reactor that was commissioned in 1962, decommissioned in 1972, and generated several megawatts of electric power. The Army installed several of these in different facilities. These nuclear systems are akin to what would be found in a submarine or naval ship. They do not have the inherent safety features of the microreactors the industry is developing today. She directed attention to the website http://acep.uaf.edu for historical information on other nuclear projects in Alaska.

3:54:13 PM
CHAIR HUGHES asked her to speak to the history of a project for the community of Galena. She noted that it never got off the ground, but the work Marvin Yoder did on the project was known around the country

MS. HOLDMANN responded that Mr. Yoder was the city manager for Galena and it was his idea to develop a 10MW reactor for the community. The project drew national attention because of the community interest it generated. The Nuclear Regulatory Commission (NRC) used that project as the impetus to rethink its permitting strategy for site licensing, and the statutes were revised as well. She noted that SB 177 recommended an update to the statute to reflect new technology.

3:56:05 PM
CHAIR HUGHES gave a shout out to Marvin Yoder for getting this started years ago. She then asked Ms. Holdmann if she thought the bill was driven by vendors or based on community or Department of Defense (DOD) needs.

MS. HOLDMANN offered her perspective that SB 170 follows up on a bill a Senator Bishop introduced two or three years ago, and it follows the recommendation in ACEP's report. The bill isn't industry driven but ACEP believes industry support is important to co-fund feasibility studies and provide a reasonable path for ACEP to develop these technologies when they're available in the future. She said an indication that the technology is evolving is that there's a project for Eielson Air Force Base that is planned to be commissioned in 2027.

3:57:43 PM
CHAIR HUGHES said she didn't believe the bill was vendor driven. Rather, it's based on the need for energy solutions for Alaska communities that started years ago with Senator Hoffman and the city manager from Galena.

MS. HOLDMANN advanced to slide 6, and reviewed the recommendations in the 2021 updated report to the legislature:

- Continue to track technology and policy/regulatory trends
- Create a state working group on Small Nuclear Energy as a forum to bring together stakeholders
- Create a roadmap for Alaska nuclear applications including specific use cases and a more robust economic analysis, especially for microreactors
- Review/revise AK state statutes related to nuclear energy

CHAIR HUGHES asked if a working group had already been formed.

MS. HOLDMANN answered yes; the group meets monthly and has heard presentations from NRC and industry representatives. The purpose is to educate Alaskans about the changes in technology, regulations, and licensing on the federal level, and to ensure that the people making decisions about developing the technology understand the geographic nuances and Alaska-specific use cases.

MS. HOLDMANN reviewed the facts about nuclear energy outlined on slide 7, with special emphasis on the safety record:

- Nuclear energy supplies 20% of the U.S. electric power needs, more than all renewable resources combined (including hydro)
- The U.S. produces more nuclear energy than any other country in the world
- In the 60-year history of the nuclear power industry in 36 countries, there have only been 3 significant accidents at nuclear power plants.
- With the exception of Chernobyl, no nuclear workers or members of the public have ever died as a result of radiation exposure due to a commercial nuclear reactor accident (including Fukushima Daiichi)

4:00:28 PM
SENATOR HOFFMAN offered his understanding that France produces more nuclear energy on a percentage basis than any other country.

MS. HOLDMANN agreed that France was the global leader for nuclear energy production on a percentage basis. She recalled that about 80 percent of France's energy supply comes from nuclear.

MS. HOLDMANN advanced to slide 8 and described the characteristics of microreactors:

Microreactors are an emerging class of small, advanced reactors with the following general attributes:

- Output of 1 to 10's of MWe **
  ** we are aligning State definition with 42 U.S.C. 16271 (capable of generating no more than 50 MWe)

MS. HOLDMANN offered comparisons. The University of Alaska Fairbanks recently built a coal-fired power plant that produces up to 20 MWe, and the peak load for Bethel is 9 megawatts of electric power output.

CHAIR HUGHES asked her to speak to the reason the bill defines microreactor as capable of generating no more than 50 megawatts of electric energy, not 10 megawatts.

MS. HOLDMANN answered that some of the microreactors in this class of advanced reactor technology are at the 10MW threshold

and ACEP doesn't want to be forced to return to the legislature in a year or two to request a revision to the statutes. She acknowledged that 50 megawatts was somewhat arbitrary, and a threshold that all the microreactors in this category were well below. Also, it aligns with the federal definition in IIJA and federal code related to advanced reactors.

4:03:09 PM
CHAIR HUGHES asked if 50MW of electric power generation came from federal law and federal code.

MS. HOLDMANN answered yes and relayed her strong belief that it was far better to reference national law and statutes than to create definitions unique to Alaska.

MS. HOLDMANN continued to discuss the characteristics of microreactors listed on slide 8:

- Capable of load following and non-electric applications (e.g., process heat)

CHAIR HUGHES asked what the temperature might be.

MS. HOLDMANN replied it's in the 400 degree Celsius range, which is similar to the heat generated in a coal-fired plant. In response to an additional question, she said it's above the temperature to generate steam.

4:05:03 PM
SENATOR MYERS joined the meeting.

MS. HOLDMANN continued to discuss the characteristics of microreactors on slide 8:

- Factory fabricated and transportable nearly fully assembled. Requires a small operational footprint.
- Employs passively safe operating and fuel designs
- Semi-autonomous control system/minimum on-site staff
- Long intervals without refueling (e.g., 10 years)

4:06:37 PM
CHAIR HUGHES asked if leakage was a concern associated with transporting microreactors.

MS. HOLDMANN answered that nuclear material is regularly transported on highways. She noted that ACEP has been working with industry in the design phase to understand packaging and the size and weight restrictions for transporting these advanced microreactors by barge. She said she didn't foresee that it would be any different than the current parameters for transporting nuclear material.

4:07:59 PM
SENATOR D. WILSON noted that some Alaska communities were still dealing with contamination from nuclear waste. He asked whether Alaska would store the nuclear waste from these microreactors in the state or ship it outside. In response to Senator Hughes' earlier question, he advised that 400 degrees Celsius was equivalent to 752 degrees Fahrenheit.

MS. HOLDMANN answered that the statute clarifies that in Alaska nuclear waste can only be moved for the purpose of moving it outside the state. SB 177 does not alter that restriction. The idea is that anytime one of these microreactors is spent, it would be returned to the vendor. There is no intention to store it within Alaska. She said disposing of nuclear waste is a national issue, and her hope is that there will be a solution for long-term waste storage in the US in the next 15 years. That's when the first microreactor will need to be replaced if it's installed five years from now.

To the point about existing nuclear waste contamination in Alaska communities and the long-term implications, Ms. Holdmann said ACEP has done a lot of research and was working closely with the Department of Energy (DOE) Nuclear Energy Office to review the reports that were filed. Her belief is that there is no remaining contamination from the Project Chariot era and she would like to work with DOE to assure communities in that region of that fact.

4:11:27 PM
CHAIR HUGHES asked where the closest nuclear waste storage site was located.

MS. HOLDMANN answered that it's the Hanford Nuclear Site in Washington state. She presumed that was where the radioactive waste from the final state decommissioning of Fort Greely would go.

SENATOR D. WILSON joked about sending it to the aerospace station in Kodiak.

MS. HOLDMANN acknowledged the potential for nuclear power to be used in long-duration space missions.

4:12:38 PM
MS. HOLDMANN directed attention to the chart on slide 9 that shows the kinds of companies working in the area of small nuclear reactors. She pointed to the companies that were quite a bit below the 10MWe threshold. She also noted that some at the leading edge were being considered for a transportable microreactor solution that the Army was working on under the umbrella of Project PELE. It will potentially be deployed in the next two years for military application. In the 10-100 MWe range are reactor designs that might replace the legacy reactors in the country. NuScale Power is looking at deploying 6-12 60MWe NuScale microreactors for that purpose

MS. HOLDMANN directed attention to the artist renderings on slide 10 of microreactors under development. Both companies have expressed interest in Alaska. The image on the left is from the Ultra Safe Nuclear Corporation in Seattle. That company is interested in working on a feasibility study of Copper Valley Electric Association. The design of that reactor is on the 10 MW threshold of electric power output. The image on the bottom is an example of the smaller footprint Westinghouse 5MWe eVinci reactor design. She noted that while the USNC reactor had the potential to be installed below grade, there was more interest in above grade installations because of seismic concerns.

4:15:52 PM
MS. HOLDMANN advanced to slide 11, What Does Passive Safety Mean? She described safety as the most important attribute of microreactors. She recapped her earlier explanation of the new fuel configurations and passive cooling. The slide read as follows:

> Fuel/fuel configuration
>
> New fuel configurations such as TRISO particles cannot melt in a reactor and can withstand extreme temperatures and stresses that are well beyond the threshold of current nuclear fuels.

The schematic illustration of a TRISO fuel pellet showed the fuel kernel (UCO_2 UO_2); the porous carbon buffer layer; the inner pyrolytic carbon layer; the silicon carbide layer; and the outer pyrolytic carbon layer.

Passive Cooling

Advanced reactors do not require active systems to cool the fuel in an emergency. Instead they rely on passive safety features which require no active controls or operational intervention to avoid accidents in the event of malfunction, and instead rely on gravity, natural convection, or resistance to high temperatures (or a combination thereof)

4:17:06 PM
MS. HOLDMANN turned to the image on slide 12 of the Trans Alaska Pipeline (TAPS) and a ground cooling thermal unit that provides an example of passive cooling through the use of heat pipes. The double set of fins on the top section dissipate the heat that has been removed from the ground to keep the permafrost frozen and stable. This system uses ammonia. The temperature range is very different than for microreactors, but the concept of using a working fluid for the passive removal of heat is the same.

MS. HOLDMANN displayed slide 13, Question: What do Micro Reactor Technologies have in Common with the Automobile Industry? She said the hope is that factory assembly will bring the price of these microreactor systems down to the point that they are competitive with the existing power generation options. She explained that the conceptual image on slide 14 shows multiple NuScale Power reactor units configured to potentially replace a legacy reactor. She displayed a picture of the diesel powerhouse in Tuluksak, Alaska and restated that these microreactors can do load following to back diesel and renewable energy generation. She acknowledged that additional studies to assess the economics was necessary.

4:19:21 PM
MS. HOLDMANN displayed slides 17 and 18 that provide a sampling of the statutes that relate to nuclear energy. The bolded statutes are the ones recommended for change.

- Sec. 18.45.020 Requires an applicant to follow the NRC regulations;
- Sec. 18.45.025 Requires DEC to provide permission to a nuclear developer, the state assembly to designate by law any land that would be used, and DEC to promulgate regulations for this section. If a municipality has jurisdiction over the proposed site, its approval is also required.

- Sec. 18.45.027 Pertains to nuclear waste. If the fuel has been used for a period of time, this statute might restrict the reactor containing partially used fuel from being moved in state for further use.
- Sec. 18.45.030 is an authorization of exhaustive/continuing studies of nuclear development related risks by DH&SS, DOL, DOT, DCCED, DF&G, DNR and other State agencies.
- Sec. 18.45.040 relates to judicial enforcement of the law via governor- required processes.
- Sec. 18.45.070 allows coordination with the federal government.
- Sec. 18.45.090 is an exemption related to mining uranium
- Sec. 18.45.900 is filled with definitions.
- Sec. 18.45.020 Requires an applicant to follow the NRC regulations;
- **Sec. 18.45.025** Requires DEC to provide permission to a nuclear developer, the state assembly to designate by law any land that would be used, and DEC to promulgate regulations for this section. If a municipality has jurisdiction over the proposed site, its approval is also required.
- Sec. 18.45.027 Pertains to nuclear waste. If the fuel has been used for a period of time, this statute might restrict the reactor containing partially used fuel from being moved in state for further use.
- **Sec. 18.45.030** is an authorization of exhaustive/continuing studies of nuclear development related risks by DH&SS, DOL, DOT, DCCED, DF&G, DNR and other State agencies.
- Sec. 18.45.040 relates to judicial enforcement of the law via governor- required processes.
- Sec. 18.45.070 allows coordination with the federal government.
- Sec. 18.45.090 is an exemption related to mining uranium
- **Sec. 18.45.900** is filled with definitions.

4:19:51 PM

MS. HOLDMANN advanced to slide 19, Question: Do Microreactors have a role in Alaska's Future Energy Mix? She posited that SB 177 provides the opportunity for communities in Alaska to

consider whether or not microreactors should be considered to meet energy needs in the future. The Department of Energy provided funding for the UAA Center for Economic Development to conduct use-case analyses for a rural hub community; Railbelt application; military base such as Eielson AFB; and mining operation such as the Red Dog. Stakeholders were interviewed to start the process of considering which of those to continue.

MS. HOLDMANN displayed an aerial view of the National Reactor Innovation Center at the Idaho National Laboratory and relayed that the committee would hear from INL Director Ashley Finan on Thursday. She noted that this was where the emerging reactor technologies were likely to be deployed in the US. There is a similar site at the Chalk River Laboratories in Canada, and that's where Ultra Safe Nuclear Corporation plans a deployment in the 2027-2029 timeframe.

MS. HOLDMANN reviewed the information on slides 22 and 23 about the Eielson Air Force Base Microreactor Pilot Project. She clarified that SB 177 was not introduced because of this project, but it provides an example of the reason that the statutes related to microreactors need amendment.

Eielson AF Microreactor Pilot

- 2019 National Defense Authorization Act (NDAA) required the DoD to seek to develop a pilot program for the development of at least one micro-reactor by December 2027.
- Managed through the Office of the Deputy Assistant Secretary of the Air Force for Environment Safety and Infrastructure (SAF/IEE, Mark Correll)

- 1-5 MWe
- Will not be grid connected; onsite heat and power only

Proposed Timeline:

- February/March 2022 RFP released
- Vender selected late 2022
- 2022-23 Permitting and licensing
- 2025 begin construction
- 2027 Commercial operation

4:22:18 PM

SENATOR MYERS asked whether SB 177 was necessary to start the pilot project, or if legislative approval of the siting was not required since it was on a military installation.

MS. HOLDMANN said her understanding was that because it is a commercial reactor it is subject to the legislative siting authority. The Nuclear Regulatory Commission has taken that position and the Air Force has agreed. By contrast, Project PELE is a purely military application and it probably would not be subject to the legislative siting authority.

4:24:03 PM
SENATOR GRAY-JACKSON asked if the Eielson AFB pilot microreactor project would be the first in Alaska.

MS. HOLDMANN answered yes, and clarified that no microreactors have been deployed in the US.

SENATOR D. WILSON asked what will happen to the coal fired power plant at Eielson AFB when the microreactor is installed.

MS. HOLDMANN replied the reactor is not adequately sized to meet the entire load at Eielson AFT, so the coal plant presumably will continue to operate. She added that if the pilot is a success, there could be a strategy to replace the coal plant with multiple small reactors for the future.

4:25:18 PM
SENATOR HOFFMAN asked, aside from the Eielson pilot, what the federal government was doing regarding microreactors.

MS. HOLDMANN answered the federal government has been investing a lot of money in this space through the Department of Energy. The National Reactor Innovation Center (NRIC) is supporting vendors in perfecting their designs and fuel components and moving the technology to market.

4:26:42 PM
SENATOR HOFFMAN relayed that he had the opportunity to travel to Russian where he met the scientist who built the first nuclear submarine for Russia. That man was interested in nuclear power generation for the northern communities in Russia. He asked what was happening in the rest of the world regarding the use of nuclear power for remote locations.

MS. HOLDMANN said Russia has deployed a barge mounted nuclear reactor on the other side of the Bering Strait. It's similar to

a naval reactor that has been repurposed for shore-based power and heat for northern communities in Russia. She acknowledged that these made her nervous because those systems lack the intrinsic and inherent safety features of microreactors. She added that Canada was working closely with the US in the microreactor area and China was doing a lot of work to develop microreactor technologies.

4:28:34 PM
CHAIR HUGHES how far the Russian barge mounted unit was from the Alaska border.

MS. HOLDMANN answered it's near Wrangel Island on the Arctic Ocean coastline.

CHAIR HUGHES asked her to send the specific location and distance from the Alaska boarder to the Senate Community and Regional Affairs Committee.

4:29:07 PM
MS. HOLDMANN advanced to slide 24, Alaska Roadmap. She relayed that the chart shows the four stage gate questions to determine whether or not nuclear energy was a viable option as part of the energy mix for the future. These are: 1) does the technology exist; 2) is it safe; 3) is it environmentally responsible to deploy in Alaska; and 4) is it cost-effective.

4:29:35 PM
MS. HOLDMANN concluded the presentation, reviewing the reasons she likes microreactors and sees them as a paradigm shift for the future, particularly in rural communities:

- Provide baseload energy – heat and power
- Can load follow
- Carbon free
- Safer?
- Competitive Pricing?
- Better long-term certainty of energy costs?
- Reduced risk of environmental contamination?
- Possible complement to existing AK resource mix

4:31:39 PM
SENATOR HOFFMAN asked whether national discussions about the use of microreactors include the potential to address global warming by reducing the carbon footprint.

MS. HOLDMANN answered that the primary driver nationally for using this technology is the potential to decarbonize the energy supply for electric power generation.

SENATOR MYERS asked if some of the uranium to fill these microreactors could come from the uranium deposits in Alaska.

MS. HOLDMANN said she couldn't speak to the quality of the uranium deposits at either Bokan Mountain or [Boulder Creek] on the Seward Peninsula, but she had not heard any discussion about using those resources for this application.

4:34:01 PM
CHAIR HUGHES observed that some of the bullets on the last slide were statements and some ended in a question mark. She specifically asked Ms. Holdmann why there was a question after "Safer" since she was so definitive that these microreactors are safe.

MS. HOLDMANN answered that she is absolutely certain that microreactors are safer than legacy reactor technologies. This is based on scientific evidence and 12 years work in this area. She said she also believes microreactors are likely to be safer than some of the status quo energy sources, but she needs to analyze that further by comparing generation sources, transportation, and storage of the fuel where it's used.

4:35:52 PM
CHAIR HUGHES asked if that explanation applied to the bullet, "Reduced risk of environmental contamination?" She is confident it is lower risk, but she'd like to do more research.

MS. HOLDMANN answered that one of her interests is to ensure that Alaskans have accurate information to make decisions about the energy mix in their communities in the future.

4:36:38 PM
SENATOR HOFFMAN noted that one of the recommendations in the updated 2021 report was to continue to track the technology trends. He asked if her office had the resources to do that.

MS. HOLDMANN answered that she strongly believes that the university and ACEP have an important role to play in looking at and tracking these emerging technologies. This includes working with state agencies and looking at other emerging technologies such as hydrogen and different transmission lines. She opined

that Alaska has the opportunity to be the best in the world in some of these technology spaces.

SENATOR HOFFMAN, speaking as chair of the budget subcommittee for the university, said he'd like to facilitate getting that accomplished.

4:39:27 PM
SENATOR D. WILSON mentioned apples to oranges comparisons and asked which would be the safer for the Bristol Bay community, the Pebble Mine or a micronuclear reactor.

MS. HOLDMANN responded that it's about the size of the footprint in the event of an incident. If there was an incident with a microreactor and some fuel was released into the environment, it would be a local event. There isn't the potential for downstream radioactive effects. A community that's ten miles away would not be affected. If there was an incident at the Pebble Mine, the downstream effects would be different and would be evaluated differently. It's not an apples to apples comparison.

CHAIR HUGHES asked Dr. Jackson if he had anything to add to Ms. Holdmann's testimony.

4:41:29 PM
JOHN JACKSON, PhD., National Technical Director, Department of Energy-nuclear energy (DOE-NE) Microreactor Program, Idaho National Laboratory, Idaho Falls, Idaho, said Ms. Holdmann did a very good job of covering the high points of microreactor deployment. He added his perspective that the Department of Energy was investing more than just money into microreactor technology. A suite of programmatic efforts run through the National Laboratory complex support de-risking the technology and backing the developers of the technology.

4:42:51 PM
CHAIR HUGHES asked Ms. Natcher if she had anything to add.

ALLISON NATCHER, Interagency Coordination Unit Manager, Division of Spill Prevention and Response, Department of Environmental Conservation (DEC), to the Nuclear Regulatory Commission (NRC), Anchorage, Alaska, stated that she had nothing to add at this point.

CHAIR HUGHES noted that Ms. Carpenter indicated she had an answer to an earlier question about legislative oversight in the unorganized borough.

4:43:43 PM
MS. CARPENTER, Department of Environmental Conservation, advised that according to art. X, sec. 6 of the Alaska Constitution, the legislature has the power of assembly in the unorganized borough. Therefore, it will continue to have siting authority for microreactors in the unorganized borough. SB 177 eliminates the legislative siting authority in the organized borough, but NRC, DEC, and the municipality with jurisdiction will need to sign off on the siting.

4:44:45 PM
CHAIR HUGHES thanked the presenters and held SB 177 in committee.

4:45:25 PM
There being no further business to come before the committee, CHAIR HUGHES adjourned the Senate Community and Regional Affairs Standing Committee meeting at 4:45 p.m.